

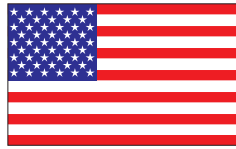
STRENGTHENING INSTITUTIONAL COLLABORATION:

Natural Resource EDUCATION AND RESEARCH In Ethiopia



Final Report
September
2005





OREGON STATE UNIVERSITY
BADEGE BISHAW, CO-DIRECTOR
MARK REED
COLLEGE OF FORESTRY
OREGON STATE UNIVERSITY
CORVALLIS, OR 97331

MARION McNAMARA
OFFICE OF INTERNATIONAL
PROGRAMS
OREGON STATE UNIVERSITY
CORVALLIS, OR 97331

GAIL WELLS
GAIL WELLS COMMUNICATIONS
11370 ELKINS ROAD
MONMOUTH, OR 97361

For more information contact:
Dr. Badege Bishaw
email: badege.bishaw@oregonstate.edu
telephone: 541-737-9495
fax: 541-737-1393
web: <http://www.cof.orst.edu/project/usaidalo/index.htm>



Debub University
Wondo Genet
College of Forestry



DEBUB UNIVERSITY
ABDU ABDELKADIR, CO-DIRECTOR
ZEBENE ASFAW, PROJECT COORDINATOR
MERSHA G/HIWOT
SOLOMON AYELE
TEFERA MENGISTU
GIRMA KELBORO
WONDO GENET COLLEGE OF FORESTRY
DEBUB UNIVERSITY
P.O. Box 128
SHASHAMANE
ETHIOPIA



Ethiopian Agricultural
Research Organization
(EARO)

ETHIOPIAN AGRICULTURAL RESEARCH ORGANIZATION
TSEDEKE ABATE, CO-DIRECTOR
ALEMU GEZAHGNE, PROJECT COORDINATOR
NEGASH MAMO
TESFAYE HUNDE
MENGISTI KINDU
MOHAMMED ADILO
ETHIOPIAN AGRICULTURAL RESEARCH ORGANIZATION
FORESTRY RESEARCH CENTER
P.O. Box 2003
ADDIS ABABA, ETHIOPIA



STRENGTHENING INSTITUTIONAL COLLABORATION: NATURAL RESOURCE EDUCATION AND RESEARCH IN ETHIOPIA

Final Report

September 2005





CONTENTS

| | |
|---|-----|
| Executive Summary | 5 |
| Section I. Introduction | 7 |
| Strengthening Institutional Collaboration: Natural Resource Education and Research in Ethiopia, <i>Badege Bishaw, Marion McNamara, Abdu Abdelkadir, Zebene Asfaw, Tsedeke Abate, and Alemu Gezagen</i> | 9 |
| Section II. Natural Resource Management Program at Wondo Genet College of Forestry | 13 |
| Natural Resource Curriculum Development , Wondo Genet College of Forestry, Debub University, <i>Zebene Asfaw, Badege Bishaw, Abdu Abdelkadir, Mersha G/Hiwot, Solomon Ayele, Tefera Mengistu, and Girma Kelboro</i> | 15 |
| Department of Soil Resources and Watershed Management | 19 |
| Department of Nature Conservation and Ecotourism | 27 |
| Department of Natural Resource Economics and Policy (NREP) | 35 |
| Department of Wildlife and Fisheries Resource Managment | 45 |
| Section III. Integrated Natural Resource Research between OSU-COF and EARO-FRC | 53 |
| Concept Note For Collaborative Research Between OSU and EARO: The Role of an Integrated Forest Management Approach in Arresting Environmental Degradation and Loss of Biodiversity and Improving the Livelihood of Communities, <i>Alemu Gezahgne, Badege Bishaw, Negash Mamo, Tesfaye Hunde, Mengisti Kindu, and Mohammed Adilo</i> | 53 |
| Integrated Watershed Management in Ethiopia: The Case of the Dire Dam Catchment Treatment, <i>Alemu Gezahgne, Badege Bishaw, Negash Mamo, Tesfaye Hunde, Mengisti Kindu, and Mohammed Adilo</i> | 55 |
| Section IV. Workshops on Scientific Communications and Education | 87 |
| Workshop on the Preparation of Scientific Papers and Reports, <i>Gail Wells</i> | 89 |
| Workshops on Communications, Pedagogy, and use of Educational Technology and Needs Assessment at the Forestry Research Center and Wondo Genet College of Forestry, <i>Mark Reed</i> | 95 |
| Section V. Trip Report, November 2-22, 2004..... | 105 |
| Strengthening Institutional Collaboration: Natural Resource Education and Research in Ethiopia, A Project Supported by the USAID Association Liaison Office for University Cooperation in Development, <i>Marion McNamara, Badege Bishaw, International Programs, College of Forestry, OSU</i> | 107 |



STRENGTHENING INSTITUTIONAL COLLABORATION: NATURAL RESOURCE EDUCATION AND RESEARCH IN ETHIOPIA

USAID/ALO Institutional Partnership between Oregon State University, Debu University, and the Ethiopian Agricultural Research Organization

Executive Summary

Ethiopia is currently faced with severe deforestation and environmental degradation. Degradation of natural resources, such as vegetation, soils and water, lead to low agricultural productivity resulting in decreasing income and food insecurity. The increase in population, about 2.9% per year, increases the demand for these natural resources, worsening the environmental degradation and poverty in the country. This project addresses the preparation of trained professionals to better manage existing natural resources and develop sound research to address food insecurity and natural resource problems. To achieve these objectives the partnership has outlined four major activities: (1) development of a natural resource curriculum; (2) preparation of problem-solving, applied research proposals; (3) presentation of a workshop on communications and scientific writing skills, and (4) presentation of a workshop on communications, pedagogy, and use of educational technology.

Early orientation and planning meetings were held by project co-directors of the three institutions from Oregon State University (OSU), Debu University (DU) and the Ethiopian Agricultural Research Organization (EARO) at Wondo Genet and Addis Ababa, Ethiopia. To accomplish the objectives of the project the partnership established two task forces at Wondo Genet College of Forestry (WGCF/DU) and three working groups at the Forestry Research Center (FRC/EARO). Task forces at WGCF were involved in need assessment surveys and the development of a natural resource curriculum and an accompanying project document to implement the programs. The working groups at FRC/EARO were involved in the preparation of problem-solving, applied research proposals in the different agro-ecological zones of the country. Two faculty members from OSU conducted workshops on communications and scientific writing skills and on pedagogy and the use of educational technology to faculty and staff members of WGCF and FRC. Through these workshops, 49 Ethiopian faculty and staff members obtained short-term training that has helped them improve their communications, scientific writing, and teaching skills.

To implement the different activities of this project, funding in the amount of \$124,000 was provided by the USAID Association Liaison Office for University Cooperation in Development, Washington, D.C. Oregon State University and the Ethiopian partner institutions have also contributed \$38,809 as a cost-share commitment to the project. In addition, OSU has contributed \$10,000 in the preparation of this report. The partnership has also secured additional funding of \$12,300 from the USAID Mission in Addis Ababa, Ethiopia, to run the Natural Resource curriculum review workshop at WGCF. The workshop involved different stakeholders, such as teachers, researchers, managers, and policy makers. One output from this workshop is the Proceedings of the Undergraduate Natural Resource curriculum workshop. It has been prepared as a separate document and is available as part of the final report. An additional project document that identifies the needed personnel, facilities, equipment, and budget to start the new natural resource program at WGCF was prepared by the Task Force. The Working Groups at FRC have developed a concept note that outlines the framework for preparing three project proposals in the different agro-ecological zones of the country; however, one complete proposal for an integrated watershed management project in Ethiopia has already been prepared and is included in the final report. The research concept note and the proposal are included in section III of this report.

Despite the many achievements, the partnership has faced major difficulties in communication. The Ethiopian partner institutions, both WGCF and FRC, have serious problems involving Internet communications. This has delayed communications between the partner institutions and has limited the exchange of information.

Finally, on behalf of all the three partner institutions, I would like to thank the USAID/ALO in Washington D.C.; the USAID mission in Addis Ababa, Ethiopia; Debub University Wondo Genet College of Forestry; the Ethiopian Agricultural Research Organization Forestry Research Center, and the College of Forestry and the International Education and Outreach Office at Oregon State University for providing financial and other necessary support to successfully complete this project.

Badege Bishaw, Ph.D.
Project Co-Director and
Director of International Programs
College of Forestry
Oregon State University

SECTION I

Introduction





STRENGTHENING INSTITUTIONAL COLLABORATION: NATURAL RESOURCE EDUCATION AND RESEARCH IN ETHIOPIA

Badege Bishaw,¹ Marion McNamara,² Abdu Abdelkadir,³ Zebene Asfaw,³ Tsedeke Abate,⁴ and Alemu Gezagen⁴

INTRODUCTION

Human needs for food, fuelwood, and fodder in Ethiopia have led to deforestation, overgrazing, the depletion of land and water resources, and a wide variety of environmental problems. To solve these problems and ensure that future generations can enjoy the benefits of the earth's natural resources, a better and more careful management of these resources is needed. To support this effort there is a great need for natural resource management professionals to train today's farmers and managers and educate the next generation.

Wondo Genet College of Forestry is responding to this challenge by establishing a Bachelor of Science degree program in Natural Resource Management with four major specialty areas. Along with natural resource education, it is equally important to undertake development-oriented research that will address real-life issues and, in turn, also improve the quality of education. The Forestry Research Center at the Ethiopian Agricultural Organization (EARO) and WGCF have national mandates to conduct research on the biology and social issues of natural resources. Strengthening WGCF/DU and FRC/EARO in natural resource education and research will help them play an important role in conserving and developing forestry and natural resources and addressing food security issues in the country.

To achieve the needed strength and qualifications, WGCF and EARO initiated a collaborative agreement with Oregon State University (OSU) in the U.S.A. Oregon State University has internationally recognized academic and research programs in natural resource management, forestry, and agriculture. As partners to these Ethiopian Forestry institutions, OSU will provide assistance in developing their academic and scientific capacity and infrastructure in order to

To ensure that future generations can enjoy the benefits of the earth's natural resources, a better and more careful management of these resources is needed. . . . There is a great need for natural resource management professionals to train today's farmers and managers and educate the next generation.

¹College of Forestry, Oregon State University (OSU); ²Office of International Programs, OSU; ³Wondo Genet College of Forestry, Debu University; ⁴Ethiopian Agricultural Research Organization, Forestry Research Center.



address challenges to Ethiopia's natural resources and food security. This collaborative project is funded by the USAID Association Liaison Office (ALO) for University Cooperation in Development.

The major goal of the project was to build human capacity in natural resource management by improving the preparation of professionals. Specific objectives include the following: (1) To strengthen the capacities of Wondo Genet College of Forestry (WGCF) to design and implement educational, research, and outreach programs in natural resource management (NRM) and conduct training for faculty in using appropriate pedagogical skills. (2) To strengthen the capacities of EARO's Forestry Research Center staff by developing their research skills through short-term training workshops on proposal writing and on the preparation of scientific papers and reports. (3) To identify opportunities for students and faculty exchanges and for collaborative research and education among partners. (4) To collaborate in conducting needs assessment at WGCF and FRC that will help direct the future use of resources in the most efficient and effective ways.



Through this linkage project, Dr. Badege Bishaw, from the College of Forestry Oregon State University, visited Ethiopia for three weeks in July 2003. While in Ethiopia, Dr. Bishaw's main tasks were to assist the Wondo Genet College of Forestry with NRM curriculum development, and the Ethiopian Forestry Research Center in preparing development-oriented research proposals. At WGCF, Dr. Bishaw was hosted by a faculty Task Force, which worked with him on NRM curriculum development. Dr. Bishaw had various meetings with Dr. Abdu Abdelkadir, Dean of Wondo Genet College of Forestry, and members of the faculty Task Force. He also met with the Director and the staff members of the Forestry Research Center in Addis Ababa, Ethiopia. During these meetings at WGCF and FRC, Dr. Bishaw gave a seminar on the overview of project objectives and activities planned for the collaborative project. The subsequent paragraphs describe the agreed-upon work plan for the project by the WGCF and EARO in Ethiopia.



WONDO GENET COLLEGE OF FORESTRY

The Wondo Genet College of Forestry in Ethiopia has planned to launch a Natural Resource Management program with four major departments: Soil Resources and Watershed Management; Nature Conservation and Ecotourism; Natural Resource Economics and Policy; and Wildlife and Fisheries Management. Faculty task forces were established to assist in the development of the Natural Resource curriculum. The curriculum development process included need assessment of stakeholders. Based on the needs of stakeholders, the draft curriculum was prepared in August 2004. A national workshop to review and improve the curricula of the various programs was scheduled for November 2004. About 100 participants, including many stakeholders, teachers, students, policy makers, and people interested in natural resource management attended

and participated in the workshop. This process was very critical in making the training relevant to existing conditions. Based on the comments and feedback from the stakeholders, the proceeding of the curriculum review workshop was prepared. Some of the procedures and outcomes of the natural resource curriculum for the four departments will be presented in section II of this report. The proceeding of the curriculum workshop will be presented as a separate document of this report. For more information on the curriculum, please see the Proceedings of the NRM Curriculum Workshop.

FORESTRY RESEARCH CENTER

The Forestry Research Center in Addis Ababa, Ethiopia, focuses on developing client-oriented, multidisciplinary applied research proposals to help solve societal problems in natural resource management. The proposed research will try to reach three different agro-ecological zones of the country: the highlands, medium altitudes, and the lowlands. It will use a watershed approach and will follow Participatory Rural Appraisal methodology to identify problems of natural resource management and suggest potential alternative technologies. The Center established three Working Groups to prepare proposals. A concept note that outlines the framework for the individual proposals was prepared in August 2004. One draft proposal on integrated watershed management for Ethiopia was prepared by the end of 2004, and was reviewed by peers from universities and other institutions, stakeholders, farmers, and policy makers who will be beneficiaries of the research results. The research concept note and the integrated watershed proposal with a case study will be presented in section III of this report.

ORGANIZATIONS VISITED IN ETHIOPIA

Establishing a new NRM program at Wondo Genet College of Forestry and developing additional NR research proposals at the Forestry Research Center in Addis Ababa, Ethiopia will have implications for national education and development policies. To introduce the new partnership and obtain feedback, Dr. Bishaw had the opportunity to visit the various ministries, the USAID mission in Addis Ababa, and governmental and non-governmental organizations (NGOs). During these meetings, Dr. Bishaw briefed the ministers and various institution leaders about the objectives of the collaborative project between OSU, WGCF (DU), and FRC (EARO), and the establishment of the new NRM program at WGCF. All individuals contacted have expressed interest and are willing to support the effort to establish a new program of NRM in Ethiopia. There were also requests and suggestions from some of the ministers on the possibility of expanding this effort to other universities in the country and providing natural resource training at both diploma and certificate levels. These ideas were very well received; however, due to limited resources and time, the partnership was forced to focus





on developing the educational and research capacity at WGCF and FRC/EARO at this time. These possibilities can be entertained in the next phase of the project, however.

The Project Co-Directors from OSU, WGCF, and EARO also attended the USAID/ALO Annual Conference in Washington, D.C., where they conducted presentations and participated in discussions. After the conference the project co-directors from WGCF and EARO visited OSU and toured its teaching and research facilities. They met with deans, directors, and the vice provost of the university, and discussed future collaboration. Two of the project coordinators from WGCF and FRC have also made a working visit to Oregon State University to discuss and consult with respective faculty members on the draft natural resource curriculum and research proposal. Faculty from the College of Forestry and the Department of Fisheries and Wildlife provided valuable comments and suggestions on improving the draft natural resource curriculum developed by the WGCF task force. Last, but not least, the Vice Minister of Higher Education in Ethiopia also made a two-and-a-half day working visit to Oregon State University while he was on another mission in the U.S. He met with deans, directors, and the vice provost of the university and discussed how to implement the new natural resource program in Ethiopia. They have agreed in principle to continue the existing partnership and expand the collaboration in other areas of specialization. Together they will look for funding to implement the new program.

This report covers the work achieved by the partnership during the last two years. Section II covers the natural resource curriculum developed for WGCF. Section III covers the research concept note and an integrated watershed management proposal for Ethiopia by EARO. Section IV addresses training on communications, writing, and pedagogy skills conducted by Mrs. Gail Wells and Mr. Mark Reed for faculty and staff members at WGCF and FRC/EARO. Section V is a report on a trip to Ethiopia taken November 2-22, 2005. Faculty from OSU, including Dr. Bishaw, from the COF and Ms. Marion McNamara, from the Office of International Programs, visited different ministries and universities in Ethiopia to explore future collaborations

There are also two supplemental documents to this report prepared by the partnership. One of them is the Proceeding of the Natural Resource Curriculum Workshop held November 6-7, 2004 at WGCF. The other report is a Project Implementation Document prepared by WGCF as a companion to the proceeding. This document covers the curriculum and the needed faculty, equipment, and facilities to implement the new natural resource program at WGCF. These two separate documents are submitted as part of this final report, as volumes 2 and 3.

SECTION II



Natural Resource Management Program at Wondo Genet College of Forestry





NATURAL RESOURCE CURRICULUM DEVELOPMENT

WONDO GENET COLLEGE OF FORESTRY, DEBUB UNIVERSITY

Zebene Asfaw, Badege Bishaw, Abdu Abdelkadir, Mersha G/Hiwot, Solomon Ayele, Tefera Mengistu, and Girma Kelboro

A brief brainstorming exercise with the aim of the future expansion of the college was initiated by the head of the college. The first idea about opening a natural resource program was initiated during the brainstorming exercises among the college staff. To assess the potential and develop a new program in natural resource management, a task force consisting of six members, five from Wondo Genet College of Forestry, Debub University, and one from the College of Forestry, Oregon State University, was assembled in March 2003. As it was difficult to start from scratch, the task force agreed to conduct need analyses through inquiries. Hence the task force began by developing a checklist and conducting a survey aimed at understanding the human resources need in natural resource management. About 110 respondents representing different institutions and prominent professionals in natural resources and related fields were identified. The institutions considered included major departments in Oromia, Southern Nations, Nationalities and People Regional States, one Agricultural Bureau from Amhara Regional State, various organizations and offices at the federal level, universities, research institutions, and NGOs; prominent professionals were also included.

During the survey 93 respondents were interviewed. The result of the survey indicated 18 different fields of specialization related to natural resources. The six fields most often identified, in order of ranking, were (1) Soil Conservation and Watershed Management, (2) Forestry, (3) Water Resource Management, (4) Wildlife and Fisheries, (5) Biodiversity, Nature Conservation and Ecotourism, and (6) Economics and Policy (social issues). Because forestry education is already well established at Wondo Genet College of Forestry, it was omitted from the ranking. Based on this finding, a curriculum for an undergraduate program in General Natural Resources Management was prepared and reviewed by the staff of the college and some prominent professionals. The curriculum was then approved by the academic commission of the College. Debub University and the Ministry of Education accepted this undergraduate



program in August 2003. Currently there are two batches of student in the program.

To assess the relevance of the new curriculum, the task force prepared a checklist and surveyed 150 summer students who have had rich experiences (7-21 years as semi-professional) in the field of agriculture and forestry. The feedback indicated that the curriculum is too broad and general. The respondents felt that such a broad approach might not allow the graduates to be employed in specialized fields/projects.

Then the task force went back to the original ranking results and raised the issue to the staff of the College at Wondo Genet. During the staff meeting, it was agreed that new programs should be developed, namely, Soil Resources and Watershed Management, Natural Resource Economics and Policy, Wildlife and Fisheries Management, and Nature Conservation and Ecotourism. To develop a curriculum for each individual program, a subcommittee was established. The work of the subcommittee was compiled by the task force and the first draft was submitted for review by prominent scientists in the respective fields at Oregon State University.

This draft document was enriched by comments and suggestions from scientists at Oregon State University and others within the country. Then the revised draft document was distributed to the participants of the workshop two weeks ahead of time. The participants were selected based on their professional background and experiences.

During the curriculum review, an overview of the curriculum for each individual department was presented by the members of task force responsible for curriculum development. The presentation centered mainly on the relevance of the respective department, the graduates' profile, graduates' career options (sustainability and attractiveness of the program), and lists of proposed courses, including common and specialized courses.

Based on the comments and suggestions from the participants during the curriculum review workshop, the following curriculum for the four major departments were developed. For each department, we will provide background, justification, objectives, graduate profile, area of competence, admission requirements, evaluation methods, graduation requirements, degree awards, course categories, course coding, and a list of courses.





DEPARTMENT OF SOIL RESOURCE AND WATERSHED MANAGEMENT

1. BACKGROUND

The diverse nature of climate, physiographic conditions, and soil types in Ethiopia has resulted in diverse types of land and water resources, which have favored the development of a mosaic of farming systems and human settlements in the country. However, these resources are being consumed at an increasing rate under the combined effect of population pressure, mismanagement of the resource, and the overutilization of the land cover.

Low capital investment, low and erratic rainfall patterns, a fast-growing population, lack of sufficient infrastructure, and low access to basic services, provide the usual detrimental combination of elements leading to chronic poverty, lack of income alternatives, accelerated depletion of the natural resource base, and severe food insecurity. The government of Ethiopia and the international community have increasingly turned their attention to finding original and sustainable multi-sectoral solutions to the complex problems associated with the development and productivity of drier and marginal areas. The development of agriculture and infrastructure in arid and semi-arid regions is possible only if adequate and productive soil and water conservation measures are implemented and integrated into land management practices.

2. JUSTIFICATION

Ethiopia has one of the richest water resource potentials in the world. Its water resources could be sufficient for domestic water supply, irrigation, and hydro-power generation. Despite this fact, however, the contribution of irrigation for the development of agricultural practices is inadequate.

The most limiting factors to agricultural productivity in the country are soil fertility and moisture. Currently moisture conservation (water harvesting) is one of the main strategies of the government for the alleviation of poverty and food insecurity. To meet this demand, there is a high need for quality professionals in the field of soil resources and watershed management who can design and plan strategies for the sustainable utilization and management of these resources.

To combat soil and water degradation through proper use and conservation of natural resources, to promote a sound management of soil and water resources, and to coordinate efforts with the “agricultural development-led industrialization” strategy for the country, it is crucial to produce competent professionals in soil resources and watershed management. This program will



make a significant contribution toward the alleviation of poverty and the improved livelihood of rural peoples by integrating human needs into project planning and development through its multidisciplinary educational approach.

3. OBJECTIVES

3.1. General Objective

The general objective of the curriculum for this department is to produce skilled and qualified experts and managers in soil and water through education, research, and extension for the development of the country.

3.2. Specific Objectives

- ❖ Offer training to provide students with basic and applied knowledge in planning, designing, and implementing sustainable soil and water conservation, water harvesting and soil fertility management, environmental management, and rural water supply
- ❖ Apply the acquired skill and knowledge in identifying various problems related to population, environment, soil, and water in various watershed areas
- ❖ Initiate and actively participate in multidisciplinary research activities by creating an environment conducive to the participation of concerned stakeholders in the sustainable development of a defined watershed, and the alleviation of poverty and improved livelihood of communities



4. GRADUATE PROFILE

Upon successful completion of the program, graduates are expected to

- ❖ Plan and design water-harvesting (moisture conservation) techniques that could be fundamentally important in supplementing drought-affected areas.
- ❖ Plan and designing integrated soil and water management projects/programs, and develop a sustainable and wise use of scarce water and soil resources to improve the livelihood of the population at large.
- ❖ Plan, design, and implement irrigation, drainage, rural water supply, and sanitation schemes, together with operation and maintenance
- ❖ Contribute to development activities to combat soil degradation and better manage the soil and water resources by introducing new technologies in land-management practices



- ❖ Demonstrate profound knowledge and understanding of the problems of soil and water and be able to contribute to the appropriate and sustainable exploitation of land and water, thereby resolving problems of resources deterioration
- ❖ Coordinate and reconcile the various interest of stakeholders involved by maximizing the land-use potential of a watershed
- ❖ Have increased understanding of the major processes involved in soil degradation and the capacity to design and implement relevant intervention
- ❖ Have attained the knowledge and skills to assess and evaluate the potential and capacity of a watershed by designing and implementing appropriate land-evaluation techniques
- ❖ Undertake basic and applied research on problems related to soil and water; teach courses on responsible soil and water management

5. AREA OF COMPETENCE OR CAREER OPPORTUNITIES FOR SOIL RESOURCES AND WATERSHED MANAGEMENT STUDENTS

High employment demands at international and national organization levels; graduates can pursue careers as planners, decision makers, academicians, consultants and professional managers in vegetation, soil, and water resources. They can be specialists in soil, vegetation, water, environmental, and rural development.

6. ADMISSION REQUIREMENTS

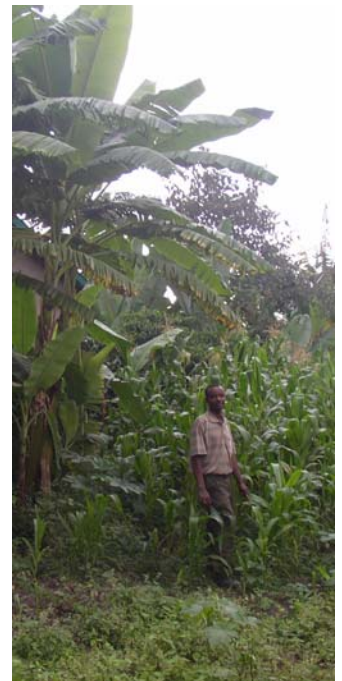
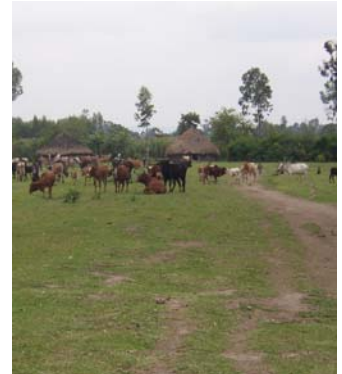
The requirements for admission and graduation are as per the university registrar's rules and regulations. The program demands students with a strong background in natural and social science; those who have a special concern for environmental and social issues are encouraged.

7. EVALUATION METHODS

In addition to the university's general examination regulations (mid- and final semester examinations), students will be evaluated on practical work (both in group and as individuals), field reports, and assignments.

8. GRADUATION REQUIREMENTS

The SRWM program runs for three academic years to qualify students for the award of a B.Sc. degree in SRWM. A candidate shall take all the required





courses and score a cumulative grade point average (CGPA) of not less than 2.00 and no “F” grade in all the courses taken to fulfill the requirements for graduation.

9. DEGREE AWARDED UPON GRADUATION

Up on successful completion of the program as indicated above the degree awarded will be the “Bachelor of Science in Soil Resources and Watershed Management.”



10. COURSE CATEGORY

The various courses to be offered in the SRWM program are categorized according to the relationship of their contents. Therefore courses that have some common boundaries or areas are grouped together.

Category 1

Introduction to Crop Production, Introduction to Livestock Production, Introduction to Forestry, Farming Systems, Agroforestry Principles and Practices, Non-timber Forest Products, Introduction to Wildlife and Ecotourism, Introduction to Fisheries

Category 2

Natural Resources and Demography of Ethiopia, Introduction to Climate, General Ecology, Introduction to Environmental Science

Category 3

Surveying, Introduction to Computers and Programming, Remote Sensing, Geographic Information Systems

Category 4

Soil Chemistry, Soil Physics, Soil Biology, Geology, Soil Genesis and Classification, Soil and Plant Nutrition

Category 5

Introduction to Hydrology; Irrigation and Drainage, Water Harvesting, Water Resource Management

Category 6

Soil Erosion Assessment, Rehabilitation of Degraded Lands, Soil Conservation, Socioeconomics of Erosion and Soil and Water Conservation



Category 7

Forest Management Planning, Dry and Wet Land Management, Land Use Planning, Watershed Management Planning,

Category 8

Natural Resource Economics, Rural Sociology and Development, Extension in Natural Resource Management, Participatory Natural Resource Management, Natural Resource Policy and Legislation, Indigenous knowledge and Conflict Management

Category 9

Sophomore English, Introduction to Statistics, Research Methods, Senior Seminar, Senior Research Project

11. COURSE CODING

Coding of the courses offered by the department of SRWM is represented by “SRWM” followed by a three-digit figure. The first digit represents the year in which the course is offered to undergraduate students. The second digit represents the course category and the last digit corresponds with the semester within which the course is to be offered (odd consecutive number for first semester and even consecutive number for the second semester). The major area courses which are unique to the department are the major area courses whereas other relevant courses taken from other programs and departments within the university are supportive courses (some of the supportive courses from other departments retain the original code) assigned in the home department.

12. LIST OF COURSES

The proposed courses of the department of SRWM are divided in to three sub sections, the *Supportive courses*, (50 credit hours), the *Major area courses* (58 credit hours) and the *Elective* (20 credit hours). The letter “E” in the bracket indicates elective courses. In any semester when the electives are more than one, students are required to take at least one as compulsory course.

| No | Course No. | Course title | Credit |
|----------------------|------------|--|--------|
| I Supportive Courses | | | |
| 1 | NaRM221 | Introduction to Natural Resources and Demography of Ethiopia | 3 |
| 2 | FLEN 201 | Sophomore English | 3 |
| 3 | Stat 273 | Introduction to Statistics | 3 |
| 4 | SRWM 111 | Introduction to Forestry | 3 |





| | | | |
|-----------------------|------------|--|--------|
| 5 | CEE 111 | Introduction to Civic and Ethical Education | 3 |
| 6 | | Introduction to Crop Production | 2 |
| 7 | | Introduction to Livestock Production | 2 |
| 8 | NaRM 215 | Introduction to Climate | 2 |
| 9 | NaRM 213 | General Ecology | 2 |
| 10 | NaRM 224 | Introduction to Environmental Science | 2 |
| 11 | Comp 203 | Introduction to Computer and Programming | 3 |
| 12 | SRWM 213 | Introduction to Wildlife and Ecotourism | 3 |
| 13 | SRWM 237 | Surveying | 3 |
| 14 | SRWM 231 | Remote Sensing (RS) | 2 |
| 15 | NaRM 431 | Extension in Natural Resource Management | 2 |
| 16 | SRWM 335 | Geographic Information System (GIS) | 2 |
| 17 | NaRM 422 | Natural Resource Policy and Legislation | 3 |
| 18 | Mgmt 414 | Entrepreneurship Development | 2 |
| 19 | SRWM 272 | Natural Recourse Economics | 3 |
| 20 | SRWM 298 | Research Methods | 2 |
| TOTAL | | | 50 |
| II Major Area Courses | | | |
| 1 | SRWM 121 | Soil Chemistry | 3 |
| 2 | SRWM 112 | Introduction to Hydrology | 3 |
| 3 | SRWM 122 | Soil Physics | 2 |
| 4 | SRWM 132 | Introduction Geology | 2 |
| 5 | SRWM 241 | Soil Biology | 2 |
| 6 | SRWM 235 | Irrigation and Drainage | 3 |
| 7 | FaFo342 | Agroforestry Practices and Systems | 3 |
| 8 | SRWM 249 | Soil Genesis and Classification | 3 |
| No | Course No. | Course title | Credit |
| 9 | SRWM 242 | Soil and Plant Nutrition | 3 |
| 10 | SRWM 264 | Soil Erosion Assessment and Modelling | 3 |
| 11 | NaRM 232 | Rural Sociology and Development | 3 |
| 12 | NaRM 462 | Water Harvesting Technology | 2 |
| 13 | SRWM 361 | Rehabilitation of Degraded Lands | 2 |
| 14 | NaRM 465 | Water Resources Management | 3 |
| 15 | SRWM 373 | Watershed Management Planning | 3 |
| 16 | SRWM 367 | Soil and Water Conservation | 3 |
| 17 | SRWM 366 | Socio-economics of Erosion and Soil and Water Conservation | 3 |

| | | | |
|----------------------|----------|---|---------|
| 18 | SRWM 378 | Land use Planning | 3 |
| 19 | SRWM 392 | Community Oriented Practical Education (COPE) | 6 |
| 20 | SRWM 399 | Senior Seminar | 1 |
| 21 | SRWM 394 | Senior Research Project | 2 |
| TOTAL | | | 58 |
| III Elective Courses | | | |
| 41 | SRWM 372 | Dry and Wet Lands Management | 2 |
| 46 | NaRM 332 | Indigenous Knowledge and Conflict Management | 3 |
| 47 | NaRM 432 | Participatory Natural Resource Management | 3 |
| 49 | PrFo 415 | Forest Management Planning | 3 |
| 50 | SRWM 272 | The Role of Forestry in Watershed Management | 3 |
| 51 | FaFo447 | Farming Systems | 2 |
| 52 | FaFo 414 | Non-Timber Forest Products | 2 |
| 53 | NaRM 242 | Introduction to Fisheries and aquatic resources | 2 |
| TOTAL | | | 20 |
| | | | 108/128 |





DEPARTMENT OF NATURE CONSERVATION AND ECOTOURISM

1. BACKGROUND

As the worldwide loss of natural resources has accelerated in recent decades, awareness has increased concerning the potentially disastrous consequences of this trend for the earth's ecological functions and the fulfillment of basic human development needs. This is particularly evident in largely agrarian societies, where people depend directly on natural resources to a far greater extent than do those in more industrialized societies.

In Ethiopia, natural resources are the direct basis for livelihoods. This enormous dependence on resources brings with it a particular vulnerability for every unwise management decision. Environmental degradation that leads to the destruction of the ecosystems must therefore be viewed as a serious threat to the country's future. Most of Ethiopia's ecosystems are coming under increasing pressure, and it has become more evident that ways must be found to raise production and incomes, while simultaneously learning how to better manage the resource base. Even so, Ethiopia still contains a wealth of diverse ecosystems; hence the opportunity still exists for proactive intervention. Not only is the natural environment among the richest in the world, but much of this endowment still remains. To prevent declining productivity due to environmental degradation, conservation-based practices must be established through all methods of securing livelihoods. The international dimension of the current nature- and community-based ecotourism industry is highly encouraging. In addition to its cultural heritage, Ethiopia is endowed with rich natural landscapes and biological diversity that will be a huge venue for the ecotourism industry in the 21st century.

The setting aside of landscapes and biological resources for ecotourism has the potential to contribute to the restoration of degraded areas. When human activities are halted, wildlife conservation areas and other landscapes often see a restoration of native vegetation, which will again contribute to the development of watershed and stable hydrological effects and conservation of soils. The current national conservation strategy of Ethiopia focuses on the conservation of natural resources and emphasizes a concern over resource degradation and devaluation. This concern is reflected in the Rural Development Policy and Strategy (2002), which is based on conservation and the appropriate use of natural resources, as well as in the Food Security Strategy (2002), which again recognizes environmental resources sustainability as a critical factor in economic development.



The strategic plan of Debub University also envisages that Wondo Genet College of Forestry will become a university College, with more programs open at both the graduate and undergraduate level. New training programs in the area of community-based natural resource management are imperative for achieving these goals. Hence, the study of conservation-based utilization of natural resources and nature-based tourism development is of increasing importance.



Wondo Genet College of Forestry, with its human resources and physical facilities, is an ideal place to launch a new program in *nature conservation and ecotourism*. Other programs within the College will support and enhance this new department and help it achieve its objectives.

2. JUSTIFICATION



Growing population densities lead to a scarcity of resources and widespread changes in land uses. The transition to sustainable economic growth requires a broad-based change in thinking about natural resources and in the ways that decisions are made about investment and proper utilization. To ensure that future generations can benefit from the earth's natural resources, a better and wiser management of these resources is needed.

Ethiopia is said to be home to a diversity of natural resources; however these resources have not been effectively conserved and managed so as to generate a sound economic return for the country. This is mainly attributed to a lack of skilled professional natural resource managers in this area. To this end, the Department of Nature Conservation and Ecotourism will contribute to the development of skilled and trained personnel in this field.

Before the current problems create severe consequences for the natural resources of the country, as well as irreversible economic burdens on rural communities, Ethiopia must produce competent professionals in the area of conservation-based natural resource management. These natural resource professionals will enable proper planning, empowering and advising the management of rural lands so that all activities are conservation based. To meet these demands, the new department will offer multidisciplinary educational opportunities through the provision of broad and diversified knowledge in the techniques of nature conservation and ecotourism.

3. OBJECTIVES

3.1. General Objectives

The main objective of this department is to produce resource conservationists who are multidisciplinary in approach and able to assist in the development of a holistic, sustainable, nature-based tourism industry.

3.2. Specific Objectives

- ❖ Offer training in nature conservation and ecotourism that will assist in establishing a strategic natural resource and land-use planning system.
- ❖ Improve the knowledge, skill, and attitude of students in order to better contribute to the empowerment of local communities in the sustainable use of resources
- ❖ Produce graduates who can conduct systematic research to examine and understand the complexity of factors involved in ecosystem management and the ecotourism industry
- ❖ Offer training that will enable graduates to be involved in policy formulation and implementation processes
- ❖ Generate problem-solving and need-based knowledge and skills to improve the quality of education and the livelihoods of local communities
- ❖ Provide consultancy services and become involved nationally and internationally in this field

4. GRADUATE PROFILE

The graduates should provide insight into the opportunities and limitations of the natural resource base of the country in order to advise sustainable management of the resources. They are expected to have broad and substantive knowledge of wildlife and wildlife management geared towards sustainable income generation schemes. This will enable them to be able to analyze information and apply it toward re-enforcing government institutions, while also assisting with the development and start-up of self-help initiatives, including private entrepreneurship. On completion of the courses graduates are expected to know

- ❖ The Conservation of Natural Resources and Strategy (2002) which basis on conservation and appropriate use of natural resources, the Food Security Strategy (2002), which again recognizes environmental resources sustainability as a critical factor in economic development, indicates a point of concern on resource degradation and devaluation
- ❖ Provide an insight in to the opportunity and limitations of the natural resource base in order to advise local development within the framework of national conservation plans, policies and strategies
- ❖ Apply the acquired knowledge and skill in identifying key actors in nature conservation in their respective interest fields and play a role in creating a conducive environment for resource-use systems that conserve nature





- ❖ Apply the acquired knowledge, skill, and attitude toward participatory management systems that better help achieve the national conservation strategy and rural development policy of the country
- ❖ Combine indigenous and modern knowledge systems to develop a deeper understanding of the full range of nature conservation concerns and associated income-generation schemes, including community-based ecotourism
- ❖ Have the basic skills to conduct action-oriented research independently in his/her profession and write clear reports to scientific standards
- ❖ Involve in project planning, monitoring, and evaluation components in terms of conservation of nature and community-based ecotourism and provide feedback to the community and to policy makers
- ❖ Introduce innovative knowledge and skill in nature and community-based ecotourism
- ❖ Introduce better land-use planning and more appropriate matching of production technologies to local ecological constraints
- ❖ Strategically develop planning at different levels to ensure that the country's unique biological heritage is not needlessly sacrificed
- ❖ Assist local communities to develop the nature- and community-based ecotourism industry
- ❖ Make an effort in proper planning, empowering, and advising rural land management and community based ecotourism so that all activities will be conservation based
- ❖ Involve in decision-making (policy) processes related to natural resources.

5. RESOURCES

5.1. Physical Facilities

There are physical facilities in Wondo Genet College of Forestry available for undergraduate training programs in different departments. Other programs within the College are important assets that will complement and support the new department. Lecture rooms, equipped laboratories, a well-stocked library, GIS laboratories furnished with latest and most highly advanced equipment and software, and computer lab and field stations are at hand for teaching and research.

But some of these facilities are limited and will need to be re-enforced by additional capacity-building activities. In addition, since natural resource management is a multi-disciplinary field, some of the material and staff resources for training are expected from external sources. In this regard, the faculty of Agriculture in Awassa, which belongs to the same university, will enrich the program through lectures and sharing of field facilities. The university as a whole will conduct the core part of the program. Collaborating government organizations

will also participate in teaching and field training. Expatriate staff from other international universities, such as Oregon State University (OSU), will be involved in training from the outset. However, the future staff training and human resource development plan must consider the human resource requirements for the new department.

5.2. Financial Resources

The program will be run by government support and other financial assistance from donors.

6. RULES AND REGULATIONS

All the academic rules and regulations of Debub University will also apply for this department.

6.1. Admission Rules

For admission in the department candidates should successfully complete the 10+2 preparatory program and pass the university entrance examination, or have earned a diploma from a technical college and fulfill the requirements for advanced standing.

6.2. Evaluation Methods

Student evaluation will include two major examinations (mid-semester and final), practical assignments, quizzes, and field evaluations. This will take a form of continuous assessment. As this program may basically focus on extended practical exercises, the achievement of students in field practical exercises and subsequent reports will be an important component of the evaluation process.

6.3. Graduation Requirement

To qualify for award of the degree in the department, a candidate shall take all the required courses and score a cumulative GPA of not less than 2.00.

7. DEGREE AWARDED UPON GRADUATION

Up on successful completion of the program as indicated in section above the degree will be awarded as be awarded the degree of “Bachelor of Science in Nature Conservation and Ecotourism.”

8. COURSE CODING

Coding of courses offered by the department of Nature Conservation and Ecotourism is represented by “NCET” and followed by a three-digit number. The





first digit indicates the year of study, the second represents the category of the department, and the third shows the semester in which the course is offered. Non-departmental courses from other departments of the university are retained with original code assigned in the home departments.

9. COURSE DESIGN

The minimum total credit hour requirement for successful completion is 108 credit hours. The courses are identified in three major focus areas. These are Major courses (53 credit hours including COPE), Common Courses (50 credit hours) and Elective Courses (12 credit hours).

10. LIST OF COURSES

The courses proposed for the department of Nature Conservation and Ecotourism are indicated in the table below. When there are two or more elective courses in the same semester, it is compulsory for the student to take the minimum requirement.

| No | Course Title | Credit Hours |
|--------------------|---|--------------|
| Courses Category 1 | | |
| 1 | Tourism Marketing & Administration | 3 |
| 2 | Tourism and Recreational Area Management | 3 |
| 3 | Nature Reserve & wildlife Management | 3 |
| 4 | Urban Forestry (E) | 2 |
| 5 | Communication skills in tourism | 2 |
| 6 | Introduction to Forestry | 3 |
| Courses Category 2 | | |
| 7 | Principles of Taxonomy | 2 |
| 8 | Ecosystem Management | 3 |
| 9 | Landscape Ecology | 3 |
| 10 | Restoration Ecology | 2 |
| 11 | General Ecology 2 | |
| 12 | Introduction to Environmental Science | 2 |
| 13 | Energy Resources Management (E) | 2 |
| 14 | Environmental Impact Assessment (E) | 3 |
| 15 | Introduction to Wildlife and Fisheries | 3 |
| Courses Category 3 | | |
| 16 | Natural Resources and Environmental Economics I | 2 |
| 17 | Nature conservation policy | 3 |
| 18 | Management Accounting | 3 |
| 19 | Introduction to Anthropology | 3 |
| 20 | Physical Geography & Demography | 3 |

| | | |
|----|--|-----|
| 21 | Participatory Natural Resource Management | 3 |
| 22 | Natural Resources and Environmental Economics II | 3 |
| 23 | Indigenous knowledge and conflict management | 3 |
| 24 | Rural Sociology and Development | 3 |
| 25 | Extension | 2 |
| | Courses Category 4 | |
| 26 | Introduction to climatology | 2 |
| 27 | Integrated Watershed Management | 3 |
| 28 | Introduction to Computer Use | 3 |
| 29 | Introduction to Agriculture | 2 |
| 30 | Introduction to Soil Sciences | 2 |
| 31 | Surveying and Mapping | 3 |
| 32 | Soil And Water Conservation | 2 |
| 34 | GIS and remote sensing | 2 |
| 35 | Land use planning | 3 |
| 36 | Project planning (E) | 3 |
| | Courses Category 5 | |
| 37 | Introduction To Statistics | 3 |
| 38 | Introduction to Civic and Ethical Education | 3 |
| 39 | Entrepreneurship Development | 3 |
| 40 | Research Methods | 3 |
| 41 | Communication Skills in Tourism II (E) | 3 |
| 42 | Sophomore English | 3 |
| | COPE with 6 Credit hours | |
| | Total hours | 109 |





DEPARTMENT OF NATURAL RESOURCE ECONOMICS AND POLICY (NREP)

1. BACKGROUND

The technical field practitioners working in different parts of Ethiopia have acknowledged the alarming rate of natural resource degradation. The challenge in attempting to reverse the situation has not been so much the technical knowledge, but rather how to deal with socioeconomic components for the practical application of resource management approaches. The survey carried out as part of the expansion of natural resource education and research in the country found that there is a need to focus on socioeconomic issues, which have not received adequate attention in the past. The Government of the Ethiopia has developed a policy direction that is described as “agricultural development-led industrialization.” Attention has been given to agriculture in rural development policies and strategies. The implementation of these strategies demands human resources that can play a leading role. In Ethiopia, agriculture is the largest economic activity, and it depends on the condition of natural resources. For the development of the agricultural sector, it is necessary to have experts capable of properly managing and facilitating the use of natural resources. The realization of the development vision for the country will become more possible when national capacity is created for properly managing the soil, vegetation, water, and other resources. Management and decision making must be conducted in a way that meets the socioeconomic needs of the people while sustaining the natural resources on which society depends. Researchers are needed who can monitor and evaluate the Government policy and make recommendations toward better action, reflecting the dynamic nature of public policies.

Recognizing the shortage of trained personnel for research and development in the country, the Ethiopian Government is engaged in the expansion of education programs in virtually all fields of study. In this regard, Wondo Genet College of Forestry is no exception. The number of students joining higher educational programs has been increasing each academic year, indicating the need for trained personnel in diversified areas of study. This is essential in order to provide opportunities for students entering the College to have alternatives among the different areas of study in natural resource management.

In addition to other departments of natural resource education and research, the Department of Natural Resource Economics and Policy (NREP) has been designed to fill the gap in trained professionals who can take on leadership roles in natural resource management in Ethiopia. The underlying assumption of studies in this department is that natural resources cannot supply goods and services to the extent possible to satisfy the maximum needs of society since natural resources are limited. Professionals working in the area of



natural resource management should be encouraged to recognize that the problem is not simply a lack of natural resources, but it is also strongly linked to managing and utilizing for the best option or combination of objectives among alternative uses. It is therefore necessary to prioritize needs and satisfy them in an order that is based on reliable reasoning.

Due to a lack of trained experts for decision making who are able to take into account the possible consequences of a course of action chosen, degradation of natural resources has been continuing at an alarming rate in Ethiopia. Therefore, the country needs capable professionals to facilitate and promote the socioeconomic and policy decision-making processes required for the optimization of the available natural resources. Additionally, these professionals will assist in making policy decisions about the creation of guidelines that are beneficial to society.

Therefore, the NREP department focuses on producing well-qualified, skilled, and competent natural resource professionals who will address

- ❖ The link between allocating natural resources for various uses and the processes of degradation
- ❖ Micro-and macro-economic aspects of natural resource management
- ❖ Economic valuation of natural resource conservation
- ❖ Benefit-cost analysis of natural resource management activities
- ❖ Optimization of economic benefits and environmental quality
- ❖ Property rights, policy, and legislation in natural resource management
- ❖ Alternative natural resource management approaches that need policy decisions
- ❖ Identification of relevant socioeconomic problems in natural resource conservation and use
- ❖ Practical application of knowledge, experience, and skills developed on the basis of specific contexts

2. JUSTIFICATION

Wondo Genet has an all rounded potential to be center of excellence in linking natural resource education and research to satisfy human needs in a sustainable manner. There is fertile ground in the College to produce professionals who are well equipped with the theoretical knowledge and practical skills to engage in overcoming natural resource-related problems in the country by working together with the diverse social groups. Geographically, Wondo Genet has been an ideal place for training in natural resources. The surrounding environment provides an ideal environment for learning to deal with many issues related to

nature. Students have a relatively close contact with the natural environment, which means that, upon completion of their studies, they have also essentially gained life experience in natural resources over three years' time. This fact has also been enhanced by transferring the Faculty of Forestry from Alemaya University to the College. Of course, the College has more than 25 years of experience in teaching and research in *forestry*, including the diploma program.

This experience also provides input on how to handle educational and research programs in natural resource management. This is important for the extension of the existing education and research programs in forestry to accommodate study of the socioeconomic aspects, not only of forest resources, but also of other natural resources. To begin the department, it is possible to utilize the already existing staff, infrastructure, and facilities, although further improvements will be needed.

Currently, the College is running Development Oriented Interdisciplinary Action Research Program, in which the needs of society are addressed through research emphasizing practical action, imbued with the notion that a problem-oriented approach is necessary in order to change the socioeconomic situation of the country. This places a lot of emphasis on strengthening the department by bringing practical knowledge to the students and stimulating the teaching-learning process. In this way the students can gain tangible practical skills as well as an understanding of socioeconomic and policy issues in natural resource management.

The Government's engagement in expansion of educational programs and increasing the number of students in higher education also has an effect on the College. The number of students placed to Wondo Genet College of Forestry has increased steadily in the last few years. To accommodate the students, there is a need to diversify the fields of study offered in natural resource management at the College.

3. OBJECTIVES

General objective

The main objective of this department is to produce Natural Resource Economics and Policy professionals who can apply multidisciplinary approaches and assist in decision-making regarding natural resource management.

Specific objectives

- ❖ Offer training in natural resource economics and policy that will assist to establish a strategic natural resource management and land use planning system
- ❖ Improve the knowledge, skill and attitude of students to enable them contribute to empowerment of the local communities in the sustainable use of resources





- ❖ Produce graduates that can involve in research to enable systematically examine and understand the complexity of factors involved in natural resource management
- ❖ Offer training that will enable the graduates to involve in policy formulation and implementation processes
- ❖ Generate problem-oriented and need-based knowledge and skills to improve quality of education and livelihood of the local communities
- ❖ Provide consultancy services and participate, nationally and internationally, in areas of natural resource and environmental management.

4. GRADUATE PROFILE

The Department of Natural Resource Economics and Policy graduates should be able to

- ❖ Analyze environments and plan integrated interventions for optimal resource use and hence for economic development
- ❖ Provide information on social, economic, and environmental impacts of alternative natural resource management policies and programs
- ❖ Apply the basic policy and legal instruments required for natural resource conservation and development; recognize the role of institutions in natural resource management
- ❖ Show the interdependence between the economy and the environment, and the application of the theory of natural resource management and be able to advise policy makers on the effect of making more use of these resources
- ❖ Systematically assess and evaluate the resource base for its sustainability under a given ecological and socioeconomic conditions.
- ❖ Investigate the rural and social structures and their influence on sustainable rural development
- ❖ Quantify the benefits and costs of various elements of the natural resource base and make recommendations on the optimal use for increased production.
- ❖ Provide insight on the opportunities and limitations of the natural resource base in order to advise on local sustainable development
- ❖ Incorporate environmental costs and benefits in the national accounting.
- ❖ Conduct research geared towards the management of natural resources for economic development
- ❖ Formulate, design and develop natural resource development projects and undertake monitoring and evaluation activities; plan and organize environmental impact assessment activities.

- ❖ Investigate and describe economic aspects of environmental degradation.

6. AREAS OF COMPETENCE FOR NATURAL RESOURCE ECONOMICS AND POLICY GRADUATES

Below are examples of expert positions with potential activities and responsibilities.

1. *Socio-economist in natural resources*

- ❖ Socioeconomic surveys for soil and water conservation, afforestation/reforestation, biodiversity conservation, common property resource management, wildlife management
- ❖ Project planning and analysis
- ❖ Integrating customary laws and traditional practices with conventional approaches and government laws and regulations
- ❖ Natural resource extension

2. *Natural resource economist*

- ❖ Eco-valuation (economic valuation of ecosystem and natural resources)
- ❖ Environmental impact analysis
- ❖ Strategy and program formulation
- ❖ Policy analysis
- ❖ Designing an appropriate implementation and monitoring and evaluation mechanism of policies, strategies and action programs
- ❖ Natural resource surveys

3. *Natural resource planning expert*

- ❖ Decision-making support among alternative land uses (from both socioeconomic and policy perspectives)

4. *Natural resource policy analyst*

- ❖ Analysis of natural resources and related policies and legislation

5. *Researcher*

- ❖ Natural resource economics and policy issues

6. *Instructor*

- ❖ Natural resource economics and policy issues





6. ADMISSION REQUIREMENTS

Generally, prospective students of the department have to fulfill the admission requirements of Debu University. The NREP Department has a multidisciplinary nature. However, to join the department, it is also necessary for the students to have a strong background in mathematics, as well as other natural and social sciences, and possess an inclination towards socioeconomic and policy aspects of natural resource management.

7. EVALUATION METHODS

In the NREP Department, student evaluation is not just a one-step activity, but a process. In addition to the two major examinations (mid-semester and final), there is also a continuous monitoring of the state of understanding through assignments, term papers, and tests. Active involvement in practical exercises and report writing are important components of the evaluation process.



8. GRADUATION REQUIREMENTS

When all the required courses are taken as indicated in this document, with no 'F' grade in any of the courses taken, and with a cumulative grade point average (CGPA) of not less than 2.00, a student is said to fulfill the requirements for graduation.

9. DEGREE AWARDED UPON GRADUATION

After fulfilling the requirements for graduation, students will be awarded the degree of "Bachelor of Science in Natural Resource Economics and Policy." Special mentions such as "with Distinction" or "with Great Distinction" will be made based on the CGPA requirements set by the University.

10. COURSE CODING

Code of courses whose home base is the department begins with NREP and followed by a three-digit number. The first number indicates the year of study; the second shows category of the course, and the third corresponds to the semester (with an odd number for the first semester and an even number for

the second semester in any of the academic years) within which the course is offered. Regarding course category, basic *economics* courses are given the number one, and the number two is used to identify the *pure economics* courses. Number three; four and five are assigned to *resource economics*, *social and policy*, and *other course* categories respectively. Courses in the last category include those that cannot be grouped easily into areas of studies as they involve two or more components of the general study, and courses that remain to be just one in a given category. Courses in each category are indicated below.

Category 1

Mathematics for Economics, Statistics for Economics, Mathematical Programming, and Principles of Accounting

Category 2

Microeconomics I, Macroeconomics I, Microeconomics II, Introduction to History of Economic Thought, Macroeconomics II, Introduction to Marketing

Category 3

Natural Resource and Environmental Valuation, The Economics of Renewable Resources, The Economics of Non-renewable Resources, The Economics of Forest Resources, Environmental Economics and Policy, Natural Resource Project Planning and Analysis,

Category 4

Rural Development, Introduction to Public Policy and Law, Property Rights and Natural Resource Management, Public Policy Analysis

Category 5

Research Methods for Economics and Policy, International Economics and Globalization, Introduction to Wildlife and Fisheries, Development and Environment, Senior Seminar in Natural Resource Economics and Policy, Introduction to Forestry, Senior Research Project in NREP

These courses are known as the *major courses* whereas other important courses taken from other departments of the College and the University are known as *supportive courses*. Courses in the latter category retain the original code assigned in the home department.



11. LIST OF COURSES*

The courses proposed for the Department of Natural Resource Economics and Policy are listed in the table below. The letter 'E' in the bracket indicates elective courses. Where there are two elective courses in the same semester, it is compulsory for the students to select at least one. Where there is just one elective course, it is up to each student to decide whether to take the course or not.

| No. | Course No. | Course Title | Credit hours |
|---------------|------------|---|--------------|
| Major courses | | | |
| 1 | NREP 111 | Mathematics for Economics | 3 |
| 2 | NREP 113 | Statistics for Economics | 3 |
| 3 | NREP 151 | Introduction to Forestry | 3 |
| 4 | NREP 152 | Introduction to Wildlife and Fisheries | 3 |
| 5 | NREP 112 | Mathematical Programming | 2 |
| 6 | NREP 114 | Principles of Accounting | 3 |
| 7 | NREP 122 | Microeconomics I | 3 |
| 8 | NREP 221 | Macroeconomics I | 3 |
| 9 | NREP 222 | Introduction to History of Economic Thought (E) | 2 |
| 10 | NREP 224 | Microeconomics II | 3 |
| 11 | NREP 232 | Natural Resource and Environmental Valuation | 3 |
| 12 | NREP 242 | Introduction to Public Policy and Law | 2 |
| 13 | NREP 244 | Rural Development (E) | 3 |
| 14 | NREP 252 | Research for Economics and Policy | 2 |
| 15 | NREP 226 | Macroeconomics II | 3 |
| 16 | NREP 234 | The Economics of Renewable Resources | 2 |
| 17 | NREP 331 | The Economics of Non-renewable Resources | 2 |
| 18 | NREP 333 | The Economics of Forest Resources | 3 |
| 19 | NREP 321 | Introduction to Marketing | 2 |
| 20 | NREP 335 | Environmental Economics and Policy | 2 |
| 21 | NREP 341 | Property Rights and Natural Resource Management | 2 |
| 22 | NREP 351 | Senior Seminar in Natural Resource Economics and Policy | 1 |
| 23 | NREP 332 | Natural Resource Project Planning and Analysis | 3 |
| 24 | NREP 352 | International Economics and Globalization | 3 |
| 25 | NREP 354 | Development and Environment | 3 |
| 26 | NREP 342 | Public Policy Analysis | 3 |
| 27 | NREP 356 | Senior Research Project in Natural Resource Economics and Policy | 2 |
| | | Total | 69 |

Supportive courses

| | | | |
|----|-----------|--|-----|
| 1 | NaRM 221 | Introduction to Natural Resources and Demography of Ethiopia | 3 |
| 2 | FLEn 201 | Sophomore English | 3 |
| 3 | CEEd 201 | Introduction to Civic and Ethical Education | 3 |
| 4 | ARSc ____ | Livestock Production | 2 |
| 5 | PISc ____ | Crop Production | 2 |
| 6 | NaRM 224 | Introduction to Environmental Science | 2 |
| 7 | PISc 242 | Introductory Soils | 2 |
| 8 | Comp 203 | Introduction to Computer Science and Programming | 3 |
| 9 | NaRM 232 | Rural Sociology and Development | 3 |
| 10 | Econ 352 | Introduction to Econometrics | 3 |
| 11 | NaRM 461 | Erosion and Soil and Water Conservation | 3 |
| 12 | NaRM 313 | Ecosystem Studies (E) | 2 |
| 13 | NaRM 352 | Remote Sensing (RS) and Geographic Information Systems (GIS) (E) | 3 |
| 14 | NaRM 411 | Environmental Impact Assessment | 2 |
| 15 | NaRM 463 | Integrated Watershed Management Planning | 3 |
| 16 | NaRM 452 | Ecotourism (E) | 2 |
| 17 | NaRM 431 | Extension in Natural Resource Management | 2 |
| 18 | Mgmt 414 | Entrepreneurship Development | 3 |
| | | Total | 46 |
| | | Grand Total | 115 |





DEPARTMENT OF WILDLIFE AND FISHERIES RESOURCE MANAGEMENT

1. BACKGROUND

A shortage of professional field practitioners in various fields of study is one of the most common problems in Ethiopia. This, in turn, has contributed to different kinds of socioeconomic and biophysical problems that seriously affect people's lives, especially in rural areas of Ethiopia. Natural resources degradation is one of the problems challenging land productivity in Ethiopia, and recurrent drought and famine have hit different parts of the country.

To combat and reverse the effects of the aforementioned problems, the Federal Government of Ethiopia has given due emphasis in its educational policy to resolving the problem of shortages of trained personnel in various fields of study and to fill the gaps of professionals for different developmental sectors. This is why the government has designed human capacity-building policy as its major concern and it has been expanding the capacity of higher learning institutions to absorb the maximum number of students in different disciplines. Indicators are evident in the number of new universities and colleges opened and expanded in order to implement the new educational policy of the country.

Debut University is one of the institutions of higher learning newly opened by the Federal Government of Ethiopia to contribute to the training of human resources in the country. This university was established by combining different colleges and newly opened faculties. Wondo Genet College of Forestry (WGCF) is one of the colleges embraced under Debut University upon its inception. The college is diversifying fields of training and is proposing the development of four new departments to address the need for trained personnel in key areas in the country. To this end, the college has completed developing curricula in four fields of study. Among these four proposed departments is the department of *Wildlife and Fisheries Resources Management (WFRM)*. The college hopes that the government will encourage the efforts made in this regard by providing the necessary financial and technical assistance.

2. JUSTIFICATION

Currently, global wild biological resources, together with their physical environment, are in a state of rapid change and are losing their inherent characteristic features that ensure sustainable utilization. Furthermore, rapid global population growth accompanied by high demand for natural resources has accelerated the rate of land-use change and loss of wild biodiversities inhabiting in different



ecosystems. This rate has, of course, a paramount effect at the global level. The rate of loss of wild biodiversities along with their natural habitats is faster in developing countries than developed countries, mainly due to various socio-economic constraints. The livelihood of most people living in developing nations comes mostly from direct exploitation of wild biodiversity resources.

Ethiopia is naturally endowed with one of the highest variety of wild biodiversity resources in the world. This is attributable to different factors, including the highly varied topography, diversified climate, and suitable landscapes. All these concurrently favored Ethiopia to be rich in wild fauna and flora resources, and with one of the highest levels of endemism in East Africa.

Despite these immense wild diversities and potentials, Ethiopia is losing (both in quality and quantity) these resources at an alarming rate. Habitat destruction, fragmentation, poaching, and lack of proper management are among the various factors that are decimating or threatening the quality and quantity of wild biodiversities in Ethiopia. As wild diversities are the products of millions years of evolution, the impact has global relevance.

Regarding utilization, even though Ethiopia is rich in wild biodiversity resources such as wildlife and fish, the existing potentials of these resources are not utilized properly and efficiently. To alleviate the effects of the aforementioned problems in the day-to-day life of the people, it is crucial to develop wise use and management of the wild diversities together with their natural habitats.

The above mentioned losses of wild biodiversity resources, like wildlife and fish, along with unwise utilization and management, has occurred due to critical shortages of trained researchers and managers in the field of wildlife and fisheries resources management.

With these issues in mind, Wondo Genet College of Forestry has found it crucial to design and launch the *Department of Wildlife and Fisheries Resources Management* so as to produce competent trained staff equipped to handle the management of wild biodiversities. Moreover, there is high demand for technically trained personnel in formulation of wildlife and fisheries resource policy to implement at various levels to secure sustainable utilization. To fill those gaps, the new department will offer opportunities in training of appropriate persons through provision of widespread theoretical and practical knowledge and skill in wildlife and fisheries resources management.

1.3 Why WFRM in Wondo Genet?

Wondo Genet College of Forestry is an ideal place to train students in the field of Wildlife and Fisheries Resources Management. This is attributed to different factors. (1) Being the member of Debub University, the university has vested a power in the college to diversify its programs, as there is an agreement for sharing teaching staff share among different colleges and faculties of the university. (2) The college has long years of teaching and research experience in forestry and related fields, which will greatly contribute to WFRM in the college.

(3) The college has already designed and begun training of students in the field of Natural Resources Management, which is of paramount importance toward implementing this newly proposed department. (4) The existing teaching staff members, infrastructure, and references materials are additional inputs for the success of WFRM in the college, although further improvements of infrastructure will be indispensable.

Geographically, the college is located in an ideal place to train students in the field of WFRM, as this is mainly an outdoor-training discipline. The closeness of the college to protected wildlife areas provides opportunities for enhancing and facilitating the learning-teaching process through wildlife safaris and educational field trips. The college will also benefit from experiences shared, as there will be a formation of domestic and international cooperation during the implementation of the program.

2. MISSION OF THE DEPARTMENT OF WFRM

The mission of the department is to provide theoretical and practical knowledge and skills that technically fit in the sustainable conservation, utilization, and management of wildlife and fisheries resources. This is achieved through education, training, research, and extension activities that will facilitate sectoral and inter-sectoral development at various levels in Ethiopia.

3. OBJECTIVES OF WFRM

The main objective of this department is to produce wildlife and fisheries resources managers and/or experts who are multidisciplinary in their approach and able to make decisions on the management of the prescribed resources.

3.1. *The specific objectives of the department are to*

- ❖ Provide training in wildlife and fisheries resources management with theoretical concepts and practical knowledge and skill, which will ensure suitable utilization
- ❖ Conduct research activities on wildlife and fisheries resources and on protected-area management and its interaction with the socioeconomic aspects of the society and the physical environment as a whole
- ❖ Disseminate the skills and knowledge developed through research and training activities to key stakeholders in wildlife and fisheries resources and develop technical and extension methods that can ensure the resolution of interest-based conflicts
- ❖ Demonstrate, monitor, and evaluate the effectiveness of technologies developed in the department and introduce them to society in harmony with their felt needs





- ❖ Construct technical and methodical capacity in the coordination and management of scientific approaches that will help to change the rudimentary and wasteful traditional way of wildlife and fisheries resources utilization and management
- ❖ Identify the various complexities and interrelations created between wild biodiversity management and society to develop scientific methods that guarantee practical solutions
- ❖ Develop technologies that magnify the different values of wildlife and fisheries resources at community and national levels through enhancement of promising survival environments

4. GRADUATE PROFILE

On successful completion of the program, graduates are expected to

- ❖ Implement conceptual and practical knowledge and skill to resolve challenging problems faced in the field of wildlife and fisheries resources management
- ❖ Analyze how to manage wildlife and fisheries resources development projects and involve in multidisciplinary teamwork to solve practical problems in wild biodiversity management
- ❖ Enhance integrated development planning, decision making, and action for the successful management and sustainable utilization of wildlife and fisheries resources in harmony with environmental conservation at various regimes
- ❖ Assess wildlife and fisheries potential areas through the application of theoretical and practical knowledge and skill to develop integrated resource-use planning, monitoring, and impact studies
- ❖ Select, formulate, and apply relevant/sound techniques and methods to solve problems faced in wildlife and fisheries resources management.
- ❖ Use research and training skills to manage wildlife and fisheries potential areas
- ❖ Work in higher learning, research, and non-governmental organizations and engage in wildlife and fisheries resources research and development activities
- ❖ Communicate the knowledge and the skill gained to reconcile the felt needs of the society and managerial spectrum of wildlife and fisheries resources development
- ❖ Explore and select basic field information so as to successfully manage special features or interests in wildlife and fisheries protected areas for optimized sustainable benefits.

- ❖ Design, analyze, and evaluate critical issues in wildlife and fisheries resources management and other land-use types at various levels
- ❖ Involve in wildlife and fisheries resources policy formulation and evaluation at various levels
- ❖ Practice wildlife and fisheries resources farming activities and introduce the technologies to local communities to ensure sustainable utilization and improve the income at various levels

5. ADMISSION REQUIREMENTS

As a general rule, students of the department must fulfill the admission requirements of Debu University. The WFRM department uses a multidisciplinary approach toward accomplishing its goals. Moreover, it is better for admitted students to have good background knowledge of biological sciences.

6. EVALUATION METHODS

In the department of WFRM, students' evaluation is not a one-step process, but is a continuous process. In addition to the two major examinations (mid-semester and final), there is also a continuous monitoring of the level of understanding through assignments, safari field reports, and tests.

7. GRADUATION REQUIREMENTS

When all the required courses of the department are taken as indicated in this document, with no "F" grade in all the courses taken, and with a cumulative grade point average (CGPA) of not less than 2.00, a student is said to fulfill the requirements for graduation.

8. DEGREE AWARDED UPON GRADUATION

After fulfilling the requirements for graduation, students will be awarded the degree of "Bachelor of Science in Wildlife and Fisheries Resources Management." Special mentions like "with distinction" or "great distinction" will be made based on the CGPA requirements set by the university.

9. COURSE CODING

A code of courses whose home base is the department begins with WFRM and followed by a three-digit number. The first digit indicates the year of the study;





the second represents the category of the department and the third digit shows the semester and the category sequencing in which the course is offered. Non departmental courses from other departments of the university are retained with original code assigned in the home departments.

10. CATEGORY OF COURSES

Category 1

Fishery biology, fish stock assessment, fishery technology, limnology, aquaculture

Category 2

Wildlife ecology, wildlife resource management, wildlife utilization, range land ecology and management, conservation of wetland

Category 3

Introduction to: mammalogy, orientology, herpetology, animal zoology

Category 4

Wildlife physiology, anatomy, genetics; wildlife disease and parasite control

Category 5

Participatory wildlife management, wildlife policy and law, Wildlife based tourism and Ecotourism, wildlife and fisheries resources economics, senior seminar, senior research project,



11. LIST OF COURSES

The courses proposed for the department of Wildlife and Fisheries Resources Management are shown in the table below.

Supportive Courses

| | Course code | Course title | Credit hours |
|---|-------------|---|--------------|
| 1 | NaRM221 | Natural Resources and Demography of Ethiopia | 3 |
| 2 | PISc242 | Introductory Soils | 3 |
| 3 | | Introduction to Crop Production | 2 |
| 4 | | Introduction to Livestock Production | 2 |
| 5 | NREP131 | Introduction to Forestry | 3 |
| 6 | NaRM213 | General Ecology | 2 |
| 7 | PrFo253 | Applied Statistics | 3 |
| 8 | Comp203 | Introduction to Computer Use and Programming | 3 |
| 9 | NaRM232 | Rural Sociology and Development | 3 |

| | | | |
|----|---------|---|----|
| 10 | CEE111 | Introduction to Civic and Ethical Education | 3 |
| 11 | FLEN201 | Sophomore English | 3 |
| 12 | NaRM352 | Remote Sensing and GIS | 3 |
| 13 | NaRM382 | Research Methods | 2 |
| 14 | NaRM431 | Extension WFRM | 2 |
| 15 | Mgmt414 | Entrepreneurship Development | 3 |
| | | Sub Total Cr. Hrs. | 40 |



Major courses

| | Course code | Course title | Credit hours |
|----|-------------|--|--------------|
| 16 | | Botany | 3 |
| 17 | NaRM361 | Integrated Watershed management and planning | 3 |
| 18 | WFRM213 | Limnology | 3 |
| 19 | WFRM114 | Fisheries Biology | 3 |
| 20 | WFRM218 | Fish Stock Assessment and Management | 3 |
| 21 | WFRM216 | Aquaculture | 3 |
| 22 | WFRM212 | Fisheries Technology | 2 |
| 23 | WFRM322 | Participatory Wildlife Resource Management | 2 |
| 24 | WFRM324 | Wildlife Policy and Law | 3 |
| 25 | WFRM221 | Rangeland Ecology and Management | 3 |
| 26 | | Introduction to Zoology | 2 |
| 27 | WFRM235 | Introduction to Mammalogy | 2 |
| 28 | WFRM237 | Introduction to Ornithology | 2 |
| 29 | WFRM232 | Introduction to Herpetology | 2 |
| 30 | WFRM244 | Wildlife Disease and Parasite Control | 3 |
| 31 | | Animal Physiology | 2 |
| 32 | WFRM146 | Comparative Vertebrate Anatomy | 2 |
| 33 | WFRM148 | Introduction to Wildlife Genetics | 3 |
| 34 | WFRM122 | Wildlife Ecology | 3 |
| 35 | WFRM351 | Wildlife – Based Tourism and Ecotourism | 3 |
| 36 | WFRM323 | Wildlife Resources Utilization | 3 |
| 37 | WFRM325 | Wildlife Management I | 2 |
| 38 | WFRM328 | Wildlife Management II | 3 |
| 39 | WFRM357 | Wildlife and Fisheries Resources Economics | 3 |
| 40 | WFRM326 | Conservation of Wetlands | 2 |
| 41 | WFRM369 | Senior Seminar in WFRM | 1 |
| 42 | WFRM368 | Senior Research Project in WFRM | 2 |
| | | Sub total credit hours | 68 |
| | | Total credit hours | 108 |



COPE with 6 credit hours

Elective Courses

| | Course code | Course title | Credit hours |
|----|-------------|--|--------------|
| 45 | NaRM411 | Environmental Impact Assessment | 2 |
| 46 | NaRM 461 | Soil and Water conservation | 2 |
| 48 | NaRM311 | Indigenous Knowledge and conflict Management | 3 |
| 49 | NaRM481 | Project Planning | 3 |
| | | Sub Total Ct. Hrs. | 10 |



SECTION III



Integrated Natural
Resource Research
Between OSU-COF
and EARO-FRC





CONCEPT NOTE FOR COLLABORATIVE RESEARCH BETWEEN OSU AND EARO

The Role of an Integrated Forest Management Approach to Arresting Environmental Degradation and Loss of Biodiversity and Improving the Livelihood of Communities

Alemu Gezahgne,¹ Badege Bishaw,² Negash Mamo,¹ Tesfaye Hunde,¹ Mengisti Kindu,¹ and Mohammed Adilo¹

ETHIOPIAN AGRICULTURAL RESEARCH ORGANIZATION, FORESTRY RESEARCH CENTER

Ethiopian Agricultural Research Organization-Forestry Research Center, which has a national mandate, will be responsible for undertaking this research. Currently, the center is coordinating research programs on plantation forest, natural forest, woodland, farm forestry, wood utilization, and nontimber forest products. The Center conducts research in collaboration with other federal and regional research centers and institutions of higher learning, as well as in collaboration with other governmental and non-governmental organizations. The center also works together with a number of international, regional research institutes and networks.

OREGON STATE UNIVERSITY, COLLEGE OF FORESTRY

OSU is one of only ten American universities to hold the Land Grant, Sea Grant, and Space Grant designation and is a Carnegie Doctoral/Research-Extensive university. The College of Forestry (COF) is a top-ranked institution in the field of natural resources. It has educated professionals for over a century, and it is a world-class center for education and research about forests and natural resources. The mission of the COF is to conduct problem-solving and fundamental research on the nature and use of forests and related resources, to effectively share that knowledge with others, to educate and engage the next generation of scholars, practitioners, and users of the world's forest resources. With

Ethiopian Agricultural Research Organization, Forestry Research Center¹ and Oregon State University, College of Forestry²



over 100 faculty, several hundred students, multi-million dollar research and educational programs, and outstanding facilities, it is a magnet for forestry professionals from around the world. The College of Forestry also has close ties to other campus units, as well as several partner agencies and organizations in the area. Additional information can be found at the College's website: <http://www.cof.orst.edu>

1. PROJECT BACKGROUND

The idea of the project generated from the national strategy of Ethiopia, which is geared towards alleviating poverty, enhancing food security, and improving the livelihoods of the people while sustaining the natural resource base. The project is intended to address these issues by targeting the major problems in key areas with full participation of stakeholders through integrated research and development schemes. The emphases will be on integrated watershed management, the development of farm forestry for sustainable forest management, and biodiversity conservation and nontimber forest products.

1.1 General information

Agriculture is the dominant economic sector in Ethiopia and it supports the livelihood of 85% of the population. Agriculture accounts for 54% of the gross domestic product (GDP), 90% of exports, and 90% of raw material for local agro-industry (CSA 2000). Ethiopia's long-term economic development strategy is described as "agricultural development-led industries (ADLI)"—meaning that agriculture will continue to lead the economic development of the country (Anonymous 1993). The sector is tremendously diverse in resources and agro-climatic conditions, and it is heavily dependent on a natural resource base that is fragile and needs special protection.

Despite the importance and the potential of the agriculture sector, agricultural production is lagging behind the population growth rate and the country is far from the attainment of its goals for food self sufficiency, meeting the domestic demand for industrial raw materials, and increasing foreign exchange earnings. The overall factors affecting agricultural production are land degradation, deforestation, recurrent drought, underdevelopment and utilization of resources, technological backwardness, a low-skilled workforce, and poor infrastructure development. However, the intensity and magnitude of the problems vary across the different agro-ecologies and farming systems. Soil erosion by water is by far the biggest land degradation problem in the Ethiopian highlands, and the highest rate occurs from cultivated fields (estimated at 42 ton/ha/year). Agriculture costs of land degradation over the next 25 years are estimated to 150,000 million Birr. If the present trend continues, today's children could see over a third of the highlands become incapable of sustaining cropping, while the population of the country triples within their lifetime.

Forestry is one component of natural resources. In the largely agrarian society of Ethiopia, where smallholder farming communities are predominant, forestry has played and is playing significant role in supporting the livelihood of the people. The roles of forestry include soil and water conservation and restoration, provision of energy, provision of construction materials, including farm implements and several nontimber forest products (NTFP). Despite this, very little is being done to protect and expand the forest resource of the country.

Available information indicates that deforestation in Ethiopia is occurring at an alarming rate. According to Reusing (1988), Ethiopia lost 77% of its forested area between 1955 and 1979. A report published by the World Bank (2002) indicated that 8% of the forest in Ethiopia is lost every year. Factors responsible for forest destruction include the clearing of forest and woodlands for cultivation, overgrazing, and the cutting of trees and shrubs for various purposes, notably for fuelwood, charcoal production, and for construction materials. Generally, the rate of deforestation is spurred by poverty, population growth, poor economic growth, and ecological disturbance.

To combat the twin major problems of the country, i.e., food insecurity and poverty, it is important to arrest environmental degradation. The new rural development policy of Ethiopia therefore recognizes that reversing environmental degradation (deforestation, land degradation, and loss of soil fertility) is critical to the economic development of the country.

The development of appropriate restoration, rehabilitation, management, and protection techniques that will ensure sustainable utilization, minimal environmental degradation, i.e., land degradation (erosion, loss of soil fertility) and decline of vegetation cover and biodiversity is essential. Equally important is to determine the role of communities on the restoration, rehabilitation, and management of the forest resource.

Therefore, this project is designed to fill the gap in participatory research and development activities aimed at meeting current government strategies for promoting sustainable natural resource management for food security and foreign exchange earnings.

2. PROJECT AREA

2.1 General

The proposed project involves four main research components:

- ❖ Integrated Watershed management
- ❖ Development of farm forestry practices for sustainable forest management and biodiversity conservation
- ❖ Nontimber forest products
- ❖ Capacity building





2.2. Specific Areas

2.2.1 Integrated Watershed Management

The Dire Dam catchment is located some 50 km east of Addis Ababa city. It is situated at 09°10'35.7" N and 38°55'10.4" E. The altitude of the catchment ranges from 2000–3028 m above sea level. The topography of the area can be categorized as 50% gentle slopes, 25% hilly, and 25% rugged slopes (District Development Agent Office). The soil of the area is brown and black clay. The area gets about 1000–1800 mm rainfall per annum. Most of the rainfall occurs between June and September. The area is categorized as the Dega agroclimatic zone and has an average temperature of 15°–20°C.

Currently one cannot find natural forest, but the upper catchment is covered with *Eucalyptus globulus* plantations managed by the Finfinne fuelwood project, which covers about 1000–1200 ha. There are remnants of trees, such as *Juniperus procera*, *Ficus sur*, *Ekebergia capensis*, *Prunus africana*, *Rubus species*, *Buddelja polystachys*, *Acacia abyssinica*, *Vernonia amaygudalina*.

Six peasants' associations (currently merged into three: Dire sokoru, Tenkole warabi, and Bura maru tulukorbecha) are found in and around the Dire Dam catchment. According to 1993 E.C. census the total population of the catchment was estimated at 8,275; the present estimate of the area's population is more than 8,800. The major economy is sedentary farming, primarily subsistence. The major crops grown are barley, teff, wheat, beans, peas, lentils, oats, and fodder beet (Sinar). Livestock are the major capital asset; without them, life for the farming community is considered to be impossible. The collection of fuelwood—mainly branches, twigs, and leaves of *Eucalyptus* from the Finfine fuelwood forest project—and the production of charcoal to be sold at Dire, Lagadadi, and Addis Ababa are common practices. Most of the farmers spend their time on fuelwood collection and marketing. A sack of dry eucalyptus leaves commonly is sold at about 2, 4, and 6 Birr or more at Dire, Lagadadi, and Addis Ababa, respectively. Although the area is hilly, rugged, and undulating there is no conservation practiced on farmlands; this is presumably because farmers are reluctant, due to suspicions about forced dislocations. According to local experts, about 2,120 ha of the catchment area can be categorized as arable land, 1100 ha grazing land, of which 268 can be arable, 2820 plantation, of which 1780 ha can be cultivated, and 1010 ha unutilized, undulating but degraded land.

2.2.2. Development of Farm Forestry for Sustainable Forest Management and Biodiversity Conservation

The areas selected are found in the Tarmaber district, under current administrative arrangement consisting of 18 peasant associations, and are characterized as Dega, Woyinadega, and Kola agro-ecological zones. Mountainous, rugged and undulating terrain topography that faces north and stretches to the lower part of Kawut district are characteristic of the Tarmaber wereda. The elevation

varies between 1500 and 3200 meters above sea level, with a bimodal rainfall distribution.

According to local informants, the district formerly had diverse vegetation types. Among the remnant montane forests, Wof-Washa is 30 km from Debre Sina. In accordance with Azene (1997), the upper catchment of the district was covered with *Juniperus procera*, *Haginia abyssiniya*, *Ehretai cymosa*, *Mimusops Kumal*, *Mellittia furginia*, *Syzygium guanensis*, *Podocarpus fulcatus*, *Acacia abyssinica*, *Measa lanciolata*, *Olea europea* and many other valuable species.

The middle part of the catchment that can be represented by Tukurso and *Tornos amba* and down to the Kawut district, species viz. *Manilkara butugi*, *Croton macrostachys*, *Tarminalia brawni*, *strychnos innocea*, *Maytenus undata*, *Dodonia angustifolia*, *Ximenia americana*, *Rhus natalesis*, *Rhus vulgaris*, *Carisa edulis*, *Acacia tortolis*, *Acacia nilotica*, *Acacia seyal*, etc. used to exist. Formerly most of the species mentioned were used as sources of fuelwood, construction materials, farm tools, household utensils, and sources of food and fodder. The species are rare and becoming endangered. In some localities fuelwood is scarce, and the people have to walk long distances to fetch fuelwood or they must use agricultural crop residues and cow dung for fuel.

The remnants of physical and biological soil and water conservation measures observed in the district indicated the introduction of agroforestry practices and physical soil and water conservation practices at Tukurso catchment. The most commonly used trees/shrubs as an agroforestry package in the district are *G. robusta* and *Rhaminus prenoids*. The physical structures of soil and water conservation measures are stone bunds, although these conservation measures have been observed to be mismanaged. Also, due to open grazing and pest problems the integration of *Rhaminus prenoids* with physical soil conservation measures is decreasing. Most of the farmers in Tukurso catchment believe that most of trees intercropped suppress agricultural crops. Therefore, the farmers are seeking other agroforestry tree crops that promote agricultural productivity.

In the highlands there are intensive *Eucalyptus globulus* woodlots around farmlands and homesteads. There are also *Cupressus lustranica* and eucalyptus plantations in the upper Mount Tarmaber. In this area, intercropping of beans with eucalyptus, *Rhaminus prenoids* with sorghum, and maize with *Rhaminus prenoids* have been observed. However, according to district agricultural bureau experts, the effect of *Eucalyptus* on cereal crop production is a question to be investigated by the researchers.

In the lower parts of the district, intercropping of teff with lentils, sunflower, maize, and sorghum has been observed. In addition, remnants of *Eucalyptus* plantations and *Acacia nilotica* woodlots established by the Food for Work Program of 1984-85 were observed along the farm boundary and roadsides. As a result of the problems identified and consultation made with the district agricul-





tural development bureau experts, the development of farm forestry for sustainable forest management and biodiversity conservation is essential. Currently the dry land forestry project in Forestry Research Center has tried to promote agroforestry tree species such as *Leucanea* to be used as fodder and soil fertilizer, and other species to be used in the lower part of the wereda, which is called Kawut.

2.2.3. The role nontimber forest products for sustainable forest management, biodiversity conservation, to improve the livelihood of the community and to strengthen community participation in forest management

This study will be conducted in the highland forest in southwestern Ethiopia primarily in and around Chena forest. This forest is located in the Keficho Administrative zone, approximately 490 km from Addis Ababa and 45 km from Bonga to Mizan and Tepi direction. Chena forest represents one of the remnant natural forests of Ethiopia. The forest is composed of a number of high-value timber species, including *Cordia africana*, *Aningeria adolfi-frederic*, and different *Olia* spp., several other woody species with less known wood value, and several nontimber forest products (such as *Piper capense* and *Afromium corrorima*). Local people also obtain edible wild fruit and medicinal plants from the forest. The forest is, however, subject to destruction, and vegetation cover is diminishing rapidly. In this study, an attempt will be made to investigate the root cause of forest destruction, evaluate the role of the forest in supporting the livelihood of the community and the role of the community in managing the forest, and make recommendations for improving the management and utilization of the resource in the forest area.

3. OVERALL PROJECT RATIONALE

The degradation of the forest resource has been known to be a serious problem in Ethiopia since the early 1970s, subsequent to the disastrous drought and famine at the time. Since then considerable efforts have been made to rehabilitate degraded areas and halt further degradation. More emphasis has been given on physical and biological soil and water conservation measures in farmlands and tree planting on hillsides as a community forestry development. The largest conservation measures were undertaken during the 1970s and 1980s. International donors made significant contributions to soil and water conservation efforts by supplying food grain and edible oil. However, the achievements attained were minimal, inefficient, and unsustainable, and overall efforts failed. Several factors have been suggested as the reasons for these failures. The most critical, however, is thought to be the top-down approach pursued in both planning and implementation processes. The disadvantage of the top-down approach is that it denies the interchangeable relationship that exists between

local people and environment and undermines stakeholders' decision-making power. The result is that resource degradation remains a serious threat to the national economy.

Mismanagement of the resource base, deforestation, cultivation of steep slopes, and overgrazing resulting from overpopulation are major causes of land and environmental degradation. Decline of vegetation cover has led to serious soil and water loss and the decline of soil fertility, and reservoirs have been affected by siltation. Dire Dam, which was constructed to overcome the shortage of drinking water in Addis Ababa, is one of the dams prone to siltation. The water catchment around Dire Dam is devoid of vegetation cover and the cultivation of steep slopes is still practiced. This catchment could serve as a good model for applying integrated watershed management. The adoption of appropriate land use practices, reforestation of degraded land, and development of farm forestry, together with other soil and water conservation techniques is essential. This project, therefore, attempts to introduce and adopt an integrated and participatory approach in order to develop and implement techniques for minimizing soil and water loss.

Among the remnant afro-montane forests, which are currently available at a radius of 30 km from Debera Sina, is Wof-Washa. It is a four-hour walk from Debera Sina and is the only stretch of forest left in the surrounding area. The local people use the forest as a source of fuelwood, construction material, and farm tools, and for collecting edible fruits, honey, and medicinal plants. The forest serves also as a grazing site. The forest prevents soil erosion and regulates the watershed in the surrounding area. However, the threat of its destruction from encroaching agriculture, the cutting of trees for various purposes by the local people, fire, and overgrazing is becoming apparent. The forest is composed of a remarkable number of rare, endemic plant and animal species. According to Demel Teketay and Tamerat Bekele (1995) the floristic composition of this forest was estimated to be over 252 plant species. Many of the species are habitat specific and can only be found in limited areas in the forest; hence, their survival depends upon the existence of the forest. Any human-caused disturbance that does not take into account this reality is very likely to destroy the specific habitats of the species, upsetting the natural process, and, in turn, resulting in the local extinction of both plant and animal species.

The acute hunger for farmland has urged the local people to cultivate steep slopes, creating extensive deforestation and severe soil erosion. The major problems recorded on the lower side of farmlands are the problems of the deposition of boulders and coarse materials and landslides. As a result of this, springs and streams that were once perennial have become seasonal, and traditional irrigation practices are also being affected. In general, the issue of conservation of forest resources is intimately connected with the absorptive capacity of the farming population and the availability of alternative means of employment. Farming is the major way of life, but the degree to which it is sufficient on its own to sustain life varies considerably. Many families farm only





on very small plots and have no oxen to plough the land. They are forced to depend on sharecropping arrangements with families who have oxen. These are the relatively lucky ones. Several families have no land at all and are inevitably forced to look for alternative employment or income, often from cutting down trees and the illegal sale of timber.

Forest ecosystems are home to most of the terrestrial biological diversity. The humid tropical forests alone contain more than 50 percent of the world's animal and plant species, which could not survive outside these ecosystems. The importance and uses of these genetic resources have not yet been thoroughly examined. Protection of forests, and particularly primary forests, is therefore outstandingly important in terms of biodiversity and global genetic resources. As a result of the Rio Conference, the international community agreed that forest conservation was a global task, provided that national sovereignty regarding the use and development of natural resources is respected. This creates the common but differentiated responsibility to cooperate and support efforts for the protection and sustainable utilization of forests in terms of the ecological, economic, social, and political dimensions of sustainable development.

Wof-Washa forest is composed of remarkable number of rare, endemic plant and animal species. Many of the species are habitat specific and can only be found in limited areas in the forest, thus their survival depends upon the existence of the forest. Human-caused disturbance could destroy the specific habitats of the species, resulting in local extinction of both plants and animals. The proposed project could instead bring sustainable development of the Wof-Wash forest through appropriate income generation. The existence of this forest is essential to the people living around in terms of fuelwood, construction material, wood for farm tools, and the collection of edible fruits, honey, and medicinal plants. Many streams generated from the forest catchments are important sources of water for local people and lowland pastoralists of Kawut up to Afar. The forest also prevents soil erosion and regulates the watershed in the surrounding area.

The present land-use patterns on watersheds in Ethiopia in general and the Tarmaber district in particular must be reshaped so that delicate water, forest, and soils relationships are not pushed beyond their limits. As the number of people and animals living in the area increases, and the quality of the land on which they live declines, the detrimental impacts of excessive grazing, deforestation, and improper agriculture will continue unless solutions are found and implemented. These solutions should consider interaction of the upstream/downstream physical and socioeconomic interrelationships.

The basic technologies required to manage forests using an integrated watershed approach under the various types of situations are known. A difficulty, however, is in getting local people to accept conservation measures, which call for participatory approaches in the planning and implementation of watershed management efforts. To minimize the pressure on this forest, combat the

ongoing degradation, bring food security, and halt the extinction of endemic fauna and flora of Wof-Washa Forest and the surrounding community, sound development intervention with research backing is of paramount importance.

Over 90% of the Ethiopian populace depends on fuelwood for their energy supply (EPAP 1994). However, the ability of the Ethiopia's forest resource to supply fuelwood on a sustainable basis is currently far below the demand. This gap is widened through overexploitation of woody vegetation and herbaceous materials in the vicinity of the households. The acute shortage of fuelwood in the country has led most of the farming community to use cow-dung and crop residue as a substitute for wood. This practice diminishes agricultural productivity and adversely affects ecosystem stability.

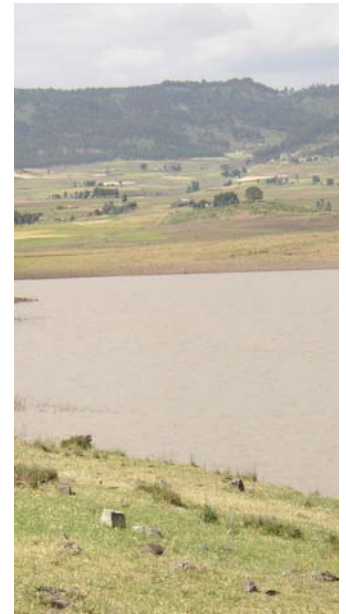
The World Energy Council (1999-2003) found that fuelwood use in Ethiopia exceeded the annual growth rate of indigenous trees by 150%. FAO's (2001) estimate of the fuelwood consumption in the year 2000 was about 99 million m³; demand for the year 2020 was projected at 133 million m³. This figure demonstrates the unbalanced situation between energy needs and the capacity of wood production from the forests of Ethiopia. Available technologies to decrease fuelwood consumption, such as wood-saving stoves and fuel substitutes, are not expected to have a significant effect. Local communities must take a direct responsibility for creating and managing their own fuelwood resources.

This can be more likely achieved through participatory agroforestry development. In alleviating the problem of wood, wood products, and feed shortages, agroforestry is an increasingly viable option for rural peoples in many parts of the world. It is therefore worth demanding that the knowledge base supporting this on-ground action keep pace with the requirements of viable agroforestry systems. The project can resolve problems related to agricultural development and presumably could bring changes to the livelihood of local people through promoting sustainable agroforestry practices and technologies.

Integrated watershed management, the development of agroforestry practices for sustainable forest management and biodiversity conservation, and the promotion of the role of nontimber forest products for sustainable forest management are vital elements of a poverty-reduction strategy. The current economic policy of the country considers deforestation and land degradation as major reasons for the decline of agricultural production, and are among the factors that should be addressed in the conservation strategy of Ethiopia.

4. PROJECT OBJECTIVES

The overall objective of the project is to promote appropriate management systems within catchments through application of improved agroforestry technologies and the enhancement of the role of nontimber forest products as a means for alleviating poverty and encouraging sustainable resource manage-





ment. This may help the national efforts towards achieving food security, reducing poverty, providing raw materials for local industries, and enhancing foreign export earnings. The specific objectives are

- ❖ To adopt or generate appropriate technologies that arrest environmental degradation through sustainable resource management
- ❖ To determine the role of the community in managing the forest and increase their participation in developing sustainable forest management options
- ❖ To evaluate and demonstrate the cultural, environmental, economical and social benefit of restoring degraded land and forest
- ❖ To promote agroforestry as tool for land and forest restoration and as means of income generation to local community
- ❖ To determine the structure and diversity and regeneration condition of different tree species in the forest
- ❖ To identify, evaluate the major NTFPs obtained from the forest and promote their production and marketing
- ❖ To maximize wood and nontimber products that contribute towards income generation and improve the livelihood of the community

5. PROJECT DESCRIPTION

5.1 *The Gaps*

The following listed gaps can be considered as constraints for the research to be far behind to solve the prevailing ecological degradation and food insecurity:

- ✗ Weak organizational structure
- ✗ Critical shortage of qualified personnel
- ✗ Lack of sufficient physical resources
- ✗ Inadequate coverage of agro-ecological zones by research
- ✗ Inadequate acquisition, management, and dissemination of information relevant to forestry research
- ✗ Absence/insufficient farmer-research extension linkage that could assist in technology dissemination and receive feedback from stakeholders
- ✗ Inadequate research capacity to address the major problems of the forestry research sector

5.2 Project Components

Five project components are involved in this project. The duration of the project will be five years.

Component 1. Integrated watershed management

Component 2. Development of farm forestry for sustainable forest management and biodiversity conservation

Component 3. The role of nontimber forest products for sustainable forest management, biodiversity conservation, improving the livelihood of communities, and strengthening community participation in forest management

Component 4. Capacity building

Component 5. Project management

5.2.1 Integrated watershed management

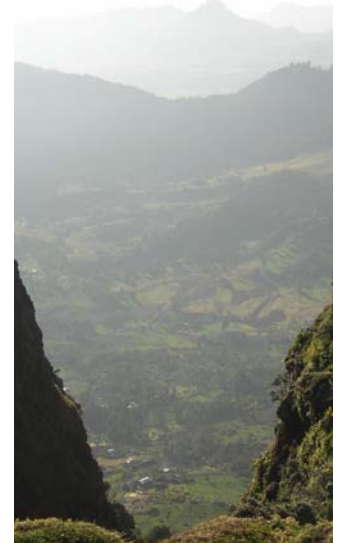
Activities to be carried out under this project component are as follows:

- ❖ Determine land cover pattern and current land use conditions in the catchment
- ❖ Develop appropriate land use categories
- ❖ Evaluate the rate of soil and water erosion in the watershed
- ❖ Select and adopt appropriate technology that help to minimize soil and water erosion and increase the vegetation cover in the catchment
- ❖ Evaluate the role of tree planting, farm forestry and soil conservation to improve agricultural productivity, income generation and minimizing rate of siltation of Dire Dam

5.2.2 Development of farm forestry for sustainable forest management and biodiversity conservation

The following activities will be carried out under this project component:

- ❖ Producing land use and land cover change maps
- ❖ Evaluate the attitude and role of the community in the management of the forest
- ❖ Understanding the species composition and population dynamics of the forest
- ❖ Studying the regeneration status in the forest
- ❖ Developing participatory forest management practice
- ❖ Developing farm forestry practice





- ❖ Introducing and promoting use of nontimber forest product that enhance the earnings of the local community
- ❖ Evaluation and domestication of multipurpose tree species and production of high value tree and products

5.2.3 The role nontimber forest products for sustainable forest management, biodiversity conservation, to improve the livelihood of the community and to strengthen community participation in forest management

The following activities will be conducted under this project component:

- ❖ Understand the driving force for forest destruction and device a mechanism to minimize rate of deforestation
- ❖ Study the land cover, land use pattern and land use change
- ❖ Determine the structure and composition of the forest including woody species and herbaceous species
- ❖ Identify the species with high potential for nontimber forest product and evaluate the contribution of nontimber forest product to the livelihood of the community
- ❖ Evaluate the current propagation, domestication and management techniques of the species useful for non- timber product and develop or adapt techniques to improve these practices
- ❖ Identify areas of intervention to improve the processing, handling and marketing of nontimber forest products
- ❖ Evaluate the role of NTFP to increase the income of the community, improve the management and conservation of the biodiversity
- ❖ Study wood property and alternate use of less known /utilized woody species
- ❖ Develop agroforestry practice as well as woodlot to minimize the pressure on the remnant forest and to meet demands for fuelwood, fodder and other wood products
- ❖ Study the natural regeneration pattern in the forest and come up with suggestion to improve the regeneration condition

5.2.4 Capacity Building

5.2.4.1 Training

This component focuses on strengthening the human and physical resources of the forestry sector. To achieve the proposed objectives of the project, the need for training of research staff and extension personnel at various levels is very important.

Training in areas of Agroforestry, Geographical Information Systems, Silviculture, Wood technology, Ecology, Forest Management, Environmental Science, and Resource Assessment are very important.

5.2.4.2 Physical Resources

The physical resources required to undertake this project are listed below:

- ❖ Equipment and facilities: Field equipment (GPS), Laboratory equipment, Field vehicles and spare parts
- ❖ Establishment of dendrology laboratory
- ❖ Strengthening of forest entomology and pathology laboratory
- ❖ Upgrading forestry information systems
- ❖ Establishment of wood quality and wood anatomy laboratory
- ❖ Establishment and upgrading of the existing nursery in the area of the study



6. PROJECT MANAGEMENT

The project would strengthen the research capacity through provision of required facilities and short and long-term training for research and extension staffs.

6.1 Indicative Cost Summary per Component (in USD)

| Component | Local | USD | Total |
|---|-------|-----------|-----------|
| 1. Integrated watershed management | | 3,219,350 | 3,219,350 |
| 2. Development of farm forestry for sustainable forest management and biodiversity conservation | | 705,639 | 705,639 |
| 3. The role of nontimber forest products in sustainable forest management, biodiversity conservation, improving the livelihood of the community, and strengthening community participation in forest management | | 155,285 | 155,285 |

6.2 Project Benefits

The main benefits anticipated from this projected are as follows:

- ❖ Improvement of farmland management through introduction agroforestry technology



- ❖ An expansion of income generating activities through promotion of high value trees and shrubs
- ❖ Strengthening research capacity
- ❖ Biodiversity conservation status be maintained and restoration of degraded lands achieved
- ❖ Expand income generating activities through promotion of NTFP
- ❖ Enhance the participation of the community in resource management
- ❖ Information generation on composition and structure of the forest, regeneration status, land use and land use change pattern
- ❖ Alternate use of less known wood species developed
- ❖ Adoption of improved forest resource management, utilization and biodiversity conservation



7. IMPLEMENTATION ARRANGEMENTS

The Forestry Research Center under Ethiopian Agricultural Research Organization will have the responsibility for undertaking project implementation in collaboration with the Federal and Regional Research Centres and Regional Agricultural Bureaux at respective weredas. During the start up of the project, participation of the rural community will play an important role in the project during planning, design, and operation schemes. Consulting residents now and during the planning process will help ensure the full participation of the farmers. Their input on design, planning, and implementation will subsequently help engage the community in resource management after the project is terminated. Agreements would be set up with the community for design, construction, and maintenance of the physical structures through voluntary labor.

In this regard the extension system should play a significant role in facilitating communication between the research system and the community. Agricultural Bureaux's extension agents should be involved in technology development and transfer activities so that they can build the skills and confidence to disseminate technologies being developed through participatory approaches and on-the-job training, based on the local circumstances. This approach enables the creation of thoughtful and capable farmers and extension staffs to sustain the project output. The project will make a contribution toward developing human capacity in the extension system to further identify, design, and implement participatory and sustainable natural resource management practices in an effort to maintain ecosystem balance. Finally, the role of agricultural development bureaux is highly important to create a successful working environment.

8. TECHNICAL ASSISTANCE REQUIREMENT

8.1. Soil and water

The project would require one technical assistant in the area of integrated watershed management.

8.2. Geographical Information System

One technical assistant of geographical information system is required. Topography maps and satellite imageries the study areas are required.

8.3. Agroforestry

Technical assistance in areas of agroforestry is also required.

8.4. Forestry

Technical assistance in areas of Forest ecologist, Forest management, Non-timber forest product, Botanist and Forest economics is highly required.

9. ISSUES AND PROPOSED ACTIONS

9.1 Technical

There are a number of technical issues to be considered in this project implementation.

9.2 Soil and water conservation

An attempt was made to introduce soil and water conservation technologies at Tukurso catchment. However, this technology was not extended to other catchments, for reasons not definitely known. Therefore, the present study will attempt to investigate the reasons it was not maintained and extended to other catchments. The measures introduced and other biological conservation approaches will be carried out with the full participation of the community.

9.3 Participation

Integrated watershed management needs multidisciplinary approaches, the full and willing participation of research staffs, extension agents, and the community. The creation of awareness through training workshops and frequent meetings will help in the successful implementation and evaluation of the project. Whenever possible the project will take advantage of experience of NGOs operating in the area. To have the full participation of the community, activities to be carried out at the catchment should be clearly defined by all stakeholders.





9.4 Financial

Activities to be carried out in the project may not bring immediate benefits to the community. It is, therefore, necessary to find means that combine immediate benefits with desired project objectives. The possible means of actions are the introduction of fruit and forage trees, and legumes that provide ground cover as well as feed for animals and marketable crops that generate direct income to the farmers.

9.5 Institutional

For fulfillment of the project objectives, the joint effort of the Forestry Research Center, Regional Research institutes and Regional Agricultural Bureaux is required; to resolve issues pertinent to agricultural development, Oregon State University is particularly needed.

9.6 Environmental

The focus is on improving the environmental status of the areas outlined in this project.

9.7 Policy

The designed project is participatory and problem-solving oriented. Hence, technology transfer mechanisms should be designed for the technologies anticipated in this project.

10. POSSIBLE RISKS

The major risks related to this project are

- ✗ Implementation delay
- ✗ Research staff turnover
- ✗ Project sustainability
- ✗ Natural calamities
- ✗ Land use conflicts
- ✗ Farmers' resistance/lack of acceptance

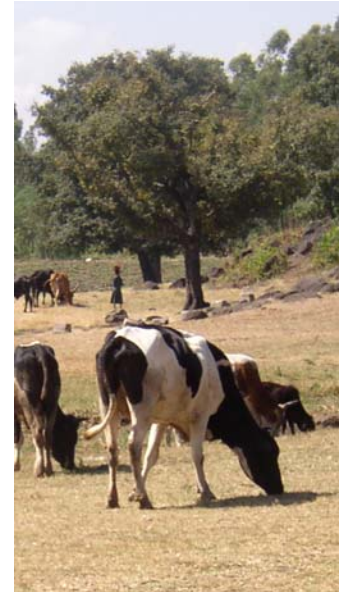
11. PROJECT BENEFICIARIES

- ❖ Farmers
- ❖ Business groups and small scale industries
- ❖ Researchers/ forest practitioners
- ❖ Teaching institutes

- ❖ Institution involved in environmental and biodiversity conservation
- ❖ Policy makers

12. MEASURABLE INDICATORS

- ❖ Crop production and productivity increased
- ❖ Soil erosion minimized
- ❖ Household energy consumption from cow dung replaced by fuelwood
- ❖ Household income and living standard improved
- ❖ Extent of rehabilitated land increased
- ❖ Areas under soil conservation measures increased
- ❖ On-farm tree density increased
- ❖ Burden on women for fetching water and fuelwood decreased
- ❖ Risk of total siltation of dams minimized
- ❖ Risk of extinction of forest species minimized
- ❖ Aquaculture introduced
- ❖ Crop intensity increased



13. EXPECTED OUTPUT

- ❖ Information on composition and structure of the forest, regeneration status, land use and land use change of the study areas is made available
- ❖ Technology for minimizing resource degradation developed/adopted
- ❖ Better understanding of the role of forest products and NTFP in the well being of the community
- ❖ Expand income generating activities through promotion of NTFP and other tree planting activities
- ❖ Alternate use of less-known wood species developed
- ❖ Improved forest resource management, utilization, and biodiversity conservation introduced/adopted
- ❖ Enhancement of the participation of the community in resource management
- ❖ Improvement of the infrastructure and research capacity



INTEGRATED WATERSHED MANAGEMENT IN ETHIOPIA: THE CASE OF THE DIRE DAM CATCHMENT TREATMENT

A Proposal for a collaborative project between the Forestry Research Center, Ethiopian Agricultural Research Organization and the College of Forestry, Oregon State University

Alemu Gezahgne,¹ Badege Bishaw,² Negash Mamo,¹ Tesfaye Hunde,¹ Mengisti Kindu,¹ and Mohammed Adilo¹

PROJECT PROFILE

Country: Ethiopia

Sector of activities: National Forestry Research

Responsible Institution: Forestry Research Center (FRC) under the Ethiopian Agricultural Research Organization (EARO) in collaboration with Oregon State University, College of Forestry USA.

Proposed project name: Integrated Watershed Management In Ethiopia: The Case of Dire Dam Catchment Treatment

Project area: Dire Dam Catchment

Duration of project: 5 years, with two phases

Total estimated cost: US\$ 3,219,350

Ethiopian Agricultural Research Organization, Forestry Research Center¹ and Oregon State University, College of Forestry²

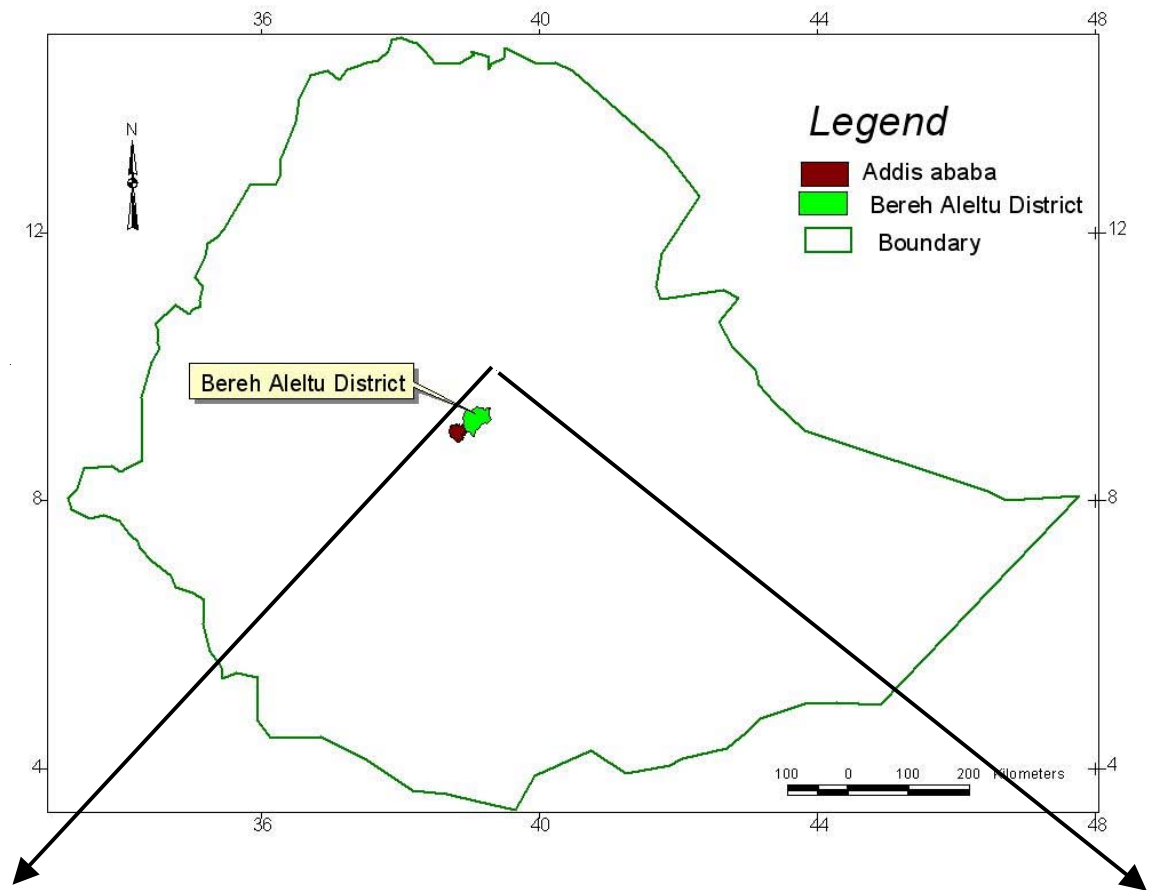


Figure 1. Map and photo of project intervention area, Dire dam catchment.

1. PROJECT BACKGROUND

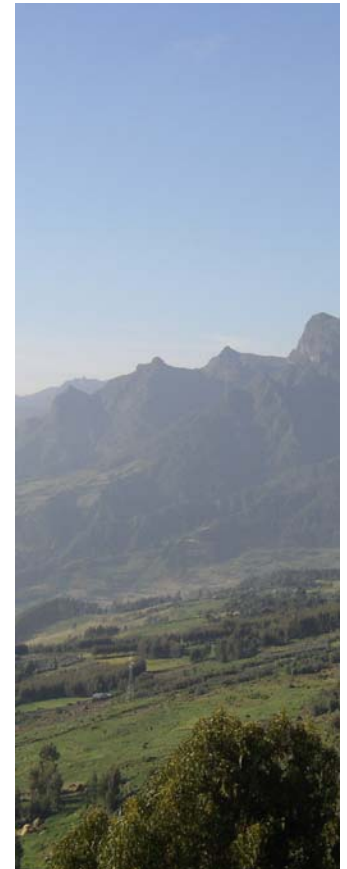
1.1 Project origin

Forestry Research Center under the Ethiopian Agricultural Research Organization has different research projects, which have many research trials in various agro-ecological zones of the country. However, the scale of research projects has been constrained by limited financial resources, research infrastructure, and human resources. The problems surrounding land use, food security, conservation, and watershed management are so diverse that large-scale investment and expertise are required to realize contributions to the development and rational utilization of the natural resources, particularly the forest resources in the country. This project is formulated on the basis of field surveys carried out on the project site in 2003 and 2004. The project is intended to address problems identified during the survey, which are also identified by the national strategy of Ethiopia as major priority goals for enhancing food security and improving the livelihoods of the people. The project will focus on multi-perspective and multi-scale investigations through an integrated watershed management approach, with full participation of stakeholders and experts trained in various disciplines. Teams of the Forestry Research Center in the Ethiopian Agricultural Research Organization (EARO) in collaboration with Oregon State University (OSU) College of Forestry, USA, will develop the project. The total project cost over the 5-year period is estimated at 3,219,350 USD.

1.2 General information

Ethiopia is a large country (>1.1 M km²) endowed with very diverse physiographic and climatic conditions, which have made possible the presence of diverse fauna and floral resources. Presently more than 70 million people inhabit the country, and the population growth rate is ~2.9% per annum. The foundation of the national economy is agriculture. Despite the importance and potential of the agriculture sector, however, agricultural production lags behind population growth. For the past three decades, Ethiopia has lagged behind in its attempts to attain food self-sufficiency, meet the domestic demand for industrial raw materials, and increase its foreign exchange earnings. Resource degradation is identified as one of the major reasons for these distressing trends in the food production and economic growth.

The degradation of resources is caused by the heavy pressure from human and livestock populations, coupled with many other physical, socio-economic, and political factors. Much of the pressure is found in the highlands above 1500 m (~45% of the country's total area). These highlands, which are characterized by favorable environmental conditions, have been settled and farmed for millennia. The most pressing forms of resource degradation in the Ethiopian highlands are destruction of natural vegetation, followed by soil erosion by water. The highest rate of soil erosion occurs from cultivated fields,





estimated at 42 ton/ha/year. Soil erosion is not only affecting agricultural production, but also creating siltation in dams constructed for different purposes.

Dire Dam (Figure 1) is one of the catchments constructed in 1998 with the long-term objective of providing drinking water for the increasing demands of the capital city of Addis Ababa, Ethiopia. The project cost over 198 million Birr, and is currently providing 42,000 m³ per day, which is 33% of the total water consumption of the people living in the city. The dam is now threatened by very rapid siltation, however, which is mainly induced by agricultural expansion, particularly farming very sloppy terrain and free grazing of livestock close to the dam.

The other problem in the catchment is the conflict over resources between the community and Finfinne fuelwood project. The high population growth rate in the Dire Dam catchment and the shortage of land for subsistence cultivation has exacerbated the situation of soil erosion and land degradation. If the present trend continues, the local community will be affected by shortages of food, drinking water, and fodder. In addition, municipal drinking water supplies for Addis Ababa will also be impacted. These negative trends suggest that immediate efforts toward integrating conservation and development measures are crucially needed in this area.

The efforts of past research and development activities in the country regarding resource conservation had only limited impacts on the livelihood of the community and did not halt the negative trend of resource degradation. The “top-down” approach pursued in the planning and implementation process is thought to be the most significant factor in the failure of previous natural resource management initiatives. During past attempts, the involvement of the farmers in conservation activities was limited to the contribution of labor alone, which was induced either by force or food-for-work payments. The local farmers were considered ignorant of land management and were not allowed to comment on the introduced conservation measures, which were alien to them.

This project is designed to fill the gap in participatory research and development activities and will include community involvement in targeting the current government strategic issues for promoting sustainable natural resource management for food security and foreign exchange earnings.



2. PROJECT AREA

A typical highland watershed, Dire Dam catchment, is selected for the project. The catchment is located some 50 km east of Addis Ababa city in Bereh Aleltu District (see Figure 1). It lies with in 09°10'35.7" N and 038°55'10.4" E. The altitude of the catchment ranges from 2000–3028 m above sea level. The topography of the area can be categorized to 50% gentle, 25% hilly and 25 % of the area as rugged (District Development Agent Office). The soil of the area is brown and black clay soil.

The area is categorized as the Dega agroclimatic zone and has an average temperature of 15–20°C. The annual rainfall ranges between 1000–1800

mm. Most of the rainy season is between June and September. Currently one cannot find natural forest, but the upper portion of the watershed is covered with *Eucalyptus globulus* plantation managed by the Finfinne fuelwood project, which covers an area of about 1000–1200 ha. As elderly local farmer told us that the area was formerly very conducive for cereal production.

Three peasants association (Dire sokoru, Tenkole warabi, and Bura maru tulukorbecha) are found in and around the Dire Dam catchment. The total population of the catchment was estimated at 8,275 in the 1993 E.C. Census, and is presently estimated to be more than 8,800. The major economy is sedentary farming mainly for subsistence purpose. The major crops grown are barley, teff, wheat, beans, peas, lentils, oats, and fodder beet (sinar). Livestock are the major capital asset, without them life for the farming community is considered to be impossible. Collection of fuelwood, mainly branches, twigs, and leaves of Eucalyptus from the Finfine fuelwood forest project, and charcoal making are common practices and the fuelwood and charcoal are sold at Dire, Lagadadi, and Addis Ababa. Most of the farmers spent their time on fuelwood collection and marketing. Although the area is hilly, rugged, and undulating, there is no conservation practice on farmland.

3. PROJECT RATIONALE

Rapid ecological change and land-use conversion in the highlands of Ethiopia necessitate new approaches aimed at halting and reversing the damage. Given the diversity in the physical and socioeconomic environment and spatial variations in the type and severity of the country's natural resources degradation, any effort toward conservation and development has to be site specific.

Designing realistic conservation and development techniques and identifying promising approaches for intervention require a rigorous understanding of process, extent and rate of resource degradation, and the socioeconomic and institutional circumstances at the local level. The physically appropriate spatial units for research on resource conservation issue are watersheds. The watershed context provides the natural framework for investigation into the complex reciprocal linkage among land use, forest, soil, and water resources, and interdependence of people in their resource-use practices. Because of this physical significance, watersheds are also considered to be the logical spatial construct for sustainable and integrated management of the resources with the direct involvement of the local populations in what is popularly known as "integrated watershed management." Research and development related to a watershed approach are identified as the major gaps in the strategic plan of the Ethiopian government in general and the Ethiopian Agricultural Research Organization (EARO) in particular. This provides a good opportunity to build on the current research activities and development practices of NGOs and government agencies in these areas.

The rationales for selection of the Dire Dam catchment as the site for this study are multiple. First, it is a typical highland in terms of various environmental





attributes such as topography, soils, climate, and socioeconomics. Second, the catchment is one of typical highlands presently threatened by resource degradation. Third, the dam is currently threatened by very rapid siltation mainly induced by agricultural activities. No detailed study has been carried out on the issue of resource degradation and management in this particular catchment. Because the study is site specific, it will be a valuable contribution to the much-needed but very scarce local-level understanding of the problem of resource degradation in Ethiopia. Additionally, with its emphasis on necessary mitigation and restoration measures that should be taken to promote sustainable resource use in developing nations, it will have much wider relevance as well.

4. PROJECT OBJECTIVES

The overall objective of the project is to demonstrate the role of integrated watershed management for catchment treatment in Ethiopia. The work will be implemented as a pilot project in a typical selected highland watershed. The objectives of the different components of the project are as follows:

- ❖ To evaluate the extent, rate and process of forest conversion
- ❖ To describe the existing land use, soil and water condition, socioeconomic condition, resource use and management practice
- ❖ To model the overall effect of the existing system on the catchments
- ❖ To identify and evaluate the requirements for practical implementation of catchments treatment using appropriate land use types.
- ❖ Capacity building

5. PROJECT DESCRIPTION

The project will run for five years and would comprise five main components. During phase I (the first two years) of the project Forest conversion analysis, identifying the existing land use system and management practice, and modeling this system for its future impact, will be the major focus. Catchment treatment based on designed suitability class of various land use type appropriate to the project area will be the major focus under phase II (during the remaining three years) of the project. During phase two, experts of different disciplines will identify suitable intervention for the project areas involved. The major activities to be conducted under each component are described below.

Component 1. Forest Conversion Analysis

In the Dire Dam Catchment treatment, the project will evaluate the extent, rate, and process of forest conversion. Activities to be undertaken under this component are as follows:

- ❖ Aerial photographs or satellite images taken in different years with base scale of 1:50, 000
- ❖ GPS data collection for training sites and ground truth (accuracy assessments)
- ❖ Geo-referencing photos according to Universal Transverse Mercator (UTM) system using 1:50, 0000 topographic maps
- ❖ Delimiting and cutting out the study catchment by tracking it from 1:50, 0000 topographic map and digitizing in Arcview
- ❖ Identification and classification of land cover types on aerial photographs by visual interpretation
- ❖ Classification of land cover types from satellite images using ERDAS imaging
- ❖ Creation of land cover maps corresponding to different reference years showing temporal changes in land cover
- ❖ Focus group interviews conducted in sample villages near the catchments to obtain additional information



Component 2. Existing Land-use System and Management Practices

The project will describe the existing land use, soil and water conditions, socio-economic conditions, and resource use and management practices of the project site. The following activities will be carried out under this component:

- ❖ Classification of the existing land use of the area using the steps mentioned in the above component
- ❖ Detailed socioeconomic studies using standard PRA techniques will be used to identify the socioeconomic condition, and resource use. In addition, information on the current management practice in the watershed will be identified.
- ❖ Field surveys, soil sampling, and hydrological evaluation to characterize the soil type and water conditions of the area

Component 3. Modeling

Based on the information identified from component 2, the overall effect of the existing circumstances and management on the catchments will be modeled. This will entail the future scenarios for the catchments, including the loss of drinking water to the capital city of Ethiopia, Addis Ababa. This will be done in collaboration with Oregon State University, College of Forestry, USA.

Component 4. Catchment Treatments

In this component, the requirement of the appropriate land use types for practical implementation for the catchment treatment will be identified and evaluated.



The following activities will be carried out under this component:

- ❖ Land-use type requirements and land capabilities will be characterized and mapped accordingly
- ❖ The two indicative maps will be overlaid
- ❖ Suitability class of the area with respect to the different land-use types options will be generated
- ❖ Various experts and stakeholders for implementing and evaluating the identified suitable land use types for catchment treatment will be involved
- ❖ Management plan for each land-use type will be developed

Component 5. Capacity Building

This component focuses on strengthening the human and physical resource of the National Forestry Research. To achieve the desired objectives and success of the proposed research program, a gradual buildup of research and extension personnel through long-term (PhD and MSc) and short-term training in the area of implementing this project are required.

6. INDICATIVE COSTS

Table 1. Cost summary per component

| Component | Local | Foreign | Total (\$US) | %Foreign exchange | % Total Base cost |
|--|-------|---------|------------------|-------------------|-------------------|
| 1. Forest conversion analysis | | | 660,000 | | |
| 2. Existing land-use system and management practice | | | 520,000 | | |
| 3. Modeling | | | 200,000 | | |
| 4. Catchment treatment | | | 1,503,000 | | |
| 5. Capacity building (Long- and short-term training) | | | 1,689,019 | | |
| Total baseline cost | | | 2,883,000 | | |
| Physical contingencies | | | 19,2200 | | |
| Price contingencies | | | 14,4150 | | |
| Total (\$US) | | | 3,219,350 | | |

Table 2. Cost summary per component per year (\$US)

| Component | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Total |
|---|----------------|-------------------|------------------|------------------|-------------------|------------------|
| 1. Forest conversion analysis | 495,000 | 165,000 | | | | 660,000 |
| 2. Existing land-use system and management practice | 130,000 | 390,000 | | | | 520,000 |
| 3. Modeling | | 50,000 | 90,000 | 60,000 | | 200,000 |
| 4. Catchment treatment | | | | 976,950 | 526,050 | 1,503,000 |
| 5. Capacity building | 59,1156.7 | 591156.7 | 168901.9 | 168901.9 | 168901.9 | 1,689,019 |
| Total baseline cost | 625,000 | 756,157 | 256,902 | 228,902 | 694,951.9 | 2,883,000 |
| Physical contingencies | 41660 | 50,410 | 17,128.8 | 15260.1 | 46,330.12 | 19,2200 |
| Price contingencies | 125,000 | 37807.85 | 12,845.1 | 11,445.1 | 34,747.6 | 14,4150 |
| Total project costs | 791,660 | 844,374.85 | 286,875.9 | 255,607.2 | 776,029.62 | 3,219,350 |



7. PROPOSED SOURCES OF FINANCING

It is anticipated that the input requirements of the projects will be met as follows:

- ❖ The Ethiopian government will cover staff salaries and make available the existing office, laboratory, and farm facilities
- ❖ The remaining financial requirements are expected from other donors. Oregon State University, College of Forestry is collaborating with Forestry Research Center in the Ethiopian Agricultural Research Organization. Assistance is expected from this University in seeking funding, providing faculty during design and analysis of the study, as well as staff training
- ❖ The stakeholders, particularly farmers, will provide part of the project cost in the form of labor, land, and other material support

8. PROJECT BENEFITS

The main benefits anticipated from the project are as follows:

- ❖ A well-managed, model catchment
- ❖ An expansion of income generating activities through promotion of high value trees and shrubs



- ❖ Increase in availability and quality of livestock feed through promotion of fodder trees and shrubs
- ❖ Improvement in social and economic growth of area communities
- ❖ Sustainable municipal drinking water supply for the local people and capital city of Ethiopia, Addis Ababa
- ❖ Improved fertility of the land through improved soil and water conservation techniques
- ❖ Expansion of income-generating activities undertaken by improving employment opportunity and socioeconomic status of local communities
- ❖ Increased availability of food (fruits), fodder, and fuelwood
- ❖ Strengthening research capacity

The main beneficiaries of the project will be

- ❖ Subsistence farmers
- ❖ Addis Ababa Water and Sewerage Authority
- ❖ Addis Ababa residents dependent on Dire Dam.
- ❖ Environmentalists/conservationists
- ❖ Researchers/forestry practitioners
- ❖ Policy makers

9. IMPLEMENTATION ARRANGEMENTS

The Forestry Research Center (FRC) of the Ethiopian Agricultural Research Organization (EARO) in collaboration with Oregon State University College of Forestry will have the overall responsibility for the implementation of the project. The Ethiopian Addis Ababa Water Supply and Sewerage Authority and project site communities and other stakeholders will participate in planning, design, and operation of schemes. Local coordinators from FRC will be assigned to run activities, and conduct reporting, planning, and implementation of routine field activities.

10. TECHNICAL ASSISTANCE REQUIREMENTS

The project requires one short-term technical assistant in the area of integrated watershed management research.

11. ISSUES AND PROPOSED ACTIONS

Technical

There are several issues that should be considered as part of further processing of this project:

Conservation technologies

Although Ethiopia has considerable experience in the application of physical conservation techniques mainly based on blanket recommendations at farm level, the use of biological methods of erosion control is much more recent and less widespread. The proposed research and development activities are site specific and will be expected to maintain the balance between physical and biological approaches at watershed scale during the implementation phase. The catchment treatment component also must be considered with respect to the land-use types to be applied and the way the implementation is to be handled, in order to ensure that farmers perceive it as a useful activity and will be prepared to participate in the activities proposed.

Participation

It is difficult to get the participation of local communities, particularly where food aid/food-for-work and cash-for-work are the norms for securing people's involvement in the project. However integrated watershed management research presupposes multidisciplinary approaches, full and willing participation of research staffs, and the community. This must be ensured through the creation of awareness by training workshops and frequent meetings for successful implementation of the project. Wherever possible, the project will take advantage of experiences of NGOs operating in the project area.

Project scale

This project is designed for a 5-year period but the outcomes of the project can be further expanded in the project area and may also be scaled to similar agroecosystems elsewhere in the country.

Financial

Most of the activities do not yield immediate benefits and may not appear to be attractive to the farmers. It is therefore necessary to find actions that combine immediate profitability with desired project effect. Some of the actions include the use of fruit and forage trees for conservation, legumes that provide ground cover as well as useful feed for animals and high value crops, and or market-





able crops that generate direct income to the farmers. Further activities are required to empower the participating farmers to sustain the project. The level of financial support available against the long-term nature of a discipline such as forestry determines the number and quality of researches and development activities. It is recognized that forestry research needs the provision of adequate funding for activities extending beyond 5 or even 10 years.

Institutional

For effective research and development activities, the joint effort of EARO and regional research institutes, along with regional agriculture bureaux and other respective institutions is required, particularly to resolve transboundary and other similar issues arising during the project life.

Policy

The designed research is action oriented and participatory. Hence appropriate release and transfer mechanisms should be thought for the technologies refined and developed through this effort.

12. POSSIBLE RISKS

There are seven major risks that can be identified at this stage:

1. Implementation delays

In the past, similar projects failed due to delays in approval of proposals, timely release of funds, and procurement of field and laboratory facilities. Therefore, autonomous and decentralized decision-making should help to reduce such risks.

2. Market

There is a possibility that low product prices may prevail due to high production and lack of seasonal crop diversity. Therefore, besides creating convenient market outlets through establishment of purpose-oriented farmers' groups, farmers should be trained in cropping calendar planning, crop diversification, and market demand assessment.

3. Research staff turnover

Availability of qualified research staffs is critical for the success of the project. Nevertheless, past experience shows that qualified staff turnover is high due to attractive employment opportunities elsewhere. The project must include policies and incentives to reduce staff turnover. It should also consider provision of fringe benefits for site coordinators.



4. Project sustainability

The capacity and capability of the farmers to sustain the project without external assistance may not be feasible after the termination of the project. For a realistic and achievement of the goal of the project, it may be necessary to provide assistance for at least two cycles. Moreover, the project should aim at empowering local communities, thereby strengthening managerial capacity of common goods and services through community action and enhancing their financial and technical capacity. However, this cannot be addressed without active involvement and subsequent technical assistance of local development and administrative institutions.

6. Natural calamities

Forestry is subject to climatic variability, disease and pest outbreaks, wildland fires, and other natural effects resulting from human-caused disturbances and uncontrolled livestock grazing, which may affect some aspects of project implementation

7. Land use conflict

In Ethiopia, land is not owned in private. This has caused insecurity of ownership of both land and trees, particularly long-term investments such as growing trees and soil conservation. The recent development of issuing the “Users’ Rights” certificate is encouraging, however, the results of this development remain to be seen.

13. CURRICULUM VITAE

The *curriculum vitae* of some of participants in developing the proposed project and involving the appropriate experts during implementation of the project are listed below.

Alemu Gezahgne

Dr. Alemu was born on 1 February 1958 in Addis Alem, West Shoa, Ethiopia. In 1979, he received a Diploma in Forestry from Wondo Genet College of Forestry. He also holds a Bsc in Forest management (1987-1989) from Swedish University of Agricultural Science, MPhil in plant protection (1992-1994) from University College of North Wales, UK and PhD in plant pathology (2000-2003) from University of Pretoria, South Africa. Currently, he is serving as Director of Forestry Research Sector in the Ethiopian Agricultural Research Organization (EARO). He had served in Forestry Research Center; as acting head of Forestry Research Centre, Coordinator of Forestry Research Office, Silviculture a



forest protection research coordinator, and junior silviculture researcher. In the ministry of Agriculture; he had also served as subject matter specialist of Forestry and Wildlife development for Bahir Dar Awraja (Province) in North western Zonal Agricultural office, senior expert for regional state for forest development Department in Regional Forestry and Wildlife Development and Conservation Authority (FaWCDA) branch office for Gojam Administrative Region, acting Head, Province (Awraja) Forestry and Wild Life Development and Conservation Authority branch office for Kola Dega Damot province in Gojam Administrative Region (FaWDCA), and junior forest Development Expert at Kola Dega Damot Province in Gojam Administrative region (MoA). Dr Alemu has conducted a number of research experiments and published several articles in various national and international Journals, participated in different seminars and short-term training. He can be reached at: forestry@earo.org.et

Tesfaye Hunde

Mr. Tesfaye Hunde was born on 9 September 1959. In 1993, he received a Diploma in general forestry from Wondo Genet College of Forestry. He holds a Bsc. in Forest management (1986-1988) from Swedish University of Agricultural Science and M.Sc. in Silviculture and Forest management (1992-1995) from University of the Philippines at Los Bois. He is a Center Manger of the Forestry Research Center of the Ethiopian Agricultural Research Organization. He had served as leader of the National Forest Research Program, coordinator of National Natural Forest Research Project, Coordinator of Forestry Research Center, and junior expert in Food For Work (MoA). Mr. Tesfaye, has conducted a number of research experiments and published several articles in various national and international Journals, conducted consultancy works, participated in different seminars and short-term training. He can be reached at: forestry_res@telecom.net.et

Mengistie Kindu

Mr. Mengistie was born on 8 June 1977 in Gojjam, Ethiopia. He obtained his first degree (BSc) with distinction in 2000 from Wondo Genet College of Forestry, Debu University. He did the best Graduation Research Project in his batch and is awarded a prize from the Gunnar Lilja Memorial Fund (GLMF) located in Sweden. His academic merit in research helped him to join the Forestry Research Centre of EARO as Junior Researcher. After two years of service, he joined Wageningen University and Research Centre for MSc study in Geo-information Science by securing full scholarship from the Netherlands Organization for intentional cooperation in higher education (Nuffic) through the University Fellowship Program. From May 2004 (Upon retuning), he continued his service as Assistant Researcher in the Forestry Research Centre of EARO. Mengistie presented papers in international conferences, conducted consultancy works and participated in different workshops, seminars and symposia. He can be reached at: mengistiek@yahoo.com.

SECTION IV



Workshops on
Scientific
Communications
and Education



WORKSHOP ON THE PREPARATION OF SCIENTIFIC PAPERS AND REPORTS

Gail Wells¹

On a temporary appointment with Oregon State University, I traveled to Ethiopia in January and February of 2004 to deliver two 10-day workshops in scientific communication. The workshops were part of a grant funded by USAID to establish a partnership between Oregon State University and the Federal Democratic Republic of Ethiopia. The project's overall goal was to develop research and teaching capacity in Ethiopia's natural resource teaching and research institutions. The workshops were directed at fulfilling the project's second objective, which was to strengthen the capacity of the Ethiopian Agricultural Research Organization's (EARO's) Forest Research Center staff by developing their research skills through short-term training, workshops on proposal writing, and preparation of scientific papers and reports.

At the time the project proposal was submitted I was employed at the Oregon State University College of Forestry as Director of Communications and manager of the College's scientific editing and graphic design service. I was asked to prepare to deliver the workshops should the project be funded. By the time it was funded, I had left the University's employ, but the directors of the U.S. partnership, Dr. Badege Bishaw and Ms. Marion McNamara, asked me to deliver the workshops as originally planned.

The first workshop, Jan. 12-23, took place at the Ethiopian Agricultural Research Organization's Forestry Research Center in Addis Ababa. The second, Jan 26-Feb. 6, took place at Wondo Genet College of Forestry. Outlines for each day's lesson are included in Appendix A.

In this report, I will set forth the objectives of the workshop and the methods by which it was taught, describe the learning environment, discuss the capabilities and needs of the participants, and offer an assessment of how the workshop was received. I will close with suggestions for developers and instructors of future workshops of this kind.

WORKSHOP OBJECTIVES

Objectives of the workshop, as set forth in Lesson 1, were

- ❖ to introduce students to the principles of scientific communication, including written and oral communication strategies, audience analysis, organizational principles, composition, editing and revising, and preparing a manuscript for publication

¹Gail Wells Communications, 11370 Elkins Road, Monmouth, OR 97361 (503) 838-6552; gailwells@ashcreekwireless.com. April 6, 2004



- ❖ To encourage participants to prepare their own research for publication as a peer-reviewed paper, extension publication, or grant proposal.

METHODS

The workshop was presented in a series of nine lessons. The first lesson introduced the workshop's major topics. Lessons 2 through 8 covered these topics: principles of communication, organizing ideas, composing, other forms of scientific communication (the subject of two lessons), preparing a paper for publication, and presentations and posters. Lesson 9 was a wrap-up and review of lessons. The tenth day was devoted to one-on-one interactions with students, evaluation of assignment portfolios, and presenting of certificates. Lesson outlines are provided in Appendix A.

Each day's class consisted of a 2-1/2 hour lecture/discussion/demonstration session and an hour set aside for one-on-one consultation at the students' request. At the Forestry Research Center the instruction was conducted in the morning and the consultation time was held in the afternoon. At Wondo Genet, because of scheduling difficulties, the instruction was conducted on alternating mornings and afternoons, and the consultation time was offered in the morning on afternoon-class days and in the afternoons on morning-class days.

Participants received in-class and take-home writing assignments. They were asked to furnish one of their own research papers on which to practice the various aspects of scientific writing, with the goal of improving the communication of their own research and moving their papers closer to readiness for publication. In most of the writing assignments, students used their research papers for practice. Some assignments were stand-alone writing assignments, most of them conducted in class.

Participants were asked to form peer-critique groups of two or three for the purpose of coaching one another in their writing skills and their progress toward a publishable paper. They also were asked to keep a diary of their thoughts and impressions about the class, to help them become more reflective and self-aware about their communication skills.

None of the assignments was graded, but I corrected the writing assignments, making suggestions about logical flow, sentence structure, and word choice, the same as I do in my editing work. I encouraged participants to rewrite passages of their papers to incorporate my corrections and suggestions, and many of them did, even though I did not require it. I did not review the diaries unless participants asked me to. Those who completed all the assignments received a certificate of completion.

LEARNING ENVIRONMENT

At the Forestry Research Center, we met in a small classroom furnished with tables and chairs for participants, an overhead projector, and a well-worn acrylic

marking board. For the afternoon conference sessions, I used the office of one of center's administrators, who put it at my disposal for the 2-week period.

At Wondo Genet, we met in a well-equipped classroom that had tables and chairs, an overhead projector, and a setup for computer presentations (which I did not use). I held the conference sessions in the same classroom.

Support capacity was more limited than I had expected. It was difficult to get materials photocopied, and access to the internet was limited at FRC and nonexistent at Wondo Genet. Support staff in both places worked hard to help me get what I needed, and I much appreciated their help.

PARTICIPANTS' CAPABILITIES AND NEEDS

All participants spoke and wrote English with at least moderate fluency, and a few were very fluent. Their scientific training had exposed them to the conventions of writing a scientific paper in English, but their experience in writing and publishing was highly varied. Participants at the Forestry Research Center, who are actively engaged in research, had more experience with scientific communication generally than did those at Wondo Genet, who are teachers and administrators rather than researchers. Thus the Forestry Research Center participants had research papers already written or conceived that they could use in the workshop, whereas most of the Wondo Genet participants did not.

At both centers, participants had to find time in their busy schedules to attend the workshop. No special time had been set aside, and they were still responsible for field trips and meetings (in the case of the FRC participants), and classes and administrative duties (at Wondo Genet). Moreover, it appears that the workshops had been scheduled during an unusually busy time at both places. Attendance was therefore irregular. At the FRC, 20 researchers initially signed up for the workshop. About 18 attended on the first day, and 12 received certificates of completion. At Wondo Genet, 22 signed up, about 8-10 attended classes, and four received certificates of completion.

HOW THE WORKSHOP WAS RECEIVED

Participants at both FRC and Wondo Genet offered positive evaluations of the workshop. Evaluations are contained in Appendix B. The large drop-off in attendance, particularly at Wondo Genet, caused me some concern. Many participants there told me that the main problem was that the workshop had been scheduled at a bad time. I think another important factor was the difference in professional priorities between the researchers at FRC and the teachers at Wondo Genet. One of the participants there, a senior lecturer, told me after the workshop was finished that he and his colleagues are so busy keeping up with their classes and administrative duties that they don't have time to think about conducting research, let alone publishing research. He said a workshop on curriculum development would have been more useful. We agreed that the



awkward schedule also made things difficult for participants. Nevertheless, this man and the others who stayed with the workshops to the end all said they had learned a lot about scientific writing and were glad they'd had the opportunity to attend.

I expected language and cultural barriers, and there were some, but I believe they were readily overcome from both sides. A couple of participants asked me to speak more slowly because they were having difficulty understanding my English. My American accent caused minor problems for a few, but on the whole we all made ourselves easily understood.

As for cultural differences, I was prepared for a more formal, lecturer-centered classroom atmosphere than prevails in the United States. That is what I found, but it was even more formal than I had expected. The participants were uncomfortable working in groups, especially for the purpose of critiquing one another. They also were unused to the ready give-and-take of classroom discussion that I hoped to encourage. They became more comfortable with it after the first couple of days, and by the end of the session we were all very comfortable with one another. However, the class discussions seldom approached the freewheeling conversations that American students often engage in with their teachers.

Participants had some difficulty at first in understanding the diary assignment. They did not grasp immediately that I wanted not class notes but personal impressions and reflections. When I clarified my intent, most of them wrote in their diaries daily, as assigned.

They appreciated the writing assignments, even though many found them demanding. My written comments in particular helped them both to clarify their scientific explanations and to write smoother and more-idiomatic English.

RECOMMENDATIONS

Because support capacity is limited in Ethiopia, instructors should count on bringing all the instructional materials they will need. I was not sure before I left for Ethiopia what the participants' needs would be, so I had developed a flexible workshop plan and taken master copies of many materials with me, hoping to save luggage space by making copies once I was there. This proved to be more difficult than I had anticipated.

I saw immediate improvement in the participants' writing in response to my written comments on their work. This one-on-one editorial coaching could be a very effective and practical way to improve writing skills of both researchers and teachers. Perhaps another project could be developed whereby faculty at FRC and Wondo Genet could submit manuscripts via the internet to the editorial shop at the College of Forestry. A grant to cover the cost of these services would not have to be large to be effective.

Instructors, particularly American instructors, should be aware that classroom decorum in Ethiopia is more formal than they may be used to. They may want to prepare lectures in some detail ahead of time, rather than relying on class conversations to bring up the points they want to convey. In addition, participants appreciate written notes to supplement the spoken lectures.

If possible, future workshops should be scheduled at intervals in the school or work year when participants' normal duties are light. It would also be helpful if administrators at the host institutions offered leave time to their employees to attend the workshops.

SUMMARY

This scientific writing workshop, although it encountered minor challenges, conveyed much useful and appreciated information to the Ethiopian scientists to whom it was presented. I believe it also strengthened the partnership between Oregon State University and the forestry teaching and research effort in Ethiopia. My hosts all expressed a desire for more such interactions, and they all invited me to come back. The relationship between Ethiopia and OSU has been fruitful so far, and it has potential to confer ongoing benefits on both parties.





WORKSHOPS ON COMMUNICATIONS, PEDAGOGY, AND USE OF EDUCATIONAL TECHNOLOGY AND NEEDS ASSESSMENT AT THE FORESTRY RESEARCH CENTER AND WONDO GENET COLLEGE OF FORESTRY

Mark Reed

From June 13 to July 23, I was in Ethiopia as part of our Institutional Partnership Program. My principal responsibilities were to conduct workshops for research staff at the Forestry Research Center (FRC), Ethiopian Agricultural Research Organization (EARO), in Addis Ababa; conduct workshops for faculty and staff at Wondo Genet College of Forestry (WGCF), Debu University, near Shashemene; and assess needs of partner institutions.

Additionally, after completing the above activities, I was to document, with videotape and digital photos, agroforestry practices in diverse ecoregions of southern Ethiopia and conduct seminars on the topic of ecotourism for faculty and staff of WGCF; and for staff of the Wildlife Conservation Department, Ministry of Natural Resources, in Addis Ababa.

WORKSHOP OBJECTIVES

One month prior to departure, I attempted to contact Dr. Alemu, Director of the FRC, and Dr. Abdu and Dr. Zebene of WGCF, via e-mail, to clarify terms of reference and workshop logistics. However, I received no responses. Based on my understanding of the needs of both institutions, I came prepared to offer short workshops addressing the following objectives:

- ❖ Strengthen presentation skills for classroom teaching and delivery of scientific papers.
- ❖ Strengthen skills in use of educational technology:
 - Microsoft Powerpoint, for production of projected visual aids and posters
 - Digital photography

Additional objectives for teaching faculty at WGCF:

¹Instructional Design and Media Production Specialist, Forestry Media Center (FMC), College of Forestry, Oregon State University (OSU). August 6, 2004.



- ❖ Strengthen skills in pedagogy, particularly,
 - Development of measurable learning objectives
 - Development of course syllabi
 - Evaluation of student learning
 - Evaluation of teaching using formal and informal feedback from students

METHODS

The workshops consisted of short modules that could be modified to fit available time and resources, since I had no clear concept of how much of either was available at the partner institutions. In particular, topics covering objective 2 required infrastructures such as computer workstations, digital cameras, and a data projector; based on the report of my colleague Gail Wells, these were not generally available at either institution. As it turned out, infrastructure at WGCF was adequate, while infrastructure at FRC was not. At WGCF, there was a fully equipped audiovisual lab, with digital cameras and data projector; and a computer lab with more than 20 terminals. At FRC, it took 8 days to secure a data projector; computer workstations had to be shared among a large number of staff, and were seldom available on a predictable basis. Infrastructure limitations at FRC severely impacted delivery of planned modules and necessitated frequent schedule changes.

Workshops were broken into 3 days on presentation skills, two days on educational technology (four at FRC), and two days on pedagogy (WGCF only). Based on participant needs, workshops at FRC were scheduled for 2-3 hour blocks once per day, with additional time available for personal instruction or consultation on individual projects. At WGCF, most workshops were offered twice, once in the morning and once in the afternoon, to maximize the number of people able to attend. As it turned out, morning workshops at WGCF were poorly attended.

PARTICIPANTS

At FRC, a total of 24 people attended at least one workshop, but only 12 people attended two or more and only 6 attended 5 or more. Attendance was sporadic because of the high work load at this time of the year: researchers were busy finishing end-of-year reports and initiating new projects for the current growing season. Because of participants' intense interest in receiving a certificate, I decided to present a certificate to anyone who attended at least 2 sessions. Attendance was highest at the presentation skills sessions. I believe that attendance at educational technology sessions would have been higher; however, these sessions had to be repeatedly postponed due to the lack of a data projector.



At WGCF, a total of 27 people attended at least one workshop; 15 attended at least 4; and 12 attended 5 or more sessions. Overall interest was highest in pedagogy, but attendance at all workshops was high. Four people, representing a committee on improvement of teaching, came from other units of Debu University. Because of their schedule, I held extra workshops to accommodate them. Certificates were presented to the 13 participants from WGCF who had attended at least 4 sessions.

Most participants at both institutions had a keen interest in all subjects presented, except for pedagogy, which understandably was of interest only to those at WGCF. Computer skills at FRC varied widely, and tended to be higher on average at WGCF.

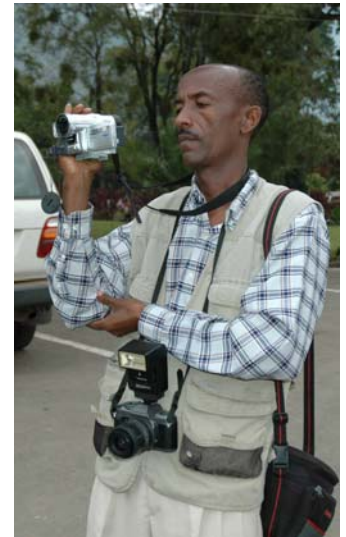
NEEDS ASSESSMENT

Improved Internet access is the most critical need that I observed during my visit. Currently, Internet access at both institutions is via dial-up modem, at a typical speed of around 26kb/sec. at FRC, and 52kb/sec. at WGCF. A single connection is shared by more than 20 staff through local area networks (LANs). This appears to be the only option within Ethiopia at present, judging from the other sites, such as hotels and Internet cafes, that I visited in the capital city of Addis Ababa. Such a slow connection speed takes interminable time to download information from the Internet. As an example, I found it impracticable to use Outlook to access e-mail. Even with a Yahoo account, it sometimes took 5-10 minutes to download a single 3k message, depending on how many users were accessing the connection at one time.

Improved information technology support is also critical, particularly at FRC. I observed a widespread incidence of computer viruses, and an overall lack of network security. Computers were shared, and passwords were generally not used, sometimes not even by network administrators. WGCF does contract with a highly experienced IT consultant from the International Livestock Research Institute (ILRI) in Addis Ababa, and many improvements are underway at present.

Lack of access to computer and communication peripherals (such as digital cameras and multimedia projectors) is hindering the FRC's ability to disseminate the information it develops to colleagues at other institutions, to other government agencies, and to those who most need it, the farmers who comprise over 80% of the Ethiopian economy. The digital cameras used during the current workshop were the first ever used at the Center. EARO has two multimedia projectors, but they are shared among many centers in different locations around the country, and it took over a week for FRC to secure a projector for the workshop.

Large class size and low entry skills of new students are two of the biggest problems at WGCF. Instructors who attended the workshops on instructional





design and pedagogy expressed frustration at trying to implement any improvements in an atmosphere that they perceive is not conducive to learning. For instance, most testing is by pen and paper final exams, because it is the most efficient way to handle large student numbers. The number of practical hands-on skills that can be taught is seen to be limited by the ability to evaluate student competence.

Currently, the practice of accreditation is very limited in Ethiopia. There is a government ministry of education that oversees all institutions, but peer review by institutions from outside of Ethiopia does not routinely take place.

OPPORTUNITIES FOR FUTURE COLLABORATIVE ACTIVITIES

Partners at the two Ethiopian institutions expressed keen interest in expanding their relationship with OSU in many dimensions. Below are a few of their ideas:

Scientific collaboration (FRC and WGCF)

- ❖ Develop more current forest inventory (most recent data is from 1994 EFAP) as an accessible database. Perhaps we can develop a joint proposal for a remote sensing – based inventory, involving Dr. Bill Ripple or others? Ato Mengistie at FRC already has access to free satellite data from MODIS.
- ❖ Develop a suitability classification (refinement of agroecological zones) – determine which type of forest spp. can grow in which parts of the country.
- ❖ Facilitate FRC's contribution to control of malaria - apply GIS to identify malarial risk areas and areas amenable to biological control (e.g. neem) by overlaying two datasets.
- ❖ Improve watershed management of Blue Nile basin. Use GIS to determine which spp. can grow in which areas, for control of soil erosion.
- ❖ Model consequences of siltation in Lake Tana, near Bahir Dar. Deforestation has led to increased runoff and soil erosion, which in turn causes rising water levels, increase of malaria, and an eventual decrease in the lake's water storage capacity. A scientific model of these consequences might help lead to the development of an effective management plan.
- ❖ A detailed study of extant *Boswellia* spp. (frankincense) stands and potential for regeneration, domestication, and efficient utilization.

Instructional design and pedagogy (WGCF)

- ❖ Conduct an accreditation of the institution's forestry curriculum.
- ❖ Conduct more in-depth workshops on teaching techniques, evaluation, and other topics.
- ❖ Help prepare audiovisual materials that can be used with the existing library and AV and computer labs.
- ❖ Share teaching materials and techniques for remote sensing and GIS.

IT support

- ❖ Conduct workshops on web design, network management, computer troubleshooting, and other topics.
- ❖ Provide technical consultation on network design and administration, website management, etc.



OTHER RECOMMENDATIONS

This project has enormous potential. There is tremendous interest from everyone in the two Ethiopian partner institutions. The principal impediments to success are communications bottlenecks and existing workloads. Because of the 10-hour time difference between Oregon and Ethiopia, telephone conversations are impractical. E-mail does not always get answered, so it is difficult to determine if it has even reached the right person. To reiterate a point made by Gail Wells in her final report, it would be good if administrators at partner institutions could provide release time to employees. It is also important to try and schedule activities so that they do not occur during busy times in the Ethiopian institutions' calendars.



WORKSHOP ON SCIENTIFIC COMMUNICATION

APPENDIX¹

Workshop 1 Getting started

Workshop objectives

Participants are introduced to principles of scientific communication, including written and oral communication strategies, audience analysis, organizational principles, composition, editing and revising, and preparing a manuscript for publication.

Participants prepare their own research for publication as a peer-reviewed paper or extension publication or as a grant proposal.

Workshop strategy:

Practical, interactive instruction guided by feedback from instructor and fellow participants. Extensive writing will be required. Participants who complete all assignments will be given a Certificate of Completion.

Main topics:

The situation with regard to scientific research and publication in Ethiopia. Major research topics and priorities. Funding sources. Applicable journals. Means of technology transfer.

Activity:

Introduce students and their work to fellow participants and instructor.

Instruction:

Freewriting I

Workshop diary

Assignments:

Freewrite for 20 minutes on the topic: What are the chief obstacles to the dissemination of scientific knowledge in Ethiopia, and what should be done to eliminate them?

Write in your workshop diary.

Workshop 2. What is this thing called communication?

Review yesterday's discussion:

Introduction of participants, introduction of workshop, the research and publication situation in Ethiopia, research priorities, technology transfer, appropriate journals, instruction in freewriting and workshop diary)

Main topics:

Communication in a social and cultural medium

The communication model: from Sender through Medium to Receiver

Barriers to communication

Communication as strategy

Considerations of audience

Scientific communication

Forms of scientific communication: journal articles, funding proposals, reports, extension publications, newsletters, annual reports, books and book chapters, posters, presentations, web sites

Gail Wells, M.S., Oregon State University, Forestry Research Center,
Addis Ababa, Ethiopia January 12-23, 2004.

The peer-reviewing protocol

Online journals

Peer critiquing

Assignments:

Write a letter of introduction about yourself and your research to a scientist with whom you hope to study. Keep it to two pages or less.

As you get time, read IANSP newsletter Oct. 2001 (on CD), about online journals.

Write in your workshop diary.

Workshop 3. Organize your thoughts

Review yesterday's discussion:

The communication model (from Sender through Medium to Receiver), barriers to communication, strategic communication, forms of scientific communication)

Main topics:

The Four Questions:

1. What did I set out to do?
2. How did I do it?
3. What did I find out?
4. Why does it matter?

Top-down organization

The iterative nature of conceiving, writing, and revising

Foundation, Framing, Finishing, Furnishing

Basic structure of a scientific paper (Introduction, Methods and Materials, Results, Discussion, Conclusion)

Making each part functional

Reciprocal relationships between Methods/Materials and Results, and between Introduction and Discussion/Conclusion.

Finding a focus (Walker 89-96, Hacker 9-10)

Outlining (Walker 87-98, Hacker 3-9)

Assignments:

Read IANSP article on health-care delivery and write an abstract that answers the Four Questions.

Write a preliminary outline of your own research.

Write in your workshop diary.

Workshop 4. Composing

Review yesterday's activities:

The Four Questions; top-down organization; Foundation, Framing, Finishing, and Furnishing; structure of a scientific paper and functions of the parts; reciprocal relationships; finding a focus; outlining

Main topics:

Principles of composition (Strunk & White 10-27)

Paragraphs

One paragraph, one idea

Thesis statements (= topic sentences)

Patterns of paragraph development (example, narration, procedure, cause-and-effect, others) (Hacker 15-29, overheads 1-7)

The TRIAC structure (Thesis, Restatement/Restriction, Illustration, Analysis, Conclusion) (Anderson 87-104)

“In-and-out” paragraph flow

Organizing ideas (clustering, freewriting, note cards, “dump-and-label,” switch-screen writing, others)

Sentences

Word choice (Hacker 63-83, Strunk & White 34-58)

Rhythm and flow (Strunk & White p. 16, Cheever passage)

Avoiding sexist language

Elements of grammar (Hacker 121-129, 337-353)

English as second language trouble spots (overheads, Hacker 121-129)

Writing under pressure (Grove)

Proofreaders’ marks (overhead)

Assignments

Share the progress on your research outline with your group partners. Each partner will read and peer-critique the others’ work. Have a discussion about each study.

Write in your workshop diary.

Workshop 5. Other forms of scientific communication (1)

Review activities from yesterday:

Patterns of paragraph development, the TRIAC structure, organizing ideas, constructing solid sentences, rhythm and flow, word choice, grammar, avoiding sexist language, ESL trouble spots

Main topics:

Considering your audience (peer scientists, scientists in other fields, legislators and policymakers, funding organizations and NGOs, journalists, the general public)

Annual reports, newsletters, and brochures (examples: Focus on Forestry newsletters, Community Forestry newsletter, Sustainable Northwest annual report)

Extension publications and training manuals (example: *Oregon’s Forest Protection Laws* manual for small-woodland owners; article “Meeting the Information Needs of Third-world Farmers”)

Assignments:

Revise your study outlines to incorporate feedback from your group and instructor.

Write an outline for an extension publication based on your own research.

Read guidelines for submission of manuscripts to *Forest Ecology and Management*. Begin thinking about how to format your study for submission.

Go to internet and find guidelines for submission of research proposals to IFS.

Freewrite for 20 minutes on the topic: What I learned from my group’s peer-critique session yesterday.

Write in your workshop diary.

Workshop 6. Other forms of scientific communication (2)

Review activities from last time:

Considering your audience; annual reports, newsletters, and brochures; extension publications and training manuals

Main topics:

Grant proposals

Finding information (internet resources, annual reports, successful proposals of colleagues)

Targeting your proposal: "What can I do for you?"

What is the organization's mission?

How does it accomplish its mission?

What projects has it funded in the past?

What efforts is it NOT interested in?

Who is eligible to apply?

Is a letter of intent required (also called a concept note or a preproposal)?

What are the terms of the grant?

How do I develop my budget?

What "leveraging" can I bring to this proposal?

How do I complete the application form?

Following the submission guidelines

Assignments:

Study the requirements for submitting a letter of intent to the NCSSF. Be aware of how the NCSSF's questions are similar in function to the Four Questions we've been learning about.

Answer question 9.7 on p. 5 of the IFS grant guidelines. You already have some of this information in your letters of introduction.

Study question 9.11 of the IFS grant guidelines. Be aware of how similar it is in structure to a Methods and Materials section. Consider how the answers to these questions will help you in composing your Methods and Materials section.

Write in your workshop diary.

Workshop 7. Preparing your paper for publication

Review activities from yesterday:

Grant proposals: finding information, targeting your proposal ("What can I do for you?")

Main topics:

Aims and purposes of journal

Previous submission or publication

Pulling your paper together

Format and style points to observe

Editing checklist

Copyright issues

Electronic submission

Cover letters

Page charges

Responding to reviewers

Returning proofs

Assignments:

Write the Methods and Materials section of your paper (first draft). Format it according to the *Forest Ecology and Management* style guidelines. Format it according to the style guidelines of a journal of your choosing.

Outline a 5-minute talk based on your research. Prepare it as if you were to present it to Dr. Tsedeke Abate, the director-general of EARO.

Write in your workshop diary.

Workshop 8. Presentations and posters

Review activities from yesterday:

Mission of journal, types of research they publish, pulling your paper together, format and style points, editing checklist, copyright issues, electronic submission, page charges, responding to reviewers, returning proofs.

Main topics:

Presentations: the Five Ps

Planning: time allotted, equipment available, condition of room, audience background and interest, focus and organization, selectivity of material, tell a story.

Visual aids: should be simple and easy to read from a distance; preparing visuals in advance.

Practicing: Practice in front of mirror, in front of colleagues, with audio or videotape; keep track of time.

Previewing: Check room and facilities, lights, microphone, projector, lectern

Preparing: Rest, Refuel, Relax. Prepare for distractions. Lay out what you need in advance. Check everything again.

Presenting: Convey excitement, talk to audience, speak distinctly, move casually (if you can), answer questions enthusiastically.

Preparing a poster

Communicate a theme: simplify and condense

Make it attractive: Order, unity, and interest; emphasis, alignment, balance, repetition, contrast, shape, color

Sizes of letters

Materials

Assignment:

Outline a five-minute talk on your research to be given to the director-general of EARO.

Write in your workshop diary.

Workshop 9. Wrapping it up

Review activities from yesterday:

Presentations: the five Ps: Planning, practicing, previewing, preparing, presenting

Posters: Simplicity, attractiveness, conciseness

Main topic:

Progress on your assignments: individual consultation. Finish them by the end of today.

Assignment:

Freewrite for 20 minutes on the topic: Has this workshop helped you become a better scientific communicator? In what ways might this workshop be improved?

(Footnotes)

*COPE (Community-Oriented Practical Education) in natural resource management with 6 credit hours will be held during summer vacation at the end of the second year second semester.

SECTION V

Trip Report:
November 2-22,
2004





STRENGTHENING INSTITUTIONAL COLLABORATION: NATURAL RESOURCE EDUCATION AND RESEARCH IN ETHIOPIA

A Project Supported by the USAID Association Liaison
Office for University Cooperation in Development

Marion McNamara and Badege Bishaw

International Programs and College of Forestry, Oregon State University

CONTENTS

| | |
|--|----|
| Tuesday and Wednesday, November 2 and 3, EARO | 1 |
| Friday, 5 November, Wondo Genet College of Forestry | 1 |
| Saturday and Sunday 6 and 7 November | 2 |
| Sunday, 6 November - afternoon | 3 |
| Monday, 7 November, Awassa and Dilla Teachers Training College | 3 |
| Tuesday, 9 November, Wondo Genet College of Forestry | 4 |
| Thursday, 11 November, USAID | 4 |
| Friday, 12 November, Ministry of Agriculture and Rural Development | 5 |
| Friday, 12 November, HAPCO | 6 |
| Friday, 12 November, EARO | 8 |
| Saturday, 13 November, Mekelle University | 8 |
| Monday, 15 November, University of Gondar | 9 |
| Wednesday, 17 November, University of Bahir Dar | 11 |
| US Embassy | 12 |
| Friday, 19 November, President of Federal Republic of Ethiopia | 12 |
| Monday, 22 November, Ministry of Education | 13 |
| Attachment 1 Workshop Agenda | 15 |
| Attachment 2 List of Contacts | 16 |
| Attachment 3 PMTCT Data from Gondar University Hospital | 18 |

TUESDAY AND WEDNESDAY, 2-3 NOVEMBER, EARO

Addis Ababa, Dire Dam and Debre Sina

Badege Bishaw met with Dr. Alemu Gezahgne, Director Forestry Research at the Ethiopian Agricultural Research Organization (FRC/EARO) and discussed about future collaborative project between EARO and Oregon State University, (OSU). A field visit to Dire Dam and Debre Sina northern Shoa was held with scientist from the FRC/EARO. Participants on the field trip include Ato Negash Mamo, Ato Tesfaye Hunde, Ato Mohammed Adilo and Ato Mengisti Kindu from FRC/EARO. The main purpose of this field trip was to see the selected project sites for future collaborative project between EARO and OSU.

1. The Dire Dam is located about 20 Km north of the city of Addis Ababa and is one of the water sources for the city. The Dam was constructed in 1998 with the long-term objective of providing water for the ever-increasing population of Addis Ababa. Currently it provides 42, 000 m³ per day, which is 33% of the total water consumption of the people living in the city. However, the dam is currently threatened by a very rapid siltation due to extensive farming and over-grazing with out any soil conservation practice. There is also conflict of resource use between the community and Finfine fuelwood project. The high population growth rate around the catchments has resulted in land shortage for agriculture and grazing. The subsistence farming practice has also caused serious soil erosion and land degradation which resulted in siltation of the dam. If the present trend continues as it is the dam can easily fill with silt in the next five to ten years period and will lead to water shortage for the city of Addis Ababa. The intended objective of the collaborative project is to initiate an integrated watershed management that involve the community and develop a sustainable management for the land and water resources around Dire Dam.

2. The Wof Washa is one of the remnant natural forests in northern Ethiopia. It is located about 30 Km from the town of Debre Sina. People who live around this forest practice subsistence farming. Currently the forest is threatened by intensive cultivation by people who live around the forest. This forest is identified as one of the pilot natural forest conservation projects by the government and yet there is no adequate forest management plan for this forest. Besides, there is no adequate reforestation program or other forms of forest development practice to provide the people around this forest with wood and other alternative products. Thus, it is important to minimize human and animal intervention on this forest and minimize loss of biodiversity, minimize land degradation through community participation. The objectives of the collaborative project is to protect the remaining natural forest at Wof Washa by providing alternatives through agroforestry practice and promoting the use of nontimber forest products through participatory approach. Friday, 5 November

Wondo Genet College of Forestry

Marion McNamara arrived from the US in the early morning, and was driven to Wondo Genet College of Forestry later that morning. Bishaw met with Dr. Abdu

Abdelkadir, Dean Wondo Genet College of Forestry and Dr. Zebene Asfaw, Head, Research and Publications, and discussed about the natural resource curriculum review workshop that is going to be held on November 6-7, 2004. In this meeting the agenda for the curriculum review workshop was prepared (see Attachment 1). Drs. Abdu and Zebene briefed Dr. Bishaw about the invited stakeholders (participants) to the workshop from different institutions and administrative regions of the country. The draft curriculum was also distributed to over 90 participants by mail and some were hand delivered ahead of time.



SATURDAY AND SUNDAY, 6-7 NOVEMBER

Wondo Genet College of Forestry

The draft natural resource curriculum developed by the Wondo Genet College of Forestry, Debub University and the College of Forestry, Oregon State University partnership was presented for review to the stakeholders from the different parts of the country on November 6- 7, 2004.

The natural resources curriculum review workshop started on November 5, 2004. Dr. Tesfaye Teshome, Academic and Research Vice President of Debub University addressed the opening session. In his opening address Dr. Teshome mentioned the importance of the curriculum to train professionals in the management and conservation of Natural Resources in the country. He encouraged workshop participants to actively participate in the review process. Dr. Badege Bishaw of OSU gave background about the project, i.e., how the partnership was initiated and the achievements up to now. Dr. Zebene Asfaw from WGCF gave background information on steps taken to develop the curriculum and the participatory process the curriculum committee took to prepare the draft. The draft curriculum was then presented to the College of Forestry faculty at OSU to get feed back in August 2004. The Natural Resource management program at WGCF proposes to have four departments. These are: 1) Soil Resources and Watershed Management, 2) Wildlife and Fisheries, 3) Nature Conservation and Ecotourism, and 4) Natural Resource Economics and Policy.

To undertake the review process, working groups were organized in line with the four major departments. About 25 participants were assigned in each group. The discussion and deliberation was lead by a chairperson and a secretary selected from each group recorded comments and suggestions. There was an intensive deliberation and discussion on the draft curriculum during Saturday's morning and afternoon sessions.



On Sunday, individual reports from each working group were presented by the chair, including comments, suggestions, and modifications to the draft curriculum. The curriculum committee has been given the responsibility to incorporate the comments from the different working group and prepare the final Natural Resources curriculum in consultation with the Curriculum Standardization Committee at Debu University. The full report of each working group will be presented in the proceedings of the workshop.

In general, the workshop participants expressed the relevance of the natural resource educational program developed by the partnership to train professionals who will address the serious natural resource degradation and sustainable development of the country. It will be critical to integrate a gender perspective into the course work and also to recruit women professors and students to be part of the program. The curriculum should also coordinate with other university programs in Natural Resource Management, to avoid duplication of effort and to help insure that each institution focuses on its comparative advantage. The participants strongly recommended that this training program be started as soon as possible. They expressed concern about whether the government would provide jobs for graduates of such a program, which speaks to the need to re-orient faculty into thinking about graduates looking to the private sector as the engine of economic growth and career possibilities in the future.

SUNDAY, 6 NOVEMBER - AFTERNOON

We were invited by Dr. Tesfaye Teshome, AVP Debu University to visit the main campus of Debu University in Awassa. We first visited the Health and Medical School in Awassa. The program has recently been moved from Dilla to a new location in Awassa. The new facility is a very complex and will serve as a teaching hospital. It will start with one hundred beds and eventually grows to a three hundred-bed hospital. The hospital will provide service to the community and medical training to students. New additional classrooms, dormitories and cafeteria are under construction to accept students in the coming academic year.

We also visited the main campus of Debu University. Training of students in the Faculties of Natural and Social Sciences is under way. There is also a plan to start a Faculty of Technology in the next academic year. The new campus has full-fledged student dormitories, classrooms, laboratories, library and new administration building.

MONDAY, 7 NOVEMBER

Awassa and Dilla Teachers Training College

Met with Professor Zinabu Gebre-Mariam, President, and Dr. Tesfaye Teshome, ARVP Debu University. Issues discussed include

1. The natural resource education program at Wondo Genet and the curriculum review workshop
2. Strengthening future collaboration between COF/OSU and Wondo Genet/DU
3. Overall development at Debu university and future directions
4. Establishment of the Institute of Society and Environment at Debu University with funding from the Christensen Fund.
5. Status of collaborative project between Wondo Genet and the Ethiopian Tree Fund Foundation which was submitted for funding to Christensen Fund
6. Request for more involvement of U.S. universities in strengthening higher education in Ethiopia.

Met with Ato Kidane Fanta, Dean of the College and were briefed about the activities of the college. Teachers' education currently has the following programs:

- ❖ Natural Sciences (majoring in Chemistry, Biology and Physics),
- ❖ Social Sciences (majoring in History, Geography and Language), and
- ❖ Pedagogical Sciences.

The college has also two centers that render service to the community. These are: 1) Center for Educational Research and 2) Center for Educational Media Testing. They have also institute of social and culture that study about the culture of the Gedeo and Guji people. There are about 100 academic staff members most of them with Master of Science and Master of Arts degrees. Other staff members are currently on training both in the country and abroad.

There is a gender office on campus that tries to help female students to be successful in their education. Girls are not assigned to their first choice when assigned to the college and are not well prepared to continue their education. The gender office is providing counseling, tutorial classes and tries to provide a stipend to help girls be successful in their education. We further discuss this issue with the Dean that this need to be addressed at the grassroots level starting high schools and primary schools and involve parents in their children education.





Ato Kidane also showed us the classrooms, computer centers and student recreation facilities. We also visited with Ato Kidane the town of Yirga Chefe, which is a source of coffee consumed in the U.S and Europe.

TUESDAY, 9 NOVEMBER

Wondo Genet College of Forestry

Dr. Abdu Abdelkadir conducted a tour of the teaching and research facilities of the college. We visited the new classrooms, laboratory facilities, GIS and library facilities of the college. A home garden agroforestry demonstration plot imitating the farming practice in southern Ethiopia was established on campus to serve as field laboratory to students and farmers training. The maintenance and service department generates additional revenue to the college by building chairs and desks to the Awassa and Dilla colleges. The college also has an arboretum and big forest plantation that are used for student practicals and that generate income to the college.

THURSDAY, 11 NOVEMBER, USAID

Addis Ababa

Met with Dr. Tadele G. Selassie, Food Security Program Manager,¹ and Dr. Belay Demissie, USAID. USAID works with the Ministry of Education on teacher training. Their unit used to be Agriculture and Natural Resource. Their new name is BEET (Business /Environment/Enterprise/Trade. USAID/Ethiopia has a new integrated strategic plan, which is on their web site http://www.dec.org/pdf_docs/PDACA400.pdf.

Their three main programs are:

1. Land use and tenure security. They have already identified a firm to undertake this.
2. Integrated Watershed Management. The International Watershed Management Institute has sent a proposal to the government for feedback.
3. Agribusiness and Market Development

They want to increase productivity in the private sector and natural resource management. There will be an RFP issued late 2004 or early 2005 to address this. It will include a component for small grants. Input Marketing (especially fertilizer and seeds) is an area where work is needed. IFDC has submitted an unsolicited proposal.

Existing programs are:

1. Food security in Amhara (Virginia Tech, Cornell, Virginia State)

¹ See Attachment 2 for all contact information

2. Relief to Development in two woredas

A new program, the safety net program, is in the process of replacing Relief to Development. This program tries to protect assets of those impacted by drought. The Pastoralist Program is focusing on animal health, marketing forage, education for nomadic kids, and health (I think this may be the program Mercy Corps is working on –Mark Ferdig told me they have vaccinated about 200,000 livestock, mostly sheep, also camels, in an attempt to help protect pastoralists' assets in the southeast.)

A Scope of Work has been developed for a dairy program. The announcement may be available later in November.

The Loan Guarantee program is an agreement with private banks to make small loans to enterprises. USAID will absorb up to 50% of the loss if the loan is unpaid. Working with (ACDI/VOCA, they have formed several coops and unions, focusing on cereals, coffee, livestock, vegetables, etc.

The HIV/AIDS program started out as being an integrated cross-cutting theme, but has emerged into a more stand-alone project. However, Gender, HIV/AIDS, and the Environment are also integrated into projects when possible.

A Land Use and Natural Resource Management RFP will be issued in 2005. This will focus on Integrated Watershed Management. Virginia Tech may have some lessons learned from their current watershed management program in Amhara. The new RFP will focus on proper land use and management. The Government has a national policy on land use, and the RFP is in the stage of negotiation between the Government and USAID to coordinate the government's policy and with the RFP.

There is an existing IQC on Market Led Strategies for Food Security.

Just as a note, the Civil Service College in Addis has videoconference facilities. This may be useful in doing further work. Also, Dr. Gebre Selassie asked that I stay in touch with him regarding the shipment of books to medical schools in the country.



FRIDAY, 12 NOVEMBER, MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT

Addis Ababa

Met with Dr. Tekalign Mamo, Minister of State, Ministry of Agriculture and Rural Development.

Their focus area is Land administration and use in some regions

The three parts of this policy (which seems to be coordinated with the USAID RFP) are:

1. Watershed management as the platform across all regions. A manual, which is under preparation on Watershed Management for use in all regions. They have commitment from the government to support the production of this manual.

2. Land use administrative policy and decrees of ownership and conservation re: prohibiting fragmentation of land. Farmers will be given a kind of title to the land, which allows them to use it forever, including giving it away, and passing it on to children, but they cannot sell it. The Land Use Policy will encourage communal ownership (Coops could lease land from individuals for developing a manufacturing plant, or to just incorporate a more efficient scale of agriculture.)

3. Development agents will be assigned in several districts (five per community and specializing in crops and livestock production, marketing and cooperatives, forestry and natural resources, Extension and irrigation). They will run farmer training schools to introduce technologies and methodologies for watershed management. These will be centers of Excellence for Farmers. Marketing information will be made more readily available to farmers. The marketing system is being strengthened and organized. There is a channel for marketing individual farmer surpluses.

4. Agriculture and rural development are closely tied. It will be a key to develop markets, practice conservation of land, water, and other natural resources, while at the same time increasing agricultural production.

They plan to use a triage approach with some regions, helping first the regions where they can have the most impact. Education, health, and communication are all a part of this integrated approach.

The challenges they face include

1. The capacity of their own organization—in order to pull off this ambitious program, they will need to develop their own human capacity.

2. The time it takes for communities, government, and donors to see results. Many of the things that need to be done will not have immediate demonstrable results.

3. Poverty of most people is the biggest challenge in getting people to try new ways of managing resources. Some way needs to be found to lessen their risk and insure that they experience success when the new technologies are introduced.

Other areas of focus include:

1. Marketing
2. Small-scale irrigation (he referred to the IWRI proposal the USAID mentioned yesterday)
3. Watershed management

The Ministry wants to solicit consultants to help with the design of the details.

Some Regional governments are issuing land certificates that help with land registration and authentication of land size. The land “owned” can be used, loaned, leased, and inherited, but never sold.

According to the bilateral agreement between USAID and Government of Ethiopia, USAID deals with sectors, and NGOs work with regional governments. Some of the NGOs working in this area now are: Sustainable Land Use Forum; Christian Relief Development; SOS Sahel, CEPOD.

FRIDAY, 12 NOVEMBER, HAPCO

Addis Ababa

Met with Dr. Ashenafi Haile, Head, and Dr. Afework Mebratu, Planning & Program, Addis Ababa HIV/AIDS Prevention and Care Organization (HAPCO).

HAPCO was started by the city government, and focuses only on the city, although they have provided training to other, more rural groups. They work with NGOs, such as informal social support groups and the Anti-AIDS Scholars, and with all government agencies that conduct anti-AIDS activities, to carry out interventions.

The situation in Addis prior to this group being formed was a prevalence rate of 17.6%. Now, after four years, the prevalence rate is down to 12.6%, and they think the incidence rate is following a similar trend. There are currently 230,000 PLWAs in Addis, and a 147,000 AIDS orphans.

AA-HAPCO focuses on prevention and mitigation. The following programs are currently underway:

1. Voluntary Counseling and Testing (VCT). There are currently 72 sites in the city for testing. Last year they tested 180,000 people, and from this group found a prevalence rate of 13.6%. The mayor of Addis tested publicly, and a picture of him testing can be found in a large calendar published by HAPCO. After the mayor tested, the number of people requesting testing doubled.

2. Information, Education, Communication Interventions. There are school programs, carried out with MOE and GTZ funding, which are used by about 270,000 (not sure if that is the number of children or contacts). The programs include an intervention called MOVE, curricula for schools, and manuals for teachers. They also have programs for kids not in schools. They do peer-to-peer education programs, one aimed at the city’s 20,000 taxi drivers, and one based on the TCM model from Botswana, where they have trained 862 young women to visit every home in their area and talk specifically to the young women in the household about HIV/AIDS.

3. Condom promotion and distribution. They distributed 12.3 million condoms last year, compared to 700,000 in the previous six years combined. They seem to think that skills in using condoms have improved as well.

4. They are working with health service providers to monitor and treat STIs more aggressively.

5. Mother To Child Transmission (MTCT). This is a two-year-old program, using nevirapine. 11,000 mothers were reached last year. They do not provide formula because although the water in Addis is safe, the government will not allow them to promote formula because of the issues of potability of water throughout the country. Also, the issue of cost of formula would make it difficult for all mothers to comply.

6. They work with the Red Cross on the issue of safe blood supply.

7. Anti-Retro Virals (ARVs) are available for those who can afford them. Last year, about 4,500 people in Addis were on ARVs. Donors are providing some drugs, and they may get funding through PEPFAR to provide ARVs for another 6,000 people.

8. They provide treatment for opportunistic infections (OIs). The most common OI is TB. They are combining ARV and DOTS with some success.

9. Home based care. 1,900 volunteer caregivers have been trained to provide care for all bedridden people in Addis (i.e., not just AIDS patients). They have a goal of training 10,000.

10. Orphan care and social support of People Living With AIDS (PLWA). The World Food Program provides a feeding program to help support these groups

Their funding comes from the Global Fund, supporting all of the above programs. In addition, the World Bank supports a Multi-Sectoral AIDS Project; Action AIDS Ethiopia is funded by DIFID and provides capacity building for providers; CDC (with PEPFAR funding, I think) is helping to scale up VCT; UNICEF is focusing on women, girls, and youth.

Their role is to provide technical support to government agencies and municipalities. They also work with communities, doing participatory planning, helping communities identify problems and work out solutions. The office has a total of 52 employees. Of the 46 government agencies they are assigned to serve, 42 are currently mainstreaming HIV/AIDS education/communication.

This office has helped the Tigray, Amhara and Somalia regions, and they also conduct regional HIV/AIDS meetings. They fund 170 NGOs to carry out work in Addis. All behavior change mass media messages regarding HIV/AIDS go through this office. They say there is a great saturation of mass media, although I did not notice the same level of billboard messages as in Botswana or South Africa, but there are many billboards in Amharic.

Their information management system is broken down into 10 units within Addis. Each unit serves about 10 kebeles. They are all networked with a central data collection system.

They have a real need to provide more youth activity centers, alternative recreation, etc. They are also very much wanting to develop income generation activities for PLWAs. The government has given them direction that they are not

happy with building dependency through feeding programs, and they want to see HAPCO develop income-generating activities.

FRIDAY, 12 NOVEMBER, EARO

Addis Ababa

Met with Dr. Tsedeke Abate, Director General, Ethiopian Agricultural Research Organization (EARO), Dr. Aberra Deressa, Deputy Director General (EARO) and Dr. Alemu Gezahegn, Director Forestry Research in EARO.

Dire Dam is one of the research sites for an Integrated Water Management proposal. The cereal-based culture that currently dominates the country is extremely risky in that it is so dependent upon good weather conditions to produce any food. A better mix of perennial crops with annual cereal crops would give the system more resiliencies.

Regarding the research OSU proposes to undertake with EARO, new projects coming in must be in line with EARO and government priorities.

Their priorities are:

1. Natural Resource management (without this, increasing of crops doesn't matter in the long run)

2. Use of multi-purpose trees, especially for their environmental benefits. Agroforestry in the extreme south would be very important. The Konso tribe has received a UNESCO award for their land management, and could be a good example of indigenous methods to replicate, although they need more tree cover in their landscape. Also, the Irob² peoples in the north have developed a meticulous system for "creating" soil in very steep environments, using a combination of mechanical and biological methods. These would be worth studying and up-scaling.

3. Non-timber forest products research will be conducted in Bonga region.

4. Dry land forestry in the rift valley

EARO will need to be rational about which projects are taken on. In the past, they cooperated on many small projects bringing in little money and using a lot of staff time.

SATURDAY, 13 NOVEMBER, MEKELLE UNIVERSITY

Mekelle

Met with Dr. Mintesinot Behailu, Vice-President for Academics and Research, and currently Acting President, Mr. Afeworki Mulugeta, Academic Program

² The Irob people occupy a small semi-arid mountainous region in northeast Tigray.

Officer and Mr. Mengistu Hailu, Public and International Relation Officer at Mekelle University. The university resulted from the merger of Mekelle University College and Mekelle Business College. Eleven years ago, they had 42 students and 5-6 academic staff. Now there are 10,000 students and 430 academic and 600 administrative staff.

There are seven Faculties, with 26 departments (see brochures for more detail on departments). Donors currently include research funding from Norway, Belgium, Netherlands, Great Britain, and a US linkage in law with Alabama. The US Embassy funds Fulbright Scholarships. In January, a group of US professors led by former US Ambassador and VC for International Programs at Texas Technical University will visit Mekelle.

The Faculty of Agriculture is the pioneer and attracts support from outside. They have a strong water management program, as they are located in a dry area. Their motto is "One crop per drop of water." The Government is investing in water management techniques such as micro dams, irrigation, shallow and deep wells. They are now able to get two crops per year, and household food security is increasing. Most of the area has rehabilitated. They are supporting the national government efforts. They don't send students abroad; all research is done here in Ethiopia. Biodiversity is improving, and land use has improved. Some commercial forestry is developing; they are working with Indian scientists on community forestry.

They have a very interesting project with Leuven University (Belgium). Because the Orthodox Church has had a very strong conservation ethic, the forests around the churches and monasteries often represent the original, indigenous vegetation. Mekelle is using these forests as "benchmarks" to compare them to areas that have been closed off to regenerate spontaneously.

Dryland forest resource is an area of interest. *Boswellia* is a multipurpose tree which grows in the western Tigray and Mekelle has developed expertise in using it.

Dr. Behailu suggested that we get a copy of the International Water Management Institute's (IWMI) publication, *Integrated Land and Water Management for Food Security and Environmental Security*.³

The Natural Resource Economics and Management are programs just launched, to bridge the gap between natural and social scientist.

They have a project with the Free University of Amsterdam to study water-harvesting schemes. They are making a difference in the lives of the people in terms of the economy, health, and nutrition.

The Department of Land Resources and Management, and Environmental Protection focuses on soil and water conservation, especially indigenous practices. The Irob have changed from pastoralists to agro-pastoralists in the last 20 years. They are in a steep area that does not lend itself to agriculture. They use

³ It is now downloaded and available in International Programs.

micro dams to trap silt and water to create land for farming.

Areas of potential collaboration include Dry land Forestry, where they would like to work on curriculum and develop a graduate program, and Natural Resource Management.

Mekelle provides special support to female students, especially the most financially needy, who get special financial assistance. The university provides tutorials, especially for the hard sciences, free photocopy service, and assertiveness training. This support has helped reduce attrition rates enormously. They want to expand their program to go to high schools and recruit female students, and offer tutorials at that level. Their goal is for 25% of their student body to be women. They are also trying to attract women academic staff, and they invest in supporting advanced training for female faculty. They have a Women's Affairs office that reports to the president. There is also an endowed "Vienna City Chair" which is given to a woman, regardless of discipline.

There are two pilot integrated watershed projects underway. The socio-economic analysis is done, and they have started some interventions. Multidisciplinary teams work on this project, including a GIS team and Livestock team.



MONDAY, 15 NOVEMBER, UNIVERSITY OF GONDAR

Gondar

Meeting with Dr. Shitaye Alemu Baccha, University of Gondar HIV/AIDS Chair. HIV/AIDS activities used to be sporadic and spread out. Now they have an HIV/AIDS chair to try to coordinate activities. There is some donor support. Save the Children, Norway, is providing support too the VCT clinic, with two nurse counselors and one peer counselor. They have tested about 300 people, and they show a very high rate (25%), primarily, they think, because people know that ARVs are also available through the clinic (as opposed to the freestanding VCT center in the town). Everyone who receives ARVs at this time has to pay for them (approximately 300 birr/month). They also think the rate is artificially inflated because doctors who suspect their clients have HIV send them to the clinic, and folks whose partners

have died of AIDS also are directed here. So, they don't think the 25% rate is representative of the area in general. They recently had a conference with all the VCT sites in North Gondar. Their colleagues indicated a rate of 8-10% for free standing VCT sites, and 12-15% for hospital sites.

Some of their activities include:

- ❖ Community Mobilization

- a. Counselor training, generally approached through the community organizations and the government

- ❖ Youth peer counselors

- ❖ Nurses

- ❖ PLWA, who are connected with the community (Edir)

- ❖ Prevention of Mother to Child Transmission (PMTCT) (see handout). In addition, they conduct PMTCT Awareness Seminars for large offices (not sure if this is private, government, or both), social organizations such as Edir (mostly for funeral services), and PLWA.

- ❖ Continuous refresher lab courses. Everyone used to be trained on ELISA, with only a few being able to conduct the fast test. Those few began using their expertise as a bargaining chip to get more privileges, and now everyone is trained on the fast test. The nature of the area (widely spread out rural areas) makes it impractical for women to return later for their test results. UNICEF is working with the PMTCT as one of four pilot sites. They conduct counselor training, especially “facilitators” who go to the community talk about services, not only in Gondar but also in some other outreach places. A key element in attracting women to the PCTMC programs seems to be that they are able to offer good childbirth/delivery services.

- ❖ Nursing staff refresher courses

- ❖ Universal precautions. They provide this training for all staff that might have contact with blood products, including the cleaning staff, etc.

- ❖ All medical interns are trained in VCT, PTMCT, and ARTs.

They conducted research on 500 women of childbearing age and (not sure how many) men less than 50 years old. They report that the level of knowledge about HIV and motivation to be tested is high. The people interviewed reported that they wanted to know their status, and said that they didn't care about stigma.

Currently about 100 people are receiving ARVs. Almost all are put on ARVs by staging—they don't generally use CD4 counts. They have had at least one pediatric patient. Everyone receiving ARVs pays for them. Costs can run between 230-600 birr/month, just for medications. The cost is one of the reasons so few are getting treatment. The other reasons are that the community has yet to be mobilized, and there are misperceptions in the community about ARVs, since often people wait to start treatment until it is too late, and the community perceives that the patient has died of the cure.

Opportunistic infections (OIs) are common. About 40% of patients admitted to hospital have HIV/AIDS. Most TB patients are co-infected. There's also leishmania, which is complicated by HIV. They currently have enough drugs to treat any of the OIs except crypto-coccal meningitis.

Currently there are NO HIV positive students at the university. They give seminars for teacher training. One of their staff is volunteering to do Character Development Education for high schools, using a curriculum from South Africa. HAPCO is active at all levels—Federal, Regional, Zonal, Woreda, and Kebele.

The university provides support to Edir (social/funeral association) in the form of counseling and home-based care training. The Mother Theresa Hospice often takes AIDS patients, but has no facilities for taking care of AIDS orphans. Red Cross provides about 50 people with 125 birr/month. There is a country-wide Organization for Social Services in AIDS, but it is not very strong.

They have done some research about the AIDS orphan situation in the area. The Kondu Trust is helping about 200 children a month, not necessarily AIDS orphans, get 175 birr/month, and tries to place them in group homes. *Bridges Ethiopia* is an orphanage for AIDS orphans, and serves about 50. The rest are pretty much on their own—there are many child-headed families, stories of extended families not able to take in AIDS orphans because of financial constraints, even of children being turned out of their family home by relatives. A possible solution would be to provide some small level of support for the extended families to be able to take care of the orphans. There's a need to develop some income generating activities, as the CVM, an Italian NGO, has done with street kids and AIDS orphans, teaching them trades.

WEDNESDAY, 17 NOVEMBER, UNIVERSITY OF BAHIR DAR

Bahir Dar

Met with Dr. Shimelis Haile, President, and Tesfaye Dagneu, External Relations Officer for Bahir Dar University. The Faculty of Agriculture and Natural Resources will be established there next academic year. They have developed curricula for six departments: Wildlife and Fisheries, Animal Science, Watershed Management, Food Security, Crop Science, and Rural Development. SIDA is helping with Disaster Management and food security.

The Faculty for Land Management and Administration are currently being trained in Stockholm, and this faculty will begin teaching when they return. The University of Bahir Dar has approved the curricula, but the Ministry of Education told them not to begin this year, perhaps next year. There will be a three-year phase in: in year one, the Rural Development and Natural Resource Management will be; in year two, Wildlife and Fisheries and Watershed Management; in year three, Animal Science and Crop Science.

They currently work with Cornell University and the Amhara Agricultural Research Organization on research issues, and have established an Institute for Water Management.

They have a GIS Center, and have had a linkage program with Germany for staff training, but it has not been adequate to meet their needs. We discussed submitting an unsolicited proposal to support the upgrading of some of their



equipment and staff training to be conducted in Bahir Dar by OSU faculty, and perhaps seeking a Fulbright fellowship for Bahir Dar faculty to come to the US for more intensive training.

We also met Dr. Fekade Yohannes, Research Associate, at Amhara Micro-enterprise development, Agricultural Research, and Watershed Management (AMAREW) Project. AMAREW is a USAID funded project run by a consortium of three Universities in the U.S. (Virginia Technical University, Cornell University and Virginia State University) and is addressing food

security and watershed management issues in the chronically food deficient area in the region. It has been two and half years since the program started and there are some valuable lessons learnt in Watershed Management and land administration in the Amhara region. Bishaw and McNamara departed for Addis.

US Embassy

We met with Tsegaye Kassa from the US Embassy to offer thanks for his assistance in developing our travel plans and to debrief regarding our findings. A copy of our trip report will be sent to him. We also met Hon. Mussie Hailu, from the World Federation of United Nations Associations. McNamara departed for the US that evening.

FRIDAY, 19 NOVEMBER, PRESIDENT OF FEDERAL REPUBLIC OF ETHIOPIA

Addis Ababa

Bishaw met with President Girma Wolde-Giorgis, Federal Republic of Ethiopia in the National Palace Addis Ababa, Ethiopia. Issues discussed included:

1. Serious natural resource degradation problems facing Ethiopia, such as

loss of vegetation, soil and water, and its implication on food security in the country,

2. Efforts made by the President in mobilizing the public and the youth through Scout program to promote tree planting and environmental protection,

3. Contributions of the College of Forestry at Oregon State University to strengthen natural resource education and research in Ethiopia in collaboration with the Wondo Genet College of Forestry, Debu University and the Forestry Research Center at the Ethiopian Agricultural Research Organization.

4. The contribution of Ethiopian Tree Fund Foundation (ETFF) to promote tree planting and sustainable agriculture. ETFF is a U.S. based NGO established by concerned Ethiopian Americans in the Diaspora. ETFF has recently received legal status to operate in Ethiopia from the Ministry of Justice in the country.

Through the concerted efforts of the government, NGO's and international organizations such as USAID and collaborating institutions such as OSU, it is possible to retard and reverse the natural resources and environmental degradation in Ethiopia.



MONDAY, 22 NOVEMBER, MINISTRY OF EDUCATION

Addis Ababa

Met with Dr. Teshome Yizengaw, Vice Minister Higher Education, Ministry of Education. Issues discussed included:

1. The natural resource program at Wondo Genet College of Forestry. Dr. Teshome has seen and reviewed the draft Natural Resources curriculum developed for Wondo Genet by OSU and Debu University partnership. He said

he had a meeting over the weekend with Wondo Genet staff and would discuss about the proposed program. He emphasized that the new natural resource curriculum should include a graduate program.

2. Looking for funding sources to implement the natural resource education program proposed at Wondo Genet. One possibility discussed was to make this effort as part of the initiative to start the Ethiopian-African American University. This will be explored in details in the future.

3. Dr. Tehome was also briefed about the visit by OSU team to the different universities in the country (Debab, Mekelle, Gondar and Bahir Dar). Although the establishment of more universities in the country impressed the team, a concern was also shared about the fast growth in infrastructure and the slow pace in staff development, which will have implication on the quality of education in these institutions.

Bishaw departed Addis in the evening.



ATTACHMENT 1. WORKSHOP AGENDA

Debu University Wondo Genet College of Forestry

Workshop on curriculum development for Under-graduate Natural Resources Management Programs (November 6-7, 2004)

November 6, 2004

| Time | Program | Presenter | Chair person/ secretary |
|--|---|---|----------------------------|
| <i>Opening session</i> | | | |
| 8.30 | Registration | Receptionist | |
| 9.00 | Welcome address | Dr. Abdu Abdelkadir | Abdu/zebene |
| 9.15 | Opening address | Dr Tesfaye Teshome | |
| 9.30 | Background | Dr Badege Bishaw and Dr Zebene Asfaw | |
| 10.00 | COFFEE BREAK | | |
| <i>Group work on individual program</i> | | | |
| 10.30 | Soil resources and Watershed management | Mersha G/Hiwot | To be selected |
| | Natural Resource Economic and Policy | Girma Kelboro | To be selected |
| | Nature conservation and eco truism | Tefera Mengistu | To be selected |
| | Wildlife and fisheries | Solomon Ayele | To be selected |
| 10.45 | Discussion on individual program | Participants | To be selected |
| 13.00 | LUNCH IN ASSEMBLY HALL | | Committee |
| <i>Afternoon session:</i> | | | |
| 14.15 | Group discussion continue | Participants | To be selected |
| 9.45 | COFFEE BREAK | | |
| 16.00 | Group discussion continue | Participants | To be selected |
| 17.00 | The last part of the day | | |

November 7 in the morning

| Time | Program | Presenter | Chair person/ secretary |
|-------|-----------------------------|--------------|----------------------------|
| 8.30 | Group report and discussion | Participants | Dr Melaku Bekele |
| 10.30 | COFFEE BREAK | | |
| | General discussion | | Dr. Abdu Abdulkadir |
| | Closing remark | | Dr. Abdu Abdulkadir |
| 12.00 | Lunch | | Commitee |

ATTACHMENT 2. LIST OF CONTACTS

Name, Address, City, Institution, Title, Phone, Fax, Mobile, Email, Website

Mats Sandewall
Department of Forest Resource Management and
Geomatics
SE-901 83Umeå, Sweden
Swedish University of Agricultural Sciences
Senior Research Officer
46 (0) 90-786 5815
46 (0) 90-77 81 16
Mats.Sandewall@resgeom.slu.se

Tesfaye Dagne
Bahir Dar
Bahir Dar University
External Relations Officer
251 8 20 59 25
251 8 20 20 25
251 (0)9 76 53 80
tesfdan@yahoo.com

Tsedeke Abate
P.O. Box 2003
Addis Ababa
Ethiopian Agricultural Research Organization
Director General
251 1 462270
251 1 461294/461251
251 (0)9 203864
dg@earonorg.et
<http://www.earo.org.et>

Zinabu Gebre Mariam
P.O. Box 5
Awassa
Debu University
President
251 (0)6 20 46 26
251 (0)6 20 54 21
aca@telecom.net.et

Mintesinot Behailu
P.O. Box 231
Mekelle
Mekelle University
Vice President for Academics and Research
251 4 408627
251 4 409304
mintefael@mu.edu.et
www.mu.edu.et

Shimelis Haile
PO Box 79
Bahir Dar
Bahir Dar University
President
251 (0)8 20 01 37
251 (0)8 20 20 25
Shimelis8@yahoo.com

Takele Deresse
Box 128
Shashemane
Wondo Genet College of Forestry
SLU Resident Representative
251 6 202490
Takele.Deresse@resgeom.slu.se

Asfaw Yimegnuhal
PO Box 5689
Addis Ababa
International Livestock Research Institute
A/Manager—Debre Zeit Station
251 1 339566 Ext. 207
251 1 338755
251 9 619363
a.yimegnuhal@cgiar.org
www.ilri.org

Azage Tegegne
PO Box 5689
Addis Ababa
International Livestock Research Institute
Scientist, IPMS Ethiopian Farmers Project
251 1 463215 Ext. 260
251 1 461252/464645
251 9 246442
a.tegegne@cgiar.org
www.ilri.org

Tekalign Mamo
P.O. Box 386
Addis Ababa
Ministry of Agriculture and Rural Development
Minister of State
251 1 51 43 89
251 1 51 41 90
moard-nr@telecom.net.et or tekalignm@yahoo.com

Tsegaye Kassa
P.O. Box 1014
Addis Ababa
U.S. Embassy
Cultural Affairs Assistant/Educational Adviser
251 1 17 42 23/17 40 00
251 1 55 17 48
kassatw@state.gov

Shitaye Balcha
PO Box 508
Gondar
University of Gondar
VCT Program Organizer
251 (0) 9 77 50 74
shitayea@yahoo.com

Aberra Deressa
PO Box 2003
Addis Ababa
Ethiopian Agricultural Research Organization
Deputy Director General
251 1 462270
251 1 461294/461251
251 (0)9 203871
ddg@earo.org.et

Tadele Gebre Selassie
PO Box 10996
Addis Ababa
USAID
Food Security Program Manager
251 1 510 088
251 1 510 043
tgebreselassie@usaid.gov

Abdu Abdelkadir
PO Box 128
Shashemene
Wondo Genet College of Forestry
Dean
251 6 109 901
251 6 109 983
251 9 202 786
wgcf@telecom.net.et

Alemu Gezahgne
PO Box 2003
Addis Ababa
Ethiopian Agricultural Research Organization
Director, Forestry Research
251 1 462 270
251 1 461 294/461 251
251 (0)9 203 864
ddg@earo.org.et

Teshome Yizengaw
PO Box 1367
Addis Ababa
Ministry of Education
Vice Minister of Higher Education
251 1 560 063
251 1 565 565
heardmoe@telecom.net.et

Mussie Hailu
PO Box 7785
Addis Ababa
World Federation of UN Associations
Representative to ECA & AU
251 1 668 572
251 9 2022 503
mussiepeace@yahoo.co.za

Zebne Asfaw
PO Box 128
Shashemene
Wondo Genet College of Forestry
Head, Research & Publications
251 6 109 903
251 6 109 983
wgcf@telecom.net.et

Tesfaye Teshome
PO Box 5
Awassa
Debu University
Academic & Research Vice-President
251 (0)6 20 46 24
251 (0)6 20 54 21
tteshome150@hotmail.com

Ashenafi Haile
PO Box 57101
Addis Ababa
Addis Ababa HAPCO
Head
251 (0)9 22 80 58
ashenafih@aahapco.org

Afewerk Mebrash
PO Box 57101
Addis Ababa
Addis Ababa HAPCO
Planning and Programs
251 9 50 26 29
afeworm@aahapco.org

ATTACHMENT 3. PMTCT DATA FROM GONDAR UNIVERSITY HOSPITAL

PMTCT Activity in Gondar University Hospital

- ❖ Started on July 9, 2003
- ❖ Group education in ANC
- ❖ Private pretest counseling
- ❖ Post test counseling
- ❖ Giving Nevirapine for sero-positive others and infants (ARV Counseling)
- ❖ Infant feeding counseling
- ❖ Couple Counseling
- ❖ Family planning counseling
- ❖ Ongoing or supportive counseling
- ❖ Follow-up

- ❖ Total no. of ANC Clients 2048
- ❖ Group counseling 1652
- ❖ Individual pretest counseling 1436 (70.1%)
- ❖ HIV-tested mother 890 (61.9%)
- ❖ HIV-negative mother 784 (88.1%)
- ❖ Post-test counseling (return rate) 694 (77.9%)
 - o HIV-positive 76/106 (71.6%)
 - o HIV-negative 618/784 (78.8%)
- ❖ Partner tested 74 (10.6%)
 - o Mother positive for HIV 10
 - o Mother negative for HIV 64
 - o HIV positive 4
 - o HIV negative 70
 - o Discord antes 7
- ❖ Repeat test 5
- ❖ Non pregnant mother HIV-tested 22
 - o HIV positive 3
 - o HIV negative 19
- ❑ Mother took Nevirapine 55
- ❑ Mother's decision on feeding
 - o Choose breast feeding 50 (90.9%)
 - o Choose replacement feeding 5 (9.1%)

July 9, 2003 – October 31, 2004

| Month | Per-test c. | Tested | Accept. (%) |
|--------------|-------------|--------|-------------|
| July 2003 | 184 | 63 | 34.2 |
| August | 138 | 47 | 34.1 |
| September | 57 | 20 | 35.1 |
| October | 106 | 58 | 54.7 |
| November | 104 | 49 | 47.1 |
| December | 83 | 46 | 55.4 |
| January 2004 | 76 | 43 | 56.6 |
| February | 42 | 35 | 83.3 |
| March | 96 | 81 | 85.0 |
| April | 106 | 86 | 81.0 |
| May | 72 | 62 | 86.1 |
| June | 65 | 47 | 72.3 |
| August | 91 | 75 | 82.4 |
| September | 54 | 42 | 77.7 |
| October | 87 | 73 | 83.9 |
| Total | 1436 | 890 | 61.9 |

- Pregnant women deliveries
 - o Overall 3473
 - o HIV positive 29 (0.8%)
 - o HIV negative 223 (6.4%)
 - o Unknown HIV status 3221 (92.7%)

- Infant
 - o Infants given Nevirapine 25
 - o Infants on follow-up 22
 - o Infants dead 4
 - o Stillbirth 1
 - o Spontaneous abortion 2
 - o Maternal death 2
 - o Infants tested for HIV 2
 - o Infants tested HIV negative 1

Problems

- Most pregnant mothers are not interested to be approached for PMTCT and tested.
- Some pregnant mothers didn't return back for post-test counseling and on-going counseling,
- Unable to disclose to partner, especially sero-positive mother

*Produced by the Forestry Communications Group at
Oregon State University, College of Forestry,
Corvallis, Oregon, USA*
