

## **Appendix 2**

### **Annual Report 2004**

#### **Report from the SLM Coordination office Asmara**

### **Sustainable Land Management Programme (SLM) Eritrea**

March 2005

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Period covered: January 2004 up to December 2004

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## **Abbreviations:**

|         |   |
|---------|---|
| CAAZ    | Centre for Arid Zones Studies, University of Wales, Bangor                  |
| CDE     | Centre for Development and Environment                                      |
| CRS     | Catholic Relief Service   |
| DGUA    | Department of Geography of the University of Asmara                         |
| DIA     | Duch Interchurch Aid  |
| DoM     | Department of Mines   |
| ESAPP   | Eastern and Southern African Partnership Programme                          |
| GIS     | Geographical Information Systems  |
| GPS     | Global Positioning System   |
| GOE     | Government of Eritrea   |
| GTZ     | Gesellschaft für Technische Zusammenarbeit                                  |
| ICCO    | Interchurch Organisation for Development and Co-operation                   |
| ICRC    | International Committee of the Red Cross                                    |
| ICRISAT | International Crops Research Institute for the Semi -Arid Tropics (ICRISAT) |
| LIS     | Landmine Impact Survey  |
| MoA     | Ministry of Agriculture   |
| MoU     | Memorandum of Understanding   |
| NARI    | National Agricultural Research Institute                                    |
| RS      | Remote Sensing  |
| SDC     | Swiss Development Agency  |
| SFSA    | Syngenta Foundation for Sustainable Agriculture                             |
| SLM     | Sustainable Land Management   |
| SPOT    | Système d'  |
| UoA     | University of Asmara  |
| VSO     | Volunteer Service Overseas  |
| WRD     | Water Resource Department of the Ministry of Land, Water and Environment    |

# 1. Introduction

The reporting period of January 2004 up to December 2004 is to be considered as the second intermediate year of SLM-Eritrea before the second phase starts on January 1, 2005 for a period of 5 years.

As a short reminder the three main interlinked programme lines as formulated in the project document for phase II shall be stated. This shall help the reader to relate the activities executed in 2004 with the objectives formulated for the programme.

## Agriculture:

- To support agricultural and environmental research and outreach in order to promote sustainable land management, firstly, by strengthening agricultural production and productivity, with a focus on pearl millet breeding and pearl millet based farming systems; and tissue culture. Secondly, by safeguarding the natural production base of farming, in particular the soil and water resources, with a focus on soil and water conservation.

## Education:

- To support capacity building in all aspects relating to sustainable land management, including GIS/Earth observation, and other skills used in land management, including an understanding of the issues at stake. Institutionally, the focus is on the University of Asmara; other important partners are government authorities and NGOs.

## Outreach:

- To support local and regional development in order to improve rural livelihoods and food security. This includes defining agreed-upon agendas for development, supporting concrete development initiatives, and monitoring. The nationwide spatial database developed in Phase I of the Programme will also be developed further mainly through funds secured from third parties.

## **Key achievements in 2004:**

### Coordination office:

Since September 2004 SLM-Eritrea has its own premises in a small office building in the centre of town. The office is not only working place for the office staff but turned out to be a meeting place and a small platform for our partners and interested people in the broad field of Sustainable Land Management.

### Agriculture:

- Two different millet varieties are ready for release; the Kona variety and the Hagaz variety
- An extensive impact assessment has show satisfactory results for the on-farm trial of the new varieties
- Extensive participative field study on applied Soil and Water Conservation measures and a detailed Soil Assessment (indigenous soil taxonomy) in Afdeyu und surroundings.

### Education:

- The Geography Lab was completed and handed over to UoA in October 2004
- By now the Lab facilities are not only used for teaching of University students but as well for other partners with interest in GIS and Remote Sensing.

Outreach:

- Back-to-village reporting for livelihood study of Amadir in May 2004
- Agreement for dam construction in Afdeyu signed in September 2004

## 2. Activities:

All SLM-Programme's interventions are complementary and can be divided into the following three fields of activities as mentioned above:

- Agriculture
- Education
- Outreach

In this report these activities are discussed one by one:

### 2.1. AGRICULTURE:

#### **Pearl Millet Research Programme:**

Currently the SLM Programme is the sole financial backer for the MoA NARI - Eritrean Pearl Millet Research Programme, which is led by the sole Pearl Millet Breeder in Eritrea: Mr. Negusse Abraha.

The breeding programme receives year round technical backstopping from experts at ICRISAT India, and this includes a yearly visit to assess the programme on the ground. Other involved stakeholders are the; University of Wales, Center for Arid-Zone Studies, Bangor; and Vision Eritrea

*Technical Report 2004: (see Pearl Millet Annual Technical Report, 2004):*

In the rainy season of 2004, landraces, exotic varieties, population crosses, new experimental varieties and new landraces population crosses were tested as on-station and on-farm trials for their adaptability, disease resistance, and yield potential and to assess the farmer's perception of the positive and negative aspects of the new crosses.

At the time of harvest only 10 out of the 23 on farm trails showed some results. The drought across the country was severe and all crops were affected.

The trials at the Hagaz Research Substation also suffered from low and erratic rainfall (235mm). The trials were supplemented by irrigation so as to complete their growing cycle. However, the trials will need to be repeated in the 2005 rainy season.



Fig. 2.1. Hagaz Research Substation. Pollination activities

### *Impact Assessment*

This study assessed the farmers' (men and women) *perception* of new released pearl millet varieties (Kona and Hagaz) released by the Ministry of Agriculture – National Agricultural Research Institution (MoA - NARI), it attempts to determine what socio-economic impact it may have had on their livelihoods, and whether they are willing to plant them again. Comparisons were made between the released varieties and local landraces. A team comprising a socio-economist (SLM staff), millet breeder, animal scientist and Zoba extension workers were responsible for the assessment. The study was carried out in three different sites in Zobas' Anseba and Gash Barka. These sites represented three different agro-ecological zones (table below) and ethnic groupings.

All the farmers rated yield, early maturity, drought resistance, disease (downy mildew) and pest (chaffer beetle) resistance as their most important priority attributes – to one extent or the other these factors were all present in the Kona and Hagaz varieties. Farmers were not so concerned with biomass production of pearl millet, but they recognized that Hagaz had a higher biomass than Kona. They recognized too, that Kona was susceptible to wind damage. On the whole the results show quite clearly that male farmers were pleased with the results of the released varieties, and were clear that they would like to receive them again the following year.

Women tended to have a rich knowledge of the palatability and culinary characteristics of the different varieties. They were more concerned with the cultural than the production factors of pearl millet. They also appear to be more traditionalist in their decision making than the men are. In all three villages women chose the local varieties over the new NARI released varieties. The team concludes that a more in-depth participatory analysis needs to be made on the reasons behind why women have their own particular varieties preferences. This

information would allow for more informed decision-making on future planned breeding activities.

### *Transplanting*

The seedlings established very well. Growth performance was very promising in general. Root depth reached to more than 20 cm. However, the field was grazed by animals like camels which were very difficult to control them.

One of the problems encountered to the project was the delay of the sowing date of the farmers. Farmers were supposed to sow their fields with direct sowing when the seedlings were transplanted. However, farmers delayed their sowing date by about 21-30 days because of the late flood condition.

By adjusting the sowing date with farmers, it is recommended to continue the program in the coming season.

There was additional information observed in the locality. The Hagaz variety was given to some farmers for sowing using their own cultural practices. It was observed that the panicle size was better than the local cultivar. It was at least 2-3 times bigger than the local variety (Gurdufan)

### *Pearl Millet Planning Workshop . (proceedings still in preparation).*

The workshop and on-farm field visit was held at the MoA Anseba Zone Headquarters between 9th and 10th September 2004. Participants (100) representing the MoA: NARI, HQ, Debub Zone, Gash Barka Zone, Anseba Zone, ICRISAT, MoA HQ, MoLG Anseba, Farmers and SLM attended.

The purpose of the workshop was to give a status report, to raise awareness, and to identify lessons learned and the way forward for Pearl Millet production in Eritrea.

Contributory presentations were made by NARI, ICRISAT, MoA Seed Unit, MoA Planning Office, and MoA Extension Department.

Some of the recommendations included:

- There should be increased efforts in distributing and monitoring pearl millet technology in areas where it could be readily incorporated into the existing farming systems.
- MOA support for pearl millet production in Debub Region has been extremely important and such support is likely to be critical for pearl millet development in the future.
- More attention should be paid to existing and potential demand for improved pearl millet. Increased attention should be given in the identification of market opportunities for pearl millet.
- Clear sharing of responsibilities should be made between the roles of research, extension, and beneficiary communities.
- In general, it is concluded that prior knowledge of pearl millet and its proper management are important factors for sustained crop production purposes.

The workshop was well covered by the media on radio, television and the press

### *ICRISAT Visit: (Pearl Millet Research Program Eritrea – 2004, Tour report Sep 07-22)*

*Mission team included: AG Bhasker Raj and Dr CT Hash from ICRISAT, India, and Dr Wendy Breese (CAAZ), Bangor.*

Recommendations from ICRISAT following their visit include:

- All trials at the Hagaz research station to be re-grown next year for proper evaluation.

- About 500 panicles to be harvested from the Hamelmalo/Golij Hagaz seed production plot to self and random mate the selected progenies to further purify the variety.
- Proper care should be taken in farm management and isolation distances for seed production plots.
- Protocols to be prepared for seed multiplication plots and on-farm trials. Research and extension persons responsible for conducting these should be asked to follow these instructions in principle.
- On-farm trial sites should be reviewed for their utility so that reliable data is collected.
- Seed of new varieties should be judiciously distributed to the deserving farmers only and in suitable quantities in time.
- Areas in Zoba Debub offer an excellent alternative option for seed production this option should be explored and utilized.
- With the increase in pearl millet research activities and workload, a qualified technician to assist Negusse will help to utilize his time and services more efficiently.

#### *ICRISAT collaboration*

##### *Golden Millet*

Thirty panicles of Eritrean landrace (LIBANA) were sent to ICRISAT to be back crossed against a Senegalese material known as 'Golden Millet'. The genes, carotene (Vitamin A), are expected to be transferred after nine backcrosses.

#### *CAAS (University of Wales - Bangor) collaboration*

##### *Downy Mildew*

The main objectives was:

- To assess pathogenic variation in the pearl millet DM pathogen in the major pearl millet growing areas of Eritrea
- To determine whether additional pearl millet DM resistance screening sites are likely to be needed by the breeding programme

The plan of the assessment was to undertake research assessment on 60 host pearl millet varieties/populations from Eritrean National Pearl Millet Breeding Program and ICRISAT against different pathotypes collected from 33 sites of millet growing areas. However, due to less downy mildew oospore-infected plants, only some of the pathogen population collected from 8 sites were used as a source of isolates. The result was presented by the investigator scientist during back stopping program in September, 2004.

#### *Other:*

A new freezer was purchased for the pearl millet varieties and landraces stored in Hagaz. Syngenta funds left over from the 2003 ICRISAT support costs were transferred by ICRISAT to the SLM Eritrea account to cover the costs for this.

#### **Soil and Water Conservation research in Afdeyu:**

##### *Construction of substation Afdeyu:*

NARI has requested to support them in putting in place a research station including residences for the purpose of agricultural research in different fields. In 2004 this station has been completed and is now integrated in the network of national research station in the quality of a "sub-station" of the main station Halhale.

##### *New river gauge station:*



Furthermore, renovation work of the research station has included putting in place of a new river gauge station with a fixed geometrical cross section. This shall facilitate calibration of the river gauge using hydraulic calculations in combination with classical flow measurements.



Fig. 2.2: New river gauge station at Afdeyu (Foto: Robert Burtscher, 02/05)

#### *New AgroMet station:*

Presently Afdeyu is operated as a class C meteo-station meaning that only daily maximum and minimum temperature and daily rainfall is measured. In time the station shall be upgraded to a class A station. In 2004 some preparation works including links with competent partners (Meteoservice Airport Asmara) were established and a list of commonly used meteodevices in Eritrea was compiled for installation at Afdeyu. The new station shall be functional for the rainy season of 2005.

#### *Backstopping:*

Routine checks of existing instruments and research set-ups are done on a periodic basis. This is handled by NARI staff based on monthly reporting forms.

#### *Long-term monitoring:*

The long-term base data collection relevant for Soil and Water Conservation research is a continuous process and it includes:

- Basic meteorological data collection (at this time temperature and rainfall)
- Runoff and sediment loss on the level of farmer's fields (4 Testplots)
- Runoff and sediment loss on catchment level (172 ha)
- Groundwater monitoring
- Photo monitoring of erosion hotspots
- Mapping of annual cropping patterns
- Harvest sampling
- Mapping of the current erosion damage (rills etc.)

#### *Data encoding and database management:*

A data-encoding tool "TESTMAIN" was introduced through a training workshop provided by Sabina Erni (CDE) in June/July 2004. The encoding is now done by NARI staff and backstopped by a local expert from WRD.



At the end of 2004 approx. 60% of the non-encoded data accumulated over the past years (1998 to 2004) was accomplished.

*Use of database:*

As the only site in Eritrea with long-term data relevant for Soil and Water Conservation research data is requested for planning purpose, educational use and research by various institutions:

- University of Asmara (College of Agriculture, Department of Geography) for teaching purpose (field trips) student's research and departmental research
- Ministry of Agriculture – Zoba Maakel for planning of dams for small scale irrigation
- ICRC for the planning of dams for groundwater harvesting
- Others: The database report of 1984 to 1998 is still a useful reference for many partners and interested institutions in SLM.

*Participatory assessment of SWC measures and soil types – Afdeyu village land and surroundings:*

An extensive assessment of different types of implemented soil and water conservation measures (introduced as well as indigenous) was done in the village land of Afdeyu and some surrounding areas. A team of 4-5 people (1 Swiss, 3-4 NARI staff) were working in the field for a period of almost 4 months.

All different types of SWC were carefully mapped and documented with regards to different characteristics like mode of implementation, suitability of technology for the practiced farming system, maintenance, effectiveness etc.

Furthermore soil types following a traditional classification were mapped on large scale (1:5'000) and soil samples taken with the aim to search for synergies with scientific soil classifications.



Fig. 2.3: Participatory Appraisal of farmers' perceptions on soil and water conservation measures

## 2.2. EDUCATION:

The programme line “Education” of SLM-Eritrea is implemented mainly together with two partners; Department of Geography and the College of Agriculture, both being part of the University of Asmara.

Whereas the linkage with the Department of Geography has been pursued further in the year 2004 based on the experience of the past years, the linkage with the College of Agriculture has been strengthened and the ground has been prepared for establishing a tissue culture lab for teaching and research purpose.

### Support to Department of Geography / University of Asmara:

#### *Geography Lab available:*

The construction of the Geography Lab comprising a computer lab (for GIS) and a seminar hall was completed and handed over to the University in September 2004. Immediately after completion of the building it was furnished with computer table in the computer lab and practical working desks in the seminar room.

The hardware equipment housed so far in the Water Resources Department was shifted to the new facilities. The computer lab includes at present 11 workstations (1 for the instructor) a server (rather outdated), a laser printer (black/white A4) and an inkjet colour printer (size A3). All the equipment is networked and connected to a small power back-up system.



Fig. 2.4: GIS-Lab: available for students and for upgrading skills of GIS and Remote Sensing professionals of other government offices.

#### *Informal handing over of undergraduate teaching:*

An important part of the activity plan 2004 with the DGUA was to prepare handing over of the teaching of the regular courses in GIS and Remote Sensing of the undergraduate programme to local staff. One Eritrean Masters' Degree holder in Environmental Science with focus on GIS and Remote Sensing had been identified. The candidate, Mr. Mehreteab Michael, was selected and accepted by the Department, however, formal processing of his

application takes time and since he is staff member of a Ministry he cannot easily change employer without formal acceptance of his respective Ministry.

Mehreteab participated actively in the last GIS course and has covered parts of it and was tutoring all the assignments. This gave him a first teaching exposure and will make him ready for his up-coming assignment.

Facilitating to formalize the part-time employment for lecturing for the undergraduate programme will be a crucial task in 2005.

#### *Training/Courses at the University of Asmara:*

##### Surveying course designed for Geographer: (Semester II of Academic year 2003/2004)

This course offered to around 30 students covers basic concepts of surveying. A focus was given to GPS techniques, since nowadays this is the most important field data collection tool used by Geographers.

##### Introduction to Cartography: (Semester II of Academic year 2003/2004)

This course was given to around 150 students focusing on basic concepts of maps and cartographic principles. The large number of students didn't allow focusing on practical aspects. Nevertheless, some assignments were given. This course is to be considered as an important pre-requisite for the GIS course in Year IV of the curriculum.

##### Introduction into GIS: (Semester I of Academic year 2004/2005)

Basic concepts of GIS using commercial software packages (ArcView etc.) were explained. The course incorporated considerable exercise time besides the regular teaching schedule. The motivation of the students was very high. The course was assisted and tutored by Mr. Mehreteab Michael, who was selected as future part-time lecturer of this course. 27 students have attended this course.

##### Introduction into Remote Sensing and Aerial Photo Interpretation: (Semester I of Academic year 2004/2005)

The course is of 3 credits and was offered to 120 students. It includes classical aerial photo interpretation as well as the basics of satellite imagery. Teaching was supported with various satellite imagery and aerial photographs of Eritrea extracted from the nation wide GIS and Remote Sensing database of SLM-Eritrea. A lot of very specific interpretation material adapted to the local context was prepared (Stereograms of aerial photographs, Satellite images of different sensors etc).

##### Introduction to Computers:

A course for (27) students of DGUA. The duration is of 10 units of duration of 4 hrs each (weekend and evening course). Beneficiaries are 4th year students expected to participate in the GIS course. The course was carried out by a consultant.

#### **Training/Courses for Government Institutions:**

##### *Refresher training: Remote Sensing (RS) for Hydrogeological Purpose*

As a continuation of a 2-weeks training in 2003 using ASTER satellite imagery for topographic mapping and hydrogeological interpretation a refresher course of 3 days was given in March 2004 by a staff member of CDE (Kurt Gerber). Funding was provided by GTZ.

##### *Base map improvement project / Municipality of Asmara (first phase):*

The Department of Infrastructure (Zoba Maakel Administration) has requested the assistance of CDE in order to improve the base map of the Municipality of Asmara as a very crucial planning tool based on existing data.

With photogrammetric processing of existing aerial photographs (from 1997) using commercial remote sensing software packages, a highly accurate orthophoto of the town and a precise digital elevation model shall be created. These two products shall serve as future reference map (base map) for all types of town planning tasks.

In the first phase of the project funded by ESAPP a CDE expert (Thomas Gurtner) focused on scanning the existing aerial photographs (from 1997) and collecting highly precise differentially corrected GPS points on the ground for photogrammetric processing. Surveyors of the Department of Infrastructure were involved and got some very focused on the job training.

*Follow-up and on-the-job training:*

Support and on-the-job training in the field of GIS was given to the following institutions:

- Water Resource Department: In the field of using ASTER stereodata for creation of topographic maps.
- Department of Land: Software installation and software license management; Plotter maintenance.
- National Museum: Advise for software purchase and software installation and license management.

**Research and research capacity building at University of Asmara:**

*Supervision of senior essay papers (BA-level) for students of the DGUA:*

The following studies were finalized successfully in June 2004:

- Landuse dynamics of Amadir. (4 students)
- Water Supply of Asmara: Balance of Water Demand and Water Availability. (4 students)
- Water Supply of Keren: Balance of Water Demand and Water Availability. (4 students)

The paper about 'Landuse dynamics of Amadir' was one of the most successful of the students' batch 2004.

Supervision of the following studies was started in the academic year 2004/2005:

- Role of Serejeka as a Rural Centre (4 students) – Supervisor: Paul Roden
- Rainfall/Runoff Analysis in the Upper Mereb and Gala Catchment (4 students) – Supervisor: Robert Burtscher
- Landuse Dynamics in the area of Serejeka (3 students) – Supervisor: Robert Burtscher
- Role of Adi Tekelezan as a Rural Centre (4 students) – Supervisor: Paul Roden

Two students of the University of Innsbruck/Austria elaborate the first two topics mentioned above as well as their MSc studies. Both students have been staying in the country for 3-4 month in mid 2004 working jointly with the students of the University of Asmara.

The papers are supposed to be submitted by June 2005.

*Use and misuse of Eritrea's land. Case study of the Serejeka –Adi Tekelezan Area:*

SLM is supporting this research project with a flat amount of 4'000 USD and some research input. Furthermore a direct research input was to contribute with some Landcover/Slope analysis using data from the GIS database established over the past view years and some Landcover mapping on the ground in a scale of 1:50'000. The landcover mapping of the headwater catchments of Anseba (study area) allows as well to get a general idea about the quality of the National Landcover Map of Eritrea in the scale of 1:100'000 supported by FAO.

**Capacity building Workshops:**

*Graduate Programme of College of Social Science:*

SLM-Eritrea and CDE was invited to actively participate in the presentation workshop of the Graduate Programme (Masters' Degree Curriculum) of the College of Social Science. Thomas Kohler was chairing a session of presentation and discussion. SLM-Eritrea will remain committed to support the Department of Geography supporting the teaching of selected courses (GIS and Remote Sensing, courses related to rural planning and rural livelihood, and land management related courses) as well as supporting actively MSc dissertations involving students in the programmes' research works.

## **2.3. OUTREACH**

### **Livelihood study Amadir:**

*Back-to-village reporting:*

After the field work in August/September 2003 the first draft report was finalized in April 2004 and a extensive back-to-village reporting was organized in May 2004. The back-to-village reporting allowed the villagers to learn from the study out-comes, to comment on them and to correct certain issues. It was a very successful mutual learning process with the presence of the community, the local administration and some government institutions.

*Second draft report:*

The second draft report of the livelihood study of Amadir was completed in October 2004 by Woldetensae Tewolde and Bissirat Dessalegn and contributors (Thomas Kohler, Michael Gasser, Robert Burtcher) considering the out-comes of the back to village reporting.

### **Dam Afdeyu:**

After nearly five years in the making, the final contract for commencement of the dam was signed between CDE, MoA Maakel and Algawerash Tewolde Building Contractor in September 2004. The projected time requirement for completion is 300 days from the date that the contractor officially commences work.

In October the contractor was given the green light to start work. A meeting was then held with community representatives from the Afdeyu and Thsahaflam villages', the Serejeka Subzoba MoLG Adminisrator, and the Serejeka Subzoba MoA Head. This officiated the commencement of the dam.

During the same period the country began to experience severe fuel shortages as the international price for oil increases. In response the GoE begins to set up a system for the distribution of fuel based on a priority and needs basis. However, this does not immediately resolve the shortages for the project.

A letter was then drafted in November to elicit the support of the Minister of Agriculture in acquiring fuel. He writes to the MoPW in support of our petition. This however does not resolve the problem. Various avenues, inaddtion, are explored through the contractor and the MoLG. The fuel crisis continues through 2004 and the project is unable to take off the ground.

SLM opens two separate bank accounts specifically for the project, one dollar and the other Nakfa.

### **Geo-Spatial Database:**

The Geo-Spatial database of Eritrea was developed further by updating existing information (layers) such as administrative boundaries, up-dated road network, settlements etc.

As new layers the following data were added:

- SPOT 3 satellite imagery from 1996/1997 was orthorectified based on the satellite imagery raw data (provided by WRD) and the national Digital Elevation Model (DEM) developed in the years before.
- Dam inventory of Eritrea: The existing dams built in Eritrea were put together from different sources (MoA, WRD, etc) and put into a consistent database. All the dams were assigned with location information, partly from satellite imagery. Further collection of data will be needed in order to fill missing data such as storage volume etc.

### **Provision of geo-spatial data:**

The geo-spatial database of SLM-Eritrea is becoming a very useful data source for many institutions in the country using GIS and Remote Sensing techniques. The following institutions and others were officially requesting data for their operations:

- ICRC: GIS data and Satellite Imagery for the TSZ of Eritrea for the planning of water supply infrastructure and groundwater recharge measures.
- WRD: GIS data for specific study areas and country coverage of SPOT 3 data. The SPOT 3 data, though provided as raw data to SLM-Eritrea by WRD were never available in an appropriate format for their use. WRD has a lot of experience using SPOT 3 satellite imagery as hardcopies for hydrogeological investigation; this newly available digital image database will strengthen their capacities in groundwater siting.
- Earth Science Department of University of Asmara: GIS database for the production of basemaps for geological mapping.

## **3. Linkages**

The links to the main partners of SLM-Eritrea were strengthened substantially. A Memorandum of Understanding (MoU) with as signatory parties NARI/Ministry of Agriculture, Vision Eritrea, CDE and SFSA was formally signed and implemented. This MoU is the backbone for the running of the SLM-Eritrea office and the support of all the agricultural research activities with NARI.

*Important contacts being established / strengthened in 2004:*

- ICRC: Besides the sharing of GIS and Remote Sensing data, ICRC was ready to fund Remote Sensing training for hydrogeological applications, building on the experience of SLM-Eritrea in that field and involving trainees previously trained by the programme.
- College of Agriculture: Though the College of Agriculture is already an important partner of SLM-Eritrea since the very beginning of its activity in Eritrea, negotiation about a new project to establish a tissue culture lab for training and research was started and pushed to an extend to enable its implementation.
- GTZ: GTZ has requested the assistance of CDE for an assessment of the IT and GIS infrastructure of WRD and possibilities of improvement. This study was successfully implemented by Kurt Geber.
- ICCO: Interchurch Cooperation of Development (a Dutch organization) has expressed its interest in funding the secondment of an expert in Soil and Water Conservation / Watershed Management in order to strengthen the capacities of NARI (especially the substation of Afdeyu) and SLM-Eritrea.



- VSO: Though SLM-Eritrea has no formal contact with the VSO office in Asmara, through direct contacts with VSO staff, the UK based Volunteer Service Overseas was willing to second an expert to the College of Agriculture of the UoA in order to handle the Animal Science lab as well as the Tissue Culture Lab to be installed in 2005.

## 4. Prospects and Opportunities for 2005

The programme future as such is secured with the agreement signed for the second phase as from January 2005 for a duration of five years. The objectives and expected results by programme line are formulated in the project document for the second phase which will serve as baseline for the annual plans. Especially considering the political situation of Eritrea, this is a very strong commitment of all the partners involved.

The outlook for the year 2005 was elaborated already during the annual planning meeting and can be summarized as follows for each programme line:

### **Research:**

#### *Pearl millet improvement programme*

##### *Research trials*

The core of the programme is the research trials for the improvement of pearl millet varieties. The 2004 rains led to a failure of much of the on-station and on-farm research trials in 2004. NARI and ICIRSAT agreed that these trials will be repeated again in 2005.

##### *Pearl Millet-Cow pea Intercropping*

The main objective of the millet-cow pea intercropping research activity is to see the effect of intercropping with respect to millet and cow pea on grain yield. The millet-cow pea research activity will be handled by NARI and an agronomist (South-South co-operation). To start the south-south co-operation work, there is a plan to undertake a meeting among the Eritrean millet breeder and Malian agronomist.

##### *Socio-economic study on impact assessment of new pearl millet varieties*

This activity will be followed up from 2004. It aims to assess the farmers' perception of new pearl millet varieties. A team that comprises socio-economist, millet breeder, pathologist, animal scientist, Zoba extension worker and one staff from SLM foundation for sustainable agriculture will perform it. Special focus shall be made on womens' perceptions of the Kona and Hagaz released varieties.

##### *ICRISAT backstopping*

The main objective of ICRISAT back stopping is to gain support in planning, survey and collection, and evaluation of experimental materials, of the programme. In addition to email contact, other support involves a two week assessment visit to Eritrea (Scheduled for September 2005).

##### *Field days and demonstration*

The aim of this activity (workshop and field visits) is to discuss and popularise the new pearl millet varieties, to obtain feed back and to identify new selections in participation with farmers and extension workers. In 2005 this activity will include a visit to farmers' fields, on-farm trials and Golij Research Substation.

##### *Millet seedling –transplanting*



This will be a continuation of the trials began in 2004. The main objective is to assess the response of transplanted pearl millet seedlings in areas where there is a shortage of moisture. This activity will take place closer to Hagaz Research Substation in Agordat Sub zone.

#### *Community Based Seed Production*

The main objective of this activity is to produce quality pearl millet seed through the informal seed sector. The demand for quality seed has increased and whilst the supply is still low. The MoA and other government support bodies are unable to meet this growing demand. As a result NARI, in collaboration with the MoA Zoba Anseba, have proposed a pilot village whereby farmers will be given the opportunity to independently set up a seed production association. Assistance will be sought from NGOs with experience in establishing community based organisations, seed banks, and micro credit facilities. SLM shall assist in a feasibility study and in lobbying for support from local donors and NGOs.

#### *Hagaz Research Substation Development*

NARI have identified the need to improve the substation based on the fact that there is now an increased demand for breeder and foundation seed production. The plan is to produce seed in the off-season. In order to achieve this goal, extra land has been identified; this land needs levelling, some infrastructure, and irrigation equipment.

#### *Soil and Water Conservation and Watershed Management:*

- A new AgroMet station will be established in Afdeyu. The existing station is quite outdated and would need a lot of maintenance. So it is much more efficient to install a new Agro-meteorological station responding to nowadays standards at a more preferable place compared to the existing one.
- Data encoding and some basic analysis:  
The encoding of the collected data over the last few years with the new software “TESTMAIN” will be completed by mid 2005. This means a very unique dataset relevant for SWC research as well as planning of interventions with a record of more than 20 years with a reasonable quality (view data gaps) will be available for all concerned partners in Eritrea. Immediately after the completion of the encoding of the data basic analysis can be undertaken updating existing papers and reports. For this there might be some input (expertise) need from CDE in order to build capacities locally.
- Completion of the “Participatory assessment of SWC measures and soil types – Afdeyu village land and surroundings”:  
This study is the first one of this type in order to assess indigenous and introduced approaches of SWC and their acceptance by rural communities. The study will be presented in a workshop and disseminated in different forms (report, fact-sheet, pictograms) to concerned stakeholders.
- Secondment of an expert in SWC and Watershed Management to NARI and SLM-Eritrea:  
ICCO is ready to fund the secondment of such an expert including providing some operational funds. This will strengthen the upgraded research station of Afdeyu (substation of NARI) after completion of the infrastructure in 2004.

#### *Land productivity improvement research \_ Afdeyu*

NARI has forwarded a proposal for funding and implementation in Afdeyu to SLM. The aim of the project is to improve crop productivity by validating integrated soil and water management practices on farmers fields and by farmers, to address the constraints that potentially hinder farmers from adapting these practices, and to empower farmers technical ability to practice and test potential technologies on their plots.

There is also the prospect that other organisations such as TOKER would be interested in partaking in this project.

**Education:***Support and supervision of BA & MA theses:*

The applied research on topics relevant for SLM-Eritrea involving students from the University of Asmara as well, if needed, from the University of Berne has always proven to be a very effective capacity building strategy.

*GIS & RS / Handing over of BA teaching and starting with MA teaching:*

After support of teaching in GIS and Remote Sensing of the bachelor level and building local capacities in this field this activity will be handed over in the year 2005. Thus, this activity was completed in a sustainable manner with regard to funding (University of Asmara takes over), and capacity wise (new lecturer – Merheteab Michael – was introduced into the teaching and feels comfortable in this role). However, technically there might be some further support until the UoA builds capacity to take over completely the maintenance of the GIS-Lab. There are still some shortcomings with regard to the organisational set-up of the maintenance, the technical skills of people, as well as financial capacity and commitment for the purchase of spare parts etc. This issue has to be addressed strongly in the year 2005.

As far as the Master Degree programme will be started at the Geography Department of the UoA the teaching of the GIS and Remote Sensing course shall be secured by CDE. This has been promised by CDE during the workshop about the graduate programme of the College of Social Science as well in a letter of March 19, 2004 written to the Department of Geography.

*Tissue Culture Lab at CA at UoA:*

The installation of the tissue culture lab shall be completed before the new academic year 2005/06 and some basic training shall be arranged by the company supplying the equipment as well as by Dr. Linh from the Swiss Federal Agricultural Research Institute (Station Changins).

The secondment of the VSO expert responsible (Sandra Wehrle) for the Labs of the College of Agriculture (including the Tissue Culture Lab) is a big asset in order to help the sustainability of the facilities, since the local expert in tissue culture (Dr. Tadesse Mehari) is extremely loaded with other tasks at the University. Sandra has as responsibility to train local lab technicians over the coming one and a half years.

*Training in GIS/RS for Ministries etc.:*

In the framework of the collaboration with ICRC a training workshop using RS technology for groundwater investigation is already set. Further training will include on-the-job assistance as usually requested by staff of WRD and other institutions.

*Awareness creation about the programmes activity:*

This was so far always a rather weak point of the programme. A clear publication framework will be established and produced studies and printed material (incl. maps) made available to relevant stakeholders.

*Support of scholarships (2-3):*

Building of local capacity is extremely important. Since candidates for MSc studies have difficulties to leave the country (and to come back) the SLM-Eritrea strategy is to support scholarships in distance education. This shall include the ongoing study of Filmon Tesfaselassie in the field of “Community Water Management” as well as studies to be identified in the field of GIS and RS.

**Outreach:**

*Concentration areas Afdeyu and Amadir and surroundings:*

- In Afdeyu the biggest project is certainly the construction of the dam in Afdeyu. It shall be completed by end of 2005.
- Contribution funds for the connection of electricity to Amadir were made available. Implementation depends on the contribution of the village itself and other contributors like HABEN.
- There is prospect to get a short-term irrigation specialist through Dutch funding (PUM) in order to support tricky situation of irrigation development in Amadir, as outlined in the livelihood study and in the MSc dissertation of Michael Gasser.

*Spatial Database Development:*

Various institutions keep requesting GIS and RS data from SLM-Eritrea. Those data is very important for those institutions for various planning purposes.

In 2005:

- the dam inventory shall be improved and completed in collaboration with MoA
- a new updated settlement dataset (by UNMEE, NSEO, LIS etc.) already secured will be enriched by adding population information as estimated by MoLG in 2001.
- a template for a topographic map as well for a satellite image map (Landsat ETM+) shall be prepared in order to enable easy printing of standard maps based on the existing national coverage from any place in Eritrea based on a new tiling system to be established.