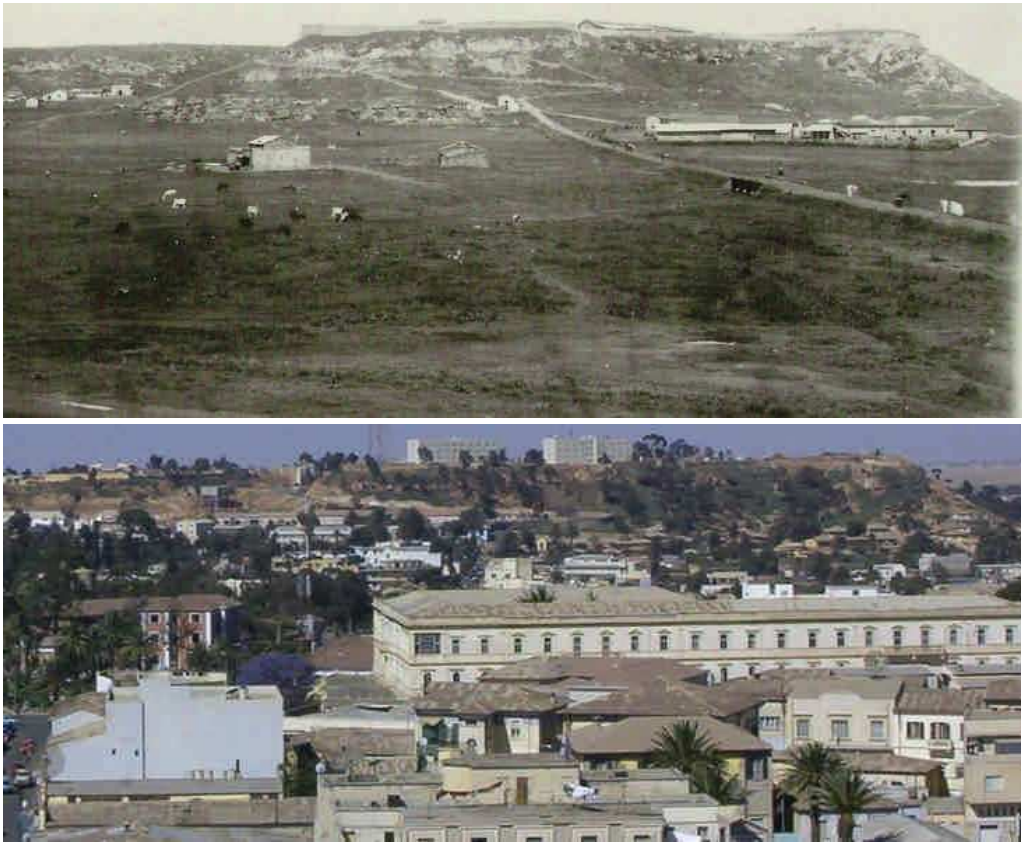
# ERITREA RE-PHOTOGRAPHED: LANDSCAPE CHANGES IN THE ERITREAN HIGHLANDS 1890 – 2004

## AN ENVIRONMENTAL-HISTORICAL STURDY BASED ON THE RECONSTRUCTION OF HISTORICAL PHOTOGRAPHS



**Master Thesis**

Faculty of Natural Sciences
University of Berne, Switzerland

**Louise Lätt**

**2004**

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## An Environmental-Historical Study Based on the Reconstruction of Historical Photographs

MSc Thesis

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Top: The Bet-Maka hill with the Fort Baldissera in the west of Asmara in 1896 (Photograph by Francesco Nicotra, 1896)
Bottom: The fort hill in February 2004, with the Ministry of Information (Photograph by Louise Lätt, 19.02.2004)

# Preface

This MSc thesis has been encouraged by Dr. Alfons Ritler, geographer and historian associated to the Centre for Development and Environment at the University of Berne, who has himself carried out intensive research on the environmental history of the Ethiopian Highlands. The persistent belief in a dramatic deforestation in Eritrea during the last hundred years and its wide implications for the environmental policy of the current and former Governments has in fact stimulated the interest in a profound analysis of the environmental history of Eritrea based on the facts presented by historical sources. With the methodology of historical photo-monitoring proposed for this research, historical photographs will be compared with the current situation along with additional historical sources in order to attribute to the understanding of the changes of woodland cover but also of general aspects of the landscape and land use in the Eritrean Highlands from the Italian colonial period until the present day. This comparison is intended to shed light on the effective changes or similarities in the landscape of the Eritrean Highlands since the start of Italian colonisation in 1890. The concept of carrying out research in an African country, only previously known to me from the newspapers, and the unconventional methodology proposed in this thesis provided the motivation to conduct this research. My studying of history as a minor subject was also an influential factor worthy of note here. The study has enabled me to gain an insight into the fascinating country and society of Eritrea.

Alfons Ritler has aided the construction of this thesis with his competence and enormous knowledge regarding the environmental history in Eastern Africa and the handling of environmental historical sources. He introduced me to the topic, provided important literature and provided valuable aid and direction concerning the evaluation of the historical photographs. I would hereby like to express my enormous gratitude to him.

Thanks go also to the two supervisors of CDE Berne, Prof. Dr. Hans Hurni and Dr. Thomas Kohler, for their support and advice, with special thanks to Thomas Kohler for his useful hints and advice regarding working in Eritrea. Further gratitude is extended to P. Fedele Merelli from the *Archivio Provinciale Cappuccini Lombardi* in Milan, Prof. Marina Puccioni and her assistants from the photographic archive of the *Istituto Agronomico per l'Oltremare* in Florence, Prof. Maria Mancini from the photographic archive of the *Società Geografica Italiana* in Rome and Mrs. Ilse Jung from the *Museum für Völkerkunde* in Vienna for their help in finding and getting copies of the historical photographs used in this thesis.

I am also very much indebted to the friendly help of many people in Eritrea, especially to Salem Solomon, who was present throughout all the field research, helped in finding the right places, negotiated with authorities and translated the interviews made with local people under circumstances, which were often rather difficult and delicate. With her open-mindedness and positive attitude towards everyone and everything she was a valuable help and friend during the field research and deserves my greatest thanks. Thanks are also due to P. Ezio Tonini from the library of the *Pavoni Mission* in Asmara and the staff of the *Research and Documentation Centre* in Asmara, notably Yerusalem Afeworki and Aron Andemichael, for their interest and help in the research and to all the people in Eritrea, who in someway offered information, transport, hospitality, general help and friendship. Best thanks also go to Robert Burtscher (CDE, Asmara) for his support and hospitality in Asmara.

Furthermore great thanks go to Kurt Gerber (CDE, Berne) for his GIS support, the "Eritrea-Experts" Andreas Gräub, Sascha Krähenbühl, Viveca Nidecker and Michael Gassner for their tips and advice and Barry Clark for the correction of my English language.

Last but not least, gratitude is also due towards my father, Jean-Maurice Lätt, who unfortunately passed away during my University time, and to my mother Maria Lätt-Käch. The financial, ideational and moral support of my parents has not only enabled me to carry out my university studies, but was also an important source of motivation for my geography studies.

Berne in August 2004,

Louise Lätt

# Abstract

The aim of this thesis is to contribute to the understanding of the use and evolution of natural resources and the general development of the landscape of the Eritrean Highlands since the early time of Italian colonisation at the end of the 19th century until the present day. The methodological approach chosen for this environmental-historical research is the methodology of historical photo-monitoring, by which historical pictures are compared with new ones which depict exactly the same location. The photograph as a graphic historical source has the advantage that it offers up a multitude of details concerning a certain landscape and its land use which is not found e.g. in a travel account. It also mimics human perception and imagination much closer than any literary source. On the other hand the information provided by a photograph is limited to the locality shown within the picture, this means that the comparison of a few historical photographs with their contemporary duplicates cannot supply enough information for the analysis of environmental changes of a broader area to be made. The method of historical photo-monitoring has therefore been supplemented with the compilation of historical travel accounts, travel guides, maps and interviews with local inhabitants which go some way to revealing how environmental changes are perceived by the Eritreans themselves.

The initial interest in the environmental history of the Eritrean Highlands was related to the so-called "narrative of deforestation", which describes a widespread belief in Eritrea and also in Ethiopia, that the woodland cover has dramatically decreased during the last hundred years and that there were abundant forests in the Central Highlands some decades ago. These are believed to have been largely destroyed by the colonial powers, during the thirty years of struggle and by the effects of the significant population increase during the last century. While this research adds evidence to the findings of Dr. Pauline Boerma, that the forest cover was already quite scarce in the Eritrean Highlands by the end of the 19th century, the findings also give an insight into the changes and similarities in the land use, biodiversity, soil situation and degradation, infrastructure, structures of the villages/towns and the architecture of the dwellings found in the Eritrean Highlands.

The historical photographs and travel accounts analysed for this thesis suggest in fact, that the Central Eritrean Highlands and the area around Keren already lacked forestation at the very beginning of Italian colonisation. The former province of Hamasien including the capital Asmara seems to have been especially scarce in woodland already by the end of the 19th century. While it can be seen on the photo-comparisons, that the shrub vegetation in the southern provinces has decreased a little around villages and while historical literature suggests, that the ravines and some other specific places (e.g. the Kohaito plain) would indeed have been more vegetated at the beginning of Italian colonisation than today, it can also be seen that the planting of trees (e.g. eucalypts and *berbere tselim*) and the natural growth of secondary vegetation like *beles* and rumex and also of acacias, has substantially increased in some places during the last hundred years. The historical photographs also offer evidence that erosion problems and terracing as a soil conservation method were already known at least at the beginning of Italian colonisation and probably long before that and can therefore not be the result of a supposedly catastrophic deforestation during the last decades.

The historical literature and photographs also give an impression of the importance of mixed agriculture in the Highlands in the early period of Italian colonisation and apparently even during several centuries before this. The ox is a linchpin of the ox-plough system and therefore

also of the whole economic system in the rural areas of the Eritrean Highlands, this has remained almost unchanged during the last century. Cattle have therefore always played a very important role in the day-to-day life of the rural Eritrean population.

Regarding the settlement structures and dwellings, the photo-comparisons show that a lot of villages at the beginning of the 20th century consisted of the traditional *aghdos* and *hidmos*, the latter requiring much wood for their construction. Since the early time of Italian colonisation these traditional dwellings have been subsequently replaced by stone houses called *mereba* and since the 1970s, the construction of new *hidmos* seems to have ceased altogether. Also through the photo-comparisons an impression of the persistence of town structure, infrastructure and especially the road system established by the Italians in Eritrea can be gained.

The methodology of historical photo-monitoring creates several difficulties, well illustrated during the field research for this thesis. The exact reproduction of historical photographs requires a lot of time and patience and may also prove to be very frustrating sometimes when the reconstruction for any reason is not possible or if the exact location cannot be found. Nevertheless, this methodology is very useful for the understanding of environmental historical processes, since the historical photographs provide valuable information about the environmental past, often not documented in literature, and since the photo-comparison allows for an objective analysis of the changes in a very specific location. To be able to get a more general impression of the landscape and also to understand certain aspects and situations depicted by the historical picture, the use of supplementary literary and oral sources has proven to be very useful for this thesis.

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## List of acronyms

| | |
|---|---|
| APCL | Archivio Provinciale Cappuccini Lombardi, Milan |
| BIS | British Information Services, Eritrea |
| CDE | Centre for Development and Environment, Berne |
| CTI | Consociazione Turistica Italiana, Milan |
| DoA | Department of Agriculture (during the Ethiopian rule) |
| ELF | Eritrean Liberation Front |
| EPLF | Eritrean People's Liberation Front |
| FAO | Food and Agriculture Organisation of the United Nations, Rome |
| IAO | Istituto Agronomico per l'Oltremare, Florence |
| ISPI | Istituto per gli Studi di Politica Internazionale |
| MoI | Ministry of Information, Asmara |
| MVK | Museum für Völkerkunde, Vienna |
| RDC | Research and Documentation Centre of Eritrea, Asmara |
| SGI | Società Geografica Italiana, Rome |
| RSCU | Regional Soil Conservation Unit, Nairobi |

## General remarks

The translation and transliteration of the Tigrinya expressions into English is based on the suggestions of Salem Solomon, Asmara, also for the places, villages and towns in Eritrea, as there is no official transliteration of Tigrinya names of places so far. For botanical expression, the transliteration is based on the book "Useful Trees and Shrubs in Eritrea" edited by the RSCU in Nairobi.

To simplify the distinction between the historical photographs and the new reproduction pictures, the latter are framed with a black border.

## List of the most common trees and shrubs in the Eritrean Highlands in Tigrinya and Latin

| | |
|---|---|
| Akba | *Acacia tortilis* |
| Awliie | *Olea Africana* |
| Beles | *Opuntia ficus-indica* |
| Berbere-tselim | *Schinus molle* |

| | |
|---|---|
| Chea | *Acacia abyssinica* |
| Daero | *Ficus vasta* |
| Hehot | *Rumex usambarensis* |
| Keih-Kelamitos | *Eucalyptus camaldulensis* |
| Keih-Kelamitos Kelamitos | *Eucalyptus cladocalyx* |
| Kelamitos megdalina | *Eucalyptus rudis* |
| Kenchib | *Euphorbia tirucalli* |
| Kolqual | *Euphorbia abyssinica* |
| Seraw | *Acacia etbaica* |
| Sesewe | *Combretum molle* |
| Sanda-ere | *Aloe macrocarpa* |
| Tahses | *Dodonea angustifolia* |
| Tsihdi | *Juniperus procera* |

# *1 INTRODUCTION*

## 1.1 Objective and structure of the thesis

The objective of this MSc thesis is to analyse changes in the landscape, the land use and the woodland cover in the Eritrean Highlands from the end of the 19th century, when the first photographs were taken here until the present day. The thesis is intended to contribute to the understanding of the use and evolution of natural resources in Eritrea in the past and on the impact of different colonisers, conflicts and ecological constraints on the landscape of the Eritrean Highlands.

In this sense the thesis is also intended to supplement the PhD thesis of Dr. Pauline Boerma, who has analysed in depth the changes of the woodland cover in Eritrea since 1890. Beside the literature review, Boerma has also reconstructed historical pictures and interviewed local people in a given area of the central Highlands of Eritrea during her field research. The study at hand, which also includes other areas of the Eritrean Highlands, may add further evidence to the thesis of Boerma and some few other scientists that, contrary to a widespread opinion, woodland cover in Eritrea has not diminished significantly during the last century: The conviction, that the woodland cover in Eritrea has dramatically decreased in the last decades from around 30% just before Italian colonisation to less than 1% today has in fact deeply entrenched itself in the collective consciousness of the Eritrean people.

Methodologically, the study is based on the comparison of historical photographs with new reconstruction pictures taken of the same area. This method of historical photo-monitoring, accompanied by a critical approach towards the historical pictorial sources, is intended to facilitate a comparatively objective insight into the changes in the landscape in some specific areas of the Eritrean Highlands since the time of Italian colonisation. Given that most the historical photographs used in this thesis have been taken close to settlements, the history of the landscape reconstructed in this thesis on the basis of the photo-comparison will also give an insight into the history of different villages and towns of the central Highlands over the last hundred years. A compilation and analysis of historical travel accounts, travel guides and historical maps will supplement the information received from the comparison of the photographs, while interviews with elder people living in the areas of the field studies may also show, how the landscape changes in Eritrea have been perceived by the local population.

The thesis is structured into five parts: The first introductory part will present the aim and goals of the study, the underlying problems, the research questions and the interest of environmental history in the specific case of Eritrea. The "narrative of deforestation" will be briefly illustrated and the environmental-historical approach of this study will be explained.

Chapter two is dedicated to the methodology used in this thesis. The method of the historical photo-monitoring will be explained and the possibilities and limits of photographs as historical sources will be discussed. An overview will also be given on the first historical photographs which were taken in Eritrea, and on the historical photographs which were used for this thesis. Also the other historical sources used in this thesis (literal sources, maps, oral history) will be illustrated.

Chapter three will put the specific field studies made in the Eritrean Highlands into their political, socio-economical, geographical and ecological context. This means that an overview will be given of different aspects of Eritrean history, geography, culture and ecology, which have in some ways influenced the livelihood, the land use and finally also the landscape of the Eritrean Highlands. This knowledge may help in the understanding of the historical photographs and of the changes made in the landscape until the present day.

Chapter four forms the main part of the thesis. In this chapter, the results of the field studies, including the comparison of the photographs, analysis of further sources and interviews, will be illustrated.

Chapter five will be a synthesis of the thesis. The findings of the field studies regarding the methodology and the contents will be analysed. Suggestions for further researches will also be made.

## 1.2 Outline of the problem

### 1.2.1 Emergence and persistence of a narrative

The specific interest in the environmental history of Eritrea is related to the so-called "narrative of deforestation" (McCann 1997): There is a widespread belief in Eritrea, that the woodland cover has decreased significantly during the last century and that the Highlands were covered with dense forests before or even during the Italian colonisation. They are believed to have mostly disappeared during the last decades because of population pressure, poor local resource management, colonial exploitation and war, a belief, which has totally pervaded the collective consciousness of the population. The elder members of the population still have vivid memories concerning abundant vegetation and dense jungles in their surroundings some fifty years ago. Even the younger people are generally convinced that a dramatic decrease of forest cover has been going on during the last decades, since they are taught so at school and hear their parents and grandparents talk about it. The deforestation is believed to have been severe especially in the Central Highlands, which have historically been the most populated area of Eritrea, and are very scarcely vegetated today.

According to Boerma (1999:149) the generally accepted figure of 30% wood cover in Eritrea just before Italian colonisation would go back to Andrea Branca, leader of the Forest and Wildlife department under the British Administration in Eritrea, who published this figure in a report in 1947. Although he failed to give any factual basis for his presumption, this number has been widely cited again and again in different publications, scientific reports, school books and travel guides and as a result of this has finally become regarded as fact.

The belief in a dramatic deforestation of catastrophic dimensions in Eritrea corresponds to a general paradigm concerning the woodland areas in Africa, which maintains that there has been a rapid process of deforestation throughout the whole continent during the 20$^{th}$ century. In Ethiopia as well, there is a frequently repeated and widely believed narrative of a significant deforestation since the beginning of the 20$^{th}$ century. The figure of 40% woodland cover at the turn of the century has been generally adopted, although according to Wøien (1995:501) even a comprehensive search in literature does not reveal the origin of this figure. Alfons Ritler, who has incited the thesis at hand, has himself written a MSc thesis and a PhD thesis on the changes of forest cover, landscape and land use in Ethiopia between 1699 and 1865 and between 1865 and 1930 respectively, based mainly on the analysis of historical travel accounts and was thereby able to throw serious doubts on this deforestation paradigm. The evidence compiled in his thesis suggests that there was already few wood left in the Ethiopian Highlands in the 19$^{th}$ century. His findings added to the doubts already raised by some few other scientists before him (Mesfin Wolde Mariam 1985 and 1991, Zerihun Woldu 1985 and Clapham 1988). The American Africa-Historian James McCann has coined the expression "narrative of deforestation" for this persistent belief in a dramatic deforestation in Ethiopia. He shows in his studies (1995 and 1997), that forest loss is neither unidirectional nor permanent and that the human habitation has continually altered the vegetative cover, not simply removed it.

Also in the case of Eritrea recent scientific reports have thrown serious doubts on the figure of 30% wood cover present just before Italian colonization:

- Francesca Liebi (1993), a Swiss geographer who wrote a MSc thesis on the evolution of land use and landscape in Eritrea between 1800 and 1952, concludes that the land cultivation which has been introduced in the Eritrean Highlands already several centuries ago, would have led to a gradual soil degradation which was already quite significant in some areas in the 19th century. The landscape descriptions in the travel accounts evaluated in her thesis suggest furthermore that by the end of the 19th century, there were hardly any closed forests in the Highlands of Eritrea.
- Pauline Boerma (1999) shows in her PhD thesis, that there has been an uneven pattern of change in the vegetation of the Eritrean Highlands, with some areas losing tree cover and others gaining it. She states, that the influence of men on their environment is much more complex than generally believed until recently and not automatically destructive. She finally concludes that both the amount and rate of deforestation in Eritrea have been greatly overestimated, while the capacity of the vegetation to regenerate has been underestimated as well as the capacity of local people to handle their resources with foresight and also take measures to protect them from overexploitation.

If these findings are correct, a question can be seen to arise: why should such a narrative exist and persist if there is no factual evidence to it? Pauline Boerma also conducted some research to find a possible answer to this question. According to her findings, there are political as well as psychological reasons for the persistence of the 'narrative of deforestation':

On the one hand this narrative has served a succession of Government administrations in Eritrea for various political and economic purposes: By stating, that the local population wasn't capable of managing their forests themselves and that a once abundant vegetation had been destroyed in a very short time, the different Governments were able to offer a justification for their presence in Eritrea and legitimise the transfer of power to their new Regime, whether it was Italian, British or Ethiopian. At the same time, they would offer hope, that the country could be easily developed in the future by huge reforestation programs, since deforestation was considered as being responsible for all the wider ecological problems of Eritrea (see chapter 3.5.1).

On the other hand, the reason why the narrative was so strongly adopted and widespread in the Eritrean population is probably mainly a psychological one. Boerma argues, that the picture of pillaged trees has become a metaphor for all the oppression and sufferings that Eritrea had to endure during its movement history. The vegetation, which has been pillaged and destroyed, stands as an appropriate symbol for their life and the life of so many of their friends and parents, which were abused, tortured, destroyed or taken away during the war against Ethiopia. Many families in Eritrea are still deeply traumatized by all the different forms of humiliation, suppression, violence and destruction they suffered during the colonisation and the war.

The green colour of vegetation stands generally for life and hope, a hope, which is strongly needed in a country like Eritrea that has been affected so much by misery, violence and hardship during its history. The hope for a 'green' future, the hope that by planting trees and making the land greener, their future will become brighter and better, motivates many people to support and participate in planting campaigns. Campaigns, where citizens are incited to plant "one tree for every martyr" have enforced the patriotic aspect of the 're'-forestation of the country, again capitalizing on the common sentiments of past grievance. Boerma (1999:332) points out that the trees in Eritrea have become a powerful metaphor for many perceptions about the past and hence a symbol around which notions of patriotism and nation building can be based. In this

context, the narrative of deforestation provides the Government with a powerful tool for popular mobilization in the process of national reconstruction after all the years of war.

The concept, that things in the past were generally better, which can also be found in western countries and cultures, the fact, that people perceive their environment differently when they are children, than when they look at the same things as adults, and the 'theory of fads', which says that we tend to adopt a collective opinion, even if it is at variance with our personal experience, rather than we would fight for a private conviction (see Boerma 1999:321), might also have contributed to the fact, that apart of some few scientists from 'outside', no one in Eritrea seems to have any doubts about the 'narrative of deforestation'.

### 1.2.2 The potential impact of environmental narratives

The American environmental-historian William Cronon once wrote in an article, that the nature we carry in our heads is often as important as the nature that is all around us. He states that it is our idea and imagination about the environment, which drives our interactions with the physical nature, transforming both ourselves and the nature in the process (Cronon 1996:2).

Environmental narratives, which have established themselves in the mind of people, can in fact have enormous political consequences, even if they are only based on very weak evidence. This is demonstrated by Wøien (1995), who raises the example of the Sahara desert, which is officially believed to spread southward at a speed of five to six kilometers per year. According to Wøien, this number can be traced back to a single travel report, in which a traveller made observations from a light aircraft and compared these with a map showing vegetation boundaries, which had been determined from precipitation data 17 years earlier. In 1976, these data were referred to in a Governmental plan and used as a scientific basis for counteracting desertification in the Sudan. Considerable resources have since been mobilized in the Sudan-Sahel region to counteract a desertification process, which was thought to be largely driven by detrimental resource management systems. Millions of dollars have been spent in development efforts in the region without sufficient knowledge of the situation, recent research findings have not been able to change substantially the view once adopted by development and aid agencies.

In Eritrea, the unanimous and persistent believe in the 'narrative of deforestation' also has led to important political consequences: It has encouraged a considerable amount of enclosures, terracing, and tree planting to prevent further erosion, since the enormous deforestation rate is seen to be the main cause for the ecological problems in Eritrea. Costly and often wasteful large-scale tree planting programs have already been financed on the basis of the 'narrative of deforestation' – partly with external means from development aid. Draconian regulation has been introduced to curtail the removal of vegetation throughout the country, this occurring prior to any serious and objective assessment being made of the effective changes in the landscape and woodland cover. The ecological impact of these measures is not undisputed. According to Boerma (1999:335), there is already unsubstantiated evidence, that the removal of large quantities of dry wood and other dry material from the ground is depleting the soil of nutrients, that restrictions on the cutting of trees hinders the growth of younger trees and that incentives for growing trees have been hindered by the strict regulations regarding the selling of wood. The emphasis of the Government seems to be on controlling the manifestations of high wood consumption rather than understanding the systems that surround the process of wood utilization and regeneration and the role of trees and wood in the context of wider resource use issues.

### 1.2.3 The approach of environmental history in this thesis

In consideration of the potentially enormous political implications of environmental narratives, the importance of an objective empirical study of environmental history on the basis of a careful analysis of historical sources seems to be evident. However, environmental history is a very large, interdisciplinary field and there are very different ways to understand the aim and target of this relatively young scientific field.

In its broad sense, environment can be described as the conditions and circumstances, which affect human lives and also the lives of other organisms. It includes the complex interaction between the organisms and their universe. Environmental history attempts to reconstruct the process of ecological development and changes in the past and also reconstructing and analysing the past human management of nature. The understanding of the interdependency between humans and their environment in the course of the time should help to provide a base from which the growing ecological changes in the world can be traced and addressed (Mussie Tesfagiorgis 2003:5-6).

According to Jäger (1994:12) people are the motor behind the environmental history. All the processes of environmental history, which are not entirely caused by nature, go back to the human being, who becomes the highest factor. People with their large variability in space and time and in their structure become therefore the key to understanding the situation and evolution of environment. According to Jäger, almost every topic of environmental history should therefore start with an analysis of the demographic situation and evolution.

Historical scientists such as McCann or Boerma however, contest the "neo-Malthusian" view, which suggests a directly linear relationship between population increase and resource availability. They point at the variances and complexity of the process of environmental change and show in their studies that the influence of people on their environment is very complex and that the relationship between population increase and resource consumption is not necessarily a linear one. The neo-Malthusian view of people-environment interaction suggests that local populations would have a short-sighted view and use their resources for their private profit only without consideration of the social and ecological consequences which their action could have on their environment. It thereby negates the capacity of local people to think and plan with foresight (Boerma 1999:261). McCann concludes in his studies, that environmental change is not a progressive, cumulative march forward in time towards current conditions, but a conjunctural process, depending on a combination of factors such as physical forces, technology, political economy and population in a given setting, society or epoch. He states that major trends in resource usage over time depend less on the ability to determine population levels than on migration and social forces that shape where people concentrate and how they organise labour and reproduction (McCann 1997:158). McCann and Boerma both reveal in their studies, that farmers have always known practices of intensive cultivation and resource conservation that they can bring to bear as needed in particular places and at particular times. According to Boerma formal and informal institutional mechanisms at the community level, have always served to control and allocate resources between different competing demands quite successfully (Boerma 1997:308). Boerma posits a dynamic view of the relationship between people and their environment, this would allow local people to be seen not just as victims of a situation beyond their control but as rational social agents, making choices about the use of their natural resource base and struggling successfully with their physical and socio-political environment.

A dynamic and open view of people-environment interaction may also serve as the basic principle of this thesis, which will not deal exclusively with the politically delicate history of woodland cover change but also with general changes in the landscape and land use. On the basis of historical sources the environmental changes and the interaction between local people and their natural resources should be reiterated as objectively as possible.

### 1.2.4 Some remarks on the terminology used

According to the definition given by FAO 1998, **land use** is defined as the arrangements, activities and inputs people undertake in a certain land cover type to produce, change or maintain it (Di Gregorio; Jansen, 1998).

Unfortunately, even in scientific papers, the expressions **'woodland'** and **'forest'** are often not clearly defined and therefore allow differing assumptions and speculations to be made, different organizations and individuals inevitably have their own perception of (for example) a minimum crown coverage of land surface that would define whether one can speak of woodland or not. According to Ritler (2003:5), the definition of FAO ("Forests are ecological systems with a minimum crown coverage of land surface (here assumed as 10 percent) and generally associated with wild flora, fauna and natural soil conditions; and not subject to agronomic practices") published in 1995 is as generalised as it is disputed. Furthermore the English terms 'woodland' and 'forest' do not always maintain their original meaning when translated into other languages. For a historical research it is therefore difficult to compare statements about woodland or forest cover over time, especially if these are written by different people in different languages.

## 1.3 Status of research on environmental history in Eritrea and Ethiopia

The statement of Ritler (1994:9) that the literature with the explicit claim of providing a contribution to the historical ecology and geography of Ethiopia is rather scarce, is even more true for the case of Eritrea, which from the late fifties until the early nineties of the 20th century was seen as an integral part of Ethiopia and therefore only marginally discussed by historians. The little historical literature that exists concerning Eritrea – understandably – has a strong focus on the political and social changes in the former Italian colony rather than on environmental changes. An exception is the study of Irma Taddia "*L'eritrea colonia 1890-1952*" (1986), in which the author also makes reference to the environmental impact of the decision making of the colonial powers. The thesis of Sr. Marisa Emilia Ranzato with the title "*Geografia Antropica ed Economica dell' Hamasien*" written in 1964/65, deals also marginally with the changes in woodland cover in the province of Hamasien since antiquity.

For the environmental history in Ethiopia, important references are Mesfin Wolde Mariam (1985 and 1991), Clapham (1988), McCann (1995 and 1997), Wøien (1995), Pankhurst (1964 and 1966) and Ritler (1994 and 2001). Ritlers MSc thesis has served as a model or orientation guide for several environmental-historical studies written at the Centre of Development and Environment at the University of Berne. Peter Stähli has written a MSc thesis on landscape changes in the northern Ethiopian province of Tigray between 1520 and 1900, based on historical travel accounts. Dino Scheideggers MSc thesis on the landscape changes in the Highlands of Ethiopia between 1930 and 1998 is based mainly on the reconstruction of historical photographs and as such served as an important methodological model also for this thesis (see Chapter 2). The MSc thesis of Francesca Liebi (1994) on the landscape changes and the changes of people-environment interaction in the Highlands of Eritrea on the basis of historical travel accounts and secondary literature has already been mentioned. Her MSc thesis covers the time period between 1800 and 1952. The travel accounts compiled in her thesis have all been written before 1900, though. An analysis of Ritler (2004) of some historical photographs of Eritrea from the German Aksum-expedition in 1905 is presently underway.

Apart from the PhD thesis of Pauline Boerma on the deforestation in the Central Highlands of Eritrea since 1890 (1999), there is almost no literature dealing with environmental changes in

Eritrea. Research concerning environmental changes in Eritrea between 1600 and 1990 has been carried out by Murtaza Niaz (1998), who analyses in his book "The pillage of sustainability in Eritrea, 1600s to 1990s" how traditional rural communities in Eritrea were transformed from "vibrant, well-endowed and self-efficacious entities to reactive, resource-poor and marginalized ones by the actions of hegemonic forces over the centuries." However, Murtaza Niaz is very uncritical towards the sources he uses, including the figure of 30% wood cover before Italian colonisation and also towards the accounts and testimonies of the people he interviewed. The same reproach can also be made to Mussie Tesfagiorgis (2003). Mussie bases his MSc thesis "Aspects of Eritrean Environmental History: Ecological Change and Strategies of survival (ca. 1850-1900)" on accounts of elderly people, who remember that in the childhood of their fathers or grandfathers, the environment was in a much better condition than today, and reiterates the impact of political rivalries, raids, *shiftas* and epidemics, droughts and famines on the environment and the survival strategies of people in Eritrea. He adopts, uncritically, different statements of Murtaza Niaz including the figure of 30% wood cover. However, his thesis provides interesting information about the reactions and survival strategies of the Eritreans to famine, drought and epidemics in the 19th century.

## 1.4 Questions and Hypothesis

### 1.4.1 Leading questions

As already exposed in chapter 1.1, this MSc thesis may on the one hand add evidence to the findings of Boerma and Liebi, that the deforestation in the Highland of Eritrea since the end of the 19th century was not as severe as generally believed and that the figure of 30% tree cover in Eritrea just before Italian colonisation should be reconsidered. Furthermore, the thesis will analyse general changes in the landscape, land use and the settlement structures in the Eritrean Highlands. These questions will be addressed with a large range of different historical sources. A careful analysis of historical travel accounts and especially the comparison of historical photographs with new ones are intended to contribute to finding the answers to the following questions:

1. **How were the landscape, the land use, the woodland cover and the settlements seen, photographed and described by Italian travellers and photographers during the time of Italian colonisation?**
2. **How do the landscape, the forest, the land use and the settlement structures look now? What changes can be noted by comparing the historical pictures with new ones of the same area?**

Further reviewing of literature and interviews with the local population concerning changes in their environment may help this thesis to find answers also to the following questions:

3. **What could be the reasons for the changes or the similarites in the landscape?**
4. **How does the local population perceive the environmental changes? Do their statements defer from the evidence given gained through the comparison of the pictures?**

### 1.4.2 Hypothesis

The hypothesis stated prior to the field studies was:

There hasn't been a catastrophic and constant decrease of woodland cover in the research areas. The evolution of the environment was a dynamic one with phases of regeneration and phases of woodland decrease. The figure of 30% forest cover at the beginning of Italian colonisation must therefore be overestimated.

# *2 RESEARCH METHODOLOGY AND SOURCES OF INFORMATION*

# 2.1 Introduction

This thesis is mainly based on the reconstruction of historical photographs: Old landscape pictures are compared with new ones, portraying as far as possible exactly the same location at a different point of time. This methodology, which is also called historical photo-monitoring, has long been neglected by scientists, who were suspicious about considering photographs as serious historical sources (see chapter 2.2). The methodology is becoming more popular in recent years, however, proving valuable when researching environmental history.

Scheidegger's MSc thesis on the evolution of the landscapes, land use and woodland cover in the Highlands of Ethiopia between 1930 and 1998, which according to Ritler (2001:90) supplies so far the best example of reconstructions of historical photographs as regards contents and methodology, has served as a guideline also for the methodological procedure used in this thesis. However, his methodology had to be adapted to the specific landscape photographs of the Eritrean Highlands that were found and to the relatively large range of other sources used for this thesis. This chapter will highlight the methodology of historical photo-monitoring and discuss the use of historical photographs in scientific historical research including the critique of historiographic sources. Furthermore the advantages and limitations of pictorial sources will be discussed and information will be given on the historical pictures used for this thesis. Also the supplementary sources used in this thesis will briefly be dealt with at the end of this chapter.

# 2.2 Photographs and the methodology of historical photo-monitoring

While the evaluation of literal sources including travel accounts has quite a long tradition, the use of pictures as historical sources has long been neglected. Different historians have pointed out that for a long time, photographs have not been regarded as valuable, serious sources in historical science and have very rarely been profoundly analysed. Photographs are considered to be suspect or at least unserious and have so far only been used for commercial, illustrative purposes in historical publications (Fritzsche 1996:11-13). The same can be said for the use of photographs in environmental history. Even though the photograph has always taken an important place in geography, as a supplement for diary notes, as an aide-mémoire during field studies or just as an illustration together with a text, the photograph was for a long time only understood as contemporary work equipment rather than as a source in a historical sense (Hornberger 1973:11). Only in recent times scientists start to realise the significance of the photograph as an important source of historical information on its own right. However, examples of scientific evaluations of historical photographs are, as yet, rare. Examples of environmental-historical studies, which were based on a comparison of historical photographs with new ones to study the landscape changes over several decades, are Tiffen 1994 and Häfeli 1994. In general, comparisons of photographs are only used to analyse one aspect of a study and thereby the historical pictures are often not analysed critically enough (cf. Scheidegger 1998:9).

## 2.2.1 The methodology of historical photo-monitoring

Terrestrial photo-monitoring can normally be defined as part of a systematic periodical or continuous collection of data to detect visible changes and eventually identify processes and affecting factors. Photo-monitoring should assist in the planning, realization and evaluation of projects (Bosshart 1997:8). This common kind of photo-monitoring is generally carried out by

one scientist or photographer, who takes pictures from the same place in regular time intervals. This methodology is frequently used in field research to complement other approaches such as interviews, surveys or measurements. Historical photo-monitoring however is based on the reconstruction of historical photographs, which have normally been taken by another photographer several decades ago. This allows the researcher to analyse the landscape changes over a larger time period. However, the reconstruction of the pictures can often be problematic given that the location of the historical picture has to be identified first. This can be a long, meticulous and time-consuming task, as historical photographs are often badly documented and difficult to identify. Triulzi (1995:146) justly deplores, that for the great majority of the historical photographs of Africa, data like the name of the author, the identification of the object and the date of its origin, which would help to identify and localise the photograph, are completely missing, and even if a caption or a description to the photograph exists, it is often very vague or even misleading[1]. Often the photographs are also kept in an unsuitable environment where they are neither documented nor classified correctly. Even in museums and libraries, photographic inventories are often not properly archived and catalogued and access to the broader public is often denied.[2]

Triulzi (1995:147) suggests historical photographs should be considerated as historiographic documents, whose context and important identificative data have to be carefully reconstructed so that each picture can assume its own documentary value. However, while there is a general consensus in literature that historical photographs can only be used as historical sources in their own right after their critical evaluation, there is unfortunately only few literature, so far, which offers advice for the processing of historical pictures for a scientific evaluation of the contents.

In his MSc thesis: "*Schein und Sein der Fotografie in der Geschichte*" Jürgen Hofer (1996) proposes a guide to the critique of pictorial sources, which has also served as a model for the thesis of Scheidegger. Hofer distinguishes between the outer and the inner criticism of historical sources. With the outer criticism, technical datas and factors such as time, place and the situation of the historical picture have to be evaluated. With the inner one, the content of the photograph is analysed. Therein the visual (explanation and description) and the factual itemisation (construction of the historical and social context) of the photograph are differentiated. Theye (1990:377) also recommends, that every historical photograph should first be put into the historical context of its genesis, since all the single photographs are always also part of a pictorial total production of a time with specific attitudes and motives.

For the evaluation of the contents of the picture, an attentive examination is indispensable. In her analysis of old photographs of Baalbek, the ethnologist Nippa makes suggestions for the detailed discussion of old pictures and pleads for the systematic handling of old photographs: First the photograph has to be examined with a critical examination regarding historical sources, whereby questions concerning the photographer, the technique he/she used and the motives he/she had to travel and to take pictures, have to be addressed. Afterwards, each picture should be deconstructed into its components for a careful evaluation of its contents. Nippa proceeds very carefully and tries not to miss out the smallest detail of the photograph. She even

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[1] Nippa (1996) suggests, that through the combination of a multitude of pictures, texts, diaries, travel accounts and further background knowledge, it is possible in such cases to make assumptions concerning the picture and the photographer. However, extensive knowledge of the land, the culture, the landscape, the inventory and the uses of the photographer and a lot of further information is indispensable for any such assumptions.

[2] There are also examples of archives, however, where a lot of time and effort was invested into a detailed documentation and classification of the photographs, for example the Mission of Basle, the photographic archive of the Società Geografica Italiana in Rome under Maria Mancini and the photographic archive of the Istituto Agronomico per l'Oltremare under Marina Puccioni.

recommends the use of a magnifying glass to search the picture for minute details and suggests taking in account also supplying information from other sources, which may help to explain certain details (1996:22). With this procedure Nippa is able to extract a surprising multitude of information out of each picture. Nippa (1996:19) recommends also "reading" the photographs as impartially as possible and the adoption of a clear and exact language when translating, describing, analyzing and interpreting a picture into written form.

Scheidegger (1998) has diligently adopted the advice to be very careful with the details of a picture for the analysis of the pictures he used in his thesis. In an overview he has divided each single picture into its component parts (often the foreground, the middle distance and the background of the picture) and has described these component parts as precisely and in-depth as possible. Using this method he concentrated especially on the vegetation, the tree cover, the land use and settlements. After the description of the historical photograph he summarised the most important findings and then turned his attention to the reconstruction photograph, which he analysed in the same manner, while he concurrently pointed out the changes between the current and the historical situation. As it will be seen in chapter 4.1.2, this, basically, is the procedure that has been adapted for the evaluation of the field studies carried out for this thesis.

A whole chapter of this study is dedicated to the political, socio-economical, ecological and geographical situation of the Eritrean Highlands in the course of the 20th century. This contextual part is important for understanding not only the historical changes but also the historical pictures themselves. Nonetheless the photographs will be described and compared as objectively as possible before the information they provide will be compared with the information given by other sources. Finally both the photographical and literal sources will be considered to make final conclusions about the changes in landscape and land use.

### 2.2.2 Advantages and limitations of photographic sources

The photograph has certain advantages over other (e.g. literary) sources in the way it becomes a useful source for research in environmental history. On the one hand, it comes very close to the specific character of human perception, even if the optic of the camera differs in certain aspects from human visual capacities (Häfeli 1997:78). A photograph can give a more specific idea of a landscape than an account and, for most of the people, pictures are generally easier to understand than a text or, as Hornberger (1973:3) would say, the "language" of a picture is international. Bosshart (1997:8) points out that photographs offer the possibility of a comprehensive, fast objective method of recording visual information, whilst a description in writing might be incomplete and rather subjective.

While an author of a text normally thinks carefully over what he is going to write and what not, photographs record a multitude of details, which were partly unseen or unintended by the photographer. It is precisely the complete rendering of detail and the impartiality of the photograph which has fascinated the pioneers of this medium who even went as far as declaring the death of the painting by the end of the 19th century (Triulzi 1995:145). A photograph improves the human perception, increases the capacity of memorising observations and facilitates the account of experiences. It allows for the repetition and continual presence of a singular observation and the recording of details, often unseen by the naked eye (Hornberger 1973:4). The multitude of details of a picture benefits to the analysis of landscape, often important geographic elements are recorded, which would probably be missing in a written description of the same situation (Ritler 2001:84).

However, the photograph also presents some limiting factors, which have to be considered, when it is used as a historic source. Firstly, a picture does not really give an objective presentation of reality, as commonly often believed. Various scientists have justly pointed out that each photograph only represents an 'extract' of reality and that the individuality of the photographer has an enormous influence on the reality shown within the picture, not including the possibilities of falsifying photographs deliberately. In fact there are socially and culturally conditioned criterions like norms and conventions, which limit or influence the motive of a photographer to take a specific picture and the information that is shown within that picture (Fritzsche 1996:15, Theye 1985:25). Pictures can thus be made and/or exploited for different reasons, e.g. political interests, whether it happens by purpose or not. Not only the personality of the photographer but also the individualty of the viewer has a strong influence on the perception of a specific picture. According to Ball and Smith (1992:18), photographic literacy is learned: Photographs are made sense of by a viewing subject and thus do not straightforwardly reflect reality. The sense viewers make of the photograph depends upon cultural assumptions, personal knowledge and the context in which the picture is presented.

Furthermore, the information provided by a photograph is limited by the extract of the picture. It remains completely unknown what is 'outside' the photograph at the time when it has been taken. Important details of the landscape may also be hidden e.g. by the topography, houses, vegetation or illustrated persons. In the case of landscape pictures it is therefore very difficult to make general assertions regarding a larger area on the basis of only a few pictures. Each generalisation would not be much more than simple speculation. Further pictures of the same area can improve the quality of information, which can be extracted from a single picture (Ritler 2001:85). Written or oral records of the environment by the photographer or other people can help to get more general information on the area. Furthermore a historical picture can often not be understood without the knowledge of its political, social and cultural context. It is therefore evident that the careful evaluation of historical photographs requires as much information as possible on the socio-political and ecological background of the area.

This shows, that photographs cannot be used and understood alone, but have to be accompanied by a text. The partnership of word and picture in scientific researches thereby does not mean equality and exchangeability of both medias. Important geographic interrelations cannot be presented with photographs. On the other hand, important spatial phenomenons cannot easily be explained in a written form. The picture is always superior in the accuracy of presenting objects or items and their spatial coexistence. It depicts the special character and unique reality of a phenomenon and serves as an individual description. The written or spoken word, however, is by its notional wideness more complex and flexible. It reaches from a simple statement and concrete description to the notional abstraction and speculation and includes the past as well as the future. It involves the inductive and the deductive process, while the picture mainly conditions the deductive way (Hornberger 1973:27).

The use of historical photographs, within the methodology of historical photo-monitoring, in this thesis will allow a fairly precise comparison between the state of the environment of a well-defined area at two different points of time to be achieved, even if very few has changed between the two photographs e.g. in the amount of trees or houses. Small differences can also be distinguished in a photo-comparison, while a travel account could never serve that well for a model of comparison. Also the question of the definition of certain objects (forest, wood, village, town) becomes a less important one since the aim of the comparison of the photographs is mainly to assess the relative changes between the two photographs.

### 2.2.3 Historical photographs of Eritrea

***General overview***

With the emergence of the photograph, officially born in 1839[3], very real-looking and immediate pictures were suddenly available. However, many editors of books or newspapers initially preferred to extract drafts or engravings from these instant photographs to make the picture look more artificial. The first photographic pictures of the Italian possessions in Eastern Africa were taken from travellers (e.g. Sebastiano Martini Bernardi, the Toscan medical doctor Leopoldo Traversi and others) and journalists, who followed the military forces. Many, if not all, of these photographs were transformed into drafts or gravings and used to ornate books and reviews. Very few photographs were effectively published before 1890 (Bottaro 2003:179).

According to Pankhurst and Gérard (1996:19), the oldest photographs of Ethiopia would originate from the British Missionary Henry Stern, who went to Ethiopia in 1859. These pictures have disappeared, but some of them were published as engravings in Sterns book „Wanderings among the Falashas in Abyssinia“ (1862). Stern's imprisonment and that of several other Europeans in 1867 provoked the British Government to dispatch an armed expedition against emperor Teodoros and his fortress at Maydala, where the captives were detained. The British expedition, which passed through Massawa and Asmara made extensive use of the camera and several of these pictures, some few ones also taken in Eritrea, were later used to enrich accounts of the Missionaries detention and of the expedition which secured their release.

The first photographer in Eritrea, who possessed a camera with which he was able to take high quality pictures, was the Italian Luigi Naretti, who came to Eritrea in 1885. He took pictures between 1885 and 1900, which can now be found in different books and reviews as well as in public and private collections. He even used the photographs to make postcards.

Until 1900, the photography was a privilege of a few professionals and laypersons. Beside Luigi Naretti only a few other photographers (Francesco and Giovanni Nicotra, Luigi Fiorello, Michele Selvestri and Alessandro Comini) took pictures, mostly of important persons and events of the colony. Rosalia Pianavia-Vivaldi, an Italian colonel's wife, came to Eritrea with her husband in 1893 and wrote a diary of her three years stay in the colony, which she supplemented with many small photographs (Bottaro 2003:179).

Most of the travelers, who came to visit northern Ethiopia (often with the intention of seeing the antiquities of the Aksum period), debarked in Massawa and travelled through Southern Eritrea. So did for instance the Englishman James Thodore Bent, who took this route and arrived in Eritrea in 1893. He also took several pictures and made drawings, which are reproduced in his travel account "The Sacred City of the Ethiopians" (1893). In 1905-1906, a German archaeological Mission led by Enno Litmann travelled to Axum. The Mission also took pictures from the Axumite ruins in Eritrea, Kohaito and Tokonda, some of them being discussed in-depth in an article in preparation by Ritler (2004).

In the early 1930s, a series of landscape photographs was also taken by Armando Maugini, former director of the *Istituto Agronomico per l'Oltremare* in Florence, who visited Eritrea extensively at this time, travelling along most of the main roadways from north to south. Several of these photographs are also published in the thesis of Pauline Boerma.

[3] For the history of the photograph see also Gernsheim (1983) and Baatz (1997).

***The historical photographs used in this thesis***

The historical photographs used in this thesis are from the *Museum für Völkerkunde* (MVK) in Vienna, the archive of the *Società Geografica Italiana* (SGI) in Rome, the *Istituto Agronomico per l'Oltremare* (IAO) in Florence, the *Archivio Provinciale Cappuccini Lombardi* (APCL) in Milan and the Research and Documentation Center (RDC) in Asmara. In the archive of the SGI in Rome, an album of Carlo Gastaldi was found, it contains some remarkable landscape pictures of the area between Asmara and Keren. The pictures seem to be very old and have probably been taken at the very beginning of the Italian colonial period. However, there is no indication about the exact year and unfortunately no information about Carlo Gastaldi was obtainable either, it is not even sure if he was really the photographer responsible for these pictures. In the archive of the IAO in Florence several albums are stored with photographs of Eritrea and other Italian colonies, which contain many photographs especially of the agricultural experimental sites like Filfil and Faghena on the eastern escarpment. The albums also contain some landscape pictures of the Highlands, e.g. the photograph series of Armando Maugini already mentioned above. In the archive of the Capuchins in Milan, two albums with photographs of the beginning of the colonial time are stored, since Milan was the so-called mother-Province of the Capuchins who went to Eritrea as Missionaries. Some of these photographs are also used in this thesis.

Unfortunately, a lot of photographic archives especially in Switzerland were closed or under restructuration at the time of research and access to them was not possible. This was also the case for the archive of the Società Africana d'Italia in Rome, which is reported as containing the largest amount of historical photographs of the former Italian colony.

The European travellers, who passed through Eritrea to reach Northern Ethiopia, generally took only few pictures of the Highlands of Eritrea and often the reproductions used in their travel accounts are very small, of bad quality or have been transformed into engravings or paintings. However, in the Research and Documentation Centre of Eritrea in Asmara an interesting travel account of Giotto Dainelli was found. He was an Italian geographer who travelled around in the Eritrean Highlands from September 1905 to January 1906 and took also several landscape pictures which were of use for thesis. His travel account also provides interesting information on the Eritrean landscape.

A lot of the historical pictures that were taken in Eritrea are photographs of people, celebrations, events and monuments, which give almost no hints on the surrounding environment. On the other hand, the photographs which only show scenery have often no or only a very vague indication regarding their exact location, so that it is almost impossible to reconstruct the picture. Most of the pictures chosen for this thesis are therefore not only showing scenery, but also often a settlement or at least a specific building, and all of them were taken close to a village or town. As a consequence the information these pictures can provide concerning environmental changes in Eritrea is quite restricted since the situation of farmland and woodland cover is always different around villages and towns than in uninhabited areas. However, the reconstruction of these pictures will provide interesting information regarding the changing structures and architecture of the villages and the changing environment and land use in the surroundings of the settlements. The interviews made and the literal sources used to supplement the findings of the photograph comparison will give more general information on the changes in the Eritrean landscape.

Apart of the photographs of Rochetti, which were taken in 1954, all the photographs used in this thesis date from the Italian period. The pictures were all taken by Italians. The few Eritreans, who had the possibility of taking pictures in the first decades of the 20$^{th}$ century, generally chose to take pictures of people (normally of their family) rather than of landscapes. This has to be taken in consideration in the evaluation of the historical pictures, since the Italian photographs only allow a 'Euro-centric' view of the historical landscape of Eritrea. It should also be noted, that the photographers all had different motives to take a photographs of a certain subjects (see

chapter 2.2.1), so that the kind of photograph differs according to the position, educational background and travel motive of the photographer. A Missionary would have different photographic motives than a scientist or an adventurer and the photographs of a professional photographer like Naretti or Nicotra, who had to satisfy the expectations of their clients, would be different again. It is not surprising, that the Capuchin's archive in Milan stores a lot of photographs of churches and Missions in Eritrea, while in the *Istituto Agronomico per l'Oltremare* a lot of photographs are stored which show agricultural experimental fields or animals somewhere in Eritrea. Since only a limited amount of information is available regarding most of the photographers, it is difficult to determine the exact motives they had for taking specific pictures. According to Ritler (1994) the photographs taken by travellers around 1900 were supposed to document the journey of the traveller, the places he/she had reached and the items he/she had come across, and to make them known by a certain publicity and were therefore purposely bequeathed. In the case of the Italians, who visited their colony, it is striking that they often took photographs not only of Eritrean characteristics but also of Italian buildings, churches, gardens, dams, forts or others, probably to testify, how much and how fast the colony had been developed by the Italian settlers.

Some historical photographs are also included in this thesis, which for different reasons it was not possible to reconstruct. Since these photographs provide a lot of information in themselves and in some cases illustrate well some aspects of the historical landscape, which are otherwise only known from literature, it was decided to include them nonetheless.

### 2.2.4 To the reconstructions of the historical photographs

It is important for the methodology of historical photo-monitoring, to reconstruct an exact comparison picture of the model picture. This means that the position of the photographer as well as the display window should be identical to the historical picture. Interpretation on the basis of improper reconstructions cannot be exact and could sometimes even be misleading (cf. Häfeli 1997:80 and Scheidegger 1999:16). To get an exact comparison picture, not only the place should be identical, but also the time of the day and the season should be the same, since the landscape changes a lot from one season to another and according to the angle of the sun. However, an exact reconstruction of the historical pictures is often restricted or even made impossible by different constraints.

The reconstructions of the historical pictures in this thesis were all made during a stay in Eritrea between mid-February and mid-April 2004. This was a problem for the comparison with some of the historical pictures, which were taken in summer or autumn just after the rainy season, when the scenery was quite green, and the fields not harvested yet, while the time of the field research was during the dry season when the landscape looked much more arid and bare. The comparison of the land use, therefore, often could not rely on the photographs alone but had to be supplemented by interviewing the local inhabitants. Furthermore, the time of day of the photograph was restricted since it always took some hours to get to the location and back, so that most of the reconstructed pictures were taken around midday or in the early afternoon[4].

To find the exact place where the picture had been taken was often quite problematic, since the caption was often vague or even wrong as in the case of Enda Amanuel (see chapter 4.3.8). Furthermore the landscape had often changed a lot in the meantime. Sometimes even prominent elements of the landscape found on the historical picture, like big trees, rocks or settlements had been moved away or replaced by something else. Even when the right location was found, it

[4] In fact the photographs were all taken by the author. However, the author was always accompanied by interpreter Salem Solomon, who also helped to find the right place and angle for the reconstructions.

was sometimes difficult to take a picture from the same angle because houses or trees often obstructed the landscape. In those cases the position was changed a little to take the photograph. Also pictures from different angles were taken to clarify some details shown by the photograph. Furthermore political constraints had to be faced since the Italian photographers often took their pictures from strategic places e.g. on hills, which are today occupied by the military, so that access was denied to these places.

All these problems and constraints, which were also partly faced by Sheidegger in his field study work, can limit considerably the choice of historical pictures, which are suitable to be used for the historical photo monitoring process.

## 2.3 Further historical sources

As mentioned above, the information obtained from the photographs is supplemented with further historical sources, which will be discussed in this chapter.

### 2.3.1 Literary sources

Old travel accounts from the early time of Italian colonisation sometimes also contain useful information on how the environment was perceived by European travellers in the Italian colonial period. Many travel accounts of this period were published in books or as articles in journals, often of geographic societies. Also the publications by specialists for agriculture or forestry of the colonial Government in Eritrea like e.g. **Adriano Fiori**, specialist of forestry botanics, who analysed the forest situation in Eritrea at the beginning of the 20$^{th}$ century, and by the geographer **Captain A. Mulazzani** provide useful information on the Eritrean landscape of the Italian era. These have partly also been evaluated by Pauline Boerma.

***Travel accounts***

The most important literary source used for this thesis was the travel account of **Giotto Dainelli** (1878-1968), whose photographs also served as historical sources. Dainelli was Geology Professor in Pisa and Napoli and later in Florence and made different expeditions to eastern Africa and Asia. In 1905, Dainelli came to Eritrea on the occasion of a geographical congress, held in Asmara, and travelled in the Highlands together with his friend Olinto Marinelli for scientific geographical research.

The German explorer **Theodor von Heuglin** visited Eritrea and Ethiopia first in the 1850s and again in 1861-62, when he travelled from Massawa to Keren and southwards through the provinces of Hamasien and Seraye to Northern Ethiopia. His travel account "*Reise nach Abessinien, den Gala-Ländern, Ost-Sudan und Chartoum in den Jahren 1861 und 1862*" provides important information about the landscape he encountered, the land use systems and socio-cultural aspects.

**Gerhard Rohlfs** was a German envoy to the court of emperor Yohannes IV. In 1880/81 he travelled from Massawa to Asmara and then south through the former province of Seraye to Adwa and Gonder. He noted his impressions of the journey in his account "*Meine Mission nach Abessinien auf Befehl Sr. Maj. des deutschen Kaisers im Winter 1880/81*" (1883).

The British explorer **James Theodore Bent** (1852-1897) engaged in archaeological research in Asia, Simbabwe and Ethiopia. In 1893 he travelled to northern Ethiopia with his wife to investigate the ruins of Axum and other places of Northern Abessinia. He made his way from Massawa to Asmara and travelled north to Keren before proceding his journey southwards to the axumite sites of Northern Ethiopia. His account "*The sacred City of the Ethiopians*" (1893)

provides not only descriptions of antiquities but also ethnographic observations, descriptions of agricultural practices, weddings, food and drink, clothing, hairstyles etc.

"Tre anni in Eritrea" (1901), the diary written by **Rosalia Pianavia-Vivaldi,** who came to Eritrea with her colonel husband in 1893 (see chapter 2.2.3), provides sensitive and indepth descriptions of the Eritrean people, their culture, customs and every days life, of historical events and also descriptions of the places and landscape.

The German Dr. **Max Schöller** travelled to Eritrea in 1894 in company of the botanist Prof. Georg Schweinfurth. They travelled from Massawa to Keren and further to the Barka, then south to Arresa and Kohaito in the Akele Guzay province and finally back to Massawa. In his travel account "*Mittheilungen über meine Reise in der Colonia Eritrea*", Schöller describes the flora, the fauna, mineralogy and archeology of the areas he passed through. He also describes the places he visited, the culture of the people, the social and economical organization of the populations he met sometimes in relation to the 'civilizing' influence of the Italians and the Catholic missions.

The Englishman **Augustus B. Wylde** entered Ethiopia from Eritrea in 1896, shortly after the battle of Adwa, as a correspondent for the Manchester-Guardian newspaper, in order to gain information about the battle and its aftermath. He had visited the country already 17 years earlier, and described aspects of the towns, the landscape and everyday life especially in Adwa and Asmara in his account "*'83 to '87 in the Soudan; with an Account of Trave land Sport chiefly in the Base Country*" (1883). The impressions he had during his second visit are reported in the second travel account "*Modern Abyssinia*" (1901). The book provides interesting information on the recent history of Eritrea and Ethiopia and the geography of these countries. Wylde was unusually free of nineteenth-century European prejudices about Africans and had particular sympathy for Ethiopia and the Ethiopians (Pankhurst; Pankhurst, 1978:131(9,1); 104(9,3).

The Frenchman **G. Saint-Yves** travelled in Eritrea from August 1898 to December 1898, under the patronage and with the help of the Chambre of Commerce of Marseille, the *Société de Géographie de Marseille* and different personalties of this town. Two articles written by him were published in a journal of the Geographic Society of Marseille in 1899. In the first article he describes his impressions on the ascent from Massawa to Asmara, in the second article he describes in depth Asmara and his journey in the former province of Akele Guzay. Finally he also adds general informations about the geography, climate, history and organisation of the young Italian colony and compiles thereby the geographic knowledge of observations made by European travelers so far.

**Felix Rosen**, a German naturalist, was a member of a diplomatic mission headed by his brother, which visited Ethiopia in 1905. Landing at Djibuti, they travelled to Addis Abeba. After visiting different sites in Northern Ethiopia like the Tana Lake, Gondar, Aksum and Adwa, they travelled north to Asmara and returned from Massawa. The travel account "*Eine deutsche Gesandtschaft in Abessinien*" (1907) provides descriptions of towns, churches and Ethiopian personalities and contains also some very clear photographs.

The German archaeology Professor **Enno Littmann** in 1905-1906 lead a German archaeological mission, which carried out research in Northern Ethiopia and Eritrea: in Aksum, Yeha and Kohaito. The findings are published in the account "Deutsche Aksum-Expedition" (1913). An extract of Littmanns diary is also included in this book, which should "just give a short orientation about our experiences, journeys and travels and doesn't claim to be a description of the country and its inhabitants" (Littmann 1913:2). Nevertheless some short comments about the Abyssinian landscape are included in this diary.

The Italian journalist **Renato Paoli** left Italy for Eritrea in August 1906. He ascended Asmara from Massawa and travelled north to Keren and Agordat and also south around the former province of Seraye. In his travel account "*Nella Colonia Eritrea*" (1908) he describes in depth the different towns and villages and the landscape, the flora and fauna and the life, culture, religion and customs of the Eritrean people he met.

**Henry de Monfreid** (1879-1974), a legendary French adventurer, travelled the coast of the Red Sea and the Horn of Africa during over 40 years and took the Arabic name *Abd el Hai* (slave of the living). Between other activities, he was merchant of drugs and weapons and maker of noodles and electricity. He published over 70 accounts of his adventures experienced on sea and land (Pinsard 2004). In his account "*Le drame éthiopien*" (1935), written at the time of Mussolini's invasion, Monfreid recalls a visit to Eritrea a year or so earlier. Some interesting photographs are also published in this book.

This listing makes clear, that like the historical photographs, also the literary sources used in this thesis are all European and therefore show a euro-centric view of the Eritrean landscape, which should be taken in consideration. Similar as with the photographs, the quality and reliability of literary sources have to be critically checked and the individual perception, the reasons and motives of the travellers and their knowledge should be questioned, before the evaluation of the account. For a detailed discussion of the critic of travel accounts and the motives of travelers to visit colonial countries it is recommended to refer to Ritler (1994:62-75) and Stähli (2000: 47-55), who deal with this subject intensively in their studies.

### *Travel guides*

Apart from the travel accounts two travel guides edited by the Italian Touring Club in 1929 and by the *Consociazione Turistica Italiana* in 1938 respectively, were also used. Both travel guides are very informative. However, they also have to be addressed critically. The guide of the Consociazione Turistica Italiana with the title "*Guida dell' Africa Orientale*" was supposed not only to serve for information and enlarging of knowledge but also to propagate Italian Eastern Africa for potential donators and investors and to incite the interest of potential settlers.

## 2.3.2 Maps

While in Europe there are maps in existence already since the 19th century, which give precise information on the woodland cover of a given area[5], the information provided by early Eritrean maps is unfortunately quite bad. Some maps of the late 19th century can be found as an annex to historical travel accounts, often indicating the route chosen by the traveller, and some historical maps of Eritrea (mostly military maps) are stored in the archive of the IAO in Florence. However, they give almost no information on the landscape and woodland cover in Eritrea, since most of them show only the borders, villages/towns, rivers and at the most also the relief of Eritrea. However, a military map of 1888 has also been stored there illustrating the routes taken by some European travelers. Information on the landscape, according to accounts of the same travellers, has been directly integrated onto the map.

The historical maps also helped in locating certain villages, which have been dissolved or integrated during the last century, like Tantarua near to Keren, or which have lost relative importance and are not indicated on recent general maps like Adi Hannes or Akrur, which for

[5] The Siegfried map, which was developed in the 1870s in Switzerland contain, for instance, exact information on the woodland cover of Switzerland at that time.

the Italians was an important village during the colonial time since it was a center of Catholic Missionary activity.

### 2.3.3 Oral history

The interviews, made in the locations of the field studies with the help of an Eritrean translator, were very informal in nature. On the one hand, this was due to the methodological priorities given to the comparison of the photographs. On the other hand there was no need of making the people feel uncomfortable or afraid about any potentially political implications of the research and the answers they would give. As far as possible they were made to feel at liberty to talk freely about their memories of the landscape in the past. The fact that the author was easily recognizable as a foreigner due to skin color, and that most of the time the talking was conducted through an intermediate was impeding enough to allow for a free conversation. The interviewees were all elderly people, men and women, met in the villages or who in some cases even came foreward and offered the research team a cup of tea. The friendliness and hospitality of the people met in the villages created a feeling of profound respect and thanks within the research team. Since the questions were formulated quite openly very different information from the interviewees were obtained, some people focusing more on the changes in agriculture and settlements and other focusing more on the vegetation. However, most of the interviewees rose the topic of the woodland cover themselves and affirmed it had been much denser in their youth. While this open method of oral history can give a lot of interesting information on the environmental changes and allows the views of local people to be taken into consideration rather than only the European view, the accounts have to be admitted with the reservation, that the memory of people concerning the environmental past is not always objective and may be burdened ideologically and by prejudices (see chapter 1.2). The main interest in the interviews was however not only to understand how the landscape in the surroundings of the people had changed, but also to hear how these changes were perceived by the indigenous population.

# *3 DESCRIPTION OF THE AREA*

# 3.1 Introduction

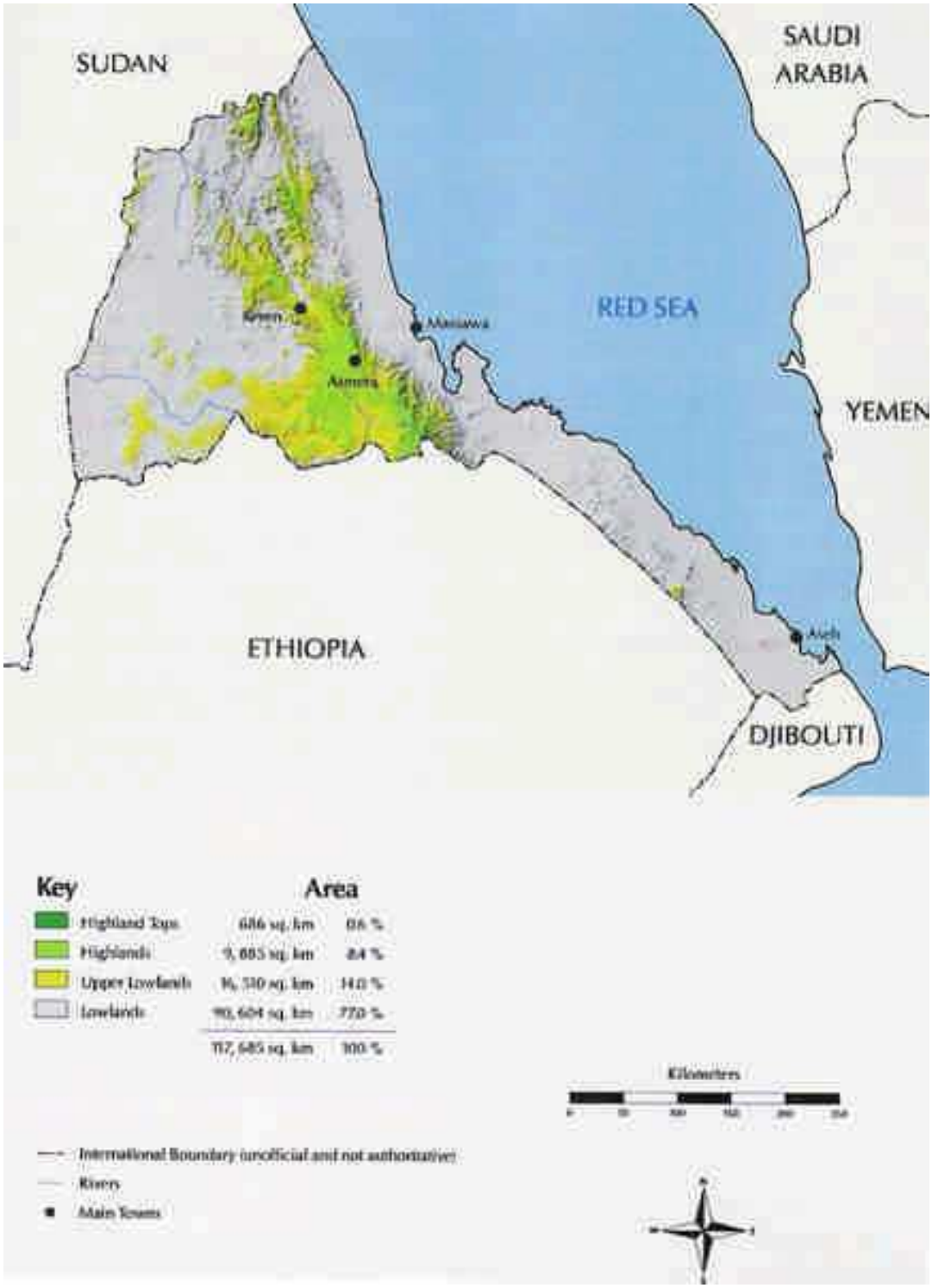


**Figure 3-1: Map of Eritrea (map by Andreas Heinimann, CDE)**

Eritrea is a country with an enormous variety of topography, soil and climate, of peoples and religions, but also with a very eventful history. Many of different rulers and Governments with different mentalities and interests have influenced the country. To be able to understand the possible reasons and interrelationships of the changes in the Eritrean landscape it will be important to have at least a basic concept of Eritrean history, society, geography and ecology. This chapter, which is mainly based on secondary literature, therefore gives a short overview of the geographical and socio-political context of Eritrea, focusing on the area of the Central Eritrean Highlands (including Keren) and on the time span between 1890 until the present day.

## 3.2 Physical geography and biota

### 3.2.1 Location and topography

Eritrea is located in the northeastern part of Africa along the Red Sea, Sudan is to the west and north, Ethiopia to the south and Djibouti at the extreme southeastern tip. It lies between 12° and 18° north and between 36° and 44° east and covers an area of about 125'000 square kilometres. The coastline with the Red Sea stretches to around 1'000 km.

The variety of topography in Eritrea is noteworthy with altitudes ranging from 60 meters below sea level to 3'030 meters above sea level. The main physiographical zones are the Red Sea coastal plain including the Dankalia desert in the southeast, the Highlands in the centre of the country and the western plains stretching towards the Sudanese border. Each zone has a distinctive physical and cultural character.

The same agro climatic zones, which are used to typify the different areas of Ethiopia, can also be found in Eritrea: The eastern and western lowlands belong to the Berha (below 500m), the escarpments belong to the Kolla (500-1500m) and the Highlands with an average altitude of 2000-2200m belong mostly to the Weyna Dega zone (1500-2300m). The higher places and mountains in the Highlands belong to the Dega (2300-3200m)[6].

Apart from Keren, which is located on the top of the western escarpment at an altitude of 1400 meters and belongs to the Kolla zone, all the places chosen for my field studies are located on the highland plateau in the zone of the Weyna Dega and Dega. The Central Eritrean Highlands cover a surface of around 20'000 $km^2$. The average elevation is between 1500 and 2500 m. Despite its relatively small surface (see figure 3-1), the Highlands are the most densely populated part of Eritrea with more than 65% of the population living here. The topography of the highland is characterized by both undulating plains and rugged elevations, which can reach up to over 3'000 meters (Liebi 1993:2; Juel 2002:27; Hurni 1995:9).

[6] The definition for the altitudinal belts of these agroclimatic zones varies according to different scientific publications. Sometimes, the Dega starts at 2400 meters only. The figures published here are based on Hurni (1995:9).

### 3.2.2 Climate

The climate of the Eritrean Highlands is generally advantageous for agriculture. It is cool and moderate throughout much of the year with minimal seasonal variations in temperature. Average temperatures vary from 10 to 17.5 centigrade, and absolute minimum and maximum temperatures are 2 and 32 degrees centigrade respectively. The hottest month is May and the coldest months are in winter between December and February. In normal years, rainfall in Eritrea varies from 400 to 650 mm annually in the Central Highlands and from 200 to 300 mm in the Lowlands. However, there is a high variability and unreliability of both the total rainfall and its distribution. Insufficient or poorly distributed rains are common and drought is also frequent in the Highlands. Four seasons are identified: *Azmera* – the period of small rains that occur during the spring months of March and April, though there are many years when these rains fail to appear to any significant degree; *kremti* – the period of the big rains starting in June and reaching their peak in July and August. The rains decrease drastically in September; *kewea* – the harvest months of October and November with small precipitations sometimes occurring in the month of November; and *hagai* – the driest part of the year lasting from December to March (Boerma 1999:74; Adam 2002:43).

### 3.2.3 Geology and soils

Precambrian crystalline basement rocks generally characterize the highland plateau of Eritrea and Northern Ethiopia, but areas of granite and diorite rock can also be found particularly on areas of the escarpment east of Saganeiti and Adi Kayeh. Isolated outcrops of Mesozoic sediments can be found e.g. around Senafe. Quaternary sediments are confined to the large riverbeds. The upper plains of Seraye including the Tsellima plain south of Debarwa consist of rocks of an older volcanic series than in most other areas of the Highlands. The rock formations of the highland plateau has been shaped over millennia by the eroding forces of wind and water, resulting in sharply differing soil types with variable fertility, depending also on the differences in the climate and the position on the hillside. In many of the more mountainous areas around Segeneiti as well as further south towards Adi Kayeh, much of this soil occurs on slopes and is of restricted agricultural value since it is usually shallow and has many stones and rock outcrops. However, in some valleys and depression, these soils are deeper and the agricultural potential relatively good. Cambisols and luvisols with their deep brown or reddish color, which are predominant on the flat and hilly plateau and on the gentle slopes of the Eritrean Highlands, are the most important soils for traditional agriculture in Eritrea (Eritrea 1995; Liebi 1993:23-24; Boerma 1999:73).

### 3.2.4 Vegetation

The vegetation of most of the Central Highland plateau is characteristic by a semiarid temperate climate. In the higher altitudes, the vegetation is characterised by different kinds of acacia. Between 1500 and 2000 m, *akba*[7] (acacia tortilis) and *tseada chea* (acacia seyal) grow on steep and rocky sites in the lower areas, gradually being replaced by s*eraw* (acacia etbaica) higher up. Above 2000 m, c*hea* (acacia abissinica) used to dominate on the waterlogged plateaus but have now become quite rare (RSCU 1996:xxiii). *Kolqual* (euphorbia abissinica) is also abundant in some areas of the Central Highlands and on the eastern and western escarpments. *Hehot* (rumex nervosus) is also frequent in the Highlands and often an indicator of secondary vegetation. Some places, for instance around Saganeiti, contain a number of fine examples of *daero* (ficus vastus), known in English as sycamore (RSCU 1996; Boerma 1999:76). Also the cactus *beles*

[7] Usually, the Tigrinya names will be used especially for plants, which are not known in Europe. The scientific names are added in brackets at the beginning.

(opuntia ficus-indica) with its edible fruit is widespread especially along the escarpment east of Adi Kayeh, Segeneiti and Dekamhare. The cactus seems to have been introduced by Catholic Missionaries in the 1830s (see e.g. RSCU 1996:xxix)[8]. Gradually, it has been dispersed by people and animals around the eastern escarpment and now covers more than 10'000 hectares. Schöller (1896:164), who traveled in Akele Guzay in 1894, noted the plantations of *beles* grown in the area by the "untiring French Mission". Aside from its advantage in conserving soil and producing edible fruits, the impact of the spread of this species on the local ecology is difficult to assess. The *beles* is considered as a pioneer plant, which grows in places, where the natural forest has been cleared and the land subsequently degraded. It seems that species such as *awliie* and juniper don't regenerate in the areas covered by this cactus (RSCU 1996:xxiv, xxix).

*Tsihdi* (juniperus procera) and *awliie* (olea africana) which are used especially for firewood, charcoal, poles, posts and timber for floor and roof shingles and furniture, are among the economically and ecologically valuable trees that still grow in the Highlands, although now they have become rare. According to different sources (RSCU 1996, Killion 1998) the greater part of the Highlands of Eritrea above 2000m was once[9] covered by a forest, which was dominated by juniperus procera with some olea africana. Forests of olive and juniper can still be found in the mountain areas between Segeneiti and Adi Kayeh towards the edge of the eastern escarpment, but they are mostly disturbed. Scattered examples of juniper are found in lower elevations but have become relatively rare. Widely scattered formations of olive trees can still be found in several areas of the Highland plateau although many stumps are visible indicating fairly widespread removal of such trees in the past (Boerma 1999:76).

According to RSCU (1996:xxiii), the forests have all been destroyed by the clearing of land for cultivation and timber. While only some mutilated individual trees remain in farmland on the plateau, an estimated 53'000 ha of degraded forest would remain on the less desirable and accessible eastern escarpment. In fact, the eastern escarpment between Asmara and Ghinda has always represented the richest area of the country in terms of vegetation, which is however mostly due to the moist climate, which ensures the flourishing of a wide variety of trees and other vegetation in this area. Travellers in the 19th century were already amazed by the contrast of the luxuriant vegetation of the eastern escarpment and the barren plains of the Highland plateau (see also chapter 4.2.1). Due to its exploitation, especially during Italian colonisation, many parts of the eastern escarpment show signs of disturbance although, since 1991, there has been substantial regeneration of much of this area (Boerma 1999:76-77).

Measures were taken already by Italians to increase the amount of woodland in the Highlands of Eritera. Plantations of Eucalypts have been established, especially on marginal lands and along riverbanks and watersheds. Efforts have been made to plant also acacia trees and *berbere tselim* (schinus molle). The total area of plantations in the Highlands is estimated at 10'000 hectares. Eucalyptus remains very popular among the tree species being planted in the Highlands, mostly because of its fast growth rate and its straight tall trunk, making it valuable for construction. However, their cultivation is discussed quite controversially. It has been argued that they have adverse environmental effects, including excessive water and nutrient requirements and allelopathic effects on adjacent crops. On the other hand, it has also been argued that the area under eucalypti is relatively small compared to the total area of the country and that the effect on the environment should not be significant as long as the trees are planted away from riverbanks and arable land (RSCU 1996:xxviii).

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[8] There are different indications regarding the exact time of when the plant was introduced in Eritrea. According to RSCU (1996:288) it was indroduced by Padre Stella in 1910.

[9] The sources don't give any precise indication about when this would have been.

According to FAO the country in 1986 constituted 0,43% disturbed high forest, 1,6% riverside woodland and bush land, 9,02% dense shrub land, 13,35% open shrub land, 7,1% bush and shrub grassland, and 1,3% wooded grassland (FAO 1986, cited in Juel 2002:34).

### 3.2.5 Wildlife

It seems that the wildlife of Eritrea was much more diverse in pre-colonial 19th century than it is today. According to Denison and Paice (2003:6) nearly all the major species of mammal common to Africa could be found, including elephant, lion, rhinoceros, hippopotamus, leopard, giraffe and zebra, while "little or nothing is left of the once plentiful wildlife" today. From some elder Eritreans it was reported that there was still leopards and tigres in the eastern escarpment area in their youth. Lefebvre and Munzinger, who both visited Eritrea in the mid 19th century, noted the presence of hyenas, jackals, leopards, warthogs, apes, antilopes and guinea fowls on the highland plateau. The western escarpments were populated with a rich fauna with panther, leopards and hyenas, which would have lived in this zone especially in the rainy season. A large number of lions, leopards, hyenas and elephants seem to have lived also in the eastern escarpment area. The animals migrated to higher areas together with the rainy season (Liebi 1993:58-63).

The substantial wildlife decrease is often given as an argument to prove that the forests as natural habitats of wild animals must have enormously dwindeled in the last hundred years and that this decrease in woodland cover was responsible for the expulsion of the wild animals. Although the expansion of cultivated land might indeed have played a role in the expulsion of animals, it seems however, that the hunting by Italian colonisers was the main cause for the expulsion or even extermination of certain breeds (Liebi 1994:111). As it will be shown in chapter 3.3.3, culture land has furthermore often expanded at the expenses of badlands and bush land rather than at the expenses of forested areas. It seems also, that epidemics, which often ravaged the highland area, were to blame for the extinction of certain breeds as well. Schöller (1896:222), who visited the area in 1895, noted for instance, that the mountains of Akrur had once been populated by Kudu antilopes, which would have died off after several epidemics.

According to MoI (2002:39), there would have been resurgence in the wildlife population since independence in 1993, helped by strict prohibitions on hunting. Squirrels, rabbits and monkeys are among the most common wild animals seen today in the Eritrean Highlands.

## 3.3 Political History

Eritrea went through a very eventful history with a lot of different Regimes in succession in a relatively short time, these having all left their specific imprint on the society, economy and finally also in the landscape of Eritrea. This chapter gives an overview over the different powers in Eritrea and on their policy and interests in and for the country. Some aspects of agriculture and resource use by the different governments will thereby also be analyzed, while the use of wood resources and the woodland cover changes under the subsequent Governments will be discussed in a special chapter (3.5.2). The focus is on the colonial and post-colonial time, since this is also the time span covered by this study.

### 3.3.1 The pre-Italian period

The earliest hominid remains in Eritrea date from two million years ago, placing the land near the dawn of humankind on the planet. The earliest inhabitants of Eritrea were probably related to the Central African Pygmies. Between 1000 and 400 BC, a Semitic group of people known as

the Sabeans crossed the Red Sea into the region of present day Eritrea, and intermingled with the Hamitic inhabitants who had migrated here from the northern Sudan. The region was later controlled by various foreign invaders such as the Axumite kingdom, which established the famous port of Adulis on the Dahlak Island close to modern Massawa. The Axumite kingdom attended its apogee in the fourth century, when king Ezana converted to Christianity. Around 700 AC however, the Dahlak Island was occupied by the Arabs and the Axumite kings were dispelled to the Eritrean Highlands. After the fall of the Axumite Empire, the Eritrean region became a multicultural periphery of political centres in present-day Ethiopia, Sudan and Yemen. In Ethiopia, a new dynasty emerged in the 13$^{th}$ century, it claimed to descend from the kings of Axum, from king Salomon and the queen of Saba. This dynasty extended its power into the neighbouring Eritrea and attended to get access to the Red Sea. In the early sixteenth century Ethiopian authority was eroded however by the Ottoman Turkish occupation of the coast. By the end of the century, present-day Eritrea was divided between the Muslim coast, which was under the nominal rule of the Turkish, the Christian Central Highlands, which were under the nominal rule of the Ethiopian Governors of Tigray and the Western Lowlands that had come under the rule of the Funj Empire of Sudan. The history of the Central Highlands was then dominated by the rise of the Tigrinya Christian clans of Tsazzega and Hazzega (see chapter 4.2.5), whose leaders eventually shook off Ethiopian political control in the early eighteenth century and briefly ruled northern Tigray, before the lords of Tigray reimposed their authority over the Highlands in mid-century. The Tigrean rulers were able to manipulate the rivalries of Tsazzega and Hazzega to impose their authority even more effectively, reaching a highpoint during the reign of Emperor Yohannes IV (1872-89). In the Northern Highlands the weak authority of the Turks and Funj was overshadowed by the rise of Egyptian power in the early nineteenth century: After occupying the coast, the Egyptians subsequently expanded their influence to Keren and tried to conquer Abyssinia but were finally defeated by the Ethiopian emperor Yohannes of Tigray in 1876 (MoI 2002:13; Kutschera 1994:8-10; Killion 1998:10-11).

Eritrea's strategic location, next to the Red Sea, meant that successive rulers in a number of regional countries, particularly Ethiopia, maintained a keen interest in controlling the region constituting present-day Eritrea. Rural communities throughout Eritrea were required to pay regular tributes to these regional powers, although these payments were usually of a tolerable level. By the 1800s, armies of over a hundred thousand soldiers were common; their potency increased tremendously during the nineteenth century as they gradually became equipped with modern arms supplied by European countries. These armies were frequently put into action to reassert control in the event of local resistance or external attacks and rural communities occasionally suffered heavy losses of life and property as a consequence (Niaz 1998:48, see also chapter 3.4.2).

### 3.3.2 Eritrea as an Italian colony (1890-1941)

The Italians were the last of the European powers to join the colonisation of Africa. Eastern Africa along the Red Sea became particularly interesting economically after the completion of the Suez Canal in 1869. In November 1869, an Italian monk, Giuseppe Sapeto, purchased a tract of land near Assab on behalf of the Società di Navigazione Rubattino. In 1882 the Italian Government purchased the land from the shipping company and established an outpost at Assab, which was used as a base to move northward towards Massawa, where the Egyptian power was on the decline. The starting of the colony was very difficult and the Italians had to face the hostility of the afar tribes at the coast. Slowly, they managed to surmount the hostility of the indigenous people and moved further inland, benefiting from the benevolence of England, which favoured the Italian expansion in the hope that the Italians would cut the road to the French and weaken Abyssinia. In 1885, Massawa was conquered and in 1888, General Baldissera occupied the area of Keren and subsequently the greatest part of Eritrea. In the treaty of Wichale signed with the Ethiopian Empower Menelik, in May 1890 the creation of the Italian

colony of Eritrea was officially proclaimed. It was the first time in history that the whole of Eritrea had come under one rule (Kutschera 1994:11-12).

The reasons for the creation of an Italian colony at the Horn of Africa are still a source of speculation among historians. Prestige and the desire to participate in the colonisation process may have been an important motivation. It seems however, that the initial objective of the Italian Government was to turn Eritrea into a colony of settlement in response to the enormous problems faced in rural Italy. The south of Italy, especially, faced deep agricultural misery and increasing unemployment at the end of the 19th century. Over 200'000 Italians emigrated each year from Italy to the United States at this time, most of them from the land-scarce areas of the south. The aim of Prime Minister Crispi's Government was to redirect this flow to Eritrea where farmers would be able to obtain new lands whilst remaining part of the Italian nation and contributing to its prosperity (Tekeste Negash 1987:13-17; Yemane Mesghenna 1989:65-66; Boerma 1999).

In his report "*Sulla colonizzazione agricola dell'altipiano Etiopico*" the agricultural advisor of the Italian Government in Eritrea, Leopoldo Franchetti estimated that there was plenty of land and few people in Eritrea and recommended the colonisation of the Highlands by Italian settler-families. The Highlands were only sparsely populated at this time because of the 'great famine', which affected the country in 1888-1892, a result of terrible rinderpest and subsequent epidemics. Because of the low population, favourable climate and fertile soil, the Highlands were considered favourable to Italian settlers, while the Lowlands were identified as being more suitable for the development of export-oriented capitalist large-scale agriculture. Franchetti undertook the first land expropriations in 1893 with the vision that finally two million Italian farmers would settle down in Eritrea. Large tracts of land were declared public and all grazing land was declared State land (*terreno demaniale*), which signified a clear interference with the traditional land right system in the Highlands (see also chapter 3.4.3), which had been wrongly understood by the Italians.[10] The resistance of the Eritreans and their attachment to their land had been underestimated. Coming back into their villages they had abandoned because of the great famine, they had the surprise of seeing their land confiscated by white men. Soon, riots and revolts broke out. Most of the few Italian settlers, who had had the courage to come to Eritrea, returned home to Italy in dismay (Liebi 1993:96; Kutschera 1998:12).

To put an end to the succeeding riots by the indigenous population and to submit Emperor Menelik in Ethiopia, General Baratieri in 1895 started the conquest of Northern Ethiopia. The final battle, which took place in Adua in 1896, resulted in disaster for the Italians, however. Four thousand Italians and two thousand Eritreans fighting on their side were killed in the battle. For the first time in African history, a white army was beaten by a black one. The impact was enormous not only in Africa but also in Europe. People required a general retreat of Italy from Eritrea. Finally the Government in Rome decided to adopt a policy of reconciliation and Italy signed a new treaty of peace, which acknowledged the total independence of Abyssinia. In Eritrea, a new civil administration was installed with Fernando Martini as the first civil Governor whose task was to apply the policy of "*raccogliamento senza liquidazione*" (reconciliation without evacuation). A decree voted for by the Parliament in 1903 theoretically put an end to the land expropriations.

Martini had a big vision for the development of Eritrea, not only should the agricultural and mine resources (gold) be exploited but also the Sudan and Abyssinia should be attracted into the

[10] The significance of these land expropriations remains contended amongst scientists. While the official level of the initial land expropriation was quite high and continued at a lower level throughout Italian and British rule, it is argued that the indigenous population continued to cultivate most of the land, that had been officially expropriated and that the land law of 1909 revoked the earlier land alienation decrees by recognising the primary rights of Eritrean peasants (Boerma 1999:275).

sphere of influence of Italy by leading their imports and exports towards the port of Massawa. To reach this goal the infrastructure had to be improved. A railway between Massawa and Ghinda was established and roads were built between Asmara, Adi Ugri, Keren and Segeneiti. Martinis successor, Giuseppe Raggi, opted for the creation of large-scale agricultural exploitations but like Martini he wasn't able to attract Italian capitalists to invest in the agriculture. Agricultural production remained limited and the Italian population in Eritrea in 1913 counted only 3'500 people, a fractional amount of the two million immigrants Franchetti had been dreaming of.

The situation changed with the advent of the new fascist Regime in Italy. The resources in Eritrea began to be exploited in a more systematic and rational way and also the agricultural policy changed. In the early 1920s, the Italians introduced coffee in Faghena and Merara on the eastern escarpment. In 1926, a new legislation reserved the agriculture on the Highlands to the Eritreans, while the Italians were supposed to exploit the Lowlands. However, in 1930 there were still 119 farmers cultivating 4'500 ha in the Highlands, while nineteen farmers cultivated 1'300 ha in the Eastern Lowlands and some twenty farmers cultivated 4'200 ha in the Western Lowlands. In the area of Tessenei, another 3'000 ha of cotton were cultivated with the help of an irrigation system from the Gash-Setit River. Important efforts were also made to improve the infrastructure and numerous roads were built between 1922 and 1932 to finally prepare Eritrea for greater ambitions: the conquest of Ethiopia.

In May 1936, General Badoglio entered Addis Abeba, where he became vice-king, while the Ethiopian Emporer Haile Selassie fled to England. The Tigray was integrated into Eritrea, which became a base for the exploitation of Ethiopia and took a significant upturn: The Italian population in the colony increased to sixty thousand people in 1941, the towns grew, the streets were improved and industry developed, providing non-agricultural employment opportunities also for Eritreans. The main economic activity of the Italian settlers changed from agriculture to the building of the infrastructure. The dependence on imports, especially food, which was a constant problem for the colony, increased after 1935, however. The decision of Mussolini to participate in World War II at the side of Hitler was finally a fatal error as it ended the goodwill of the French and British in Africa. In March 1941, the British defeated the Italian army after a 50-day siege of Keren (Kutschera 1998:12-16; Liebi 1993:103-104).

Throughout the time of the Italian colonisation the traditional agricultural sector remained the linchpin of the economy. The development of strong colonial agriculture was weak and remained repressed mainly due to the lack of capital, credits and subventions from the Italian Government (Liebi 1993:106).

### 3.3.3 The British mandate (1941-1952)

After the Italian defeat in 1941, Eritrea was administrated by Great Britain until September 1952. At first, until 1947, it was ruled by the military administration of the British East Command and later it was placed under a civil British mandate, waiting for the four parties, which had won the war, and afterwards also the UN, to agree on the destiny of the ancient Italian colony in Africa. The members of the UN commission were divided but finally decided for a compromise solution: A federation of Eritrea with Ethiopia. The resolution, which went into effect on the 15th September 1952, ensured the Eritreans some democratic rights and autonomy over internal issues such as internal security, taxation, education, labour, health, agriculture and commerce, while the Ethiopian Government was to be responsible for currency, finance, external communication, trade and defence.

Despite the brevity of their mandate in Eritrea, the presence of the British has greatly influenced the economy and especially the social and political system of Eritrea. In the first period the industrial infrastructure was considerably modernised and over 300 factories opened throughout

the country. Also the agriculture was developed since Eritrea was utilised as a production base to supply the military and commercial needs of the British in the Middle East during World War II. It seems however, that the British were not interested in the promotion of innovations in the agricultural domain and the agricultural experimentations started by the Italians ceased during the British period. The war boom once again provided employment as well as trading opportunities for the local population. However, this boom ended after 1945, many of the factories closed down after the war. The problem of food supply also remained unchanged in this period (Kutschera 1994:18; Niaz 1998:63; Taddia 1986:260).

On the social level, a national education system was introduced and schoolbooks were edited in Tigrinya and Arab, so that Eritrean children, who had been excluded from education during the Italian colonisation, were granted access to education. Important changes also happened in politics with the emergence of labour unions and political parties (Kutschera 1994:18).

The British were aware that their tenure in Eritrea would be short and had no colonial ambitions in Eritrea. This allowed them to abolish the racial segregation which had been introduced by the Italians. On the other hand, they had no long-term interest in the future of their colony, unlike the Italians. Concerned that their stay should at least pay its way and had few qualms about exploiting the natural resources of Eritrea (see also chapter 3.5.2).

### 3.3.4 The federation with Ethiopia (1952-1962)

Emperor Haile Selassie, who had come back to Ethiopia in 1941 together with the allied Forces, viewed Eritrea as a highly prized region as it contained Ethiopia's only access to the sea, the Massawa and Assab ports. After assuring the American support he started to take gradual steps to convert the federation status of Eritrea into a Union. After two months already, all the political parties, except the unionists were made illegal. In November 1962, the Ethiopian army took position before the public buildings in Amara and Massawa and the Eritrean parliament was constrained to 'vote' for the dissolution of the federal system. On the 14$^{th}$ of November 1962, Eritrea was annexed, becoming the fourteenth province of Ethiopia. This annexation re-ignited the armed resistance against the Ethiopian occupation, which had already started in 1961 (Kutschera 1994:19).

### 3.3.5 The thirty-years-struggle (1961-1991)

The first armed resistance against the Ethiopians came from a few resistance fighters in 1961, who after eight years of peaceful protest against the Ethiopian violations of the basic principles of the federation began an armed struggle. The Ethiopian forces, however, destroyed this resistance immediately. In the same year, some Eritrean leaders in exile in Egypt founded the Eritrean Liberation Front (ELF). Very soon, thousands of fighters were joining the guerrillas. This steep increase accentuated the tensions between the different wings of the movement. Initially an essentially Moslem movement, it attracted more and more Christians from the Highlands. The ELF was not able to integrate all the different ideologies of its members and in 1970, a new group, the Eritrean People Liberation Front (EPLF) detached from the ELF. The Ethiopians meanwhile received the support of the Americans and Israel. They multiplied their exactions, burnt villages, slaughtered the cattle and killed thousands of civilians. In 1967 the first refugees arrived in the Sudan. Their numbers grew to 700'000 by the end of the war.

In Ethiopia, Emperor Haile Selassie was overthrown by the socialist *Derg* (Military Committee) Regime in 1974 and war against Eritrea intensified. The country descended into full-scale civil war. For some time and despite their internal disputes, the ELF and EPLF were quite successful and retook some smaller towns. However the situation changed, when the Derg Regime under Mengistu Haile Mariam in 1977 received massive support from the Soviet Union, while Israel continued to provide the Ethiopians with military material. Realising, that they would not be

able to resist such a strong enemy, the leaders of the EPLF decided to make a strategic withdrawal with the evacuation of all the towns and areas taken in the last year, with the exception of the town Nakfa, where they took refuge. Mengistu, supported by the Soviets, intensified the offensives against the EPLF. In 1984 a terrible famine engulfed the Sahel area and especially Eritrea. The EPLF while continuing the war had to help to distribute the aid coming from Sudan amongst the Eritrean people. The efficiency of the guerrillas in fulfilling this difficult task made the international public opinion turn in their favour. Visitors from abroad were surprised by the organisation of the Eritrean resistance fighters. The leaders of the EPLF, who had been trained in Havana, Moscow or Peking, had marked the movement with a left wing ideology (Kutschera 1994:20-22). The EPLF emphasized the need for a social revolution even before independence and came out with a detailed manifesto in 1977 that went far beyond immediate military issues and enunciated a comprehensive national development program. The program emphasised a number of socialist slogans such as opposition to imperialism, a planned economy, equality of rights for workers and women and non-alignment. Agrarian reforms and the education of men and women played an also important role in this plan (Firebrace; Holland 1985:41, Kutschera 1994:22). Several terracing, forestation and dam building projects were propagated by the Ethiopian Government as well as by the EPLF in the areas they were already controlling after the famine of 1984.

The take-over of Afabet in March 1988 marked the beginning of the end for the Ethiopian army. In February 1990 Massawa also fell. The crisis of the Soviet Union accelerated the decomposition of the Mengistu-Regime and in May 1991, after a liberation war that had lasted 30 years, the leaders of the EPLF entered Asmara. After a referendum, which was approved by over 99% of the voting Eritrean population, independence was officially proclaimed on the 24$^{th}$ May 1993. Issayas Afeworky, the former general-secretary of the EPLF, became President of the state of Eritrea (Kutschera 1994:23). He is still in power today.

Eritreans who have experienced the thirty-years-struggle are still deeply traumatized by the violence and atrocities such as rape, looting of animals, burning down of houses and the shooting of innocent citizen endured under the Ethiopians especially under the Derg Regime (Boerma 1999:330). Already under Haile Selassie, the Ethiopian army committed terrible atrocities on the rural population to crush Eritrean resistance. Although the Western Lowlands were most affected, atrocities occurred throughout Eritrea. Almost all of the villages near Keren were destroyed in 1970 (see also chapter 4.4.6). Rural communities were also forced by the army to abandon their villages and settle in hamlets, so as to restrict the ability of the ELF to operate in the region. A large number of Eritreans migrated to Sudan to escape these atrocities. (Niaz 1998:76-77) Economically however it seems that the 1960s were years of relative prosperity for Eritrea. With a good infrastructure and a relatively well-developed industrial sector, Eritreans made strides in many areas including education and advancement in the Government and business hierarchy of Ethiopia as a whole. (Boerma 1999:82). With the advent of the Derg, profound political and economic changes swept through Eritrea. With the nationalization of private industry and confiscation of private land, the economy plunged into decline. The intensity of the war was much higher throughout the Derg period than under the Haile Selassie Regime with thousands of people killed, imprisoned, raped and the whole infrastructure destroyed. According to MoI (2002:7) more than 65'000 Eritreans were killed during the whole war.

The 30 years struggle, accompanied by heavy droughts in the 1970s, in the early 1980s and around 1990, prevented the development of an efficient agrarian sector. A lot of agricultural land was fallow during the years of war due to the enrolment in military service and the death of a lot of Eritreans. The number of livestock decreased substantially and during war the incentive for yield increases were not given. Between 1968 and 1991, the production of cereals decreased from 218'000 to 68'000 tons, the amount of livestock decreased from 2.5 millions cattle and 5 millions sheep in 1973 to 285'000 cattle and 650'000 goats and sheep in 1991. According to

figures compiled by Boerma, the amount of oxen in the Tsellima district around Debarwa (see chapter 4.3.6) for instance decreased from 9'358 in 1966 to 3'447 in 1994, the number of donkeys from 6'293 to 2'222 and the number of goats from 14'027 to 3'348. When the war was over, two thirds of the population was dependant on food aid (Langknecht 1998:72; Boerma 1999:301).

### 3.3.6 The post-war period

The new Governmental party under Issayas Afeworky had to face the challenge of rebuilding a land completely destroyed after 30 years of war. The country had a low industrial and agricultural base, severely damaged infrastructure and extremely poor health and educational facilities (FAO 2003:3). Everything had to be rebuilt. The Government pursued a radical transformation of the political, social and economic basis of the country, including the establishment of a new constitution, the reorganisation of the administrative boundaries and a radical land reform aimed at giving households permanent usufruct rights over land (Boerma 1999:83). A National Service was also established in 1994, requiring all women and men over eighteen to undergo six months of military training and a year of work on national reconstruction. These terms can be extended during emergency situations. The National Service was supposed to compensate for the country's lack of capital and to reduce dependence on foreign aid, while welding together the diverse society (MoI 2002:8). Massive campaigns were initiated to undertake wide scale terracing and reforestation on eroded hillsides. Not only villagers themselves were mobilized to participate in these programs, but also soldiers, students and national service members (Boerma 1999:208). The EPLF-led Government itself established a reputation as a committed, honest and efficient Government, which has kept nepotism, corruption and bureaucracy to a minimum. At the same time, the Government has kept tight control in the political arena (Niaz 1998:98). Initially intended as a transitional Government in 1993 it is still in power today.

In the first years after liberation, Eritrea knew a time of relative peace and booming economy. It enjoyed an average annual growth rate of 7 percent, one of the highest in Africa. However, the exact delineation of the border with Ethiopia had never been exactly cleared and tensions between the two neighbouring states resulted in war in 1998 with tragic consequences for the Eritrean people and the economy of the country. The infrastructure, which had been rebuilt after independence, was severely damaged. GDP declined, inflation rose, the external current account worsened and international reserves were nearly depleted (Gräub, Krähenbühl 2004:47). Officially it was a small village at the border, Badme, the two states were fighting about, but speculations arose, that the war was due more to the ambition of Ethiopia to gain access to the Red Sea and conquer the Eritrean port of Assab. A peace agreement was signed in December 2000 but the question over demarcation is not yet cleared and the situation seems unfortunately to be deteriorating again at the moment.

## 3.4 Society, demography and rural economy

### 3.4.1 The Eritrean population

There are nine ethnic groups in Eritrea, a number that has remained the same since the arrival of the last of the waves of migrants in the middle of the 19$^{th}$ century. The most important ethnic group are the Tigrinya, who make up around 50% of the total population and inhabit the Eritrean Highlands. The Tigrinya language is the only official working language beside Arabic. The second group are the Tigre (31.4%), who inhabit a large area of Northern, North-Eastern

and Western Eritrea and are predominantly Muslim. Further ethnic groups are the Saho (5%), Afar (5%), Beja (2.5%), Bilen (2.1%), Kunama (2%), Nara (1.5%), and Rashaida (0.5%). The Bilen populate Keren and its immediate surroundings (Denison, Paice 2002:10-11).

The Central Eritrean Highlands, formerly divided into the Provinces of Hamasien, Seraye and Akele Guzay, have traditionally been the most heavily populated region of Eritrea. The majority of the inhabitants are Tigrinia speaking and belong to the Christian orthodox religion. However, there are also some Catholic enclaves especially in the area of Segeneiti, which were converted mostly during the 19th century by French Lazarist and later by Italian Capuchin priests, who established Missionary stations mainly in the Akele Guzay but also in Asmara, Adi Ugri and Keren. Taddia (1986:189) suggests, that the Capuchins in Eritrea had quite an important influence on the agricultural development of the colony, since they promoted the allocation of new agricultural concessions in the villages under their control, inciting the believers to cultivate and to introduce new techniques in the cultivation of the fields. Furthermore they helped to reduce the superstitions of the native farmers and to reduce the religious celebrations of the Coptic Church and in consequence the periods of labour breaks.

### 3.4.2 Population increase since the start of Italian colonisation

There is, unfortunately, no exact data available regarding the population figures in pre-colonial time in the Highlands of Eritrea. Liebi (1994:28) presumes that the area was never densely populated in comparison to today, although the area of the Woyna Dega was often described as well populated by travellers. The most densely populated Province of the Highlands was Hamasien, which was also called "The Plain of the Thousand Villages". The periodical famines, epidemics, wars and Egyptian campaigns hindered a constant increase in the population. It seems in fact, that the Highland population was decimated considerably between 1865 and 1892 because of war, famine and disease. With the establishing of law and order in Eritrea under the Italians and the cessation of hostilities, population numbers recuperated as people returned to abandoned lands. The population levels began to increase substantially. This was on the one hand due to the new political stability and cessation of inter-tribal conflicts and war, the eradication of rinderpest and animal plagues and a better sanitary and medical situation. On the other hand, Niaz (1998:68) suggests, that the change of the land tenure system from *Risti* to *Diessa* (see chapter 3.4.3) favoured by the Italians, has also incited many people from the Tigray to immigrate to the Eritrean Highlands.

**Table 3-1: Population estimations of the former highland provinces and Keren between 1883 and 1993**

| | 1893 | 1899 | 1905 | 1931 | 1939 | 1993 |
|---|---|---|---|---|---|---|
| Hamasien | 30'001 | 25'768 | 34'942 | 97'537 | 123'459 | 587'000 |
| Seraye | 16'440 | 27'448 | 36'241 | 110'854 | 122'323 | 367'000 |
| Akele Guzay | 26'951 | 58'196 | 52'226 | 111'358 | 106'366 | 327'000 |
| Keren | 41'829 | 33'714 | 62'330 | 121'101 | 108'147 | 350'000 |
| Eritrea | 191'127 | 301'096 | 274'944 | 596'013 | 614'353 | 2'268'000 |

(Source: Ciampi 1995:504)

Table 3-1, which is based on population figures compiled by Boerma (1999:251) on the basis of Ciampi (1995:504), indicates the population levels in the Highlands of Eritrea since 1893 according to the former regional administrations. Unfortunately there is a large gap in the

population statistics between 1939 and 1993 due to the lack of census taking in this time. It should be noted, that the population figures of the first Italian census in Eritrea were probably unusually low, due to the devastating effect of the famine in 1888-1890. The numbers of 1993 were calculated on the basis of the registration of people for the 1993 referendum, they seem to be estimated quite low, however. There was obviously a substantial population growth between 1939 and 1993, although the growth was probably slowed in the 1970s-80s because of war and famine. The British Administration's indirect census of 1952 showed an increase in the total Eritrean population to 1'031'000. The Ethiopian administration's estimate in 1966 was 1'583'964 (Killion 1998:344).

Since 1993 the population has again increased enormously, partly due to the return of many of the half-million refugees from camps in Sudan and, to a lower extend, the expulsion of people of Eritrean origin living in Ethiopia who where forced to return to their home country during the war of 1998-2000. There still remains considerable ambiguity as to the exact population of Eritrea today, due to the lack of an official population census since 1939. Recent estimations of the Eritrean population, including the Eritreans still living overseas (around 200'000), vary between 3.5 and 4 millions.

### 3.4.3 Agriculture and pastoralism

With an estimated 70-80 percent of the Eritrean population depending on the production of crops, livestock and fisheries for income and employment, Eritrea can be described as an agrarian society, although agriculture accounts for only a fifth of GDP and less than half of its merchandise exports. The Highlands with adequate rainfall and fertile soils provide the most suitable terrain for the practice of rain-fed agriculture within Eritrea, while in the dryer coastal plains and the arid regions of the north and west, raising livestock predominates (MoI 2002:71).

The communities in the Eritrean Highlands have always relied strongly on agriculture and livestock, although secondary activities play an important role in sustaining many households, especially in view of the ever-present threat of drought. About half of the Central Highlands population is rural and consists mostly of sedentarised farmers. However many households still migrate seasonally with their animals to additional pastures and agricultural land in the Eastern Lowlands (Boerma 1999:75). The most important supplementary activities of rural households in the Eritrean Highlands are keeping animals such as goats, sheep and cows, mostly for selling. Households normally build their herds by selling vegetables, engaging in cash activities or herding the animals of other families in return for a share in the offspring. Employment in the modern economy in nearby towns has also become an important secondary activity ever since Italian colonisation (Niaz 1998:34-35).

More than 95 percent of the cultivated area of Eritrea is rain-fed and depends on rains that are highly variable in terms of quantity and distribution. Due to this unpredictable rainfall pattern, farmers are forced to adopt defensive low productivity systems with preference for low value but drought resistant crops in most years. Generally, crop yields are very low, and the crop season is short, covering 2-3 months. The production is mostly subsistence-oriented and most holdings are very small with an average of about 1 hectare (Juel 2002:27).

Due to the erratic rainfall, there is a high degree of diversity in the crops cultivated. Cereals like sorghum, barley, wheat, millet, maize and teff are the main crops grown in the Highlands. They are used in the preparation of the staple breads (*injera* and *kitcha*) (Niaz 1998:34). Only 22'000 ha out of a total of 439'000 hectares of cultivated land in Eritrea are under irrigation. A number of villages benefit from micro-dams, wells or river diversions, which are used for small-scale irrigation. The irrigated land is used to grow vegetables such as tomatoes, onions, carrots, potatoes and bieta a variety of spinach (Tekeste Ghebray 1987:3; Boerma 1999:75).

Livestock plays an important role in the agriculture in the Eritrean Highlands. Livestock are not only a primary source of disposable income for many families, supplementing the often uncertain returns of agriculture, but they are also essential for agricultural production and for day-to-day living (Boerma 1999:257). The agricultural production is dependent on the ox-drawn plough, a system that has been in place in Eritrea for several centuries[11]. This ox-plough system, obviously, requires oxen and therefore the raising of cattle, which also has consequences for the agriculture. The cultivated fields, permanent meadows, fallow land and, after harvest, often also cropland have to provide livestock with food (Ritler 2004). Livestock in turn provide important products like milk, meat, leather etc. and dung. Donkeys, horses and in some areas also camels are also an important form of transport. According to McCann (1995:36), the introduction of the ox-plough would have brought significant changes in the Highlands vegetative cover. Under the influence of the plough, virtually all the dry evergreen forests and grassland and part of the moist evergreen forests would have changed to open farmlands and pasture, with the juniper forests being the first to disappear.

Agricultural techniques are still largely based on indigenous technology, organisation and knowledge. The actual planting begins in May, but the agricultural cycle begins in the *Hagay* season (January to March) when farmers start to plough their lands. Ploughing is carried out repeatedly, with gaps of three to four weeks, in order to expose the various layers of soil to nitrogen-emitting sunlight. The ploughing, the exact number of which depends on the availability of oxen to each household, is carried out with the help of a steel-tipped wooden plough pulled by a pair of oxen. The seeds are set, by hand, in the "*Ayet*" season (April to June) and a final ploughing is carried out to cover them with soil. Harvesting starts in October and continues until January. It is carried out with a sickle and the crop is cut close to the ground to maximize straw and stalk yields, which are used as animal feed (Niaz 1998:34-35).

### *Land tenure systems*

Up until recently, two categories of traditional land right systems were differentiated in the Highlands of Eritrea: The *Diessa* or village system and the *Risti* or family system. With the *Risti* system, land was owned by an extended family group, called enda, and could be leased out or transferred to children through heritage. The rights on risti-land was denied however to foreigners, Moslems, Jews or members of other ethnic groups. With the *Diessa* system, land was collectively owned by the village community and reallocated to heads of families every five to seven years by a system of drawing lots. This periodical redistribution also made it possible for new families and foreigners to get access to land. Both the *Risti* and *Diessa* systems have prevented landlessness and fostered a profound sense of community and were therefore economically and socially valuable in the context of subsistence agriculture.

However, the *Diessa* system, which has prevailed almost exclusively in the highland areas, has had detrimental effect on sustainable land management. As a result of the periodic reallocations, land has become increasingly fragmented and difficult to manage as plots are often widely dispersed. Because of the periodic redistribution of arable land, investments, intensification or general improvements of individual plots were discouraged, while people were incited to over-exploit the village commons (Juel 2002; Liebi 1994).

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[11] The Eritrean and Ethiopian Highlands are believed to be among the earliest places, where farming started. The earliest evidence of the existence of specific production activities consists of drawings of humpless, long-horned cattle on rocky crags discovered in Northern Eritrea, which suggest the presence of pastoral groups in the region as early as 8'000 BC. Wheat and barley, as well as the plough for tilling, were introduced in Eritrea by Semitic groups during the first millennium B.C., who also brought with them the camel, the horse, the sheep and new cultivation and warfare techniques (Niaz 1998:46).

Apart from the short period of expropriations by the Italians, the pre-colonial *Diessa/Risti*-system persisted in the Eritrean Highlands up until recently: In 1994, a land reform program announced by the Eritrean Government declared all rural and urban land as property of the Government, which allocates lifetime usufruct rights for agriculture and residence to all male and female citizens over the age of eighteen. The Government has the right to declare any land as State property, to be used as reserve areas or to be leased to business concerns. This implies that the village now has no collective claim to its former farmland, although it is allowed continuous use and control of its pastureland, woodland and water resources. The intent behind the new system was to provide individual farmers with lifetime security of land tenure over the same piece of land, which should encourage investment in land and the adoption of modern methods of cultivation (MoI 2002:8; Niaz 1998:104). While this intention is certainly salutary, it has been objected to, the new legislation requires equal distribution of farming land in both quality and quantity terms, which in the context of the Eritrean Highlands is difficult to implement without having to produce land fragmentation, due to diverse quality of the land. The shift of control of land allocation and administration from the village assembly to the Government might furthermore create insecurity and be expensive and uneconomical in comparison to the traditional decentralized way of land administration. It seems that in most Highland regions, a combination of rules from both the *Diessa* and the new law has been applied for the redistributions that were carried out in 1998 (see also Gräub, Krähenbühl 2004:63-64).

***Increase of farmland***

The supposed enormous expansion of farmland, due to the increase in population during the 20th century, is often seen as an important cause for the decrease of woodland cover in Eritrea. Boerma (1999:255-256) points out however, that the land, which was not cultivated in the past, was not necessarily forested and that most uncultivated land was normally grazing land, which generally comprised of a mixture of grass, bushes and scattered woodland. It also appears that the extent to which land was converted to agriculture was far less than generally believed. The availability of good quality arable land was already limited in the 19th century and even if there may have been room to move into areas of inferior soil or into sloping areas, people normally thought that these would have better value as grazing land than as agricultural land. Livestock was, and still is, very important in people's survival strategy, making people cautious about encroaching too much land for agriculture.

### 3.4.4 Rural settlements and dwellings

People in the rural areas of the Eritrean Highlands live together in villages, often well away from main routes and generally located on the top or at the foot of a hill or on the edges of high ridges in order to defend themselves from enemies or animals and avoid natural disasters and diseases, while their land is located below in valleys and small plains.

The name given to a Tigrinya community or hamlet is *Adi*. The traditional dwelling used by Tigrinya people is the *hidmo*, a rectangular, flat roofed house made of wood, stone and clay. The main frame is constructed from thick tree trunks or branches and then filled in using smaller branches and clay. The roof is made up of layers of twigs and branches and reinforced with earth, supported by thick, dry-stone walls and large tree-trunks. Normally a *hidmo* remains intact for about two generations (Denison, Paice 2002:12).

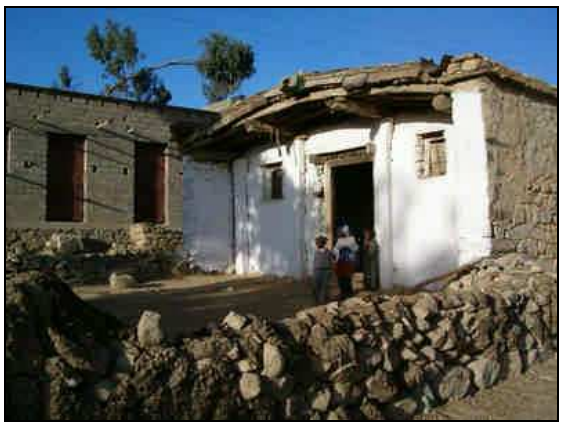


**Figure 3-2: Front side of a hidmo in Emba Derho (photograph by L. Lätt, 2004)**

Olea Africana and juniperus procera are mainly used as pillars inside and outside the house. However it seems that there has been also an increase of eucalyptus used for the construction of *hidmos* because of its greater and easier availability compared to the other species (Boerma 1999:272). The construction of the *hidmo* is extremely resource-intensive and some estimates indicate that about a hundred trees are felled to construct one such house (RSCU 1996:xxvi).

However the *hidmo* is not the only type of house found in the Highlands. The *mereba* today predominate, these are square or rectangular houses with the walls built of stone and roofs consisting of corrugated iron sheets. *Merebas* were known from the earliest time of the Italian colonisation, although their number has significantly increased during the last century. Another traditional house is the *aghdo*, a cylindrical shaped structure with a conical roof, which also needs less wood than a *hidmo*. An *aghdo* remains intact for about ten years, although the lifetime varies according to the material used for its construction. Rosalia Pianavia Vivaldi (1901:46) observed, that the bigger *aghdos* were called *adarash*, while the *aghdos*, which are constructed only of straw and branches were also called *tukul*. Even the churches were constructed in the style of the *adarash* or the *hidmo*. The *aghdo* with a diameter of about three meters accommodates the whole family and often even animals.

**Figure 3-3: Merebas and aghdos in Ona close to Keren (photograph by L. Lätt, 2004)**

According to the findings of Boerma (1999:272), the number of *hidmos* being built declined particularly after the 1930s, with more stone houses being built instead. From the mid-1970 onwards the construction of new *hidmos* seems to have ceased completely.

# 3.5 Ecological constraints and the dynamics and policy of wood resources in Eritrea

## 3.5.1 Ecological constraints

Eritrea is considered to be one of the poorest countries of the world with a poverty rate of 53%. The country is also highly food deficient. In a year of adequate rainfall Eritrea produces about half of its food requirements. Reasons for this are seen in several ecological constraints that the country has to face:

The **erratic and low rainfall** and frequent droughts encourages 'defensive cultivation' (low input/low output, sequential planting etc.) and thus retains the population in a low-productivity system (Juel 2002:46). The potential for irrigation is limited by the seasonal nature of the country's three major river systems (which remain dry for almost nine months of the year) and the limited availability of ground water. Small-scale irrigation using micro dams and wells are practiced in the Highlands, these are, however, totally dependent on rainfall (FAO 2003:4).

Since there is almost no or insufficient fallowed land, virtually no fertilizer and little farmyard manure used, soil fertility in the Eritrean Highlands is on the decline. This process is reinforced by progressive **soil erosion**. According to Juel (2002:31), the annual net rate of soil loss from croplands is estimated at about 12 tons/ha and crop yields are declining at the rate of about 0.5 percent per annum, owing to soil erosion alone. A relatively high level of erosion is inevitable in Eritrea given the topography: Geological instability and steep slopes, high rainfall intensity and limited natural depositional opportunities naturally result in high degradation rates. However, it seems that human interaction under the impact of population pressure has substantially accelerated the natural erosion especially in the 20$^{th}$ century[12]. The soil erosion causes removal of humus and plant nutrients and increased crusting of the soil surface, which leads not only to shallow soils but also to less water infiltration and less retention of water in the soil (Juel 2002:54).

Another problem is the **shortage of firewood** in all areas that are intensively cultivated. This not only brings hardship to the people but also undermines the whole farming system, since cow dung and crop residues are used as substitutes when there is no firewood. This is part of a vicious cycle as it means that nutrients and organic matter that would be returned to the soil are lost resulting in reduced crop yields (RSCU 1996:xxvii).

A decrease in woodland cover of catastrophic dimensions since the start of Italian colonisation, and especially in the second part of the 20$^{th}$ century, as well as overgrazing is commonly seen as the main cause of these ecological problems. The idea that the climate and ecology of Eritrea have been subject to desertification as a result of progressive removal of its vegetation influences nearly all recent policy statements made by the Ministry of Agriculture, it is also found prominently in the media and has even entered into the curriculum of secondary school students (Boerma 1999:209).

The following chapter gives an overview over the use of wood resources and the different forestry policies applied by the subsequent Governments. For this the findings of Boerma will mainly be relied upon as she has already carefully researched this topic.

[12] Liebi points out in her thesis, however, that although the process of degradation has intensified during the Italian period, the gradual degradation of land and vegetation already began over 2'500 years ago, when people started to cultivate the land in this area.

### 3.5.2 History of the forestry policy and deforestation in Eritrea

A glance back in history shows that already travellers in the 19th century were noting the scarcity of tree vegetation and wood for fuel in the Highlands of Eritrea and that since this time at least, people have always been complaining that the wood resources have dwindled enormously during a very recent period. The reasons evoked for the dramatic decrease of woodland cover have always been more or less the same: Population pressure and poor local resource management resulting in the extension of farmland, overgrazing by cattle and the cutting of trees for the construction of houses (*hidmos*) and for fuel and charcoal. Later, during the 20th century, also exploitation by the colonialists and war, with a lot of land being destroyed by bombs and a lot of wood pillaged by soldiers or used for trenches were seen as important causes for the decrease in woodland.

Most scientists today agree that forests throughout the Highlands were indeed probably a great deal more extensive at some point in time than they are now. Sr. Marisa Ranzato suggests in her thesis that the Egyptian and Roman ships, which navigated across the Red Sea, where made of wood from the mountains of the Eritrean Highlands, they were then the closest wooded area to the Red Sea (Ranzato 1964:160). However, there seems to be a great deal of uncertainty about the amount and the start of the deforestation in the Highlands. Unfortunately, there is little information available that makes it possible to reconstruct climate change in the area, which could help in making conclusions regarding vegetation change. In the absence of in-depth archaeological studies the only historical sources, which can provide information on the state of the vegetation in the pre-colonial era, are historical travel accounts[13].

Already the earliest travel accounts of Northern Abyssinia by Portuguese Catholic Missionaries suggest that forest cover was not a significant feature of the landscape. Large areas of the Highlands, particularly in the regions of Hamasien and Seraye, were already extensively cultivated as far back as the 16th century and therefore unlikely to have been heavily forested (Boerma 1999:91).

The accounts evaluated by both Boerma and Liebi suggest, that the plains of the Highlands lacked trees almost completely by the 19th century, apart from the areas surrounding holy places, valley bottoms and along riverbeds, which seem to have been more forested during the 19th century than today. Only a few areas are described as being densely forested. One is the mountainous Mataten area around Halai and another is the eastern escarpment stretching from the slopes below Ghinda up to the Hamasien plain which was, and still is, favoured by a relatively moist climate (Boerma 1999:92-94). In the travel accounts of the 19th century evaluated by Liebi, the flat plateau of Northern Hamasien is generally described as bleak and bare. Towards Southern Hamasien, in the Province of Seraye and Akele Guzay, the tree vegetation would have slightly increased, probably due to the topography. The plateaus were still described as treeless, while the steeper hills seem to have often been overgrown with trees. The shrubs were mostly in degradation- regeneration cycle. In the Province of Akele Guzay the hills and mountains are often described as arid and only covered by rocks, tree cover was very scarce. Acacia, aloe, wonsa, salvia abyssinica, juniper and cacti were the most common shrubs in the area. *Rumex* was widespread as well which would indicate that there was already secondary vegetation (Liebi 1993:65-66).

[13] It seems that there are also church manuscripts dating back several centuries and written in Ge'ez, which are thought to contain information on land transaction and could serve to throw light on relevant issues such as land use. However, this material has not been comprehensively compiled, translated or analysed as yet (Boerma 1999:90).

***Forestry policy and woodland cover during Italian colonisation***

The literature of the early colonial period was full of comments on the lack of vegetation in many areas of the colony. The first general assessments of the forestry situation in Eritrea were made by the forestry inspector L. Senni between 1905 and 1907 and by Adriano Fiori in 1909. Senni stated in his report, that there were real woodland formations only on the eastern escarpment zone. According to Boerma (1999), if one were to take Senni's observation at face value it would appear that not more than 7.5% of the country was forested between 1905 and 1907. Fiori's overall impression of the state of Eritreas woods and forests was generally more favourable than Senni's but he also described the Highlands as being rather lacking in vegetation in contrast to the relatively rich woodland of the eastern escarpment. Fiori was convinced that the colony would have been completely covered in forests had it not been for the effects of centuries of ruinous practices by the indigenous population. Thereby he articulated a view that has persisted to the present day in one form or another. He speculated that the deforestation had accelerated considerably since the arrival of the Italians.

According to the findings of Boerma (1999), it seems that in the early years of colonial rule, large quantities of wood were indeed used for various military, infrastructural and constructional purposes. During this time there is evidence that the forests of the eastern escarpment suffered from high levels of wood exploitation also brought about by clearance of land for agriculture by the local population and illegal trading in wood by both Italians and Eritreans. The indigenous population required a lot of wood as fuel and tree branches as animal fodder, the traditional *hidmos* required vast number of trees for their construction. However, the quantities of wood being consumed by the Italian military and exploited by private Italian commercial operators exceeded the level of consumption by individual Eritreans by large amount. Though legal concessions to cut wood were granted to several Italian traders, many operated without a permit or illegally exceeded the amount of wood that their concession entitled them to. The legislation, which was mostly directed to control the wood cutting practices of the native population, failed to target Italian woodcutters. Despite new legislation to contain deforestation, the Colonial administration largely failed to control illegal cutting of wood for commercial purposes, since too many Italians were engaged in such activities.

With the change of the political Regime in Italy in the 1920's, vigorous action was initiated to deal with forestry issues in Eritrea. The Government set about establishing a police-like civil forestry guard, which in 1935 received a quasi-military identity and was renamed the *Milizia Nazionale Forestale*. In 1933, comprehensive legislation was introduced, which laid down what type of wood could be cut by the Italian and native population respectively, in which areas and under what circumstances and specified the conditions of the allocation of concessions. The regeneration of the tree population of the country was seen as important to the process of general agricultural improvements because of their assumed beneficial effect on land stability, climate and fertility. Therefore different places were 're'-forested with mostly eucalyptus trees and agave silsana. In the early 1930s, different reforestation and soil conservation measures were made throughout the Eritrean Highlands. The survival rates of the planted seedlings seem to have been generally poor at the beginning, however. Greater success was achieved in Government run plantations in the vicinity of Asmara, Segeneiti and Adi Ugri, which received much publicity.

During the last years of the fascist period, years of concern for the preservation of Eritrea's woodlands were swept aside for the purpose of Italy's wider colonial ambitions. The firewood requirements of the military as well as the rapid burst of urbanisation, industrialisation and expansion in infrastructure placed heavy demands on the available wood supply of the country. Apart from these last years however the intentions of the colonial administration regarding wood resources seem to have been otherwise generally careful and sustainable. Not only was most of the wood required for construction imported from abroad and tree planting programmes

fostered but the Government also spent considerable effort in putting into place stringent legislation to prevent the excessive felling of trees (Boerma 1999:94-142).

**Figure 3-4a: "*Bet Ghirghis – Rimboschimenti*" (Photographer unknown, 1937. AOI, ER 16)**

**Figure 3-4b: Bet Gherghis (photograph by L. Lätt, 18.02.2004)**

The photograph of Bet Gherghis shown by figure 3-4a was taken in 1937 by an unknown photographer in Bet Gherghis to show one of the first reforestation programs which was run by the Italian Government. The Bet Gherghis Park had been opened in 1933. Clearly one can see young eucalyptus trees growing up in groups, and sisal plants, which have been planted in regular lines. Bet Gherghis, situated on the outskirt of Asmara along the road, which connects the town to the eastern escarpment and Massawa, is today covered with a dense forest of eucalyptus trees with different kinds of cacti, mostly sisal and beles, growing between them (see figure 3-4b). The park is used as a recreation area for the urban population of Asmara and there is even a zoo there.

### *Forestry policy and woodland cover during British administration*

The history of the British Military Administration's role in the process of deforestation in Eritrea is on the whole little known and has generally been eclipsed by the presumption that Italian colonialists were chiefly to blame for the removal of trees in Eritrea.

The great expansion in urban population created a large market for wood as fuel and charcoal, this was also brought about by shortages in alternative fuel sources. Because of the war supplies of oil became increasingly difficult to obtain. The population was therefore increasingly dependent on wood as fuel for domestic purposes. Furthermore, there was a large external demand for wood and charcoal from other British occupied territories which had partly restricted access to the usual channels of timber and charcoal due to war. Timber and charcoal exports were economically very profitable for the British Administration. Most of the timber that was exported consisted of juniper, obtained mainly from the Mataten forests around Halai and from the Rora Habab region in the north, acacia albida and also euphorbia, which was particularly valued for the manufacturing of matches, battery separators and also used for roofing.

Andrea Branca, the head of the Forest and Wildlife department, estimated the percentage of wood cover at 10% in the areas of Hamasien, Seraye and Akele Guzay, 5% in the Province of Keren, 20% in the Western Lowlands, under 2 percent in the Eastern Lowlands and 11% of the country as a whole. However his definition of wooded areas ("*zone boscate*" in Italian) is not

exactly clear.[14] The assessment of 30% woodland cover before Italian colonisation seems to appear in this publication for the first time.

The legislation that had been introduced by the Italian Government in 1933 was adopted with no significant changes. The *Milizia Nazionale Forestale* continued in much the same form as under the Italians and the British also continued to allocate wood concessions. While the British Administration felt that concessions were essential for the controlled supply of wood to the urban areas and export market there seems to have been some uneasiness by 1945 with the extent of wood-cutting in the country, especially in the area of Adi Kayeh. The extent of concessions began to be resented by people on whose land they were granted. Illegal woodcutting continued despite the legislation in place while grazing restrictions were consistently violated.

Forestation was also an important aspect of the BMA's forestry strategy in Eritrea. The rural population should be fully involved in the replanting of trees. As under the Italians, however, the survival rates of the seedlings seem to have been very low. The poor results of the tree-planting programmes arose largely from the failure of the British to properly understand the role of trees in the daily resource strategies of the local population. Many people saw tree planting as problematic because it interfered with the way they managed their time, their energy, their grazing land and other aspects of their existence. They were also hostile to the idea of planting trees when so many had been removed by the British themselves. Furthermore they had no economical interest in planting trees as they were not allowed to sell them and the eucalyptus trees, while useful for construction, are not suitable as firewood or for charcoal.

It also seems that the Eritreans themselves knew of long-established systems of wood resource management. For instance temporary closure of certain areas of common village land for several years at a time was widely practiced in order to restrict livestock grazing and to allow for the regeneration of the local vegetation. Wood used for house construction was generally cut at specific times of the year to allow maximum regeneration.

The total amount of wood extracted from the Central Highland area was not particularly large and relatively few areas were affected by wood concessions. Conversely in the areas where concessions were granted the level of extraction seems to have often been very high causing considerable damage, hardship and resentment. The extraction of timber from previously well-forested areas such as the Mataten area, the eastern escarpment areas of Hamasien and the Kohaito plain where archival evidence confirms the existence of denser vegetation in the past, seems to have become a particularly notorious legacy of the colonial experience (Boerma 1999:120; 145-191).

### *Woodland cover during Ethiopian rule*

Despite the change in Eritrea's political status in 1952, the legislation and policies in place with regard to forestry did not go through any significant transformation during the Federation period. The Italian forestry legislation of 1933 which the British had retained, remained unchanged and the basic tenures of the forestry service, namely the granting of wood concessions to ensure domestic wood supply together with tree planting by communities, continued as the cornerstones of actions. Villagers were also required to plant sisal and cacti on land not otherwise used in their villages. With the dissolution of the Federation in 1962, Eritrea came under the legislative of the Ethiopian state. The Ethiopian legislation did not represent any radical departure as far as Eritrea was concerned in terms of forestry management. As in the

[14] In fact it is difficult to compare the different figures of woodland assessment published in different reports, since often the exact definition of woodland or forest is not given (see also chapter 1.2.4).

case of the Italian decree of 1933, the 1965 forestry proclamation designated certain areas of woodland and forest as reserved areas, which in the case of Eritrea remained largely unchanged. It also required that permission was sought to cut or collect wood for commercial purposes and made it an offence to cut any tree on private land without the prior consent of the Government. The implementation of forestry legislation designed to protect trees from over-exploitation seems to have been rather lax, however. The Ethiopian Government was also very keen on planting trees and on promoting terracing, a policy that was pursued throughout Ethiopia. During 1961 and 1965 an extensive re-forestation and soil conservation programme (work relief programme) was implemented by the Ethiopian Government in Nefasit, Lesa, Mai Habar on the Asmara-Massaua road. The species used was mostly sisal (Boerma 1999:200-204, see also DOA 1974). People were incited to participate in the reforestation under food-for-work programmes, which were also carried out later on under the Derg and in the post-liberation period. However, the motive for participation in these programmes appears to have been mainly to obtain food rather than any enthusiasm for planting trees.

When Emperor Haile Selassie was overthrown in 1974 and the Derg Regime took over the struggle for independence escalated into a wider war of liberation and in the context of increasingly intensive fighting a systematic implementation of forestry legislation was not possible. The EPLF devised agricultural development strategies for the area, which they had liberated and for those areas which they sought to infiltrate particularly in the Central Highlands. By embracing concepts like the relationship between tree removal, soil erosion and desertification, they made soil conservation and tree planting an important cornerstone of their campaign to educate rural farmers and bring about agricultural development in the areas which it had liberated (Boerma 1999:205-206).

The 30 years civil war is blamed for the destruction of much of Eritrea's vegetation, although what impact the war had on vegetation cover seems to be a matter for conjecture. On the one hand, bombs and napalm have been used in some parts of Eritrea to clear vegetation for defence purposes and a lot of trees were pillaged and plantations destroyed by Ethiopian soldiers. Trees were cut to sell in Asmara and also for the building of trenches, which required a lot of wood. On the other hand, Boerma shows in her study that the increased inaccessibility of certain areas during war might have had a positive impact on the landscape in some Highland areas. General military activity and mines kept animals and their herders away from the more remote areas of community land. So while greater pressure was placed on land and vegetation closer to the villages more distant grazing lands were effectively left to regenerate. The fall in livestock numbers that occurred during the 1980s throughout the Eritrean Highlands may also have relieved pressure on grazing land and favoured the regeneration of vegetation particularly in areas that were a greater distance from community settlements (Boerma 1999:298-307).

### *Forestry policy in the post-liberation period*

Tree planting and the regeneration of the landscape as an act of faith in the future of the country and of its ability to prosper, was vigorously pursued and transformed into activities of patriotic dimensions in the post 1991 period. A massive campaign was launched to undertake wide scale terracing and reforestation on eroded hillsides (see also chapter 3.3.6). Besides the tree planting and terracing, natural woodland closures, micro-catchments protection, dam construction and the upgrading and expanding of the seedling nursery network were some other initiatives undertaken to restore the degraded landscape which seemed to stand as a testament for all the years of violence and destruction.

The provisional Government introduced a series of directives designed for implementation at the village level that strictly forbade the cutting of live trees for whatever purpose. Villagers were allowed to collect dry wood for domestic purposes only while a restricted number of

licenses were issued to private traders permitting controlled collection of wood for sale to the urban centres.

Forestry issues are still regularly discussed in the media both in newspapers and on the radio. The extraordinary level of resources devoted to the planting of trees, coinciding with a prolonged period of above average rainfall, resulted in a huge expansion in the number of trees and an impressive regeneration of much of the Eritrean landscape in the late 1990s (Boerma 1999:207-208).

# *4 EVALUATION OF THE FIELD STUDIES*

# 4.1 Introduction

## 4.1.1 Places of the field studies

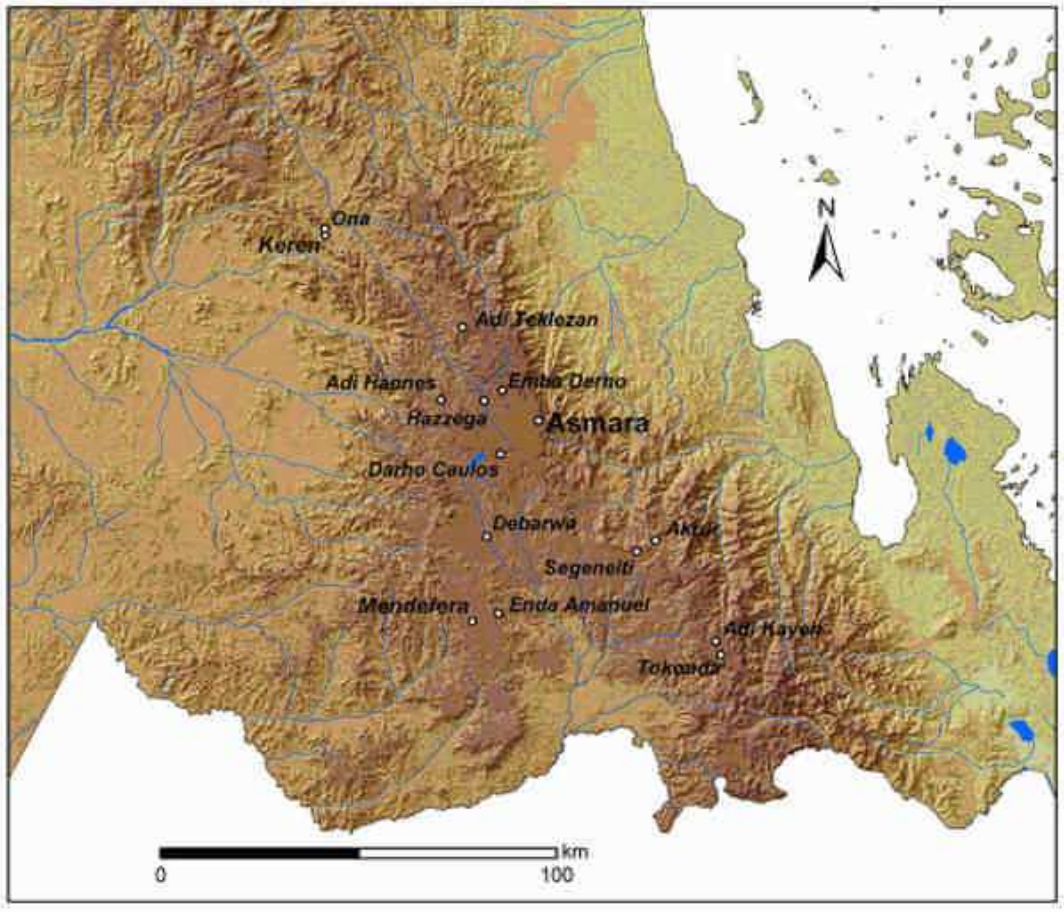



**Figure 4-1: Map of the Central Highlands of Eritrea with the locations of the field studies (map by Kurt Gerber, CDE)**

Apart from Keren and Ona, which at an altitude of 1400m belong to the western escarpment (see also chapter 3.2.1), all field studies were carried out in the Central Eritrean Highlands. The altitudes of the places vary between 1870m (Akrur) and 2420m (Adi Kayeh). The capital Asmara is located at an altitude of 2347m. The places Asmara, Darho Caulos, Emba Derho, Hazzega, Adi Hannes and Adi Teklezan, formerly belonged to the historic province of Hamasien. The southern areas Segeneiti, Akrur, Adi Kayeh and Tokonda used to belong to the Akele Guzay and Debarwa, Mendefera and Enda Amanuel to the Seraye province. The Akele Guzay and the Seraye are now integrated in the new administration region Debub. Keren and Ona were once part of the Senhit or Keren province, which now belongs to the Anseba administrative district.

### 4.1.2 Structure of the field studies

The locations of the field research are geographically grouped into three areas: The first area includes the area between Darho Caulos, a few kilometres southeast of Asmara, and Adi Teklezan forty kilometres north of Asmara, which formerly belonged to the province of Hamasien. The second area includes the southern part of the Central Eritrean Highlands, the former provinces of Akele Guzay and Seraye, and the third area will focus on Keren and its surroundings. For each of these areas, general information will be given first on its history and environment, mostly based on historical travel accounts, travel guides and secondary literature. Afterwards, each photographic comparison will be separately discussed. Firstly general information will be given again on the specific place. Afterwards, the historical picture will be analysed. This happens in two steps: First, general information will be given regarding the photographer, the caption, and the time when the picture has been taken, (outer critique) and afterwards the contents of the picture will be analysed (inner critique, see chapter 2.2.1). Here the photograph is screened especially for information about the soil, agriculture, vegetation, settlement structure and the architecture of the houses. After the analysis of the historical picture the modern comparison picture will be approached, this will be analysed in the same way as the historical picture and a comparison will be made. After the analysis of the landscape and landscape changes on the reconstructed picture, information will be added that was obtained from interviews and other sources that have not been involved already in the description of the pictures. Sometimes non-reconstructive historical photographs or new photographs showing the location from another angle will be included in this part to clarify certain aspects. In conclusion to this part an overview will be given of the most important changes or similarities in the area and an attempt to reconstruct the method and reasons for these changes will be made.

## 4.2 The northern part of the Central Eritrean Highlands

### 4.2.1 About the area

The highland plateau of Asmara formerly belonged to the province of Hamasien, before the provincial borders and names were changed in 1996. The “Republic of Hamasien” was politically independent under the House of Tsazzega, which dominated the province until the 1870s. Because of its central location, on the trade routes from the coast and the Anseba valley, Hamasien’s ruling families were traditionally the most powerful in Eritrea, and succeeding Tigrean and Italian rulers established their capital at Asmara. The attractive power of the location led to a considerable growth of this city, outlining villages have been drawn into the urban economy and many former villagers have settled here, so the history of Hamasien has largely become the history of Asmara. The area is today the centre of Eritrean politics and the dominant Tigrinya culture (Killion 1998:243).

Most foreigners who travelled to Eritrea or to Northern Ethiopia in the 19$^{th}$ or early 20$^{th}$ century, passed the highland plateau of Asmara and the town itself and often stayed there for some time before travelling to Keren in the north or southwards to Ethiopia. They mostly docked at the port of Massawa and ascended the eastern escarpment to reach the highland plateau. The change of vegetation cover from the eastern escarpment to the highland plateau seems to have often impressed these travellers, who sometimes expressed their amazement of this brusque change in their travel accounts. G. Saint-Yves, an envoy of the Geographical Society of Marseille, for instance wrote in 1899:

"At the moment when after a long ascension from Arbarobe on the road which draws sinuous meanders on the hillsides you arrive on the plateau of Hamasien, the change of the setting is abrupt, unexpected, like in a dream. No wooden mountains any more, no alpine valleys, no euphorbia-candelabras: A plate stretching to the extreme limits of the horizon, without a tree, almost without any shrubs, just short grass, with here and there elevations of the soil, showing all the same table-like shape, the same geometrical regularity; it is what the Italians call the altipiano, the highland, the voina-dega of the Abyssinians" (Saint-Yves 1899:275, translated from the French[15]).

35 years later, the French adventurer Henry de Monfreid used similar words to describe his disappointment in seeing the dry, dusty and sunburnt plain after having admired the beautiful vegetation of the middle altitudes. He noted that there was no sign of vegetation any more apart from some eucalypti, which had been planted by the Government. Apart from those there was "no grass, nothing; dust and rocks…." (Monfreid 1934:164).

Dainelli, who travelled in the Eritrean Highlands in 1905, noted that the soil around Asmara was fertile, despite the lack of cultivations or trees:

"The soil here, on the highland of Asmara (…) is very ferruginous. Any cultivation or tree vegetation is lacking, it's true, certainly due to human fault more than to nature, but the layer of agricultural soil is rather profound and rich of elements which are suitable for the cultures" (Dainelli 1909:33, translated from the Italian).

According to the Italian journalist Renato Paoli, who travelled in the Hamasien area in 1908, the whole Hamasien plain would have had a rather desolate appearance at the beginning of the 20th century:

"The horse ran like the wind along the straight road, through very green fields of grain, barley and *teff*. The scenery, which looked a bit sad, reminded me of the Roman Campagna: the same endless cultivated fields, the same nudity of the terrain without any tree, the same rocky and dry riverbeds (…) the same soft undulations of the soil. Only the hills with their unusual line and plain top and their nude, steep, rocky slopes put here and there an end to the horizon. Like dark spots indigenous villages emerge between the green fields or they appear on the hills. From far they seem thatched, grouped around a bigger conical roof, surmounted by a cross – the church – close to a little forest – the cemetery (…) All along these vast valleys not a tree nor a shrub appears to interrupt the monotonous, desolate, severe aspect of the green fields and of the regular hills. The whole highland looks like that: Who has seen it in Asmara can say to have seen everything. More or less fertile, the highland presents a tiring and saddening uniformity. Hills following one another; undulating lands, green during the short humid station, reddish, dry and dusty during all the long dry season. Just here and there some poor agaves, scarce thorny shrubs or acacias can be found, which resist to the dry climate" (Paoli 1908:196-197, translated from the Italian).

Dainelli had a rather more differentiated view of the landscape. Although he described the north of Asmara as almost treeless as well, he noted that the small ravines in the north of Emba Derho were vegetated.

"Until Amba Derho, the road literally runs over the highland of Asmara, a uniform surface, almost horizontal, slightly inclined to the south-east, from which here and there some elevations are rising. Tree vegetation is lacking, apart some picturesque gigantic trees close to the village of Amba Derho; apart from those, there are just short shrubs of sage perfuming the air and there are ploughed fields and extensive meadows. (…) Proceeding to the north, the small rills of water become larger and get the aspect of small valleys where some olive trees and agaves with their beautiful orange colour are adding to the short vegetation" (Dainelli 1909:40, translated from Italian).

[15] The French, German and Italian citations have all been translated to English. They are all listed in their original language in the Annex

Bent, who also travelled to the north of Asmara in 1893, also noted that there were no trees for miles north of Asmara. He also provides the reader with information about the agriculture and livestock in the area:

"We elected to take a week for a journey to the north of Asmara (…) Our road was decidedly uninteresting at first, across the dry, undulating plateau, without a tree in sight for miles. During the rainy season, I am told, this road is hardly passable for mud; in the dry season it is painfully arid and burnt up. (…) About an hour's ride brought us to the village of Addi David, with its little square stone church dedicated to St. George, built on the same lines as that at Asmara. Here we saw large quantities of cattle with the high hump and long dewlap of the Indian breed. The inhabitants were busily engaged in threshing their teff (…) Another hour brought us to the important village of Amba Derho, built on a gentle hill overlooking a somewhat fertile valley. (…) The chief of this village, Dejethmatch Hatwa, is a wealthy man for Abyssinia, having a large stock of cattle and many fertile acres" (Bent 1893:67-68).

On a military map of 1888, stored in the IAO of Florence, the whole distance between Asmara and Adi Teklezan is described as hilly plateau without tree vegetation, relying on observations made by the Swiss Werner Munzinger, who passed here in 1858 and 1860. On the other hand, the valley of the Anseba river, which runs to the north some kilometres west of the Asmara-Keren road, is described as rich in water and vegetation, based on observations made by Heuglin in 1861. This information would confirm the observations made by the geographer Captain A Mulazzani (1935:70), that while the tree vegetation in the Highlands was generally scarce, there was abundant vegetation in the deeper basins and along ravines[16].

These few descriptions of the appearance of the Hamasien plateau during the time of Italian colonisation seem to confirm largely the observations described in other travel accounts compiled by Liebi (1993) and Boerma (1999), which date from before Italian colonisation (see also chapter 3.5.2).

### 4.2.2 Asmara

Asmara is located centrally on the plateau of the Eritrean Highlands, at an altitude of 2347m, about four kilometres west of the edge of the eastern escarpment. When the town was occupied by the Italians in 1889 under General Baldissera, the town actually consisted of three main settlements and two others on nearby hills. Initially the town was founded in the 12$^{th}$ or 13$^{th}$ century, when four villages became established in the area where the town is located today. When the villages merged together, the settlement received the name "arbate Asmara" with arbate meaning four in the Tigrinya language. Ferdinando Martini, the first colonial governor, made it the capital of the territory as Asmara had a more favourable climate than the initial capital Massawa on the coast of the Red Sea. Asmara then had a population of around 5'500 Eritreans and 910 Europeans. The Italian military-colonial administration in Asmara was at first entirely conducted from tents but it was not long before extensive building was undertaken. By autumn of 1892 a Belgian officer reported that the Italians had displayed prodigious activity in making the town as rapidly as possible a military position and the base of operations for their expeditions into the interior. Bent in the following year noted that the settlement was already one of the most important locations in the colony and the basis of all Italian operations (Pankhurst 1985:331).

[16] It is not exactly clear, however, if this statement refers to Hamasien only, or to the highland area in general.

The modern town Asmara was largely constructed in the 1930s when the population rose to 20'638 Eritreans and 3'101 Europeans[17]. Although it was built during the fascist period Asmara was built with style and elegance: A dazzling international Moderne City was created, which was well planned, functional and of great aesthetic appeal. Many of the great architectural styles of the period are seen all over the city: Italian Rationalism, Futurism and Novecento; Streamline Moderne, Bauhaus, Expressionism, Functionalism and Cubism. Whole suburbs of Art Déco spread out and the town centre with the palm-line boulevards, the cafes, bars, parks and gardens creates the atmosphere of a Mediterranean resort town of the 1930s. Fortunately, most of the buildings survived all the different changes of Governments and the war with Ethiopia (Killion 1998; Denison; Paice 2002:89; Oriolo 1998:31). Today Asmara is by far the largest city of Eritrea and is growing rapidly with an estimated population of around 450'000. The city also attracts a lot of people returning to Eritrea from abroad including a large number of Eritreans who grew up in Addis Abeba and were expelled during the last conflict.

#### 4.2.2.1 View towards the east

The capital Asmara was photographed by different photographers at the very beginning of the Italian colonisation. By chance two pictures were found whilst conducting the research for this thesis, one taken in 1896 by Francesco Nicotra and kept in the photographic archive of the *Museum für Völkerkunde* of Vienna and the other belonging to the collection of Carlo Gastaldi and dating probably from around 1900, these show almost exactly the same view of the east of Asmara: Two small villages with most of the huts being constructed as *aghdos*, situated in a barren looking plain and in the horizon a line of high hills marking the top of the eastern escarpment.

***To figure 4-2a***

The photograph 4-2a was taken by the Italian Photographer Francesco Nicotra, who was among the first people in Eritrea to possess a high quality camera (see chapter 2.2.3). According to the indication on the bottom of the picture, the photograph was taken in 1896. As an inheritance of a named Steindacher, the picture is stored in the "*Museum für Völkerkunde*" in Vienna. The photographer must have stood somewhere on a hill or on an elevation, where he was able to overlook the plain of Asmara. Probably he was standing on the place where today the presidential palace is situated, looking towards the east.

The picture shows a plain, stretching some few kilometres to the horizon, where a line of rather high hills appears. The plain looks very deserted and bleak, apart from some bunches of grass in the foreground, there is almost no vegetation visible on the picture. The hard soil is covered in some places with small rocks. In the centre of the picture some huts and tents are grouped together surrounded by a fence of small shrubs forming an irregular square. These live fences always seem to have been quite popular in the Highlands of Eritrea and Ethiopia, where people preferred to plant shrubs rather than to build fences out of wood. Towards the back of the square, some *aghdos* or *tukuls* can be seen. The circular wall and the conical roof of these huts are both thatched. Just in front of these *tukuls* there are some circular and some square white tents testifying from the presence of the Italians in this area, who were apparently ruling the town in the first period of their occupation from these provisional accommodations. The tents do not seem to be arranged in any specific order. Towards the right side of the settlement a square thatched house is standing. The construction of the house with the pitched roof testifies clearly to an Italian influence. In front of this house some further circular *tukuls* can be seen.

[17] This is the official figure for the population in 1931, which is cited in Killion 1998: 95

**Figure 4-2a: "*Asmara-Villaggio indigeno"* (photograph by F. Nicotra, 1896. MVK No.12.815)**

**Figure 4-2b: "*Baracamento Ascari, Villagio Asmara, La Porte del Diavolo, Villagio di Ras Alula"* (Extract, photograph probably by C. Gastaldi , ~1900. SGI Album 116)**

**Figure 4-2c: Asmara towards the east (photograph by L. Lätt, 16.04.2004)**

In the foreground of the photograph, in front of the settlement, some further thatched huts are present. Some water jugs have been placed before them. Between these houses, in the foreground of the village in the centre of the picture, a group of people of different ages can be seen, all of which seem to be native Eritreans. Some are dressed in white clothes and some are standing, while most of them seem to be kneeling or sitting and seem to be looking in the same direction suggesting that the picture might be illustrating a religious celebration or other convention. Behind the village in the centre of the picture, another similar settlement can be seen, again thatched *tukuls* and square huts are present. The hill behind this small village is also covered with scattered huts along with, what appears to be, two white tents. The mountains in the background look as bleak as the plain, whether they are covered with short grass is not clear.

***To figure 4-2b***

This picture of Asmara has probably been taken by an Italian called Carlo Gastaldi. It is stored in an Album with the title *Ricordi della Colonia Eritrea*[18] in the photographic archive of the SGI in Rome and carries the name of Gastaldi. Unfortunately it is not known when Gastaldi took these pictures, but to judge from the architecture of the villages shown on them it cannot have been much later than 1900. In fact, Carlo Gastaldi has taken four panorama pictures of Asmara looking towards the east. Figure 4-2b show an extract of this picture series on which the following descriptions will be focused as it shows exactly the same frame as the photograph of Nicotra, although the angle may differ a little.[19] The photographer was probably standing on the same elevation as Nicotra, possibly some meters to the right.

The picture shows the same arid, bleak plain already seen on the photograph of Nicotra, with the two small villages. In the background the same outlines of the hills that indicate the top of the eastern escarpment can be seen. A street is now also on this picture on the left of the main settlement, which leads to the mountains in the background and probably further on to Ghinda and Massawa. Some people are walking on this road and one person seems to be riding on a donkey. To the left of this street, about eight *aghdos* have been built in a line and to the left of this line there is again another file of *aghdos*. This regular linear structure has probably been made or imposed by the Italians since it is not common for Eritrean villages. The walls of the huts are all made of stone. On the right side of the street three small fields are aligned and bordered by live fences of short grass. Just to the right of the front field, in which a cow seems to be grazing, the same village can be seen as on plate 4-2a, having changed a little in the meantime. In general the settlement has a less temporary and provisional appearance than on the first historical picture. Most of the huts are still aligned at the back of the square fence but their walls are all now made of stone. The long square house on the right side has exactly the same shape as on the picture of Nicotra but its walls are also made of stone and its roof is probably made of corrugated iron. The white tents do not appear. Most of the huts in front of the village are also not apparent and only one square house remains, this has also been made of stone but with a flat roof of straw. These houses must have been built or renovated by Italians. Unfortunately picture quality hinders the recognition of many details in the background of the village front. It can be seen however, that the settlement in the back is still there and the hill is still covered with *aghdos*, though two circles, which can be seen on this hill, seem to indicate that the huts have now been constructed according to a more specific structure. The *aghdos* of stone normally have a longer life span than the thatched *tukuls*. According to Denison and Paice (2002:13) they normally last about ten years, so that the structure of the settlements has probably played a more important role here, than on the first historical picture. Obviously the

[18] Memories of the colony Eritrea

[19] For the whole picture see Appendix

vegetation has not changed since 1896: Apart from the short grass fencing the fields and the settlement, no vegetation can be found at all and the plain still looks very deserted.

### *To figure 4-2c*

This reconstruction picture has been taken in the early afternoon on the 16th of April 2004 from the top of the bell tower of the Roman Catholic Cathedral in the town centre of Asmara. It was the only possible location available to take a picture overlooking the town and where it was also possible to see the outlines of the mountains east of Asmara. However, it can be presumed that both photographers of the historical pictures were standing further away from the mountains than this location.

Apart from the shape of the mountains in the background of the picture the landscape of Asmara is almost unrecognisable. Neither huts nor other settlements can be found on the picture, only a part of a big town showing only square, flat-roofed multi-storey buildings, which are mostly dating from the Italian era and on which dish antennas are installed and washing is hanging. On the right side of the picture the building of the Red Sea Corporation is standing out with its modern architecture. In the centre of the picture Harnet Street, the main avenue of Asmara, can be seen. It is leading towards the east of the town and is bordered by big palm trees. Surprisingly, the road seems to be in exactly the same place at which a street was vaguely indicated on the photograph of Carlo Gastaldi. It obviously has now been asphalted and cars are driving on it. To the right side of the street, in the middle distance, there is a small forest of eucalyptus trees. They belong to a park dedicated to John the Baptist. The hill on which scattered huts could be seen on the historical pictures is now overbuilt with houses, its relief can still be imagined since the houses on the hill are visibly higher than the houses in the town centre. The mountains on the left are partly overgrown with trees (mostly eucalypti) which were probably partly planted here already under the Italians. The antennas on the very left mountain cannot be identified very well on the picture.

### *Conclusion*

The two historical pictures show very clearly how bleak and barren the surroundings of Asmara were already at the very beginning of the Italian colonisation, confirming the descriptions in the travel accounts cited in chapter 4.2.1. They also provide a lot of information about the structure of the villages and the architecture of the houses at this time. Already between the two historical pictures a lot of changes can be detected. It seems that the settlements were already changing from a very provisional to a more future-oriented town-like state soon after the Italian occupation. Both the historical photographs testify to the influence of the Italians. A comparison with the reconstruction photograph shows that the town has changed extremely in the last hundred years, growing to an important city with almost half a million inhabitants. The buildings of the town centre are mostly dating from the thirties when the town was built up under the fascist Regime. An interesting aspect is that the main road has persisted in exactly the same place during the last hundred years. Regarding the vegetation Asmara looks definitely much greener today compared to the historical pictures, although the plain now has houses built over with. While there were no trees at all in evidence on the historical pictures there are many trees in Asmara today, not only the eucalypti on the hills bordering the eastern escarpment but also palm trees and other trees and shrubs which are bordering the roads or which are growing in gardens and in parks. The influence of an enormous population increase has obviously not only been bad for the environment of Asmara and its immediate surroundings.

#### 4.2.2.2 Forto Baldissera

***Introduction***

The Bet-Maka or Forto hill in the west of Asmara was also a popular object for photographers in colonial times. On this hill of red lateritic rock a fort was built by General Baldissera just after occupying the town in 1889 which named after him for many years. Today it is usually just called Forto. Wylde (1901:123) described the fort, which commanded the plateau on the south and west, as very large, very strong and perfectly impregnable. The camp underneath the fortress would have been capable of holding many thousands of men. Powell-Cotton noted that the fort covered a large area, and was surrounded by strong stone-walls protected at the angles by seven cannons. On a nearby height 800 metres from the main fort were the officers quarters, lodgings for a company of Italian troops, an ammunition magazine and arsenal, all protected by a large wall and a series of block-houses, while the camps for the native troops were placed on the periphery (see Pankhurst 1985:333). According to Saint-Yves (1899:277), Fort Baldissera was the most important fortification of the colony and was of major strategic importance in that it a commanding view over the Hamasien plateau. The view over the vast surrounding plain was only limited by the hills in the east towards the escarpment. Also Rosalia Pianavia-Vivaldi (1901:30) describes the fantastic view one has from the Bet-Maka hill over herds of oxen, goats, sheep, donkeys, mules and horses spread on the meadows in the basins and on the slopes, and on couples of oxen attached to the plough.

Bet-Maka was not only the name of the hill but also the name of a village which was once located on the hill and was removed to its western side when the Italians occupied the town and the hill. According to Saint-Yves (1899:277), the village in 1892 counted 10 families (about 50 people), 46 oxen (!) and hundred sheeps. Today it is a suburb of Asmara. At the beginning of the 20$^{th}$ century, the "*cemiterio per gli europei e assimilati*" was also established here (Bertarelli 1929:626). The shape of the hill with the long flat top is characteristic of many hills in the Central Eritrean Highlands.

***To figure 4-3a***

The historical photograph of the Fort Baldissera has also been taken by Francesco Nicotra in 1896. It is possible that the picture was taken from the same elevation as the other photograph of the western part of Asmara only that this was taken facing west.

The photograph shows a plain with a rocky hill in the background, which is crowned by a long fortification surrounding some houses. The plain is covered with short grass. As on the eastern side of Asmara no trees or shrubs can be seen in the area. Some cows or cattle are grazing on the plain. At the foot of the hill an indigenous village with *aghdos* can vaguely be seen. Only the conical, thatched roofs of the huts are clearly recognisable. From the right side of the picture a road is leading towards the village and up the hill to the fort probably more or less in the same position where today the Revolution Avenue leads from the presidential palace down to the fort. Some people can be seen walking on this road. At a certain point a small bridge has been built, probably where the road leads over a small river, which is not visible on the photograph. However, there seems to be a small pool of water on the right of the bridge, which could possibly be part of the river. Bent, who returned to visit Eritrea in 1896, 17 years after his first visit to the country in 1879, noted that indeed, good roads had been built by the Italians in the intervening time in every direction with "culverts over the waterways and good bridges over the streams" (Bent 1901:123). The soil seems to be more moist than on the other historical photographs and there is more grass growing. On the left side of the road in the foreground one can see two square houses of wood with a pitched roofs, which have obviously been built by Italians. On the right of the village at the bottom of the hill, just next to the road, there is a small

square house of stone which has obviously also been constructed by the Italians. It may be a guard post. To the left side of the village, at the foot of the fort hill, some other Italian stone-houses can be seen. On the right side, some hundred metres before the fort, there are some long square buildings of stone, which are probably shanties. On the rocky hillside, which does not seem to be vegetated at all, different paths can be seen leading up to the top of the hill. The long and thick stone fortification partly covers the few long houses with their pitched roofs, which can be seen on the hill. Also at the very right end of the hill there seems to be a building belonging to the fort.

**Figure 4-3a: "*Asmara – Col: Bet-Maka e forte Baldissera"* (photograph by F. Nicotra, 1896. MVK)**

**Figure 4-3b: The forto hill in the west of Asmara (photograph by L. Lätt, 19.02.2004)**

### *To figure 4-3b*

This photograph has also been taken from the top of the bell tower of the Roman Catholic Cathedral on the morning of the 19th February 2004. This was the best place to have a view of the Fort Baldissera hill. The location was situated some hundred metres further away from the fort than the position of the historical picture and a zoom lens was used to get the hill more or less at the same scale.

Apart from the shape of the Bet-Maka-hill the landscape of the historical picture is almost unrecognisable. The plain has been built over with multi-storey houses with roofs of corrugated

sheets, most of them probably dating from the late 1930s. Palm trees, eucalypti and other kinds of trees have been planted between the houses. Large parts of the fort hill in the background are also overgrown by eucalypti and various kinds of cacti, mostly *beles* and *kolqual*. The large fortification wall is no longer there. Parts of the fort have still remained on the right side of the hill and there is still a military outpost there. In the centre of the plateau of the hill the two large white buildings of the Ministry of Information can be seen and just on the left of the buildings, the television aerial stretches towards the sky. Also on the plateau of the hill, different kinds of trees (mostly eucalypti) are growing.

***Conclusion***

The function of the fort hill seems to have remained the same during the last hundred years, since the military is still stationed there, although the relative importance of the hill for the military might have decreased since the fortification has become smaller and there are also other important military camps in the surrounding area. The strategic location of the fort hill has obviously also attracted the Ministry of Information including the Eritrean Television to install their buildings on the plateau of the hill.

Similarly, as with the first photo-comparison of Asmara, it can be seen that the western part of Asmara has also changed almost into an oasis during the last hundred years. Here it is also evident that the massive population increase and the change in architecture and structure of the town has on one side led to the overbuilding of the plain, which was almost empty at the beginning of Italian colonisation. On the other hand, a formerly mostly barren plain and hill have been covered with palm trees, eucalypti and other types of trees and shrubs bordering the avenues, growing between the houses and in parks, cacti can be seen to be growing on the hillside.

### 4.2.3 Darho Caulos

***Introduction***

Unfortunately, only little is known about Darho Caulos, a small village located about thirteen kilometres southeast of Asmara. According to Bertarelli (1929:629), there was a grotto with antique sculptures around it. The village is situated on an elevation from the border of which a broad valley can be overlooked.

***To figure 4-4a***

This historical picture has been taken by an Italian photographer called Rochetti in 1954 and is stored in the IAO in album ER 25. The picture must have been taken from the top of the elevation where the estate is situated and from where there is a perfect view over the irrigated valley. The estate photographed in this picture was formerly owned by a wealthy Italian who was apparently a friend of the photographer. Other photographs from the same album show the two men standing together. The farm was probably a kind of model estate since irrigation on this scale was not very common in the Eritrean Highlands in Italian and British colonial times.

The photograph can be roughly separated into the foreground with some fields lined up in a very regular geometry, on which obviously different kinds of crops or vegetables are growing and the background where various fields are stretching towards the horizon of the photograph. The large valley is framed by different long hills to the right and to the left of the picture, these

do not seem to be vegetated although their colour is darker than that of most of the fields in the valley. Given that the photograph must have been taken during the rainy season or shortly afterwards the hills may be overgrown with grass. In the very foreground of the picture some shrubs can be seen which are probably growing on the hillside. The fields in the foreground of the valley are geometrically lined up in two stripes, the right and the left part being separated by a line of eucalyptus trees. To the right side of the fields there are also some eucalyptus trees growing in the valley. Some younger eucalyptus trees are also growing between the different fields on the left. Unfortunately it cannot be seen exactly what kind of crop or vegetable is growing on the fields. Probably vegetables are grown on the fields in the foreground which are especially irrigated, while on the fields in the background mostly crops are grown. On one of the fields, just to the left of the eucalyptus trees planted in the middle, one can distinguish a round circle probably a well. Some of the fields in the background seem to have been harvested already, some may also be used as pastureland. On some fields it seems that bundles of hay can be seen, however, they could also be small shrubs.

**Figure 4-4a: "*Azienda Darho Caulos: La valle irrigabile"* (photograph by Rochetti, 1954. IAO, ER 25)**

**Figure 4-4b: The irrigated valley of Darho Caulos (photograph by L. Lätt, 20. 02. 2004)**

***To figure 4-4b***

This reconstructed picture was taken on the 20th of February 2004 around midday. The estate still exists and was not very difficult to locate, it is now owned by the military who are also responsible for the livestock and for the cultivation of the fields. Unfortunately it was not permitted to take pictures from the elevation on which the estate is located. Therefore the picture was taken from further down than the original one. Furthermore it was taken more to the left than the historical picture as the shrubs hindered access. Although the picture was taken in a different season (dry season), when all the fields where already harvested, the similarities and differences between the two pictures still appear quite clearly.

Although the general appearance of the reconstruction picture is very similar to the historical one, some landscape changes have obviously taken place in this area between 1954 and the present day. The tall eucalyptus trees seen on the historic picture have been cut and new ones planted, some of them between the fields on the right side, more on the right side of the fields and others further in the background. Some shrubs are also growing in the fields in the background of the picture. The well, now looking ruined, is probably the same as the one seen on the historical picture. A second well can be found on the right part of the fields, which was probably already there on the model picture but was previously hidden by trees. The arrangement of the fields in the foreground has obviously been changed a little. There are only two stripes of fields separated by a path in the middle, which seems to be located a bit more to the left than in the historical picture. A path cutting through the fields is destroying the rectangular geometry of the field stripes at the back. The geometry of the field stripes is better visible on the figure 4-4c, which was taken from the left/west. On the left part of the front fields two small engines can be seen, probably water pumps. At the back of the fields there are around fifty cows grazing. Behind the fields of the foreground there is now also a new dam, which was not visible on the historic picture. Unfortunately also on the black and white copy the dam cannot be distinguished very well. A man met in the village explained that this dam had been removed from its original location closer to the estate only recently. A white spot is also visible in the background, probably indicating a sandy place. The hill on the left is now covered with eucalyptus trees, while the hill on the right is terraced which cannot be seen very well on the picture. It cannot be excluded that it was already terraced when the historic picture was taken. In the very foreground some shrubs can be seen, again these are growing on the hillside. On the colour picture, the reddish luvisol, typical for this area, is also clearly recognisable.

**Figure 4-4c: The irrigated valley seen from the west (L. Lätt, 20.02.2004)**

The second reconstruction picture, although taken from another direction (towards the east instead of towards north) may help to get a more precise idea of the geometry of the fields and the eucalypti, which have been planted on the right side of the fields. Also the cows, which are grazing on one of the harvested fields are more recognisable on this picture.

***Conclusion***

In general, only little seems to have changed in the valley of Darho Caulos in the last fifty years, although the land is occupied by the military now and is not privately owned any more. The general land use seems to be the same with irrigated fields which are cultivated with vegetables especially in the foreground, while in the background mostly crops are grown. The scene portrayed of cattle grazing on the harvested fields is typical of that to be seen in the Eritrean Highlands. Eucalypti were obviously already growing on this land in the fifties. The old eucalyptus trees have obviously been replaced by new ones quite recently, some of them appearing very young on the reconstruction picture. The hill on the left of the picture has also been newly forested with eucalypti. Whether the terrace structures on the hills were already there in the fifties unfortunately cannot be determined on the basis of the historical landscape picture at hand.

## 4.2.4 Emba Derho

Emba Derho (which in Tigrinya means "chicken hill") is located eleven kilometres north of Asmara near the roadway to Keren. Different European travellers have passed the village on their way north during the Italian colonial times and often noted the huge picturesque acacia trees in the surroundings of Emba Derho, these apparently represented the only tree vegetation in the area. According to the guide of the Touring Club of 1929 water could be found in this area. The guide also explains that Emba Derho was the capital of the Carnescim district, which seems to have been an administration unit in the Hamasien Province. The location of the village on the hills is quite typical for the villages in the Eritrean Highlands (see also chapter 3.4.4).

### 4.2.4.1 The surroundings of Emba Derho: Acacia trees

The following two photographs of Giotto Dainelli and Armando Maugini give an impression of the surroundings of Emba Derho in 1905 and in 1933 respectively. The photographs show the huge acacia trees, which attracted the attention of the travellers. Unfortunately, it wasn't possible to reconstruct these photographs. The acacia trees have since been cut down because of their age.

***To figure 4-5a***

The photograph of Giotto Dainelli, who also describes his impressions of the surroundings in his travel account (see chapter 4.2.1), shows three tall acacia trees standing close together in the middle of a vast plain, which is bordered by various hills. A white-dressed lady, who is standing just left of the acacias in the shade, helps to illustrate the enormous proportions of these huge trees. Next to the lady there seem to be two horses mounted by two riders, but they cannot be distinguished clearly. Possibly it could also be a chariot. Just behind the tall acacia trees there are three smaller shrubs, probably smaller acacia trees. On the hill to the left some darker stripes can be seen possibly indicating some grass vegetation. The plain, however, appears very bleak, apart from the acacia trees. Whether it was used as grazing land cannot be deduced from the picture.

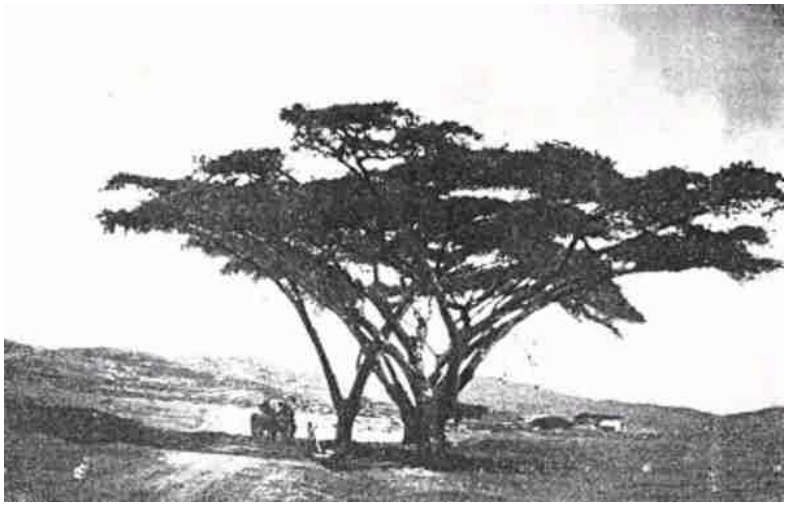


**Figure 4-5a: "*Le acacie di Amba Derhò*" (photograph by G. Dainelli, 1905. In: Dainelli 1908:17)**

## *To figure 4-5b*

This photograph has been taken in 1933 by Armando Maugini. As the caption suggests, the photograph shows two huge acacia trees in the centre of the picture. They are standing in a rather arid looking plain which on the left side of the picture is bordered by a low hill. On the right side of the acacia trees a road is crossing the picture gradually from left to right, bending a little just to the right as it exits the picture. The structure of the road indicates that it has been built by Italians. On the right of the road the vegetation consists of short grass largely covered with small stones. On the left side of the road five cows are seen, probably grazing, on a plain meadow where, apart from the short grass, some dark spots can also be seen, possibly small shrubs. There is also a person sitting between the cows, dressed in white, presumably the herder. Whether the field is also used to grow crops is not visible from the photograph. The hill on the left of the meadow is partly covered with scattered shrubs, probably small acacia shrubs.

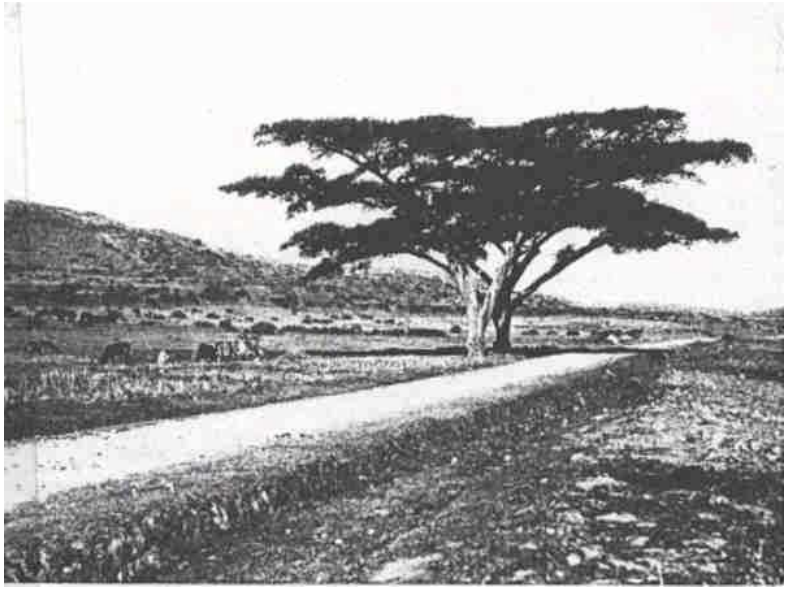


**Figure 4-5b: "*Dintorni di Ambaderò – grosse Acacie*" (photograph by A. Maugini, 1933. IAO, ER 20)**

### *Current Situation*

Although there are no pictures to compare the two landscape pictures exactly with the present situation, it can be said that the general appearance of the landscape is still very similar to the picture of Maugini. The area is quite hilly with the hills having now mostly been terraced (most of them during the Ethiopian period, it was reported). Some small acacia trees are still growing here, especially on the hillsides. The oldest and biggest ones can now be found close to the neighbouring village Ametsi. It seems that the large acacia trees have been cut down when they were very old, having survived untouched until then. Only dry wood is collected. An elderly lady was questioned about the evolution in the landscape surrounding Emba Derho and stated that almost nothing had changed and that there had never been more trees in the area. The land is still cultivated and used as grazing land for cows, cattle and sheep. Farming is mostly traditional, though some tractors are now used in flatter areas. The acacia trees provide the only vegetation, apart from the eucalyptus trees, which are growing mainly in the basins around waterholes and dams (see also next pictures). They can be chopped down if wood is needed, although permission from the Government must be requested first. It was reported that a lot of wood was formerly needed for weddings and for the construction of the traditional houses. Today less wood is needed as most the houses are now made of stone.

**Figure 4-5c: Acacia trees close to Ametsi (photograph by L. Lätt, 27.02.2004)**

Figure 4-5c gives an impression of the surroundings of Emba Derho at present. The photograph was taken on the way from Emba Derho to Ametsi, the village that is visible in the background of the picture. The acacia tree seen on the photograph is the largest acacia growing presently in the surroundings of Emba Derho. The picture also illustrates how the hills on both the left and the right side of the new road are terraced. The soil appears dry and dusty and is partially covered with small stones. Apart from some smaller acacia trees, which are growing on the hillside and on the left side of the road, there is almost no vegetation. Only the shores of the streamlet on the left side, where a donkey is grazing, are covered with grass.

### 4.2.4.2 Agriculture in the surroundings of Emba Derho

**Figure 4-6a: "*Altipiano Eritrea Amba Derhò 1"* (photograph by Rochetti, 1954. IAO, ER 25)**

**Figure 4-6b: Cultivated hillsides in the surroundings of Emba Derho (photograph by L. Lätt, 27.02.2004)**

***To figure 4-6a***

This historical picture has been taken in 1954 by Rochetti, the same photographer who has also photographed the valley of Darho Caulos. The picture was taken facing southwards.

The photograph is showing two hillsides, which are gently falling away towards a basin in the centre of the picture, possibly leading towards a lake although it cannot be identified clearly on the picture. Around the basin there is a small forest consisting of, what appears to be, mostly eucalyptus trees. Eucalypti have often been planted in moist areas around dams or in river areas, here they receive sufficient water and the seedlings do not require watering (see also Boerma 1999:292). In the background a higher hill with a characteristic shape can be seen. In the very foreground of the picture wheat is obviously growing, the hillsides in the foreground seem to be heavily cultivated. Various fields can be distinguished with different kinds of crops growing in them. Although it is not clear from the photograph the hillsides are probably terraced: The fields run parallel to the slope, which usually indicates that there are indeed terrace structures present. Some small shrubs are also growing between the fields. The hill in the background is too far away for an accurate assessment of its vegetation cover, however it appears that there is no substantial plant life present.

***To figure 4-6b***

The reconstruction picture was taken in the morning of the 27th February 2004. It was taken about a kilometre north of the village close to a path which leads away from the main road towards Medri Zien, a neighbouring village to the west of Emba Derho. The picture was taken facing south.

The photograph shows the same two hillsides, which, according to the season, have already been harvested. The soil appears fertile although in some places it also appears very hard and impermeable. The terrace structures are clearly visible on the hillsides. In summer, it was reported, wheat and sorghum are grown here. In the rocky fields some small shrubs can be observed growing. At the bottom of the hill a dam can clearly be seen. As was reported by an Eritrean, the micro-dams in the Eritrean Highlands are not only used in agriculture for irrigating the fields, but also for the local households, they often provide the water used for washing and for the animals. It seems that the water of the dams is usually not as salty as the water in the wells. However, many of dams currently face problems with the build up of silt due to the increased silt load in the rivers.

Many of the eucalyptus trees, which were growing around the lake on the historical picture have been cut down, whilst the left side of the hill in the background appears newly forested with eucalypti. Some square stone houses are visible close to the dam. In the very foreground of the photograph there is a very small young tree, which has recently been planted. Other newly planted trees are growing all along the path to Medri Zien.

Around the villages there is also some gardening where with the help of an irrigation system, differing vegetables (mostly beans, chicken peas, carrots, potatoes and spinach) are grown. These gardens cannot be seen on the picture.

### 4.2.4.3 The village of Emba Derho

**Figure 4-7a: "*Altipiano Eritrea Amba Derhò 2"* (photograph by Rocchetti, 1954. IAO, ER 25)**

**Figure 4-7b: The village of Emba Derho (photograph by L. Lätt, 20.02.2004)**

### *To figure 4-7a*

This picture has again been taken by Rochetti in 1954, probably on the same day as the other Emba Derho photograph. It has probably been taken from the road to Keren facing towards the east and illustrates a large part of the main village of Emba Derho, located on different hills which are situated closely in line with each other.

The photograph can be roughly dissected into a foreground area, showing a large field and a background where a village is located on the three hills standing side by side. The field in the foreground can be subdivided into a front section, on which wheat is growing, and a back section. Whether there are also crops or if it is grass growing here can not be seen well on the picture, there are no animals visible on the photograph. On the left side of the picture on the meadow a heap of small rocks can be seen, it is not clear however, whether it is a ruin of a stone house which may have stood here previously. On the side of the hill to the left and also on the lower part of the two other hills, different kinds of houses can be seen. Most of them are *hidmos* but there is also a relatively high number of stone houses with pitched roofs, these are obviously testifying to the Italian presence in this village. There also seems to be a house on the top of the central hill, no houses can be seen on the upper part of the hill. The terrain is probably too steep here and there are also signs of erosion. On the top of the third hill there is a circular Coptic Church, which is surrounded by trees. There appears to be terrace structures on this third hill although they cannot be distinguished very clearly. Quite a lot of eucalyptus trees are growing between the houses and especially on the upper part of the hill apparently representing the only tree vegetation in the immediate surroundings of the village.

### *To figure 4-7b*

The reconstruction picture was taken in the afternoon of the 20th February 2004. It was necessary to stand further back to take the picture, as many houses have been built in Emba Derho during the last fifty years, these obscured the view of the hills when standing closer. For the same reason the reconstruction picture is also taken slightly to the right of the original.

In the foreground of the picture a field is stretching to a road with many rocks and sand heaps on it, obviously construction waste which has been left over from the building of new houses in the immediate surroundings. On the left side of the field a newly constructed *mereba* house can be seen close to the road. The soil appears very dry and dusty. Due to the season there are no crops growing in the fields at the moment, agriculture is still carried out here in the summer, though. Behind the place from which the picture was taken the hills were also terraced and there were bundles of straw, surrounded by dry-stone-walls, similar as it can also be seen on plate Ic. Although it was reported that the straw had been carried there from further outside the village. The farmland seen on the historical picture has obviously partly been built over with houses during the last decades. Just behind the dry, almost empty area with the newly built houses the main road can be seen, this links Keren to Asmara. Some donkeys are grazing along it. The plain between the road and the hills is totally covered with houses, as is the hillside of the hill on the left. More houses are visible than on the historical picture. The upper part of the other two hills is still without houses (possibly erosion problems), only in the valley between the two hills have new houses been built. Most of the houses on the picture are *merebas*, only a few *hidmos* have remained from 1954. The eucalypti, which have been seen on the historical photograph, have mostly been cut down while many have been newly planted between and around the houses.

### *Additional information*

An illustration of Emba Derho made by James Theodore Bent in 1893 shows the village at the end of the 19th century. Although a drawing can, of course, never be as precise as a photograph, this illustration may put forward some useful information concerning the former architecture of the village. The illustration shows the circular Coptic Church of Emba Derho with the stone wall, which seems to be located somewhere up on a hill. Just behind the church there is small tower with another *aghdo* on it, perhaps a watchtower. The two buildings are surrounded by a dry-stone-wall, just in front of which there is a special type of a *hidmo* with a large entrance, the two supporting poles can be seen inside. Just behind the *hidmo* two tall trees and apparently a *kolqual* are also visible. An *aghdo* village is also visible further down, which probably consists of several dozens of huts. In the background the outlines of the surrounding hills of Emba Derho can be identified.

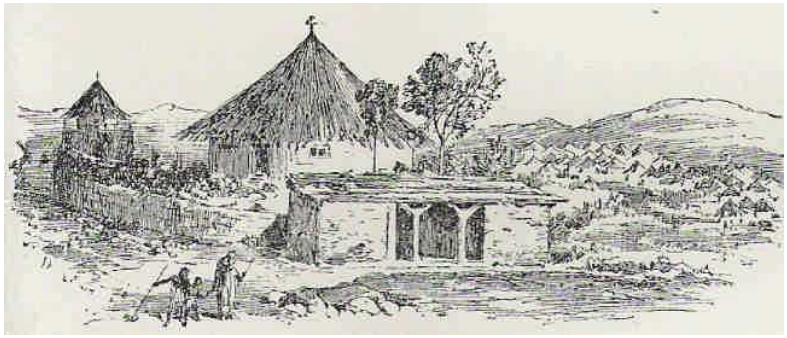


**Figure 4-7c*: "Church of Amba Derho"* (drawing by J.T. Bent, 1893. In: Bent 1893:69)**

### *Conclusion*

In general it seems that the statement of the elderly lady interviewed, namely that nothing has changed in the area of Emba Derho, is quite true. The natural vegetation still seems mainly to consist of some acacia trees of differing sizes, eucalyptus trees being apparently already planted around the water and close to the village during Italian colonial times. Where eucalyptus trees were removed others have been planted in the same place or in the surroundings according to the Governmental law that states that for each tree that is cut down another must be planted. The amount of eucalypti in the surrounding area of Emba Derho seems to have even increased a little during the last fifty years. The area has been cultivated and used as pastureland in the thirties if not much longer (see citation of Bent, chapter 4.2.1). Most of the terraces on the other hand are more recent as it seems that many of hills were terraced during the Ethiopian rule. The hillsides shown on plate 4-6a seem to suggest however, that some hills were terraced already at least fifty years ago. The village itself has increased significantly during the last fifty years and is obviously still expanding relatively quickly. It seems that it has changed from an *aghdo* into a *hidmo* village in the first decades of the 20th century, while today, all the newer houses in Emba Derho are *merebas*, consequently much less wood is now needed in house construction.

### 4.2.5 Hazzega

***Introduction***

Hazzega is located approximately twelve kilometres northwest of Asmara some kilometres west of Emba Derho close to the Anseba river at an altitude of 2323 m. According to the travel guide of the CTI (1938), it was formerly the capital of the Minabe Zerai district. The village has historical importance as it was challenging its neighbouring village, Tsazzega to gain rule over the former Province of Hamasien during the 18th and 19th century. However, its brief success in the middle of the 19th century ended with the fall of both Houses, first to Tigrean rule and then to the Italians. During the Italian period it seems that the importance of Hazzega was rather small, almost no information on the village can be found in the literature of that time. During the struggle the town was held by the ELF during 1974-77 and by the EPLF until 1978, when the Derg broke through Eritrean lines at the neighbouring village of Adi Yaqob. Today Hazzega is a small village of approximately two thousand inhabitants (Killion 1998:279).

Heuglin (1862:125), who passed through the neighbour village Tsazzega in 1861-62 described the undulating plateau in the surrounding of this village as uniforme and almost bleak, with just here and there some cripple rosebushes and shrinket violets growing. He noted also, that the whole area showed signs of temporaty soil culture nevertheless and that there were stripes of upland moor and pastures with rumex. Rohlfs (1880:140-141), who visited Tsazzega in 1880 noted, that the hilly surrounding was sometimes vegetated with more or less tree vegetation and kolquals, although the general aspect of the landscape was bleak, an impression, which was underlined by the incinerated villages he saw. He was surprised to see big and beautiful herds of cattle after the terrible times of war, which had ravaged the area.

***To figure 4-8a***

This historical photograph of the village Hazzega is again one of the photographs, which have been published in the travel guide of Giotto Dainelli, he seems to have passed this area in October 1905 following the Anseba River towards the north. The photograph was taken facing towards the northeast.

The picture shows a small village in a slightly hilly and rather barren looking area. In the foreground dry wood is lying on a field forming a line from the left to the right of the picture, possibly indicating a symbolic border. Some meters behind this wood, two circular *aghdos* can be seen. The one on the left is partially hidden behind a dry-stone-wall. There also seems to be a fence between the two houses, either consisting of, or being covered by shrubs or another type of vegetation. To the left of the *aghdos* there appears to be another hut, which cannot be distinguished very well on the photograph due to its dark colour. Behind the two houses the barren looking, slightly undulating plain is stretching towards the horizon.

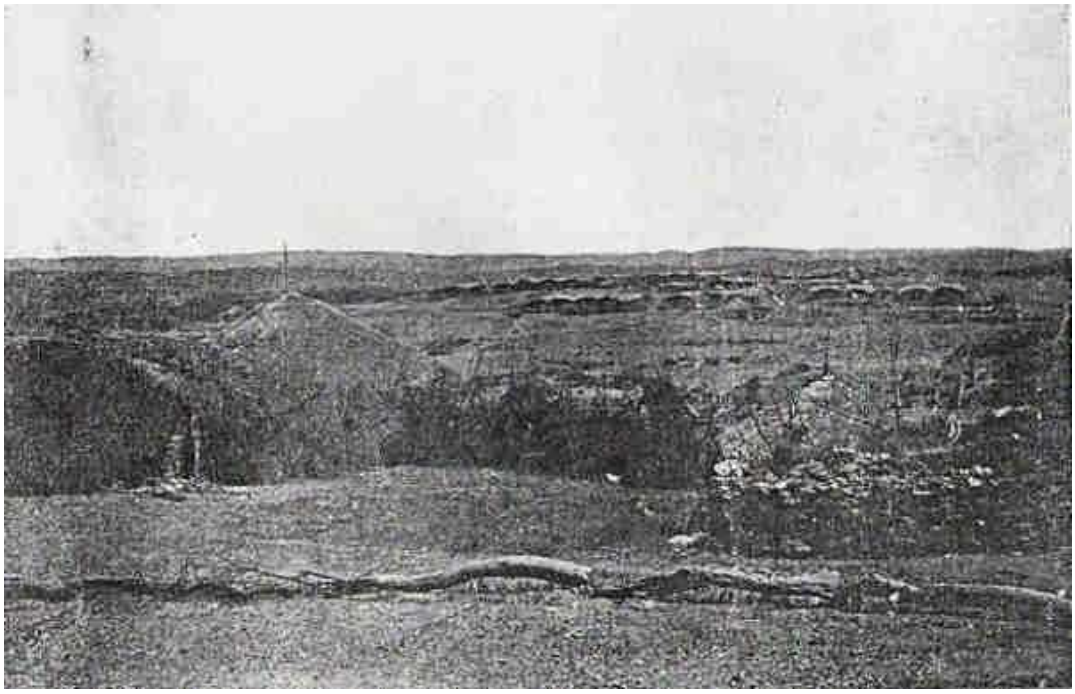


**Figure 4-8a: "*Azzega*" (photograph by G. Dainelli, 1905. In: Dainelli 1908:123)**

**Figure 4-8b: Hazzega towards north (photograph by L. Lätt, 08.03.2004)**

Some hundred meters further behind the two *aghdos*, about thirty flat low huts, possibly *hidmos*, can be seen. These are arranged in about three or four lines. In front of these huts there seems to be an *aghdo,* which may have belonged to a local chief. We were told that people in higher positions used to live in large *aghdos*, while common people usually lived in *hidmos*. In the background of the picture the terrain becomes more hilly, the horizon being marked by a low hill line.

The vegetation on this picture seems to be very scarce, apart from the live fence in the foreground, some small bunches of grass on the field behind the houses provide the only vegetation to be seen on the photograph. The rest of the plain looks very arid and stony. Unfortunately the type of land use practiced is not visible from the photograph.

***To figure 4-8b***

This picture was taken on March 8th 2004 around midday facing northeast. The characteristic hill line in the background of the historical picture aided in locating the exact position for the photograph although the landscape in the foreground has changed considerably in the last hundred years.

In the foreground of the picture, on the plateau of a knoll, there is a rectangular, quite modern-looking stone house with a pitched roof of corrugated sheets. Just behind this house, the back of a traditional, rather old looking *hidmo* appears. The houses are surrounded by a small and partly destroyed dry-stone-wall, some of the stones are also lying loosely around. A heap of wood is piled up towards one side of the modern looking house. Around the houses some young plants are growing, probably weeds. Behind this small hill the terrain is falling away slightly. The terrain is neatly terraced and the different fields can be distinguished clearly, some of which are freshly ploughed. They are ploughed with oxen in summer, wheat and sorghum being grown on the fields. Between the fields, at the border of the terraces and of the footpaths, the same type of weeds that can be seen in the foreground are growing. From the right and from the left of the picture two footpaths are converging some hundred meters behind the hummock in the foreground leading to an assembly of houses, obviously the old part of the village Hazzega, where the *hidmos* were standing in the original picture. Most of the houses are now the typical *merebas*, built of stone and painted in different colours but there are still some *hidmos* present. Along the right border of the right-hand path there are poles for an electrical wire which has just been installed recently with financial aid from the Government, as someone in the village stated proudly[20]. Between the houses, in the middle distance of the picture, some eucalyptus trees are growing. Behind the houses the hilly terrain stretches to the horizon, there are no houses here but the fields are showing a terrace structure and seem to be highly cultivated. On the top of the hill groups of trees can be seen, these are also probably eucalypti.

***Additional information***

The people interviewed in Hazzega stated that indeed, all the houses in the area were *hidmos* in the past, which required a lot of wood for their construction. They also stated that there were more trees in the past, specially *seraw* (acacia) and *awlie* (wild olive), although these never grew densely in the area. Today if people need wood they receive a piece of land where they can grow and cut eucalyptus trees.

[20] Electricity is not a matter of course in Eritrea, wood has to provide almost all the energy needed. A lot of the villages in the highlands are still without electricity.

### *Conclusion*

The reconstruction picture of Hazzega shows quite a typical extract of the scenery that predominates the Highlands around Asmara and the comparison also summarises quite well the most important changes that have taken place during the last hundred years. Whereas at the beginning of the 20th century no trees were growing at all on the plain around the village there are now quite a lot of more or less newly planted eucalyptus trees. Most of the hilly land has been terraced, largely during the Derg Regime. All the tree planting and terracing must have required a lot of financial and human resources, which have obviously not been economized for the sake of extension of the cultivation area and for the prevention of further erosion. It is interesting to see that the houses are still standing in more or less the same position as a hundred years ago although the village has obviously expanded, especially to the western part of the village which cannot be seen on the photograph, indeed most of the houses of Hazzega are not visible on the picture. The main village was behind the photographic position and the houses on the picture are only forming the periphery of the village. Whether Dainelli's picture is of the periphery of Hazzega or if the houses seen on the historical picture were representing the whole village then cannot be determined. An important and typical change, which can be found in the comparison of the pictures, is that the houses are now almost all stone constructions. This, naturally, aids the conservation of wood, which would otherwise be used in the construction of the *hidmos*.

## 4.2.6 Adi Hannes

### *Introduction*

Unfortunately very little information can be discovered regarding Adi Hannes, located around seven kilometres west of Hazzega at an altitude of 2200m, close to the Anseba River. On the map of 1888 the village is indicated together with the sign of a church. The historical travel guide of the Touring Club (1929:631) mentions the "*grosso paese di Adi Ioannes, m. 2200*, *nello Scioatte Anseba*[21]". Theodor von Heuglin, who passed here in 1861, noted that the village Az-Johannes was located on a rocky elevation and that a plain stretched from this elevation to the western escarpment, on which a lot of different Abyssinian crops were grown, like flax, barley, wheat, tef and nuk. He noted also, that there were a lot of *kolqual*-euphorbias and olive trees in this area (Heuglin 1868:124). In fact the *kolquals* are still a very characteristic feature of this area. They can be found in both the historical and the contemporary picture of Adi Hannes, in certain places they are growing quite densely. They were and still are mostly used as firewood, for roofing, match-making and also to build live fences. Adi Hannes is located on a hillock close to the village of Decadascim, which has also given its name to the area. The back of the hillock falls away quite steeply to the northeast towards an arm of the river Anseba. Between Decadascim and Adi Hannes there is a large field where in summer sorghum, wheat and millet are grown. During the rest of the year, cattle and sheep graze here. However, as the pictures have been taken from the back of the hill the fields cannot be seen on.

[21] Vast land of Adi Hannes, at an altitude of 2200 m., in the Scioatte Anseba (name of the district).

**Figure 4-9a: "Veduta generale di *Az-Johannis* (Decadascim)" (photograph by C. Gastaldi, ~1900. SGI, Album 116)**

**Figure 4-9b: Adi Hannes (photograph by L. Lätt, 25.02.2004)**

***To figure 4-9a***

This is another picture from the album of Carlo Gastaldi, which is stored in the archive of the SGI and probably dates from around 1900. It has the caption *Az Johannis (Decadascim)*. The picture was taken from the back of the village facing the southwest. The photographer must have stood in an elevated position, maybe on a tree or a heap of rocks or somewhere on a hill, which has since disappeared. Therefore it was difficult to reconstruct this picture in the exact location.

The picture shows the profile of a hill with a natural terrace, on this some *hidmos* can be seen which are built closely together especially on the left border of the terrace. The top of the hill, at the right of the natural terrace, appears very rocky. In the centre of the natural terrace one can vaguely see a stone house, which is a little higher than the other huts. It may be the Coptic Church, which is already indicated on the map of 1888.

The soil of the hill appears quite dry and dusty. There are many euphorbia plants growing on it most of them looking relatively young and short. They seem to grow here naturally without a specific order or structure. Between these *kolquals* there are also some smaller shrubs growing (perhaps *hehot*). In the near foreground of the picture the terrain seems to be almost flat. There is a large tree standing on the right, which is possibly a *daero*, a tree species, which can still be found in the area (see plate Id). Whether the land is also used for agricultural or pastoral purposes is difficult to say. It seems that the soil in the foreground, where the terrain becomes almost a plain, was worked recently, though. The structure of two different fields can be vaguely guessed. No bigger rocks are lying around. On the left side of the picture a second hill appears in the background of the Adi Hannes hill.

***To figure 4-9b***

The reconstruction picture of Adi Hannes was taken in the early afternoon on the 25th February 2004. Although it was not a problem to find the village of Adi Hannes and to get to the back of the hill it proved to be very difficult to find the exact location. As already mentioned, the photographer must have been standing on some elevation, which could not be found. The hill in the background of the original picture was not visible from any position on the hillside.

The shape of the hill looks considerably different on the reconstructed picture. This may partly be due to the different focal width of the camera or to the different angle of the picture or possibly the hill has also slightly eroded. The terrace structure is almost not invisible now, only the rocky top of the hill can still be distinguished clearly. The village has expanded a lot since the original picture was taken. Numerous new houses have been built in the last hundred years, most of them being built of stone while there are still also some *hidmos* remaining. Most of the new houses cannot be seen on the picture however as they reside on the other side of the hill. The vegetation still consists mainly of euphorbias, many of which are in bloom. In general, they seem to be larger in this picture than on the historical one[22] and their number does not seem to have decreased. They also seem to grow in a more structured order. Some of the *kolquals* are purposely planted closely together to form live fences enclosing the fields (see figure 4-9c). Also on this picture there can be seen some shrubs (probably *hehot*) and some cactus plants (sisal). It is also noticeable on this reconstruction picture that there are a lot of stones in the area now, some of them being used for terraces, some lying together in heaps or just spread around. In the foreground of the picture some terraces can be seen which are obviously used for agriculture and seem to be freshly ploughed, sorghum, wheat and millet are the main crops grown in this area in summer. Sheep were also herded on this hillside at the time of this study

[22] In fact, euphorbias can grow quite high reaching up to ten metres.

although they cannot be seen on the photograph. Further down this side of the hill there is a small river, an arm of the Anseba, where more, larger trees are growing.

**Figure 4-9c: Live fences with kolqual in the surroundings of Adi Hannes (photograph by L. Lätt, 25.02.2004)**

***Conclusion***

Unfortunately, extended interviews were not possible in Adi Hannes, which would have given us further information regarding the changes in landscape and land use in the area. From the comparison of the pictures one can say that the vegetation has obviously remained more or less the same during the last century with the *kolqual* remaining the main feature of the landscape. However, it seems that they have grown and are growing in a more systematic manner today. The *kolqual* vegetation does not seem to have decreased during the last hundred years. It seems also that the top of the hill has been partly eroded although the angle of the reconstructed picture might also be deceiving to some extend. Important changes have occurred regarding terracing, intensive agriculture is now possible on this steep slope. The village of Adi Hannes has also expanded during the last century and most of the houses are now built out of stone rather than wood as could also be see on the photographic comparison of Hazzega and Emba Derho. Obviously the expansion of the village of Adi Hannes did not happen at the expense of the crop fields here but instead promoted the expansion of agriculture to the relatively steep hillside towards the back of Adi Hannes.

### 4.2.7 Adi Teklezan

***Introduction***

Adi Teklezan is located close to the main road from Asmara to Keren, 42 kilometres north of Asmara, at an altitude of 2270m. Adi Teklezan commands the strategic northern approaches to the Central Highlands and was the administrative centre of the historic Dembezan district. During the colonial period, Adi Teklezan became a popular settlement for the Tigre who converted to protestant Christianity. Colonial rule and the building of the Asmara-Keren highway in the 1920s led to the growth of Adi Teklezan as a market centre and highway resting stop. During the struggle the town was held by the Derg. Today it is a rapidly growing commercial centre with an urban population of 4’000; around 6’000 more people are living in surrounding agricultural villages (Killion 1998:31).

**Figure 4-10a: "*Az Teclezan*" (photographer unknown, ~1920. IAO, ER 2)**

**Figure 4-10b: Adi Teklezan from the north (photograph by L. Lätt, 01.03.2003)**

***To figure 4-10a***

This historical picture of Adi Teklezan, which is stored in an Album of the IAO, has been taken by an unknown Italian photographer, probably in the 1920s. It seems to have been taken in the rainy season. It was taken from north of Adi Teklezan facing towards the town, which is visible in the background of the picture.

In the foreground a vast, slightly hilly, meadow can be seen which is crossed by a road on the left side of the picture. At the borders of the road and also further inside the field mostly on the small elevations where the availability of water and soil nutrients is probably better, some small shrubs (*hehot*?) and bundles of high grass are growing. Apparently there is no higher vegetation in this area. It seems that the meadow is only used as grazing land at the moment as there is only grass growing on it. Just before the road cuts the left border of the picture a small hole can be seen on the left side of the road, probably forming a tunnel for a water rill, this seems to continue on the other side of the road. There are many small rocks lying on the field to the left side of the road. The town in the background, located on different small hills, seems to consist mainly of round huts with thatched roofs, the traditional *aghdos*, while also at least one, more modern looking, rectangular stone house with a white pitched roof can be seen, which is most probably belonging to an Italian. One of the *aghdos* in the centre of the picture seems to be a little bit higher and larger than the other ones, this may be the Coptic Church, but it could also belong to a local chief.

***To figure 4-10b***

The reconstruction picture was taken on the first of March 2004 in the late morning. Again because of the different season it is difficult to make an exact comparison. The town has changed enormously since the 1920s and seems to be built on a higher hill. It is possible that the later photograph was not taken in exactly the right location. However, comparisons between the two pictures of the town and the general aspect of the surroundings can be made nevertheless.

In the foreground of the photograph a vast plain can still be found, however, many modern stone houses in different colours have been built or are under construction. The heaps of rocks, which can be seen in the foreground, are testifying to the construction of houses. The soil of the plain appears very hard, dry and dusty due to the season. Between the newly constructed houses, where the terrain is rather hilly, terraces have been made. The road, which can be seen on the picture, is the highway connecting Asmara to Keren. It is probably the same road that is shown in the original picture and has possibly been asphalted. Some trees have obviously just been planted on the right border of the road. They can be found all along the road from Asmara to Adi Teklezan and also along most main roads in the Southern Highlands of Eritrea, it was reported that they were mostly planted by students on summer campaigns. The main tree species planted here are eucalypti and *berbere tsellim*.

The town in the background seems to be more elevated than on the historical picture. The hill, upon which it is located, is now terraced and there is also a path visible on it leading directly to the village. On a small elevation within the town the circular shape of the Coptic Church can be seen. To the right side of the town there is a bell-tower of another church, which is probably protestant. Most of the houses of Adi Teklezan are now made of stone, which is not clearly visible on the photograph. Some traditional *hidmos* can still be found. Around the houses of the town numerous trees, mostly eucalypti, are growing. There are also some acacia trees, some cacti and euphorbias growing in the surrounding area of the town, which cannot be seen on the picture.

***Additional information***

An elderly lady, interviewed in Adi Teklezan and who was living in a *hidmo*, confirmed that there were almost no trees in the surrounding area of the town even in her youth and that the wood for the construction of her house had been taken from further away. She stated however, that there used to be a big forest outside the village from which wood was taken and that this forest was in great parts destroyed during the Derg Regime. The fields around the village are still used for agriculture during the cropping season with wheat and sorghum being the most important crops. Most of the terraces were made under the Ethiopians, during the Derg Regime, while some of them were also made quite recently during summer campaigns. The lady also stated that there used to be a water source in the village whereas tap water is used now.

***Conclusion***

Although it is difficult to make an exact comparison of the photographs of Adi Teklezan, since the environment and the buildings have so much changed that it was impossible to know where exactly the original picture had been taken some general assessments can be made nevertheless. A very similar phenomenon to that encountered in the example of the village of Emba Derho can be seen, this is namely that an increase in the population in the last decades has led to an expansion of the town into the surrounding area, which was formerly used for agriculture. It was not woodland but former grazing or cropland that had to give way to the new houses. Other changes, which are visible in the landscape are the eucalyptus trees planted in the town and especially along the road, proof of recent summer campaigns in these areas. There must have been more trees in the further surroundings of Adi Teklezan, probably some vegetation was indeed damaged by the Ethiopian soldiers but whether there really was dense forests in the surroundings of Adi Teklezan is rather doubtful taking into consideration the map of 1888, on which the whole area between Asmara and Adi Teklezan is described to be a hilly plain without any tree vegetation.

### 4.2.8 Partial synthesis: Landscape changes in the northern part of the Central Eritrean Highlands

As already illustrated in chapter two, the historical photographs published in this thesis show only very limited extracts of the scenery of the Eritrean Highlands around Asmara and it is therefore wise to be cautious about making any general assessments on the basis of these photographs. It is, nevertheless, worth attempting in this chapter to summarise the most important findings of the photograph comparisons made so far, also utilising the supplementary information provided by the travel accounts and interviews.

The land of the Eritrean Highlands around Asmara appears to have been extensively used for agriculture as early as the Italian colonial time, mostly as grazing land (Adi Teklezan, Emba Derho, maybe Hazzega) but also for cultivation. As Dainelli and Bent report in their accounts, the land was fertile, although according to Dainelli the whole area was not cultivated. The irrigated cultivation in the valley of Darho Caulos, which must have been introduced there by an Italian in the forties or even earlier must have represented quite an exception in the Eritrean Highlands. Even today irrigation on this scale is rather unusual in the Highlands outside the surrounding areas of the towns. It is also interesting to see that despite the change of ownership from private to military almost nothing has changed in this area during the last fifty years regarding landscape and land use. In general, only little seems to have changed in the agricultural techniques used in the Highlands around Asmara during the last century. Almost everywhere traditional farming systems are used and the use of a tractor still represents an

exception rather that the rule. Wheat and sorghum and in some areas millet and teff have always been the favourite crops grown in this area

A striking change in the landscape has been brought about by all the terraces that have been made during the last hundred years. There is almost no hill in the area today, which has not been carefully terraced, allowing the cultivation of the hillsides or merely preventing soil erosion, this must have required an enormous amount of human resources. It appears that most of the terracing has been carried out by soldiers during the Ethiopian Regime and in recent times by students, national service workers and workers in food-for-work or cash-for-work programmes. However, some terraces also seem to be older, for instance the ones shown on the picture of Emba Derho in 1954.

At the beginning of the 20$^{th}$ century vegetation seems to have been scarce in the Highlands surrounding Asmara. On most of the historical pictures, the soil generally appears very bleak and barren, almost no trees or shrubs can be seen apart from the acacia trees in Emba Derho. This would confirm the observations described in the travel accounts of Dainelli, Paoli, Bent and others. An exception is the photograph of Adi Hannes where there seems to have always been quite a dense covering of euphorbia which does not seem to have substantially diminished. This area along the Anseba river was also described as rich in vegetation by the travellers who passed here. It is not beyond comprehension that some travellers and also Eritreans have partly extrapolated their impression of these green river valleys onto the larger region of the Highland area.

Dense tree vegetation seems to have been growing only directly along the ravines. A significant change, which can be noted in the landscape, are all the eucalyptus trees, which were planted on the highland plateau in the course of the last century. The amount of these, which at least in Asmara, Darho Caulos and Emba Derho have already been planted in the colonial period by the Italians or British, seems to have increased during the last fifty years, even if the elder trees were subsequently cut. In some places new plantations have been made during this period. Because of these and other newly planted trees some places in the Highlands look even more vegetated today than hundred or fifty years ago, this is especially so on the site of the town Asmara. The young trees bordering the roads and highways, which have probably a more symbolical and esthetical value and were mostly planted in the last years during summer campaigns, give the landscape a new appearance as well.

The Eritrean dwellings, which can be seen on the historical pictures, are all *hidmos* (Emba Derho, Hazzega, Adi Hannes) or *aghdos* (Asmara, Adi Teklezan). However, already square stone houses can be found at the beginning of the Italian colonisation era in Asmara (1896) and Adi Teklezan (~1920). In more remote places like Hazzega and Adi Hannes, where the Italian influence was weaker, the stone houses were probably established later. Today most of the houses found in the Highlands are obviously the so-called *merebas* made of stone with the flat roof of corrugated sheets. The few traditional *hidmos*, which can still be seen today, will probably not be replaced.

The photo-comparison shows quite impressively how the city of Asmara and also the villages in the surrounding area have increased enormously during the last hundred or even the last fifty years. However, it seems that in most of the cases this expansion does not proceed at the cost of the vegetation but rather at the cost of farmland or agriculturally unusable land. The expansion of villages and towns has in some cases also resulted in the planting of many trees and bushes in the surroundings, especially in the case of Asmara.

# 4.3 The southern part of the Central Eritrean Highlands

## 4.3.1 About the area

The area of the Southern Highlands of Eritrea includes the former provinces of Akele Guzay and Seraye, which are today integrated in the Debub province. Travellers in the 19th and 20th century generally described this area as being more vegetated than the province of Hamasien, although real forests were not present apart from in the Matatan area on the eastern escarpment and on the Kohaito plain which is believed to have been densely vegetated once with juniperus trees (Bertarelli 1929; Boerma 1999, RSCU 1996). Felix Rosen, who was a member of the first German Mission to Ethiopia, passed the Southern Highlands of Eritrea on his way to Ethiopia. The landscape appeared very bleak to him but he noticed that the soil was very fertile:

"To a person who reaches Eritrea from the south, from the fertile plateaus of Tigre, the land, which the Italians have conquered with so many losses of goods and blood, may appear poor and bleak. Wide plateaus without specific mountains are stretching as far as one can see; forests, which were rare already in Abyssinia, are totally lacking here and the bushes are replaced with low, thorny shrubs. The soil is fertile, though, but it requires hard handwork since it has been neglected for centuries" (Rosen 1907:490, translated from the German).

The Seraye plateau, the western part of the Southern Highlands, which is commonly known also as the basalt plateau, is one of the most populated areas in Eritrea. The relief of this former province is characterised by dissected, shallow river courses and exposed fossil soils created by excessive erosion. The most important towns in the Seraye are Debarwa, Mendefera and Adi Quala. The favourable climate and fertile soil of this area led to the establishment of permanent agricultural settlements in early times. It seems that in the later medieval period the area was already heavily populated along the important pilgrimage and trade routes that ran through it from Aksum to the Asmara area (Killion 1998:374, Mussie 2003:22). The area is described as very fertile and intensively used for agriculture by several travellers who passed this area at the end of the 19th century. The landscape appears to have been dominated by cultivated fields and grasslands with relatively few trees of any note. Werner Munzinger, who travelled in the Seraye in the early 1860s, observed that the Province had more trees than Hamasien but that these grew almost exclusively in valley bottoms or along ravines (Munzinger 1890:305, cited in Boerma 1997:93). Henry de Monfreid on his way from Asmara southwards to the province of Seraye also noted that this Province was more fertile and humid than the Hamasien plateau, which, in his eyes, looked like a desert:

"An arid plain, a desert, it seems to me, all covered with rocks. But in summer, the cereals are growing wonderfully. As soon as the first rains of April fall, everything becomes green and the rocks are carefully left on the soil by the Eritreans to conserve the moisture of the soil. (…) We reach the extreme limits of the high plateau of 2400m to descend into the Province of Seraye, which is located at only 2000m. The climate is less rude here, the water more abundant, the soil more fertile" (De Monfreid 1938:174, translated from the French).

Giotto Dainelli describes the area between Asmara and Adi Ugri (Mendefera) to be almost treeless but fertile:

"The horizon remains the same and seems far, far, almost infinite. There are cultivated fields, plantations of sorghum and forage crops, green meadows (…) no trees apart from the big sycamore of Debarwa. The landscape is always the same until Adi Ugri, Godofelassi and even further, throughout the whole Seraye. Everywhere fields and meadows, always the uniform plain… " (Dainelli 1909:11, translated from the Italian).

Paoli in 1908 described the landscape quite similarly, although he noted, that the ravines were vegetated:

> "The landscape is always alike and bleak, with geometrical hills and green fields cultivated with grain, with teff, and with ravines vegetated by euphorbias and wild olives…" (Paoli 1908:276, translated from the Italian).

One of the major agricultural areas on the Seraye plateau is the Tsellima plain, in the surroundings of the town Debarwa (see chapter 4.3.6). Also Godofelassi, a village about five kilometers east of Mendefera, seems to have been an important agricultural center already during the Italian colonial era. Since the end of the war in 1991 the Government made efforts in developing the agricultural potential of the province of Seraye and many new businesses were opened around the capital Mendefera (Killion 1998:374).

The former province of Akele Guzay, the south-eastern part of the Central Eritrean Highlands, is characterised (as with the Hamasien and Seraye area) by mild climate, alluvial and fossil soils and a dissected relief. The sub zone is characterised by sandstone and trachytes in the southern parts while the central parts are dominated by metamorphic and granite rocks. The highest mountains of Eritrea can be found in this area with Emba Soira (3031m) being the highest. The average elevation in this region is approximately 2500m. The province has been one of the major human settlement areas in Eritrea since early history. Some ruins in the southern part of the Akele Guzay such as Kohaito, Metera and Tokonda (see chapter 4.3.5), are evidence that it was the central part of the ancient Axumite Kingdom. A variety of crops including wheat, barley and teff seem to have been produced in this province since the earlier times of history.

The following photograph with the caption *Acchelé Guzai* dates from the 1930s. Unfortunately it was not possible to find the exact place to reconstruct the picture but the photograph may be presented here as it provides an impression of the general appearance of the landscape of the Highlands of Akele Guzay in 1938.

**Figure 4-11: "*Acchelé Guzai*" (photograph by Candussio, 1938. IAO, AOI 19)**

Figure 4-11, which has been taken in 1938 by the Italian photographer Candussio, shows a part of a relatively broad, asphalted road, which was obviously constructed by the Italians not long before the picture was taken. The road, which is probably the highway connecting Asmara to Decamhare, Segeneiti, Adi Keyh, Senafe and Northern Ethiopia, meanders through a mountainous area, which is covered by scattered shrubs, which are difficult to identify. The most common shrubs found today along the road to the south are acacias and *tahses* (dodonea angustifolia). Some acacias may be seen on this picture, although it seems that there are more small thorny shrubs. Apparently no trees are growing along the road. The mountainside on the right side of the road seems to be eroded in some areas, which is probably related to the construction of the street. That the general appearance of the landscape along the road from Asmara to Adi Kayeh and further has not changed very much can be seen on plate IIa, which was taken from the road some kilometres north of Dekamhare. The newly planted eucalypti, *berbere tsellim* (schinus molle) and acacias, which can be seen in some parts close to the road, and the terracing made on the steeper hill slopes are the main features characterising any changes that have occurred in this area during the last decades.

### 4.3.2 Segeneiti

***Introduction***

Segeneiti is a small town at an altitude of 2203m, situated 64 kilometres south of Asmara close to the road from Dekamhare to Adi Kayeh. The town rose to prominence in the nineteenth century as the centre of Catholic Church Missionary work in Akele Guzay. Lazzarist priests founded a Catholic school there in the early 1880s, when it had a population of nine hundred, the "*Schola d'arti e mestieri*". Because of the strategic position of Segeneiti as the gateway to the Central Eritrean plateau the Italian administration fortified the hills above the town during the 1890s and made it an administrative centre. The town grew as a colonial '*Residenza'*. The Italian Touring Club estimated its population in 1929 at 2'000, the travel guide of the CTI in 1938 assessed the figure already at 3'500. In the 1960s Segeneiti became a base for Eritrean Commandos and locally recruited Christian resistance fighters. Today it is a district administrative centre and benefits from renewed Italian Catholic investment in its schools (Killion 1998). There are no exact numbers for the actual population but estimations vary between 10'000 and 15'000.

The area around Segeneiti is generally described as being surprisingly green and pleasant by travellers and in historical travel guides. Schweinfurth and Schöller (1894) observed juniper trees around Segeneiti, which were growing "with great vitality" and Schöller also commented on the presence of olive trees and wild rose bushes in the area around Segeneiti and Degra (Schöller 1896:224). Segeneiti is situated in a basin, which is open to the east towards the escarpment and dominated in the west by mountains crowned with fortifications. Dainelli (1908:61) suggests that the fact that the surroundings of Saganeiti were still rich in trees at the beginning of the 20$^{th}$ century was a result of the attentions of a certain Comissario Bruna who had given severe orders to favour the reforestation of the mountains and forbid the cutting not only of whole trees but even of live branches. The town is especially known for the sycamore fig trees, known as *daeros,* which are growing in the surroundings. The trees are greatly revered by locals as they form a place where the community can assemble for discussion or debate as well as providing ample shade (Denison, Paice 2003:190).

Concerning the village itself, Schöller (1896:214) noted in 1895, that the civilization had made "remarkable progress", which was "testified by the splendid church of the Catholic Mission, the new accurately built houses and the telegraphic line which connected Segeneiti to Halai, Asmara and Massawa."

### 4.3.2.1 The west of Segeneiti

**Figure 4-12a*: "Saganeiti coronata dai colli fortificati*" (photograph by G. Dainelli, 1905. In: Dainelli 1908:61)**

**Figure 4-12b: Segeneiti, view towards west (photograph by L. Lätt, 17.03.2004)**

***To figure 4-12a***

This picture has been taken by Giotto Dainelli in the Autumn of 1905 looking towards the west of Segeneiti. It shows some houses on a hill and in the background another hill topped with a long building, probably the fort mentioned in the caption of the picture. The photographer must have stood on a hill or on a building to take the picture. Probably he was standing on the steps of the St. Michaels Church or on the hill upon which the Church is located.

The picture shows in the foreground the slope of a hill with in the near foreground a lot of granite rocks of differing sizes lying on the ground, some shrubs can be seen growing between them. In the foreground on the left side of the picture a *kolqual* can also be seen. On the right side of the picture, also in the foreground, there is a group of people standing or sitting with an animal beside them, probably a dog. Just in front of this group a path is leading to the upper part of the hill where some houses can be seen. The first house on the left seems to be a long stone house with a pitched sheeted roof, behind this house the conical roof of an *aghdo* is visible. Most of the other houses, however, seem to be *hidmos*. In some places they are built closely together in lines. On the left side there is an area between the upper houses and the top of the hill where the vegetation is quite scarce, this place may be used as pastureland or for cultivation. The top of the hill seems again to be covered with small bushes or shrubs. On the right, behind the *hidmos*, four rectangular white spots can be seen. They could be roofs of corrugated sheets belonging to Italian houses. The mountain in the background seems to be vegetated by short shrubs or bushes. No trees can be distinguished on the hillside. It is very difficult to say, however, what the vegetation exactly consists of but it is probably a rather short vegetation type such as grass or small shrubs. There are some clear lines on the hillside, which could be paths leading up to the top of the hill where a long, flat building can be seen, presumably this must be an Italian fort.

***To figure 4-12b***

This reconstruction picture has been taken on the 17$^{th}$ of March 2004 on the top of the stairs of St. Michael's Cathedral facing west. Although the general aspect of the western surroundings of Segeneiti looks dryer than on the historical photograph, given that it was taken in the dry season, some specific changes and similarities of the landscape can be distinguished quite well on the photo-comparison.

In the foreground of the picture a part of the church wall is visible with a shrub with yellow flowers growing in front of it. Just behind the wall there is a small path leading to the right side of the picture and behind this path some big rocks are lying on the ground. On closer examination it can be seen that some rocks are in exactly the same position as they are on the historic picture (for instance the kidney-shaped rock under the *daero* tree). Between the rocks there are less shrubs than on the original picture, there are, however, more high trees growing. Just in the centre of the picture, on the right of the rocks, a big *daero* tree is growing. Another *daero* is growing further in the background and there are also other species of trees growing between the rocks. On the left of the picture, in the foreground, there is a path in exactly the same position as in the original picture. Today it is leading to the asphalted main road of Segeneiti. Where the two roads join, a fountain has been constructed and beside it, on the border of the asphalted road, some water cans can be seen. In the east of the town a micro-dam was constructed from which people take water, this is not visible on the picture. Behind this road a part of the village is visible. Almost all the houses are now built of stone. The number of houses has generally increased, only few old hidmos have remained in Segeneiti, which are not visible on this picture. The hillside on the left, behind the houses, still looks quite bleak and there is little vegetation growing on it. This part of the hill now seems to be terraced. The top of the hill is covered with a dense wood of eucalyptus trees, which were planted here recently. On the hill

in the background there appears to be less vegetation than in the original picture, although this impression may also be caused by it being the dry season. A path is leading up to the hill where the long fort is still visible. Along the path and on the top of the hill eucalyptus trees have also been planted, some of them can also be seen on the hillside, although the vegetation here seems to consist mostly of smaller shrubs. The eucalyptus trees in the surrounding area of the village have mostly been planted during the last 20 years (of the photograph being taken) some of them were also planted during recent summer campaigns, while there is also a continual reforestation.

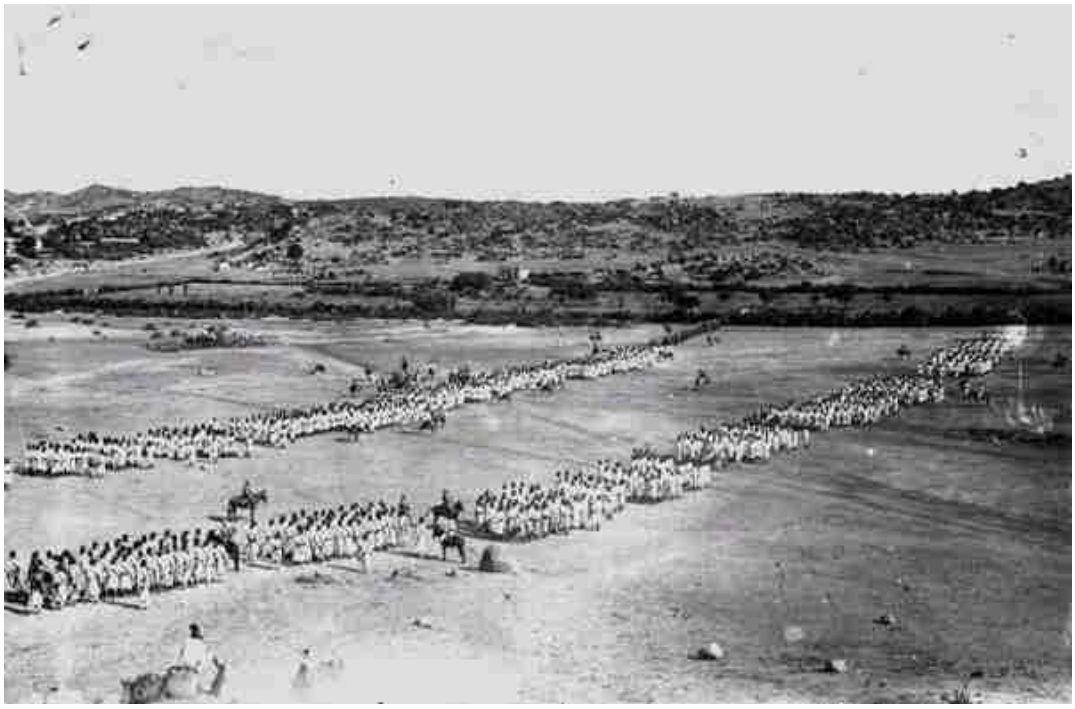
#### 4.3.2.2 The north of Segeneiti

***To figure 4-13a***

This is a photograph of the Catholic Mission of Asmara, which was found stored in the APCL in Milan. Unfortunately the author of the photograph as well as its date of origin is totally unknown and it is quite difficult to make any assumptions about this. The amount of *Ascaris*[23] mobilized on this picture suggests that it was probably taken during the fascist period in the twenties or early thirties of the 20th century, it may, however, have been taken earlier. According to Killion (1998:91), the recruitment of Ascaris began in 1890 and by 1896, there were over 5'000 Eritreans serving in the army, which invaded Ethiopia. Eritrean Ascari also served in the Italian occupation of Somalia and during 1911-32 period a total of 60'000 Ascari served in Italy's colonial conquest of Libya. The photographer was probably standing somewhere on a hill or on a heap of rocks to take the picture, which was taken facing towards the north of the town.

The photograph with the caption "*Saganeiti – Rivista di Ascari*" can be roughly dissected into the foreground, showing a vast plain with two lines of soldiers, and the background, showing a long hillside. In the very foreground of the picture a man is sitting on a trunk or rock on a hillside and observing the scene occurring on the vast plain in front of him. There are two lines of black-skinned armed soldiers in white dresses divided in groups of around forty. Between the lines some men on horseback are patrolling. The plain appears very bleak; there is no vegetation apart of some stones that can be seen in the foreground. Just behind this field there seems to be a long square garden surrounded by a fence of bushes. Some *kolquals* also seem to be visible. Inside the garden some trees (possibly fruit trees) are growing in lines. Just behind the garden there is a square building of stone, probably forming part of the Catholic Mission, to which the garden still belongs. On the right side, behind the garden, a group of white tents with some bushes growing around them are present. On the left side of the hill are three single *aghdos* with a tree growing beside them. On the left side of the houses a path is leading up the hill where there seem to be some more square stone houses. On the very left side of the path some stone houses can be seen as well. It appears that there are also small *aghdos* with shrubs growing between them. The rest of the hill is covered by small stones, with some shrubs or bushes. On the top of the hill, especially on the right side, some single trees can be distinguished. The right side of the hill has in parts been neatly terraced. Unfortunately when these terraces could have been made can be only speculated upon. Since the town was strongly influenced by the Italians already at the beginning of their colonial rule, it could be that the terraces were also made or incited by them. However, this method of soil conservation seems to have been known by the Eritreans before the Italian colonisation (see also chapter 4.3.5 and 4.3.7).

[23] Ascari was the name given to the Eritrean soldiers serving in the regular Italian colonial army.



**Figrure 4-13a: Missione Cattolica Asmara: "*Saganeiti – Rivista di ascari"* (photographer unknown, ~1930. APCL Album II, 15)**

**Figure 4-13b: Segeneiti towards north (photograph by L. Lätt, 17.03.2004)**

***To figure 4-13b***

This reconstruction photograph was taken on the 17th March 2004 also from the top of the stairs of the St. Michael Cathedral, looking this time towards the north. It was necessary to stand higher up than the photographer of the original picture as otherwise the trees and houses would have obstructed the view of the hill in the background.

In the foreground of the picture a part of the wall of the church is visible and also a part of the hill upon which the church is built. Some high trees are growing on the hillside, apart from these, there are only some small areas of grass growing on it. On the plain at the bottom of the hill, on which several decades ago the Ascari soldiers were standing, a lot of new *mereba* houses have been built, and many trees and bushes are growing between them. Behind these houses, the square garden of the Catholic Mission is still visible on the reconstruction picture, although now it looks a bit shorter. The building of the Catholic school can also still be found in the same place, it has now been renovated and enlarged. Behind the garden to the left and to the right side of the building, a line of trees is growing. The hill in the background looks quite bleak, it still has a lot of small rocks lying on it. Growing randomly, some rather big single trees are growing on the hillside. These are probably *daeros*. Just behind the Catholic Mission, there are two *merebas* and around these houses some further trees are growing. On the left side of the picture, in the same place as in the original photograph, a footpath is leading up the hill. On the right side of this path there are some other large trees, again probably *daeros*. On the top of the hill, however, no trees can be found anymore. The shrub vegetation on the hillside seems to have generally decreased although it was already scarce in the first picture. Perhaps the dry season is also responsible for the arid and bleak aspect of the hillside, which seems to have even accentuated in comparison to the historical photograph. Although the trees are covering the very right side of the hill it can be said that the terraces, which could be seen on the early pictures, are not there any more. The structures seem to have been destroyed by erosion and not reconstructed.

***Conclusion***

In comparison to the historical pictures of the Highlands north of Asmara shown in chapter 4.2, the surrounding area of Segeneiti seems to have been significantly more vegetated in the past; even if there were almost no high trees there were quite a lot of shrubs growing in the surroundings of the small town, especially on the hills in the west of Segeneiti. It seems that the *daero* tree was always quite common in the area. Apparently the Italians took care of the vegetation here since, according to Dainelli, the Commissar made strict orders to prevent the cutting of trees and trees were also newly planted, at least in the garden of the Mission. It seems that today more high trees are growing in the immediate surroundings of the town and especially between the newly built houses. Some have probably been planted purposely there, others, especially the *daero* trees have probably propagated naturally. The hills have obviously been newly forested with eucalyptus trees during the last few decades. However, the shrub vegetation seems to have decreased a little on the hills in the west of the town and also possibly on the hill to the north, although the different season and the quality of the original pictures makes it difficult to make exact comparisons. It is possible, however, that some shrub vegetation was cleared in the immediate surrounding of the village for domestic use.

The significant increase of the town in the course of the last century is also quite visible on the two comparisons. In the north of the town especially, a once perfectly empty plain has been built over with houses and trees have been planted between them. Again it is striking that almost no *hidmos* can now be found and obviously all the newly built houses are *merebas*. The large amount of granite rocks in the surroundings provides sufficient material for their construction, although it is interesting to see, that some rocks have remained in exactly the same position

during the last hundred years. While the terrace structures in the north of the village have disappeared during the last century, it seems that new ones were made e.g. in the west of the village.

### 4.3.3 Pasture in the surroundings of Segeneiti

**Figure 4-14*: "Mandrie al pascolo sull'altopiano (Segeneiti)"* (photograph by Candussio, 1938. IAO, AOI 19)**

***To figure 4-14***

This photograph, which has been taken by the Italian Candussio in 1938 and is stored in the archive of the IAO, is again one of the photographs it was not possible to reconstruct because of the lack information regarding the precise location. The caption given by the photographer only says: *Mandrie al pascolo sull'altopiano*[24], someone has added with a pencil the word "Segeneiti" under the photograph, which is probably an indication that the picture has been taken in the surrounding area of this village.

The photograph shows a vast undulating and lush meadow, slightly inclined to the right of the picture, with in the background the slopes of a long mountain. There are several hundred black and white cattle grazing on the pasture. Apart from the lush grass there is no higher vegetation on the meadow, only randomly a single shrub can be seen. In the foreground the pasture is covered with some small rocks. Some meters inside there also seems to be a cavity in the soil, probably indicating the beginning of rill erosion. Also the lower part of the mountain in the background, which is totally denuded from vegetation, shows signs of erosion. The large amount of cattle seen on the picture suggests, that the soil erosion may be caused by overgrazing. The mountainside is mostly covered with some short vegetation, probably grass,

[24] Herds grazing on the highlands

possibly also with some shrubs and *beles*. However, there are also large areas of rock on which nothing at all is growing. Some larger shrubs also appear to be growing in groups in some areas, probably remnants of formerly denser bush vegetation which must have been cleared some time ago.

Although a reconstruction of this picture was not possible, in itself it has quite a degree of importance. The huge amount of cattle shown on the picture testifies the enormous importance of livestock and especially of oxen for the livelihood of people, which according to the findings of Boerma, who interviewed elder people on this topic, would have been even bigger in the past. It seems in fact, that although there was more agricultural land per capita previously, the grain was often insufficient to meet the populations needs due to the high incidence of drought, locust plagues and the periodic plundering of grain stores by the warring factions, it was therefore necessary to import grain from Tigray or from Yemen or Sudan. The population therefore relied more on their animals and the milk from these for nourishment than on agriculture, also generally they could achieve relative affluence from livestock rather than from land cultivation (Boerma 1999:257).

The number of livestock seems to have decreased substantially during the 30 years of war (see chapter 3.3.5), especially during the last periods of drought. Some Eritreans commented upon the terrible drought in the last years of war, when "so many cattle died, people suffered from hunger and trees were getting dry". Mussie Tesfagiorgis' thesis was also written under the influence of the impressions he had when he travelled to Eritrea during the drought of 1989-1991 and saw, that "hundreds of thousands of livestock perished while agricultural production dramatically declined". It seems that this critical time was accompanied not only by insufficient rain but also by vast locust invasions in the regions of Akkele Guzay and Seraye (Mussie Tesfagiorgis 2003:2). However livestock numbers seem to have in parts recuperated in the 1990s.

A large number of cattle were encountered in the surrounding area of Akrur on the route from Segeneiti to Akrur (see also plate IIb). A boy, present at the time, reported that there were around two thousand cattle from the village, which were mostly grazed down in the valley. Even if his report was exaggerated (Akrur has probably about 2500 inhabitants in the whole) or the number also included oxen from other villages it is certainly indisputable that oxen still play a very important role in rural Eritrean life as they support the whole agricultural system.

### 4.3.4 Akrur

***Introduction***

Akrur, situated at an altitude of 1871m a few kilometres west of Segeneiti, is as well as Keren one of the early centres of Catholicism in the Eritrean Highlands. It was initially founded by French Lazarists and was then overtaken by the Italian Capuchins at the end of the 19$^{th}$ century. The village is historically known for the huge granite rocks found here in heaps or lying around loosely. Schöller (1896:216) noted in his travel account that Akrur was quite a small village with habitations which were hidden in quite a special way between masses of rocks. The travel guide edited by Bertarelli (1929:675) indicates that there was a good road between Segeneiti and Akrur at that time, this ran through a well cultivated area and that the houses in the village were picturesquely scattered between huge rocks. The Catholic Mission founded there was one

of the first that had been established by Bishop de Jacobis[25]. According to the figures compiled by Boerma, the village had a population of 310 in 1905 and 2100 in 1996 (Boerma 1999:252).

Today a lot of *beles* are growing in the Highlands surrounding Akrur as well as in other areas of Akele Guzay. According to different sources this plant was introduced by Catholic Missionaries in the 19th century. The *beles* are used as supplementary source of food for people during the rainy season and are also used to feed the animals (Mussie Tesfagiorgis 2003:25, see also chapter 3.2.4).

***To figure 4-15a***

This photograph was taken by the photographer Luigi Naretti and is kept in an album of the *Archivio Provinciale Cappuccini Lombardi* in Milan. Unfortunately there is no indication of the date when it was taken but it is known that Naretti took pictures between 1885 and 1900 (see chapter 2.2.3).

The photograph can be divided into three parts. The foreground, where a part of a huge heap of rocks can be seen, the middle distance, showing some houses at the foot of a mountain, and the mountains in the background.

In the foreground, on the left, some big rocks of granite with some smaller ones between them are visible. A *kolqual* and some smaller shrubs are growing between the rocks. Behind these rocks, on the right side of the picture, there is a small field in which two equestrians are standing. The soil appears relatively bleak and very scarcely vegetated. The darker areas could possibly be indicative of grass vegetation. Behind this field there are again some granite rocks lying on the ground with some small shrubs, probably *hehot*, growing between them. In the centre of the picture, behind the rocks, there are three or four huts of wood with thatched, flat roofs, probably *hidmos*, built one behind the other. Just to the right side of these huts a part of a stone house can be seen, this probably belongs to a church. There is what seems to be a bell tower at the left end of it. This is probably the church of the Catholic Mission mentioned in the caption of the picture. It is partly hidden behind the conical thatched roofs of two a*ghdos*. On the right side of these huts, a little back, there are more huts or houses. It seem that they are long square houses of stone, unfortunately the quality of the picture does not allow for a positive identification of their structure.

The mountain on the left in the background of the picture is covered with scattered dark spots, probably indicating some shrub or cactus vegetation. The scarce vegetation allows the underlying rock of the mountain to be visible. Unfortunately it cannot be seen exactly what kind of vegetation it is. Today the mountains in the surroundings of Akrur are covered with *beles* and *hehot*, but it is unlikely that *beles* would have grown so widespread at the end of the 19th century, although it might have been introduced earlier in Akrur than in other areas as the plant was introduced by Catholic Missionaries and this is an early Catholic Missionary area. The plants could also be *kolquals* or some kind of shrub. On the right a second mountain is situated in front of the left one, partly obscuring it, the same kind and amount of shrub or cactus vegetation appears to be growing here.

[25] Giustino de Jacobis was a pioneer missionary of the Catholic Church in Eritrea. He joined the Lazarists in 1818 and was nominated Bishop of Ethiopia in 1839, when he journeyed to Massawa. He focused his activities on Akele Guzay, where he evangelised the first Catholic congregation in Eritrea, adapting Catholic liturgy to the Alexandrine rite of the Orthodox Church, ordaining Eritrean clergy and translating Christian texts into Tigrinya (Killion 1998:132).

**Figure 4-15a: "*Presso Saganeiti Acrur Missione Cattolica"* (photograph by L. Naretti, ~1890. APCL, Album I, 47)**

**Figure 4-15b: Akrur towards east (photograph by L. Lätt, 15.03.2004)**

### *To figure 4-15b*

The reconstruction picture of Akrur was taken on the 15th March 2004 facing the east. Again it was difficult to find the exact location from which Naretti had taken the model picture. The village has changed considerably, many houses have been built and rocks have been replaced or used for construction. The reconstruction picture was finally taken closer to the mountains than the historic one. Nevertheless a comparison should still reveal the most important changes that have occurred in the area.

In the foreground of the contemporary picture, on the left side, there is a large, flat dirt area, which leads to the houses at the foot of the mountains. A lot of the rocks, which were present on the original picture, seem to have been removed, although a lot of granite blocks can still be found surrounding the village. Some young trees seem to have been newly planted in this flat area. In the centre of the foreground, a square modern-looking *mereba* can be seen, behind of which there is a camel. These animals are quite common in the area and are used to carry water and other goods. On the right side of the house there is a wall of stones belonging to another *mereba* house, which is partly visible to the very right of the picture. Just behind this house, a part of the roof and the entrance of the Catholic Church are visible. It has obviously been rebuilt and appears to have been moved a little, although it is difficult to clearly define how much the location has really changed as the different angle of the photograph may also be deceiving.

Just in front of the entrance to the church a *daero* tree is standing. To the left of it, different kinds of shrubs and cacti, mostly *beles*, acacia trees and *hehot*, are growing. At the foot of the mountain on the right and on a hillside on the left of the picture various kinds of houses can be seen. Most of them are *merebas* of differing colours, traditional *hidmos* can also be found in the centre of the mountainside. Some houses (mostly *hidmos*) have also been built higher up on the mountainside. Between these houses and spread over the two mountains there is scattered vegetation, which consists almost exclusively of *beles*. In parts they are growing together in clusters especially so around the *hidmos* on the right side of the picture. In general the vegetation seems to have decreased since 1890, on the clear triangle on the mountainside in the centre there is almost no vegetation visible any more. It seems that the primary vegetation was displaced and partly substituted by the *beles* plants. Possibly the use of the shrubs as firewood by the locals and also erosion have played a role in clearing the vegetation.

### *Additional information*

An elderly man in Akrur was interviewed regarding the environmental changes in the area surrounding the village, he stated that there were formerly many trees in the area like *seraw* and *awlie* and that these trees were used by the people to build their *hidmos*. Today most of the vegetation has disappeared as a result of the population pressure. He went on to say that the population of Akrur has increased enormously during the last generation. Today most of the houses are made of granite rocks taken from the surroundings. This releases the pressure on the vegetation although vegetation is removed in some parts to reach the rocks. The interviewee implied that there was formerly denser vegetation in the area but when shown the picture admitted, that maybe the vegetation was not so dense. In recent times a lot of eucalyptus trees have been planted in the area. The law that for each tree cut a tree must be planted, is enforced here, this was confirmed during the interview.

The fields surrounding Akrur are used as pastureland for cattle, cows and camels, and also for cultivation. In summer, wheat, millet and sorghum are grown here. The interviewee stated that there was gardening done in the area, although it seems that there is actually only one big garden in Akrur; this belongs to the Catholic Mission. For the irrigation of the garden, water is pumped by generators from wells. The huge granite rocks are still an important feature of the village, some houses are also constructed on and between these enormous heaps of granite.

***Conclusion***

The most characteristic feature of Akrur, the granite rock formations, which were described by Schöller in 1896, can still be found throughout the area. It appears, however, that a lot of these rocks have been quarried in the past and are still used in the construction of houses today. Obviously all the houses constructed today are built of these rocks whereas, at the end of the 19th century, most the houses seem to have been the wood based, shorter lived *hidmos*. However, it must not be forgotten that the population was much smaller at that time. Some *hidmos* were built on the mountainside during the 20th century but the more recently constructed *merebas* are mostly built at the foot of the mountain or on the plain. How many olive trees and acacias and other kinds of trees and shrubs were really growing in the surroundings hundred years ago is unfortunately difficult to ascertain using the original photograph. It appears that the vegetation was never really dense on the mountainsides in the immediate surroundings of Akrur. However, it can safely be put forward that the scarce vegetation would have diminished a little during the last century especially towards the bottom of the mountainsides. The facts that *beles* can be used as food and fodder and that *seraw* and *hehot* are popular as firewood infers that the vegetation has at some time been partly cleared and has not regenerated yet, the regeneration having perhaps also in parts been hindered on the steep slopes by erosion.

### 4.3.5 Adi Kayeh and Tokonda

***Introduction***

Adi Kayeh, a town located at an altitude of 2420 m, 115 km south of Asmara on the way to Senafe, used to be the provincial capital of Akele Guzay. The town is settled on a ridge, covered with white sand (Bertarelli 1927:660), which is commanding the intersection of the Hadas River valley and the main highland route from Asmara to Ethiopia. Adi Kayeh was essentially the creation of Italian colonists, who constructed a fort on the site in 1890 and built up the town as a colonial administrative and market centre with a Catholic Mission and military garrison. By 1931 the population grew to approximately three thousands, it increased further during 1937-38, when the main road from Asmara to Addis Abeba was built making it an important highway stop. Growth stopped during 1947-55 when *shifta* (rebel) attacks drove away most Italians and the area suffered from the tensions arising between Muslim and Christian communities. In the mid-1960s the ELF began to operate from bases on the nearby Kohaito plateau and by the mid-1970s Adi Kayeh had been transformed into an Ethiopian garrison town. In March 1975, the garrison massacred scores of Eritrean residents who then fled en masse. Throughout the 80s, the town was held by the Derg and was ringed with land mines so that the residents were unable to farm or graze their animals. Finally in 1990, Adi Kayeh was liberated by the EPLF (Killion 1998). Today Adi Kayeh is a growing administrative and market centre with population figures estimated at around 20’000. The historically important sites of Kohaito and Tokonda with ruins from the Axumite period are both located in the surrounding area of the town.

### 4.3.5.1 Adi Kayeh: View towards the east

**Figure 4-16a: "*Adi Cahié – Accampamento Indigeni"* (photograph by F. Nicotra, 1896. MVK)**

**Figure 4-16b: View from Adi Kayeh towards the east (photograph by L. Lätt, 19.03.2004)**

***To figure 4-16a***

This photograph of Adi Kayeh is another photograph, which has been taken by Francesco Nicotra in 1896 and is stored in the *Museum für Völkerkunde* in Vienna inherited by a named Steindacher. The official caption is *Adi Cahié – Accampamento Indigeni*[26], while the German caption *Blick auf ein Dorf mit Kegeldachhäusern*[27] has probably been added by Steindacher. The photograph has been taken close to the edge of the ridge on which Adi Kayeh is located, facing east, where the slopes of the Kohaito plain are visible.

Again the original can be divided into the foreground, showing an *aghdo*-village on a plateau at the edge of an elevated plain, the middle distance, showing the slopes of two hills, and the background, showing the mountain slopes of the Kohaito plain.

The plateau in the foreground is slightly hilly and largely covered with small white rocks, especially in the foreground. Some small shrubs (perhaps *hehot*) are also growing on the sandy ground. A part of the plateau close to the edge is covered by about a hundred thatched *aghdos* or *tukuls*, which have been built in a linear fashion. The location of the settlement at the edge of the plateau was well chosen from a strategic point of view, since the people had a good view overlooking the Haddas valley in the east. In the far left of the photograph, in front of the settlement, there can be seen two more thatched *tukuls* and another, higher one, with a stone wall and a thatched roof which is covered with canvas, this house probably being owned by a local chief. It seems that these 'important' people usually lived in bigger huts, compared to the huts of the 'common' people. To the right side of the village a white tent can also be seen obscured in parts by a square stone house with a pitched roof already illustrating the Italian influence in the area as early as 1896. Here and there, some people, probably Eritreans, can be seen between the houses. Also in the foreground, in front of the settlement slightly to the right, a group of white-dressed people are sitting on the ground. They are looking towards a man who is standing in the middle of them and is wearing white pants and a coloured pullover. He is probably European. The plain around the settlement does not seem to have been used for cultivation, it is more likely to have been grazing land.

The hills, which are emerging from behind the plateau, are covered by scattered, shrubby vegetation, although large areas seem to be bleak. Unfortunately it is not exactly clear, what kind of vegetation is growing on the hillsides, but it can safely be assumed that it must be a kind of shrub or grass. Possibly it could be *hehot*, as in the foreground, or also *seraw*, which is mostly growing on the hillsides of this area today. Also some paths, which are leading up the hill, can be distinguished.

The mesozoical sandstone (GoE 1994) mountain slopes of the Kohaito plain in the background are probably covered with the same shrubby vegetation up to the highest level which then becomes very rocky and therefore devoid of vegetation.

***To figure 4-16b***

The reconstruction picture was taken on the 19th of March 2004. Only a photocopy of the original picture was available at the time so the picture was orientated by using the ridgeline of the Kohaito plain. It is clear that the reconstruction photograph was taken in a place some meters closer and to the right of the historical picture.

In the foreground the reconstruction photograph shows the same plain that is seen on the historical picture. However, now no settlement on the plain can be found. The strategic

[26] Encampments of the natives

[27] View of a village with houses with conical roofs

importance of the location has decreased after the cessation of political rivalries, raids, *shiftas* and invasions that occurred during the Italian colonisation. All the houses that belonging to Adi Kayeh have now been built further away from the edge of the ridge, approximately one hundred meters behind the place where the photograph was taken, no *tukuls* at all can now be found in Adi Kayeh. The people in Adi Kayeh who were asked about the *tukul* village could not remember any such settlement, however, they stated that houses generally were built as *tukuls*. Later they were replaced by *hidmos* while now all the houses are usually made of stone. The terrace is covered with light reddish sand and small rocks (see also plate IIc). In summer, as was reported, the plain is mainly cultivated with sorghum, millet and teff. The vegetation on this plain is about as dense as on the original picture, although the main plant growing here now seems to be *beles*, which has also obviously expanded into this area. Apart from the *beles*, there are some small shrubs and aloe macrocarpa (*sanda-ere*) to be found on the sandy plain.

The hills behind the plateau are now covered with eucalyptus trees, which have been planted here. There are now no paths visible. The mountain slopes of the Kohaito plain are in parts forested with eucalypti whilst other parts are covered with scattered vegetation, consisting mainly of acacias. In comparison to the first picture the shrub vegetation seems to have decreased a little, although it is difficult to compare the backgrounds of the photographs, since the vegetation cannot be recognised clearly on either of the pictures.

### *Additional information*

The two men interviewed in Adi Kayeh stated that there were more trees (especially *awlie*) in the towns surroundings. They reported that a lot of trees were cut during the Derg Regime and that also some Eritreans cut wood illegally. The people collected dry wood for fuel and cut trees in the mountains for the construction of their houses. As today all the houses are made of stone this problem does not arise. One of the men reported that there are less trees now because of the expansion of the town especially during the last few decades. A lot of trees would have been cut to make space for the construction of houses. Most of the hills in the surrounding area of Adi Kayeh are also terraced now, many of these have been made by students during summer campaigns. Many trees have been planted recently, mostly eucalyptus and *berbere tsellim.* The water used by the population of Adi Kayeh is now taken from wells. Previously there were also dams but it seems that they were closed because children had drowned in them. The area is intensively used for agriculture. Mainly millet, sorghum and teff are planted here in summer, sometimes maize is also sown.

Historic literature concerning the Kohaito plain, in the east of Adi Kayeh, hints that it was previously very rich in vegetation especially juniper (Bertarelli 1929:661). The vegetation was probably largely destroyed during the period of British Administration and possibly later (see also chapter 3.4.3). Unfortunately no significant historical pictures of the area could be found. Littmann, who visited the Axumite sites in Eritrean and northern Ethiopia in 1906 described the Kohaito plateau as overgrown with shrubs and trees, a view which he found very agreeable in the midst of the Abyssinian Highland, which, in his eyes, was rather poor in trees (Littmann 1913:24). This statement also seems to confirm the thesis that the general appearance of the Ethiopian and Eritrean Highlands was bleak and lacking in vegetation already hundred years ago, and that the Kohaito plain was rather an exception in this regard.

***Conclusion***

Here photo-comparison provides an excellent illustration of settlement migration, the original settlement is now totally replaced by the one on edge of a ridge further back. A field that was once covered with *tukuls* is now used for agriculture, the norm being the reverse of this. In the original it is of interest to see the regular geometry in which the *tukuls* have been aligned (most probably induced by the Italian) and how the 'better' houses of the chiefs of the village are clearly distinguishable by their shape and more solid construction.

It is rather difficult to imagine that the ridge, on which Adi Kayeh is located, was really once covered by dense vegetation, which was cleared to build houses. The slopes of the hills and the mountains in the background also do not seem to have ever been densely vegetated, at least not with trees. It is possible that the shrub vegetation has indeed decreased a little on the slopes, while there seems to be evidence that the Kohaito plain was much more vegetated during the Italian colonial time. The elderly people in Adi Kayeh seem to mainly blame the Derg Regime and Eritreans themselves for the decrease in tree cover. It seems that the influence of the British Administration period is already too far in the past to be within the contemporary social consciousness.

#### 4.3.5.2 View from Adi Kayeh towards southeast

***To figure 4-17a***

This picture is stored in an Album of the IAO, which contains photographs from various authors, which were taken between 1912 and 1927. It is not exactly clear when this photograph was taken and by whom. The photographer was standing on the slopes of the Adi Kayeh plateau, probably on a path leading from Adi Kayeh directly to the fort.

The photograph shows a valley in the southeast of Adi Kayeh. In the background on the right, the hill of Tokonda is visible while on the left the mountain slopes of the Kohaito plain can be seen. On the plain in the foreground of the picture a path, bordered by big rocks, is describing a bend and then leading straight towards the fort, which is situated in the centre of the picture. Some people are walking on the path and there is also a horse or a donkey grazing on it. The location of the fort in the middle of a vast plain is rather untypical since the forts are normally located on high hills or ridges. The fort is situated on a low and rather rocky looking hill. In front of the fort there is a small house with an inclined roof, probably a guard post. The fort consists of different houses surrounded by a stone wall. The plain around the fort is covered with short grass and some scattered small shrubs. No tree is visible in the whole area covered by the photograph. The white lines seen crossing the plain are probably footpaths. The slopes of the table-shaped Kohaito plain in the background, on the left of the picture, are also covered with a grass layer and scattered shrubs. The vegetation on this part of the Kohaito escarpment seems to be scarcer than on figure 4-16a. The vegetation of the Tokonda hill is the same as that observable on the plain and mountain slopes. A house is vaguely visible on the ridge of the hill.

***To figure 4-17b***

The reconstruction picture was taken on the 19$^{th}$ March 2004 from Adi Kayeh facing southeast. The landscape in the foreground seems to have changed enormously during the last century. The area in front of the fort seems to have been flattened, this meant it was not possible to take a picture from exactly the same position as the original picture. The photograph is taken from further away and to the left. The fort in the foreground, the slopes of the Kohaito plateau and Tokonda hill in the background are all still clearly visible on the picture.

**Figure 4-17a: "*Fortino di Adi Caiè verso Toconda"* (photographer unknown, ~1920. IAO, ER 2)**

**Figure 4-17b: Fort of Adi Kayeh towards southeast (photograph by L. Lätt, 19.03.2004)**

In the foreground of the photograph, the terrain is falling away slightly. On the right side there are different shrubs, cacti and acacia trees. Three freshly ploughed fields can be seen. On the left side there is a tool shed surrounded by shrubs. The broad path, which leads to the fort, has disappeared and at its place there are now three small paths leading from and to the fort, one from the left, one from the right and one from the centre of the picture. In front of the fort an irrigated garden has obviously been established on the plain. Different fields used for growing vegetables can be seen. It was reported that this garden is called Enda Gallo, it used to belong to an Italian called Gallo for some time. The vegetables grown here are mainly chabich, salad and spinach. Different paths are leading over the plain. The fort itself has changed since the original picture was taken. Three or four stone houses are now standing separately and only a part of the stepped stone wall is now visible in the background of the fort. Just behind and beside the fort, a large forest is now growing, it consists mainly of eucalyptus trees.

On the top of the Tokonda hill many of eucalyptus trees have been planted and on the left side of the hill a house is visible. Other houses are possibly hidden between the eucalyptus trees. Also on the top border of the slopes of the Kahaito plateau on the left, eucalyptus trees are growing. The mountain slopes generally look dryer and there seems to be even less vegetation growing on them than on the original photograph. Again, it must be noted, however, that the second picture was taken during the dry season. As can also be seen on the next picture there are acacia trees growing on these slopes, they are very light green because of the season and therefore cannot be distinguished well on the photograph.

***Conclusion***

It can certainly be said that the general appearance of the area southeast of Adi Kayeh has totally changed during the last century. The foreground of the picture, especially, is almost unrecognisable now, the deconstruction of the fort being probably the least important change. The plain in the foreground, at front of the fort, which was only covered by grass and rocks at the beginning of the 20$^{th}$ century, has been transformed into an irrigated garden (present for several decades), the terrain has been levelled for this purpose. Meanwhile, the back part of the plain is now covered with a large forest of eucalyptus trees. It seems that the forest also has been here for several decades. According to the findings of Boerma, Adi Kayeh would indeed have belonged to the towns of the Central Highlands, where tree planting programmes were fostered already by the Italian colonial Government in the 1930s (see Boerma 1999:136). Also the hills in the background seem to have in parts been forested with eucalyptus trees. In the very foreground there seems to be quite dense shrub vegetation. *Beles* is seen between the fields showing that this cactus has also spread to this area over time. This photo-comparison is an example of a place where the population increase has obviously had a creative impact on the environment in a positive sense.

#### 4.3.5.3 The ruins of Tokonda

Tokonda is located four kilometers southeast of Addi Kayeh in the direction of Senafe, at an altitude of 2350m. Its publicity derives from old axumite columns, which are probably remnants of an ancient axumite settlement (Bertarelli 1927:662). These are open to visitors. Only one of the columns has remained intact during the 30-years struggle, however.

**Figure 4-18a: Missione Cattolica Asmara: "*Rovine di Toconda"* (photographer unknown, probably 1920s. APCL Album I, 408)**

**Figure 4-18b: Tokonda. View towards southeast (photograph by L. Lätt, 19.03.2004)**

***To figure 4-18a***

This is a picture of the Catholic Mission in Asmara, stored in an album of the Capuchin Province archive in Milan. Unfortunately the name of the photographer is again unknown as well as the date of its issue. The picture probably dates from the 1920s or 30s. It shows four columns built in a square in a rocky surrounding, in the background are the hills of Kohaito. The picture was taken facing towards the east.

In the foreground of the picture there is a flat hill, which is covered with chiselled rocks of medium size, probably the remains of the ancient Axumite settlement. On the right side two large steps can be seen separated by smaller stone steps all of which are probably Axumite. The first step is mostly covered with rocks and some shrubs, while the second step leads up to a plain at the back, which stretches to the horizon and is apparently covered with grass. Unfortunately it cannot be deduced whether the field is used for grazing or cultivation. In the centre of the picture, on the stony hill, there are four columns standing in a square on pedestals. In front of them, there is a single pedestal. It seems, that a column is also lying on the ground just next to it. Some small shrubs can be found to the left of the columns.

The mountain slopes of the Kohaito plain, in the background of the picture, are covered with a scattering of shrubs, similar to the vegetation seen on plate 4-17a. The horizontal lines, which can vaguely be seen on the mountain slopes, indicate that these were already terraced at this time, obviously to prevent erosion and to store water. The terraces do not seem to be made recently, they were probably made before the Italian colonisation. In the centre of the photograph, just in front of the mountainsides there is a round hill, which also seems to be terraced, although it cannot be seen distinctly. In the background on the right side of the picture, there are some high shrubs, probably *kolquals*. One of them is clearly silhouetted against the sky.

***To figure 4-18b***

This reconstruction picture has been taken on the 19th March 2004 with the kind permission of the National Museum in Asmara. Most of the Axumite columns were destroyed by the Ethiopians during the struggle, and were used for fencing and terracing. Only one column has remained intact and is still standing in more or less the same place. It is possibly the one that was lying on the ground in the original picture. As many of the rocks have been removed, the foreground looks quite different today; it was therefore necessary to focus more on the background matching it to the original print.

In the foreground of the picture a square plateau of hard rock is visible with a long column standing in the centre. Behind the column to the left there are some shrubs with red flowers growing. They seem to be bigger and denser than the shrubs seen previously, although it could still be the same kind of shrub. On the right towards the back of the plateau the plain is visible, which is obviously used agriculturally. The different fields are fenced with schistose, chiselled stones, probably some of the ones, which were lying loosely around in the historical picture. An electricity wire is crossing the harvested fields, on which some shrubs are also growing. In the background of the picture one can again see the mountain slopes with the terrace structures and the hill in the centre. Some of the terrace structures appear much more clearly than on the historical picture and were probably renewed and enforced. Other terraces, especially on the hill, seem to have vanished, probably through erosion. Some shrubs are growing on the slopes and there is also a scattered vegetation of seraw growing, which, unfortunately, cannot be seen clearly on the picture. In the background just to the right side of the column, two cows are grazing. The top of the mountainside on the left has been forested with eucalyptus trees. Also on the right side of the picture, at the border of the road, which is hidden behind the fields, some tall trees are growing. These could also be eucalypti.

### *Additional information*

Unfortunately, the rocks in the foreground of the historical picture obscure the view of the background of the small hill so it is not possible to see if the field was used for agriculture already at this time. The ruins of Tokonda seem to have been a popular object for photographers who passed this site in the early times of the colony, however, this leads to the lucky situation that photographs of Tokonda in the early Italian colonial time also exist from the German Aksum-Expedition, which passed this area in 1906. One of these photographs, which dates from the 19th of April 1906 and has been taken by Theodor von Lüpke, a professional photographer, shows the field in the background of the columns and illustrates that it was cultivated with different crops at the beginning of the 20th century. Also the terrace structures can already vaguely be seen on the mountainside in the background. It is interesting to find the terrace structures on the historical pictures since they show that the Eritreans knew of this system of soil conservation already at least in the 19th century, since it is very improbable that the terraces were made by the Italians so soon after their arrival in Eritrea. This finding contradicts the assumption of scientists that methods of intensive cultivation like terrace constructions were not known in pre-colonial Eritrea (e.g. Taddia 1986:96; Liebi 1993:69). The photograph also shows some scattered *kolquals* growing on the mountain slopes, a plant, which seems to have become rare in this area[28]. The picture if von Lüpke is discussed in depth by Ritler (2004).

### *Conclusion*

Generally, it can be said, that the vegetation in the valley of Tokonda and also on the mountain slopes of Kohaito is not substantially denser in the historical picture than in the later one. There seems to have been only shrub vegetation and maybe also acacias, which like on the modern picture cannot be distinguished very clearly on the photograph. Only the euphorbia, which was growing on the mountainsides at the beginning of the last century, seem to have mostly disappeared. However, like on the other two photographs of the surroundings of Adi Kayeh, there are no trees on the earlier picture while the trees found now are mainly eucalyptus, planted during different campaigns.

Apart from the newly planted eucalypti and the missing *kolqual*, little has changed in the surroundings of Tokonda. It is interesting to note that a lot of things, which can be observed on the modern picture, were already there on the model, for instance the erosion problems, the terraces, and the agricultural fields. Apart from the electricity wire, the most striking difference on the reconstruction picture is of course the change in the foreground, all the stones having been cleared and the destroyed columns, which can now be found nearby as pieces in the fences and terraces. The destruction of their cultural inheritance by the Ethiopians must have added to the traumatic experience of the Eritreans in the 30-years war.

[28] The *kolqual* seems to have been a very popular plant especially for the roofing of the *hidmos*. Boerma also noted on some of the photo comparisons she made, that the amount of kolqual had decreased in certain areas of the Akele Guzay province, while other plants like seraw and of course eucalypts and *berbere tselim* had increased.

### 4.3.6 The surroundings of Debarwa

Debarwa, located at an altitude of 1930m, 36.5 kilometres southeast of Asmara, was earlier the medieval capital of Central Eritrea. The town is situated in the fertile Tsellima district on the headwaters of the Mareb River, which drains a large part of the Central Eritrean Highlands. It forms much of the southern border with Ethiopia until it flows into the Lowlands in the former Gash-Setit Province, where its name changes to the Gash. Debarwa is situated in a strategic place, the trade route from the former Hamasien province to northern Tigray crosses the river here. This made it a caravan stop and regional market as early as the fifteenth century. In the seventeenth century the political importance of the town was eclipsed by the rise of Tsazzega but the town continued as an important market centre throughout the nineteenth century. By the end of the 19th century, the town (probably largely because of the great famine) must have looked rather pitiful: Bent describes Debarwa as a "place of abject squalor and misery". The "wretched inhabitants" would have lost all their stocks and been decimated by cholera and other diseases (Bent 1893:87). Also Wylde describes the "tumbledown appearance" of Debaroa, which he encountered almost uninhabited, while it would have been a "famous old town, once" (Wylde 1901:127). Under Italian rule the town was developed as a district administrative centre on the Asmara-Mendefera road, and a bridge was built over the Mareb, just to the north of the town. In 1998 it had some 3'000 inhabitants (Killion 1998:149).

#### 4.3.6.1 The Tsellima plain

**Figure 4-19*: "La piana di Debaroa. Azienda Magazzini"* (photograph by Candussio, 1938. IAO, AOI 18)

The fertile Tsellima plain, on which Debarwa is situated, is one of the major agricultural areas of the Seraye plateau and is probably one of the earliest scenes of cultivation and settlement in Eritrea. Figure 4-19 may give an impression of the appearance of this fertile and heavily cultivated plain at the end of the Italian colonisation.

The picture was taken by Candussio in 1938 from an estate in the surroundings of Debarwa, which must have belonged to a certain Marazzini. It is stored in an album of the IAO in Florence. The field, shown in the foreground, is covered with grass and some shrubs and on the right side with cacti (mostly *beles* and sisal). A telephone wire is crossing the field in the foreground, which is bordered in the back by a live fencing, apparently consisting of cacti. Behind this fence a vast crop field is stretching far to the horizon where two hills with a long, flat shape, typical of the hills of the Eritrean Highlands, appear. The variations in the colour of the vast field probably derive from the shadow of clouds rather than from the differing crop sorts. It seems, in fact, that the same crop is grown on the whole plain. The huge field is crossed by a small road, which leads to the hills in the background. Several people seem to be walking on this road. There appears to be a small settlement in the background on the left. In the foreground a part of a building with pillars can be seen, it probably belongs to a farm building of the '*azienda'*.

For this study it was wrongly supposed that this photograph had been reconstructed already by Boerma, who focused a part of her field studies also on the Debarwa area and has in fact reconstructed two very similar photographs of the extensive crop fields of the Tsellima plain taken by A. Maugini in April 1930 (cf. Boerma 1999, plates 4-12 and 4-13; pp.136-137). An attempt therefore was not made to reconstruct this photograph. The reconstructions made by Boerma show that generally very little has changed in the appearance of the Tsellima landscape apart from the spread of *beles* and growing of shrubs in some places, while some single trees have disappeared. On one of the pictures, a small eucalypt forest can also be seen in the horizon, which was obviously planted there after 1930. It seems that the Tsellima plain contained several major Italian farms on which the owners planted partly quite extensive groves of trees in the late 1930s. The area is still extensively cultivated.

#### 4.3.6.2 The Mareb River north of Debarwa

***To figure 4-20a***

This picture was taken in 1905 by Giotto Dainelli facing towards the north of Debarwa. The photographer was standing on the bridge over the Mareb river just northwest of the town, it had been recently built by the Italians. Unfortunately, the quality of the photocopy taken from the photograph is quite poor.

The picture is dominated by a riverbed. The river itself is only visible in some areas as it meanders towards the horizon of the picture. The banks of the riverbed in the foreground appear to be very rocky and there is almost no vegetation growing on them apart from some moss and some small shrubs in the foreground. These banks rise up quite steeply, especially on the right side, towards the back of the picture they raise little gentler. In the background of the picture, on the right, a round hill with some scattered vegetation on it appears. The horizon line of the bank on the left is very defined; it has a natural terrace in the centre and apparently no vegetation on it. On the top of the bank, on the far left, there are some long stone houses, possibly belonging to a fort; a small white house stands just in front of them.

**Figure 4-20a: "*Il Mareb presso a Debaroà"* (G. Dainelli, 1905. In: Dainelli 1908:70)**

**Figure 4-20b: The river Mareb in the north of Debarwa (L. Lätt, 22.03.2004)**

### *To figure 4-20b*

The reconstruction picture was taken on the 22nd March 2004 on the Italian bridge, which is still in the same location as a hundred years ago. The riverbed looks very different today, which proves a little confusing but on comparing the two horizon lines in the background one can clearly see that it is the same location.

The riverbed, which is empty at the moment because of the dry season, looks much more channelled now. In the foreground it leads straight to the northwest in the first hundred meters before it bends and continues to the northeast. Consequently there is only a small part of the right riverbank visible in the picture. The right bank of the valley still looks quite steep although it seems a little less rocky. In some parts the bank seems to have been eroded. There are numerous small shrubs growing between the rocks. Further back there are higher shrubs growing and close to the river some eucalyptus trees have been planted. On the hill at the back there are some trees, probably eucalypti, and some scattered shrubby vegetation.

The left riverbank is larger now and the terrain falls away more gently than on the previous picture. It is covered with sand and small rocks. In the foreground and along the border of the riverbed some small shrubs are growing. The rest of the riverbank is quite densely covered with eucalyptus trees. Higher up the hill other trees (possibly acacia) are visible. Finger euphorbia (*kenchib*) was also growing in many places of the riverbed although the plant cannot be seen on this picture. Behind the horizon line of the riverbank a lot of eucalyptus trees are also growing. On the natural terrace one can now see the ruins of a stone house. Some meters higher up, obscured slightly by the shrubs and eucalyptus trees, another facade of a house can be seen. The long buildings on the top of the hill, seen on the original picture, are now not visible.

### *Additional information*

Two elderly men were interviewed in Debarwa regarding the landscape and vegetation changes in the area surrounding Debarwa. They stated that previously there were huge forests in the surrounding areas of the village consisting mainly of *seraw* and *awlie*. One of the men reported that these forests have given the name "*tsellima*" to the area; this means "black" in Tigrinya. The other man then corrected him explaining that the name *tsellima* had a different meaning. According to him, the name derived from the struggles that took place in this area in pre-colonial times. The people used to burn down their village and the land before they left it, which gave the area a black appearance. An example illustrating the caution that must be taken when using oral evidence. Today the wood is usually taken from further away from behind the hills. The eucalyptus trees in the area were mostly planted approximately 20 years ago during the Derg Regime; again a new tree is planted for every tree cut. The water was previously taken from the river, which would have had more water than today. People in Debarwa now have tap water.

### *Conclusion*

The affirmation of our interviewees that there would have been huge forests in the surroundings of Debarwa seems to be more than a little doubtful given that the area is known to be very fertile and was intensively used for cultivation as early as several centuries ago, however, there may have been more wild olive trees growing than today especially along ravines. A huge sycamore tree, which was noticed by several travellers such as Paoli (1908:277), Dainelli (1909:11) and Bent (1893:87), seems to have been a rather outstanding exception in the otherwise featureless and highly cultivated plain.

The historical photograph also shows that the riverbed of the Mareb seems to have been scarcely vegetated at the beginning of the 20th century, although the picture was taken shortly after the rainy season. Due to the plantations of the eucalypti, the riverbed appears much more vegetated today.

### 4.3.7 Mendefera / Adi Ugri

***Introduction***

Mendefera, 54 kilometres southeast of Asmara at an altitude of 1950m, is now the fifth largest urban centre in Eritrea with a population of over 20'000 inhabitants. It is the administrative centre of the new Southern Highland Province of Debub. The town was known as Adi Ugri on all pre-1980s maps. Mendefera was originally a village near the Italian garrison of Adi Ugri, which was fortified in 1889 as the colonial headquarters for Seraye. Bent reports, that the hilltop, on which the fort had been constructed, was covered with wild olives, kolquals and other trees forming a dense jungle. Most of the trees were cut down when the Italians built the fort (Bent 1893:88). By 1905, Adi Ugri had a population of 2'800, which grew to over 5'000 by 1931, boasting a secondary school and important Catholic institutions (Killion 1998). An experimental field for agriculture was also established here by the Italians (Bertarelli 1929:650).

Paoli in 1907 wrote about Adi Ugri:

"The village, which consists of tukuls and European houses, is enclosed by soft hills and shines white between the beles, the flower gardens and the small eucalypt forests, in front of a vast basin, where the climate is milder if not even more healthy than the Hamasien" (Paoli 1908:277).

**Figure 4-21a: "*Panorama di Adi Ugri visto del Fortino"* (photographer unknown, probably 1912. IAO, ER 2)**

***To figure 4-21a***

This photograph has been taken by an unknown photographer and is stored in an album of the IAO in Florence. All the pictures in this album date from between 1912 and 1927 and it is probable, looking at the architecture of the village, that this photograph has been taken rather early in this time interval. As the caption says, the picture has been taken from the fort, which is located on the top of the hill in the southeast of the town. The photograph was taken facing towards the northwest.

The photograph overlooks a plain, which is bordered at the back by some gentle hills. Behind the hills a vast plain can be seen at a somewhat lower level, this is again bordered by hills in the horizon. The soil of the plain in the foreground appears quite rough. Probably the soil layer is quite thin here. There is no vegetation visible on the plain apart from three or four single trees. From the fort hill, where the photographer was standing, two apparently newly built roads are leading towards a settlement located in the centre of the plain in the foreground. Some people dressed in white are walking on them. A small settlement consisting of some *tukuls* and some square houses with pitched, thatched roofs can be seen in the foreground spreading over the left and right side of one of the roads. The main settlement, in the middle of the plain, consists of (as already described by Paoli in 1907) some white square Italian stone houses with pitched roofs, and at least two hundred *tukuls*. The stone houses have been constructed in a square, open at one side. Various people can be seen inside this square, which is possibly also used as market place. The *tukuls* have been arranged in very regular lines at the back and on the left side of the Italian houses. They all appear to be thatched. Two paths are leading from the settlement up to the hills.

The plain in the background can only vaguely be seen. It looks very regular and is certainly not forested though some darker spots may indicate the presence of some small groves of trees. The variances in the colour of the plain seem to indicate vaguely the structures of different fields. The vast plain is bordered in the background by two characteristic ‘table-shaped’ hills.

***To figure 4-21b***

This photograph has been taken in 1938 by the photographer Candussio from the same fort hill as the other historical picture. The angle is a little different as the characteristic shapes of the small hills in the background of this picture weren’t visible on plate 4-21a. The picture was taken facing more towards the north.

In the foreground of the picture a large garden can be seen in which crops are growing, these are probably maize. To the right of the garden there is a small villa, which is surrounded by tall eucalypti. Numerous large trees are growing just in front of the garden and bordering the main avenue of the town which leads to the north of the village. The houses to the right and to the left side of the avenue are all long square stone houses of different colours, they have obviously been built by the Italians. To the right of the avenue there are three parallel roads and to the right of the third parallel road a large white Mosque is clearly visible. Just behind these houses, in the foreground of the picture, there is a long, low hill. There appears to be many trees growing on the top of it, some houses are also standing there. The plain at the background of the town cannot be analysed since it is not clear what is growing or standing on it. However, as this plain was used for agriculture in the 1910s and is still used for agriculture today it is probable that it was also used for agriculture in 1938. In the horizon the shapes of some very characteristic mountains can be seen, the second one from the right is the top of the hill of Enda Amanuel, which will be discussed in chapter 4.3.8.

**Figure 4-21b: "*Panorama di Adi Ugri visto dal Forte"* (photograph by Candussio, 1938. IAO, AOI 19)**

**Figure 4-21c: Mendefera – view from the fort hill (photograph by L. Lätt, 24.03.2004)**

### *To figure 4-21c*

This reconstruction picture was taken on the 24th of March 2004. Since pictures were not allowed to be taken from the fort, the lower part of the hill was climbed. Consequently the picture is taken at a lower angle than the original of Candussio. However, the angle is almost the same as the one chosen by Candussio to take his photograph.

In the foreground of the picture a part of the hill is shown which is now covered with *beles* and euphorbia plants, some eucalypti have also been planted at the border of the hill. Stone houses have been built up to the foot of the hill. The house on the left of the picture with the small tower just before the main avenue was already visible on the picture of Candussio. Also the main avenue bordered by trees and the three parallel roads are still there and also the Mosque, which seems to have been renovated, it is a little larger now and the cupola has been painted in green. It appears that several houses in the town have remained exactly the same. There are more houses now and the amount of trees seems to have decreased. The hill in the background of the Mosque is overgrown with eucalyptus trees, and many new houses have been built on it in recent times. To the left of the hill the Coptic Church of St. Ghiorgis built in a rather futuristic style is visible. The fields in the background of the town, used for agriculture and pasture, can unfortunately not be seen on the photograph. The hills in the horizon however are silhouetted clearly against the sky.

### *Interview*

An elderly man was interviewed in the village of Adi Belay between Enda Amanuel and Mendefera about landscape changes; he stated that the same fields surrounding the town were always used for agriculture. Millet, wheat and peas are mainly grown here. During the rainy season in summer an irrigation system is used to water the fields. He also commented that every year new terraces are made on the hills around Mendefera and showed us a hill, which looked freshly terraced and had a school on it. He reported also, that the area was overgrown with *beles* and seraw shrubs; these were cut when the town expanded.

### *Conclusions*

As regards the vegetation of Mendefera, it seems indeed, that vegetation was cleared when the town expanded in the course of the 20th century. However, most of the trees, shrubs and cacti which were cut must have been plants which were growing after the arrival of the Italians or were even planted by them since the surroundings of the town looks much greener in 1938 than on the picture of 1912 where almost no vegetation can be seen. This is not to deny the possibility that the Italians would have cleared some vegetation, especially on the fort hill, just after they arrived, to build up the town and the fortification. According to Bent many of villages had been deserted by the end of the 19th century (probably because of the 'great famine' and the campaigns of the Egyptians) and were marked by thick clusters of trees, these having grown in after they were deserted (Bent 1893:88). Since the surrounding plain of Mendefera seems to have been used for agriculture, certainly at the beginning of the 20th century and probably much earlier, it is unlikely that there were ever dense forests growing here.

The town itself has expanded during the last century like almost all the villages and towns of the Eritrean Highlands; this is illustrated well through the photo-comparison. The typical evolution of the settlement from an *aghdo*-village to a town with square stone houses can therefore be seen as characteristic. It is also interesting to see that, apart from the expansion of the town and the tree felling, almost nothing has changed in the structure of the town between the picture of 1938 and the reconstruction photograph. The main roads are still in exactly the same place and even some of the houses can be recognised, this indicates persistence in structure of the towns

and especially of the road system that occurs as soon as a town is constructed as a permanent site with stone houses.

### 4.3.8 Enda Amanuel

***Introduction***

Enda Amanuel is a hill approximately six kilometres northeast of Mendefera. On the flat hilltop the Amanuel Church has been built, possibly centuries earlier. The view from the hilltop of the surrounding plain is excellent and the location of the village on the hillside is certainly well chosen with the fertile surrounding area. Unfortunately, no literature concerning the hill or the church could be found.

***To figure 4-22a***

This is also a photograph, which is stored in the album of the IAO, which contains photographs produced by different photographers between 1912 and 1927. The caption of the photograph says "Enda Michièl", which is actually a hill close to Debarwa. Obviously the photographer has confused the two places. The picture has been taken facing towards the northeast.

The photograph illustrates a hill with a characteristic 'table-like' shape. The downward slope of the hill in the front is covered with scattered shrubs, the upper part shows signs of erosion and is almost free of vegetation, there is not even grass growing on it. On the left side the hill slopes fall away less steeply than in the foreground so that a long edge is formed, here the foreground and the left side of the hill join. Along this edge erosion structures are evident. At the bottom of the left hillside some terraces can clearly be seen, these having probably been constructed here by local people. There are some houses, probably *hidmos*, built on the hillside. On top of the hill, to the left, a structure can vaguely be distinguished, probably the church dedicated to Jesus, it is surrounded by some high trees and/or *kolquals*. On the right, on the top part of the hill, and also in some lower parts, erosion is visible; the soil seems to be slightly degraded. Only a small part of the two hills to the left and the right side of the hill of Enda Amanuel can be seen, they appear to be lightly vegetated with shrubs.

***To figure 4-22b***

This reconstruction picture has been taken on the 10$^{th}$ of April 2004 in the morning. The characteristic shape of the hill was not difficult to locate and aided orientation.

At a first glance it seems that there were not many changes around Enda Amanuel during the last 80 years. The lower area of the front slope of the hill is still covered with probably the same kind of shrubs (mostly *seraw*), while it seems that the structures created by erosion have become larger and more distinct, especially at the edge where the front part of the hill joins the left side. This impression might however be strengthened by the different light and the clearance of the shrub vegetation on this part of the hill. In fact, it seems that the amount of shrubs growing on the hillside has slightly diminished. Whether the people of Enda Amanuel have partly cut the shrubs in the last decades to use for firewood or if the dry season is also responsible in making the site look less vegetated than on the historical picture is unfortunately difficult to say.

**Figure 4-22a: "*Enda Michièl presso Adi Ugri"* (photographer unknown, around 1920. IAO, ER 2)**

**Figure 4-22b: Enda Amanuel (photograph by L. Lätt, 10.04.2004)**

Erosion may also have hindered the natural regrowth of the vegetation in some parts. It seems that, at least today, only dry wood is collected as fuel. On the left side of the hill there are only fragments of the highest terraces left,[29] the *hidmos* have also disappeared. The lower area of this side of the hill looks denuded and a lot of stone houses have now been constructed up to the foot of the hill, a location, which from a strategic point of view might not be as good as the old one but which is possibly safer in view of the soil erosion on the hill slopes, it is also easier to access. Different kinds of trees are growing between the houses. Some are eucalyptus but, according to the report of the children of the village, there is also *awlie* (wild olive*)*, *seraw* (acacia etbaica), *tahses (*dodonea angustifolia) and different kinds of shrubs and cacti growing in the area. A man met in this village (which is also called Enda Amanuel) stated that the ruins of the *hidmos* shown on the historic picture could still be seen when he was a boy (probably some 40 years ago). Meanwhile all the houses are built lower on the hill, possibly because of erosion or also because the hill should be left vacated. On the top of this hill, to the left, there is still a round building visible, now clearly identifiable as a church. Around the church there are still some trees growing. It seems that the vegetation on the top part of the hill has slightly increased since the time the historical picture was taken. Also on the top part of the hill slopes, there are shrubs growing, probably these are mostly *seraw.* The hills, which can be seen partly to the left and right of Enda Amanuel, show remarkable signs of erosion now. The hill on the left is also covered slightly with shrubs. A part of the plain in the background of the hills is also visible due of the clear weather conditions existing on the day the photograph was taken.

***Conclusion***

The historical photograph of Enda Amanuel shows us again that terraces were made by Eritreans probably prior to the Italian colonisation proving that techniques of soil conservation were known long ago[30]. The location of the church on the top the hill is quite typical for the area of the Eritrean Highlands. The most important changes are possibly the growth of the village and its migration to the bottom of the hill, whilst at the same time most of the houses are now built of stone. Another important change that can be found in this comparison are the signs of erosion, these have intensified whilst the amount of bush wood present has decreased. It seems however, that the decrease of woodland is not of catastrophic dimensions and may be partly caused by soil erosion. In some places the vegetation has actually increased, especially on the top part of the hill.

[29] Terraces can however still be found on the back of the hill.

[30] From de Monfreid (see chapter 4.3.1) and other travellers it is also known that the farmers purposely left stones on the fields to retain moisture.

### 4.3.9 Partial synthesis: Landscape changes in the southern part of the Central Eritrean Highlands

The photo-comparisons and the additional historical sources of information collected for the field studies in the southern part of the Central Eritrean Highlands are similar to those of the case presented in chapter 4.2.8 in that they are insufficient to make any general assertions on the environmental changes in the area as a whole. However, they do highlight some interesting points:

The pictures and the descriptions in the travel accounts show that mixed farming was important in the area as early as the end of the 19th century (and probably long before), with livestock and grazing having probably even played a more important role than today. Travel accounts and photographs of the Italian colonial times confirm that especially the former province of Seraye was already heavily cultivated at the beginning of the 20th century (see also Appendix A).

On the modern photographs taken in the former provinces of Akele Guzay and Seraye erosional structures are often clearly visible. However, signs of erosion are also already visible on several of the historic pictures, although the extent might in some cases have been less than today. This would confirm the thesis that erosion problems have begun in the Eritrean Highlands not only in the last fifty years but much earlier. At the same time it can be seen that the awareness for these problems was already present and that technical knowledge about possible soil and water conservation measures were known by the local population at the very beginning of the Italian colonisation as shown by the figures 4-19a and 4-22a, and have probably existed long before this.

Regarding the vegetation of the southern area of the Eritrean Highlands, the historic pictures would confirm the observations made by travellers in the early colonial time that there was more vegetation, especially shrub vegetation, in this area than in the former Hamasien province. In some parts this shrub vegetation seems to have decreased a little around the villages and towns, although this impression might also be strengthened by the fact that all the contemporary pictures were taken in the dry season. It also appears that primary vegetation was substituted in some areas by *beles*. Indeed, the photographs illustrate well just how fast this plant has spread over the Highlands, not only in the Akele Guzay Province close to the eastern escarpment but also in the former Seraye where it was already common in Italian colonial period. The photographs also provide, as in chapter 4.2, an impression of the enormous amount of eucalyptus and other trees that have been planted in the area. Even though in some places shrub and euphorbia vegetation has diminished around the settlements and the amount of *awliie* and juniper may have also decreased it seems that the vegetation in other areas has increased due to the spread of *beles* and *rumex* and the plantations of eucalyptus, *berbere tselim* and other trees. In general it seems that large parts of the southern highlands were extensively cultivated or covered with a light, scattered shrub vegetation and are therefore unlikely to have been densely forested in Italian colonial period, the exceptions being the areas along ravines and some specific areas like the Kohaito plain.

Regarding the settlements, it can be seen that in the southern part of the Eritrean Highlands the houses, which at the beginning of the Italian colonial time were mostly *aghdos or tukuls* (as in Adi Ugri and Adi Kayeh) and *hidmos* (like in Segeneiti, Akrur and Enda Amanuel), are today all built of stone, this being facilitated in the case of Segeneiti and Akrur by the proximity of the granite blocks scattered around the area. The photographs also largely confirm the thesis that Eritrean settlements in the highlands, due to strategic reasons, are often located on a hill, on a ridge or at the foot of a mountain.

# 4.4 The surroundings of Keren

## 4.4.1 About the area

The former province of Keren, also called Senhit, is generally described as being more vegetated than the plateau of Hamasien. Especially the Anseba valley between Adi Teklezan and Keren is described as being quite densely vegetated with a variety of different plants. According to the travel accounts compiled by Francesca Liebi (1993:67) the tree and grass vegetation was quite developed in the area in pre-colonial time, as long as the water and the topography of the land was favourable. The vegetation consisted, and still consists, mostly of acacia trees, *kolquals* (over 1500m), baobab and tamarinds. On the shores of the river there were also sycamore trees and tamarisks growing, which gave the vegetation a rather jungle-like appearance. The bigger plains, including the basin of Keren however, were described as treeless by some authors.

The area around Mai Elaberet, between Adi Teklezan and Keren, was relatively well known for its gardens, intensive irrigated agriculture being practiced here. The British Information Services in Eritrea described the area along the Anseba River as follows:

> "The somewhat monotonous highland scenery changes towards the west and halfway between Asmara and Keren the perennial vegetation becomes richer. In the precipitous valleys large wild Fig trees appear, casting the shade of their huge and dense crowns over wide areas. Further down, Baobab arrests attention. It's important to the economy of the natives who utilize the fruit, leaves and bark (BIS 1950:25).

Most of the historical pictures from this area were taken in or around the town Keren, the urban centre of the former Senhit province and the new Anseba administrative region. Keren is situated at an altitude of about 1400m in a depression of the upper Anseba valley and has consequently a hotter climate than Asmara. The town is located in a bowl surrounded by granite mountains at the junction of ancient trade routes connecting the Bilen region with the western lowlands, the Hamasien plateau and the coast. It was, and still is, also the centre of the Bilen people in Eritrea. When Giovanni Stella, the Italian Missionary and agricultural pioneer, visited the area in 1851 Keren village had a Bilen population of around two thousand. Despite Stella's support of the local population, the area suffered from Egyptian and Tigrean raids until 1872, when the Swiss adventurer Werner Munzinger garrisoned it with Egyptian troops and constructed the fort on Senhit hill that still dominates the town. In June 1889, the town was occupied by the Italians who developed it as an administrative and market centre with a growing Bilen Catholic population and important Muslim religious institutions. Italian agricultural concessions were developed around the town and agricultural tests were carried out here. Along the Daari River, an irrigation system was established to grow agrumes (lemons and oranges). Coffee, agaves, bananas, tobacco and dum palms were also grown in Keren. James Theodore Bent, who arrived in Keren in 1893, wrote about the area:

> "The valley of Keren is exceedingly fertile, quite the garden of the Italian colony; they water their gardens with an elaborate system of irrigation, and they are most productive. Everything planted here grows in profusion" (Bent 1893:79).

The travel guide of the Consociazione Turistica Italiana in 1938 describes the town as gracious white garden town with a temperate climate, which rends the stay very pleasant.

Paoli describes in detail the impressions he had of the town:

> "(From the top of the fort hill) I had a view over the magnificent basin, which during the rainy season is covered by a velvety green grass layer. You have to imagine an amphitheatre of high rocky mountains, denuded of any tree vegetation. The plateau is crossed by a pebbled and arid riverbed, which meanders and cuts in equal parts the big tukul village, of which some are of stone, some of branches and

straw due to the mild climate. In the centre of this valley a hill rises like a sugar loaf fortified already in the times of the Egyptians. (…) In regular lines like soldiers, the tukuls of the indigenous encampments are extending between hedges of figs[31], which in Keren can reach an unbelievable height. A street leads from the gate of the fortification to the village: A group of houses, some European, with roofs of corrugated steel, others finished in the Arabic style with a terrace, are located around a square place with trees, which serves as market place. (…) On the other side of the village, scarcely hidden, on an elevation of the soil you can see the thin minaret and the Arabic cupola of a white Mosque and just next to it a Greek chapel and further away in the same direction a Moslem cemetery. (…) On the bare plain and on the slopes covered by grass, enormous baobab trees emerge here and there. (…) White spots are shining between the green meadows, on the rough back of the mountains. They are Bilen tombs" (Paoli 1908:217-219, translated from the Italian).

In the early 1930s Keren had a population of almost 3000 including 200 Italians. In 1941 the British beat the Italian colonial army here. During the Derg Regime, Keren was transformed into a garrison and supply centre for the Derg's offensives into northern Eritrea. After liberation, many former residents repatriated from Sudan. Today, Keren is the third largest town of Eritrea with a population of around 60'000 (Killion 1998; CTI 1938; Denison, Paice 2002).

## 4.4.2 Keren

Only a few elderly people in Keren vaguely recall the name of Tantarua, which was given by the Italians to a small village once located in the north of Keren, it is now totally integrated into the town. The travel guide of the CTI in 1938 describes Tantarua as a Moslem village at an altitude of 1390m. It seems that the train even stopped here. James Theodore Bent noted in 1893, that the daily market of Keren was held at a village "called Tantarouga" and mentioned that it was "an interesting sight to see the nationalities assembled there – Bedouins from Barka and Mensa, Abyssinians, Jews, Greeks and Italians" (1893:79). A photograph stored in the Album of Carlo Gastaldi in the archive of the SGI shows the Moslem village standing apart of Keren at the foot of a series of hills in the southeast of Keren. Today, the village cannot be photographed, as it has been totally absorbed within the expansion of Keren.

### 4.4.2.1 Tantarua

***To figure 4-23a***

As mentioned previously, this historical picture is stored in the album of Carlo Gastaldi in the archive of the SGI in Rome. The photographer must have taken the picture from an elevated position where he was able to see the mountains in the background. It is very probable, that the picture was taken from the minaret of the Mosque, which was certainly the highest building in this part of the town at the beginning of the 20th century.

[31] The expression "fichi" used by Paoli at this place probably means *beles*, which with the scientific name is called opuntia ficus indica. Later on, Paoli also uses the expression "fichi indiani". It is not probable, that there were a lot of wild fig trees in Keren at the beginning of the 20th century.

**Figure 4-23a: "Veduta generale di *Tantarua (Bogos)"* (photograph by C. Gastaldi, ~1900. SGI, Album 116)**

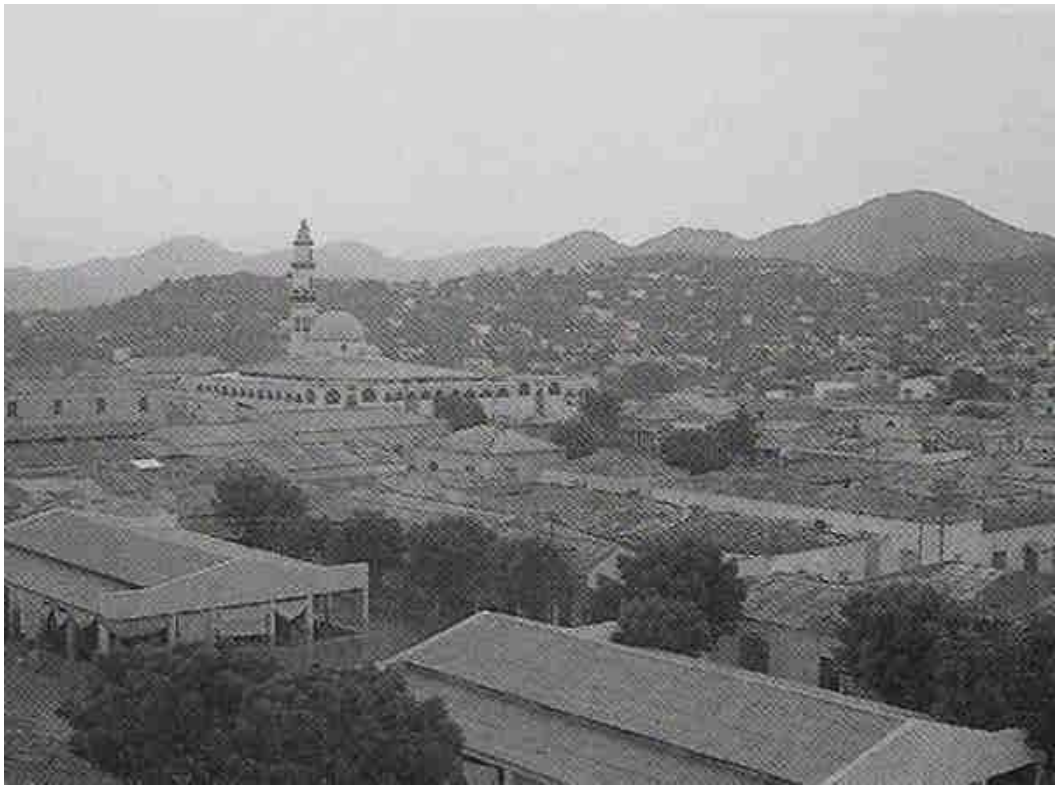


**Figure 4-23b: „*Blick auf Keren"* (extract, photograph by R. Blase, 1990s. In: Langknecht 1998:102)**

The picture shows a plain situated before a series of hills in the foreground and a series of mountains in the background. At the bottom of the hills a small village has been settled. The plain in the foreground appears very bleak apart from some small bushes and big rocks in the front of the picture. A path is leading from the right of the picture into the village, describing a large bow. Another path on the very left of the picture seems to lead directly to the village. Twelve or more people are walking on or near the paths; some of them seem to be Moslems, judging from their dress. The houses of the village are constructed in differing styles. At the front, on the right, there are some square *mereba*-like stone houses, some of which have triangular roofs. Behind these houses, situated closely together, are several *aghdos*. It seems that their walls are built of stone, while the roofs are thatched. The houses on the left of the picture are mostly constructed as *aghdos*. In the centre of the picture, behind the other houses and standing higher on the hillside, a house of stone is standing separately; its door has a round top giving it a rather Arabic appearance. The front hills appear to be lacking in vegetation with randomly placed single trees standing out in the bare landscape. Some of the trees, especially the ones on the right, appear to be baobab trees. On top of the hill line two triangular white spots appear, these are probably the roofs of *aghdos*. The high hills in the background of the picture also seem to be quite bleak, although, on closer inspection, scattered dark points can be seen, probably created by bushes or shrubs.

***To figure 4-23b***

When the field research was conducted in Keren it was unfortunately not possible to discover, where the picture had been taken from, the village of Tantarua having disappeared. The whole plain and also the hills were covered with houses; the mountains shown in the background of the historic picture were only visible when the hills were climbed. By chance a picture in a modern travel guide was later discovered, this shows the hills and the mountains in the background from almost the same angle, possibly from hundred meters further away. The photographer probably took the picture from a window or from a terrace of a high building to the south of the Mosque. The travel guide was published by Langknecht in 1998 and the photograph is probably not much older.

The picture shows a part of the plain of Keren, it has been built over with stone houses. Their roofs of corrugated sheets are clearly visible despite the rather bad quality of the photograph. On the left side two market halls can be seen, in the centre of the picture is the big Mosque of Keren; this is from where the historic photograph was probably taken. Some trees are growing between the houses. The hills in the background have obviously also been built upon with houses, most of which are *merebas* but there are also *aghdos* on these hills, which are not visible on the picture.

### *Additional information*

**Figure 4-23c: View on the mountains in the north of Keren (photograph by L. Lätt, 29.03.2003)**

This picture, taken on the 29th March 2003 in the afternoon from the top of the developed hills, provides additional information regarding the mountains in the background, which are hardly distinguishable on the photograph of Blase. In the picture the mountains are still covered with scattered vegetation of *seraw,* which does not seem to have substantially decreased. The riverbed of the Daari can also be seen meandering along the bottom of the valley. The hills from which the photograph was taken and the hills just in front of the mountains in the background have been terraced. The terrace structures can be seen quite well in the foreground to the left of the picture.

### *Conclusion*

The example of Tantarua presents an interesting case as the village was often referred to in the travel accounts and guides of the Italian colonial period, judging from these it seems to have held quite an important role. Today the former village of Tantarua is a part of Keren like any other part, there is nothing to suggest that it was once a small village with Moslem houses, standing alone at the bottom of the hills to the south of the river Daari. It was therefore not surprising that even the people in Keren were not able offer assistance in finding the 'village Tantarua'. Obviously, the population increase of Keren has (as with Asmara) had a considerable impact on the appearance of the environment. A formerly empty and bleak plain has now been totally built over with houses, apart from the mountains in the background there is now no comparable point. As well as the enormous population increase and the village becoming part of Keren other changes can also be noted, one of these being that the hills have all been terraced in an effort to prevent erosion. The importance of taking measures against erosion has certainly increased with the growing population. Another important point in the comparison of the former and the present landscapes is that the mountains were certainly not more vegetated in the past than today, disproving the assertions of the elderly men interviewed at St. Michaels Church (see chapter 4.4.3) and confirming the descriptions made by Paoli and other travellers (see chapter 4.4.1).

#### 4.4.2.2 Panorama of Keren

***To figure 4-24a***

This picture was published in 1936 in the book "Africa Orientale Italiana", edited by the Institute for the International Political Studies department in Rome. The unknown photographer has taken the picture from the fort on the top of the Senhit hill in the north of Keren, looking towards the east. Unfortunately it is not known exactly when the photograph was taken, but it was presumably taken not many years before the book was published.

The picture gives an overview of the town of Keren, its architecture, structure and also its location in a basin surrounded by relatively high mountains. Close to the fort, from which the picture was taken, there is a field partly obscured by the hill. A group of *aghdos* can be seen on it, they are built in straight lines forming a very regular pattern. The walls of the *aghdos* are made of stone while the roofs are thatched. The field is fenced by bushes, also planted very regularly in lines. Behind this field, in the foreground, there are more fields built in the same geometric pattern, here *aghdos* are again fenced by bushes. Between the different fields there are some rectangular stone houses, probably built and inhabited by Italians. The field in the centre seems to be the largest containing the most *aghdos*. To the left of this central field a small road leads to the town centre, here all the houses are square and built of stone reflecting an Italian influence. To the left of the town centre a Mosque is overlooking the other houses. Trees or bushes can be seen between these houses in the centre, but also to the left and right of the town, on the right they are standing together forming a small forest. Most of them were probably planted by the Italians. It could possibly be high *beles* plants, as described by Paoli in his account (see chapter 4.4.1). The town is surrounded by hills and mountains converging together in the background of the picture. The hills and the mountains seen on the left are the ones seen on the previous figures showing the village Tantarua. The mountains and the hills appear very bleak and do not seem to be covered with any tree or shrub vegetation.

***To figure 4-24b***

This picture was been taken on the fourth of March 2004. It was not possible to take pictures from the fort, however on climbing halfway up the hill it was possible to take the picture from roughly the same angle as that used in the historical photograph, although the angle was a little lower.

Comparing the new picture with the historical one, one can see at once that the town has expanded a lot towards the horizon and also towards the left and right side of the picture, the north and the south of the town. *Aghdos* cannot be seen now and the layout of the town is no longer geometric, it now consists almost exclusively of square stone houses. On the left the famous Mosque of Keren with its high minaret is still clearly visible. Many stone houses have been built around the Mosque; it is now standing almost in the middle of the town. In the foreground a non-asphalted road can be seen leading to the town centre. The high, modern white buildings in the right of the foreground are the administration buildings for the Anseba area. A lot of trees, shrubs and palm trees are growing between the houses. On the left of the picture, just in front of the Mosque, a dark long ruined building testifies to the war against Ethiopia, clearly showing the signs of damage produced by bombing. The hills on the left, which looked perfectly bare on the historical picture, are now covered with houses, on the right side of the picture it appears that the small forest has disappeared under newly constructed houses which are stretching up to the foot of the mountain on the right. The mountains still have a bleak appearance and on the mountain on the right terrace structures are vaguely visible.

**Figure 4-24a: "*La città di Cheren" (*photographer unknown, before 1936. In: ISPI 1936:443)**

**Figure 4-24b: Panorama of Keren, seen from the fort hill (photograph by L. Lätt, 04.03.2004)**

***Conclusion***

The biggest change seen by comparing the historical picture of Keren with the later picture is undoubtedly the enormous expansion of the town. In the 1930s the town centre of Keren seems to have been clearly dominated by the Italians and their buildings, the native Keren people living mostly in *aghdo* villages settled around the town centre. Every house could be distinguished clearly; today there is no regular geometry to be seen. The town has grown into an important town with over 50'000 inhabitants, *aghdos* and stone houses are mingled together, and most the houses seen today are *merebas*. Even the hills have been covered with houses. As in Asmara, a lot of bush and tree vegetation has been planted between the houses. The troubled history of Keren has also left its imprints with bombed houses, which can be seen just next to modern buildings. The mountains still appear bleak and lacking in vegetation although they are too far away to assess clearly, however terraces have obviously been constructed to prevent erosion.

### 4.4.3 The Catholic Mission

***Introduction***

"At Old Keren is the large building and gardens of a Roman Catholic Mission, nestling beneath the mountain, which has been established here twenty-five years (Bent 1893:78)".

"A kilometre away of the fort, nestled at the roots of the mountains, the buildings of the once Lazzarist and now Francescan Mission are shining white between the greenery of the trees at the back of a straight alley. The church, which is not beautiful, is dedicated to Saint Michael and was enlarged and restored by the (now deceased) Padre Callisto (Paoli 1908:218-219)".

Keren has quite a long Catholic tradition. In 1851, the Lazzarist Missionary Giovanni Stella came here together with another Lazzarist, Sapeto, and founded a Catholic community among the Bilen. According to the citation of Theodore Bent, the Catholic Church of St. Michael, the most ancient Catholic Church of Keren, was constructed in the 1860s. As in Akrur, the Mission passed from the Lazzarists to the Capuchins at the end of the 19$^{th}$ century. It is located close to the mountains to the south of Keren.

***To figure 4-25a***

This picture of the Catholic Mission of Keren has been taken in 1905 by Giotto Dainelli and was published in his travel account of 1908.

In the foreground of the picture one can see a road leading straight towards a large church, seen from the side, the main entrance probably being on the left. Just in front of the church, on the left of the side door, a tree seems to be growing. On the left of the church, towards the back, there is another building, probably the Mission. It has a terrace where two people are standing. A group of people are also standing in front of the church. The Mission complex is fenced with a short, thick dry-stone-wall.

On the road leading to the church, two Capuchin Missionaries in their typical cowl are posing for the photographer. Behind them other people can be seen walking or posing on the street. A group of people are standing just in front of the wall of the Mission around a small tree. The road is bordered to the left and right by live fences with high plants. They are probably high *beles* plants but they cannot be definitely identified. To the right of the road, between the plant fence and the Mission, a part of an *aghdo* hut can be seen almost hidden behind the plants.

**Figure 4-25a: "*Missione Francescana*" (photograph by G. Dainelli, 1905. In: Dainelli 1908:51)**

**Figure 4-25b: The St. Michael's church in Keren (photograph by L. Lätt, 04.03.2004)**

Behind the church there is a mountain of which three summits can be seen. The mountain appears very rocky and no plants can be seen on it apart from the bush just behind the roof of the *aghdo*.

***To figure 4-25b***

This picture has been taken on the fourth march 2004 in the early afternoon. The St. Michaels church was relatively easy to locate, since it is known as the oldest Catholic Church in Keren.

The same road seen on the historic picture, which has since been asphalted, still leads straight to church, which now appears quite different, possibly the result of several renovations. The entrance of the church is now facing the road; just behind this two short towers appear. The tower towards the front, which is constructed as a part of the church, is capped by a cupola. The bell tower towards the back of the church has been built in a square form. The church is painted in white with light blue borders and seems slightly influenced by the Arabic style. The light architecture of the building gives a much more esthetical appearance to the church today. A wall or rather a fence can still be seen in front of the Mission, it is now painted in white and shows a more sophisticated pattern than the simple stone wall seen in the original picture. Behind the church, on the left, a building which is a high school is now located. Between the church and the wall, there is a roof of straw and trees are planted to provide shade. A group of people are sitting on the pavement just in front of the wall.

The asphalted road leading to the church is now bordered by pavements and walls belonging to private houses. To the left the side of a stone house can be seen. Between the houses and the walls several trees are growing. The mountains in the background look very similar to a hundred years ago, although there seems to be slightly more vegetation. The trees, which can be seen on this mountain, are mainly *seraw.*

***Additional information***

**Figure 4-25c: "*Cheren Missione*" (aquarelle by L. Roggiero, based on a photograph by R. Pianavia Vivaldi, between 1893 and 1895. In: R. Pianavia Vivaldi 1901:211)**

Figure 4-25c shows an aquarelle made my Luigia Roggiero probably after a photograph made by Rosalia Pianavia Vivaldi (see chapter 2.3.1) from the back of the catholic mission towards northwest. The mission must have previously been substantially bigger and more important at that time, than it is today. It is interesting to note, that apart from the mission and some *aghdos* in the surroundings, the plain looks absolutely deserted, only two or three single trees can be seen in the picture.

Elderly people sitting in front of the church, some of whom were still speaking Italian, were questioned regarding any transformations in the landscape. Most of the men were totally

convinced that the mountain in the background of the picture was covered by forests during the time of the Italian colonisation, like all the hills and mountains in the surrounding of Keren and even stated that it was all "nero di bosco"[32]. One of them pointed to an area on the mountain to the left of the scene depicted in the picture where comparatively many acacia trees were growing and where houses were built on the rock of the mountain, they apparently seemed to be protected from erosion by the trees. He stated that the whole mountain was once densely covered with trees and that only small parts of this forest have been left, now. They did not want to believe the pictures shown to them as they were convinced their recollections were correct. Regarding the possible reasons for this dramatic decrease of tree cover, they remained quite vague, "time…" suggested as an answer. However, one of them added that there had been erosion on the mountainside and a big population increase especially after the time of the Italian colonisation, this resulting in the clearance of a lot of trees. "The Italians took care about the trees", he said. "They even had guards who made sure that they weren't cut illegally. But after the Italians, a lot of people came to Keren and cut wood without taking care."

***Conclusion***

Although the population in Keren has increased enormously during the last century it seems that the pressure on wood resources in the immediate surroundings was probably less than the interviewees stated. As the historic pictures and the travel accounts illustrate, there was never any dense vegetation cover on the hills and mountainsides in this area. Even in early colonial times the wood required by the population must have been carried in from further away. The tremendous growth of the population after the Italian colonial period and especially after the war plus all the new houses being built may have instigated the idea that the whole natural environment was built over and that a formerly abundant vegetation was thereby destroyed forever.

This photograph also shows how the architecture of the old Catholic Church in Keren has totally changed in the last hundred years, while the street leading towards it has remained in exactly the same position.

### 4.4.4 Gardens of the river Daari

***Introduction***

The water, used for the irrigation of the gardens in Keren, was and still is mostly taken from the river Daari, which flows through the basin of Keren. It originates in the mountains around Beit-Gabrù, about 11 kilometres west of Keren and flows into the Anseba another six kilometres north of Keren. Although the river is quite short it carries a lot of water during the rainy season. According to Baldacci (1891:91), this water was accessed through deep wells reaching up to six or seven meters already at the very beginning of the Italian colonial era.

[32] Black with wood

**Figure 4-26a: "*Orti del Da'ari*" (photograph by G. Dainelli, 1905. In: Dainelli 1908:52)**

**Figure 4-26b: Irrigated Gardens at the River Daari (photograph by L. Lätt, 04.03.2004)**

***To figure 4-26a***

This is again a picture by Giotto Dainelli, which was taken in 1905 and published in his travel account *In Africa* (1908:52). It has been taken in the north of the town at the shore of the riverbed of the Daari facing towards the south.

In the foreground of the picture a garden can be seen in which some small plants are growing in regular lines. In the middle of the garden a path is running in a straight line from the left to right. The details on the left side of the picture cannot be seen clearly but there seems to be quite a large shrub in the foreground, covering a part of the garden and of the path. Behind the garden a rocky riverbank is visible, the river itself being hidden between the garden and the riverbank. Just behind the riverbank there is a short plain on which some small bushes appear to be growing. Behind this, two bleak hills can be seen, here only two or three trunks, probably belonging to old baobab trees, can be seen. These hills were the ones visible on the Tantarua picture but from the other side. Behind the hill in the centre a part of a larger hill or mountain can be seen, here also there appears to be a lack of vegetation. Apart of the trunks of baobab trees, there are only two or three more trees in the picture, one on the riverbank on the right side, and the other on the far left of the picture. In the background, to the right of the picture, the outline of a mountain behind the hills is just visible.

***To figure 4-26b***

This picture was taken in the late morning of the fourth of March 2004 from the border of a road along the bank of the river Daari.

In the foreground of the picture there is still an irrigated garden with small trees growing in broad lines. These were reported to be lemon and orange trees. The soil between these trees appears more arid than in the original picture, probably due to the differing season. In the middle of the garden again there is a path in the same place as in the first picture. Just behind this path, on the left of the picture, there is now a small square house of stone, probably used for the irrigation system or to store garden equipment, on the right side two high palm trees are growing. At the back of the garden, partly obscured by the shrub in the foreground, a line of bushes can be seen; on the left side there are also small trees and palm trees growing. The riverbank seems to be less steep and now shows signs of erosion, however, on the far left side of the picture it still appears relatively steep. On the plain behind the riverbank there are still bushes, on the left side some trees (acacia) and electricity poles can also be seen. A road, which cannot be seen on this picture, is located there. Towards the right, houses have been constructed on the riverbank; these mostly consist of traditional *aghdos*. The two hills are now covered with houses, as could be seen also on the panorama picture of Keren. Most of them are *merebas*, but (especially on the top of the hills) one can also see the sharp roofs of *aghdo* huts. The hill towards the back, on the left, cannot be seen clearly enough to be analysed, however a small hill just in front of the larger one can be seen showing terrace structures.

***Conclusion***

As will also be seen on the next photo-comparison, it is quite typical for an Italian photographer to take pictures of Italian buildings and constructions in the colony, probably to illustrate how much and how fast the country was developed by the Italians. It is interesting to see that the garden at the shore of the river Daari still exists and that the system of irrigation is still in use although it has certainly been improved (see also plate IIIb). The most important changes that can be noted by comparing the two pictures are certainly that the hills behind the river are now covered with different kinds of houses and that the riverbed clearly shows signs of erosion, this would be quite natural for a time span of hundred years. As was already seen on other pictures,

the vegetation around the houses on the hill seems to be rather denser than a hundred years ago when there were no houses at all.

### 4.4.5 The dam of Shif-Shfit

***Introduction***

The dam of the river Shif-Shfit to the southeast of the town Keren is unfortunately not mentioned in any travel accounts or travel guides of the Italian period, it must, however, be an Italian construction, built quite early in the colonial period.

***To figure 4-27a***

This picture with the caption "Cheren – Lago artificale di Cinf-Cinfit" was taken in 1933 by the Italian photographer Armando Maugini and is stored in the IAO in Florence. The photographer was standing close to the dam, looking towards the west.

The picture shows a relatively small dam in the right foreground, it has a double-wall of stone. On the wall, at the front, the single small stones used to construct the dam can be distinguished very clearly. An indigenous man is standing on the dam. To the left side of this dam a part of a shrub can be seen. Behind the dam an artificial lake is visible. It converges upwards into the middle of the picture becoming a river which leads of somewhere into the horizon. The lake and also the river are bordered by many large rocks between which various kinds of shrubs and bushes are growing. In the background of the picture two mountains can be seen, these are called Senkil and Felestak in the Bilen language and converge in the middle of the picture where the river Shif-Shfit emerges. Behind the convergence of the two mountains the top of a third mountain appears. Though the quality of the picture is quite bad and the mountains cannot be seen very exactly it seems that they have no vegetation cover.

***To figure 4-27b***

This picture was taken at midday on the 29$^{th}$ of March 2004. Large rock masses behind the dam were carried away by an excavator, therefore it was not possible to find an elevated position, from which the picture could have been taken from, this reconstruction has been taken from a spot slightly lower and closer to the dam than the original picture.

Again this photograph shows the dam wall of Shif-Shfit in the foreground, appearing a little eroded now, especially around the top of the dam. The wall appears a little lower than in the historical picture and it seems that it has been fortified at the front. The water level of the lake is lower than on the historical picture as it is the dry season. It is possible to detect some grass bunches growing on the exposed lakebed. The riverbed is now completely dry and there is grass and small cacti (*beles*) growing on it, a donkey can also be seen grazing there. On the border of the lake and along the riverbed many rocks can still be seen, some of which, especially on the left, seem to be exactly the same, others have obviously been removed. There are still numerous bushes between the rocks, although the vegetation seems to be scarcer than on the original picture, this may also be due to the different season.

**Figure 4-27a: "*Cheren – Lago artificiale di Cinf-Cinfit"* (photograph by A. Margini, 1933/34. IAO, ER 20)**

**Figure 4-27b: The dam of Shif-Shfit (photograph by L. Lätt, 29.03.2004)**

Some of the bushes are *seraw*, the most common plant in the surroundings of Keren; others are *chekomte* (ficus glumosa), *momona* (acacia albida), *tahses* (dodonaea), *gaba* (ziziphus spina-christi), *ghindae* (calotropis procera) and *beltug*[33], which are used for the roofs of the houses. The mountains in the background still appear quite bleak, apart from some acacia trees distinguishable only on the colour picture.

***Conclusion***

This picture of Armando Maugini is again an example, which shows that Italian photographers often concentrated on taking pictures of Italian buildings in the colony. The area around the lake of Shif-Shfit is one of the few landscape pictures used for this thesis in which houses cannot be found either in the historical or in the reconstruction picture. Obviously the town of Keren has not expanded into this area. Apart from the rocks, which have been partly quarried, the place has been left more or less untouched and very few changes are visible. The dam has been fortified and appears somewhat eroded, although the structure of the stones can still be seen very well. Trees and shrubs have not been removed from this area, as confirmed by soldiers stationed in this area. The mountains in the background do not show much vegetation, as in the first picture.

### 4.4.6 Ona

***Introduction***

Ona, which in the Tigre language means ruins, is a small village with scattered buildings to the northwest of Keren mostly inhabited by people of the Bilen tribe. Despite being a small agglomeration village, Ona is quite famous because of its tragic history: Ona was occupied by the Ethiopian military as a 'strategic hamlet' in 1967. When the ELF ambushed and killed the Commander of the Second Division, General Teshome Ergetu, near Keren in 1970 neighbouring villages were subjected to brutal reprisals. On November the 27th 120 people were machine-gunned in their Mosque at Basik Dera, and on the 1st of December Ethiopian army units surrounded Ona killing 625 civilians and burning the village. Further massacres followed at Elabered, Gheleb and elsewhere around Keren (Killion 1998:330). Unfortunately the quality of the historic picture found of the village Ona is of low quality. Because of the historic importance of the village it was, however, decided to include the comparison. The photo-comparison may also illustrate how traumatic experiences, like the one of Ona, can influence the collective memory of the people concerned not only regarding the atrocities inflicted by the Ethiopians but also about the environment and environmental changes connected to them.

[33] This are the plant names, stated by the soldiers stationed here. Searches were made for the scientific names of these plants in a dictionaries, but unfortunately the name beltug was not found.

***To figure 4-28a***

This is another picture taken by Giotto Dainelli and published in his travel account *In Africa* (1908:52) with the caption "*scheletri di Capanne Bilene nel villaggio di Ona*"[34].

The foreground presents an apparently lush meadow with quite high grass, it slopes away rather steeply and the woody frames of two Bilen huts can be seen in the foreground. The architecture of these huts, long branches (normally partially covered with animal skins or straw) forming a circular kind of tent, seems to have been common for Bilen dwellings. Behind these huts two trees are growing on the meadow and behind this field, a part of a hill, with shrubs or small trees (probably *seraw*) growing on it, can be seen. In the background behind the hill there is a slightly undulating plain, this seems to be quite fertile, it also has trees and shrubs are growing on it. There are possibly also one or two single houses on the plain, unfortunately the quality of the picture does not allow for an accurate description.

***To figure 4-28b***

This picture was taken on the 3rd of March 2004. No guarantee can be given that the reconstruction photograph shows exactly the same spot, the village of Ona is very spread out and not many indications as to the exact location were available.

Again in the foreground of the picture there can be found a field falling slightly away and being partly covered by straw, which is also framing the picture in the foreground. The field is obviously cultivated in summer; it seems to have been harvested some time ago. It was noted that sorghum, wheat millet and maize are grown in this area. Behind this field, to the left of the picture, a small road leads into a small settlement belonging to the village of Ona. As in the village seen in the original picture of Tantarua, there are two different kinds of houses in this part of the village. Six *mereba* houses, painted in different colours and eight *aghdos* can be seen. The traditional Bilen huts are not now present in the area. The Bilen people seem to live in either *aghdos* or *merebas* now. A few single acacia trees are growing between the houses. The hillside, which can now be seen behind the houses, has been terraced and also appears to be cultivated. There are numerous small acacia trees growing on this hill as well as on the plain in the background. On this plain, again, *mereba* and *aghdos* can be found, the lower areas of some small hills is also visible. The vegetation looks generally dryer than on the historical picture, again probably mostly due to the seasonal difference.

***Additional information***

An elderly lady of this village was interviewed; she was a survivor of the massacre of Ona. She was still deeply traumatized by this tragic experience and commented that no human who survived it would ever forget the day when the Ethiopians came. When asked about her memories of the landscape in her youth she stated that the area used to be very fertile and there was quite a density of acacia in the surroundings. Before the Ethiopian rule they did not need to ask for permission to cut trees, now they must as wood has become scarce. A lot of trees were previously cut close to the nearby riverbed of the Daari where more trees were growing than in the immediate surroundings of Ona. The Ethiopian soldiers seem to have used much wood; the lady reported that more wood was used previously than today even though the population was smaller. During the war the whole area was burnt including all the vegetation. According to the ladies account, there was much more vegetation in her youth than there is today.

[34] Sceletons of Bilen cabans in the village of Ona

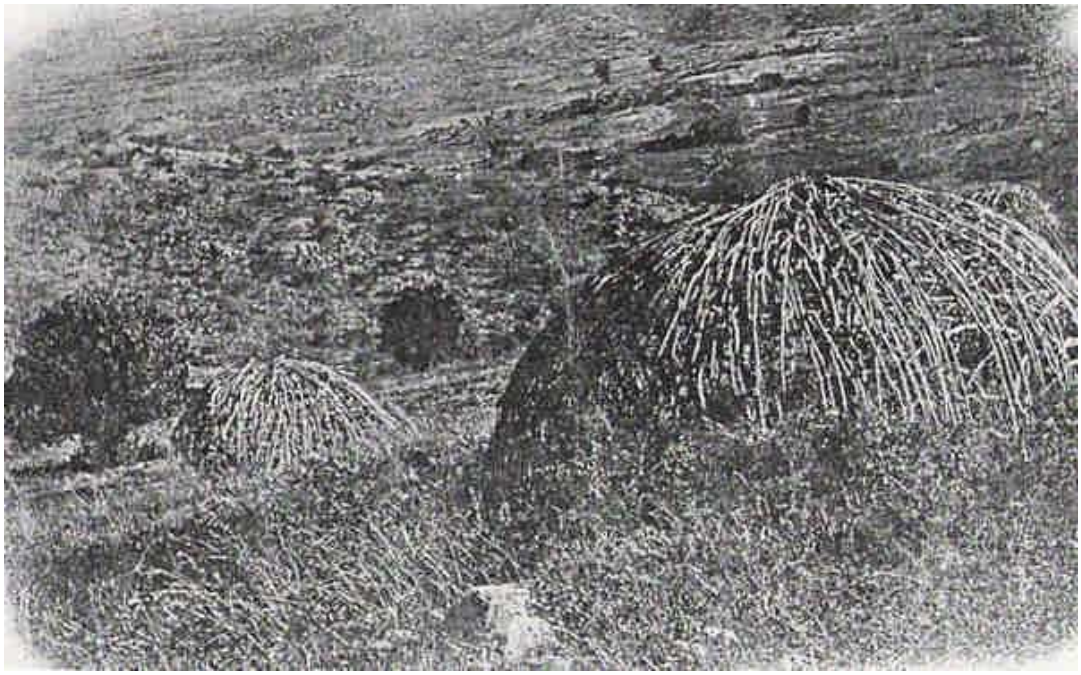


**Figure 4-28a: "*Scheletri di Capanne Bilene nel villaggio di Ona"* (photograph by G. Dainelli, 1905. In Dainelli 1908:52)**

**Figure 4-28b: Ona (photograph by L. Lätt, 03.03.2004)**

***Conclusion***

When comparing the original picture of Ona with the recent one it can be seen that the vegetation is not considerably diminished now. The vegetation, which was cleared during the struggle with Ethiopia and the massacre of Ona, seems to have regenerated relatively quickly. The main difference being that the architecture of the houses has changed. The houses are not traditional Bilen huts any more but the typical mixture of traditional *aghdos* and square, coloured *mereba* houses.

The massacre of Ona has – understandably – had a deep impact on the collective memory of the local population. The impression has persisted that the Ethiopians have taken everything away from the people. Not only the life of so many of their friends and family but also all their belongings, their happiness and all the green vegetation. They are seen as having irreversibly taken away the life and soul of the area, leaving only a bleak, monotonous landscape.

### 4.4.7 Partial synthesis: Landscape changes in the surroundings of Keren

Due to its different climate and also to the different culture of the Bilen tribe and the Moslem population living in Keren, the landscape of the town and its surroundings appears to be quite different from the landscape found in the highland provinces. Because of the lower altitude and milder climate of the town the Italians undertook agricultural experiments here and transformed the area into a flourishing garden where, with the help of an irrigation system from the river Daari, various fruits such as oranges and lemons were grown, along with coffee and bananas. The small Bilen village mutated under Egyptian and especially under Italian influence to a garden city with an important agricultural output. It is interesting to note that the most striking changes are more or less the same ones as in the Highlands: A town with a very strong force of attraction has enormously expanded during the last decades and, as with Asmara, has totally integrated some small villages which were previously independent settlements at the beginning of the Italian colonisation. Unlike in the historical pictures of Hamasien, no *hidmos* can be found on the historical pictures of the surroundings of Keren. Obviously the people used to live in *aghdos* and stone houses at the beginning of the 20$^{th}$ century, apart of the Bilen who seem to have been living in special huts constructed out of branches. As seen on the panorama picture of Keren published in 1936, the town centre of Keren was clearly dominated by the Italians and their buildings during Italian colonial period while the native population lived in a settlement around the centre where the *aghdos* had been constructed in a very regular order. Meanwhile the structure of the town has totally changed. *Mereba* houses and *aghdos* are intermingled and no clear structures can be recognised in the town now. The traces of the troubled history of the area are clearly visible in the buildings of Keren with some houses looking bomb damaged.

Of course the vegetation differs to the vegetation present in the Highlands especially along the Anseba river, the vegetation is much more abundant and diverse. However, on the plain, in which the town of Keren is located and in the surrounding mountains, photographic evidence shows that tree cover was already very scarce at the beginning of the 20$^{th}$ century and does not seem to have decreased dramatically. Only the amount of baobab trees in the immediate surroundings of the town seems to have diminished. As in Asmara, it is evident here that a formerly bleak plain has not only been covered with houses but has also been planted with bushes and trees. The most remarkable ones probably being the palm trees, this makes the area appear rather greener than at the beginning of the 20$^{th}$ century. Unlike in the Highland areas no attempts of reforestation with eucalyptus trees have been made, the climate simply is not suitable. The *beles* plant also seems to have been imported in this area quite early in Italian colonial times or even before, probably by the first Catholic Missionaries.

# *5 SYNTHESIS AND SUGGES-TIONS FOR FURTHER RESEARCH*

# 5.1 Synthesis of the findings of the field research

## 5.1.1 Landscape and land use changes in the Central Highlands of Eritrea and around Keren since 1890: A synthesis

The historical pictures, especially when combined with the travel accounts compiled in this thesis, confirm that the Eritrean Highlands were extensively cultivated already at the very beginning of the Italian colonisation (see also Appendix A). The travellers who visited the Highlands north and south of Asmara at the beginning of the Italian colonial era often describe how they were travelling through fields of wheat, teff or sorghum. The traditional ox-plough system with mixed farming has largely persisted until the present day; tractors are also used now but only in some restricted areas. Gardening with the help of irrigation systems has also increased. Livestock has always played an important role, it seems to have been even more important earlier as livestock recovered faster from droughts and epidemics and people relied more on them to supplement the uncertain returns from agriculture. Donkeys (in some areas also camels) are traditionally important as pack animals. The most important animals however always seem to have been cattle as they play an integral role in the traditional ox-plough-system. The agriculture has expanded in some areas thanks to the terracing of hillsides and to the reclaiming of low quality or bush land. In other places in the immediate surroundings of settlements, agriculture also had to give way to the construction of new houses or terracing was created because of erosion. Although terraces were propagated mainly under Ethiopian occupation and after the war, the historical pictures show, that terraces were made in some areas in the early period of Italian colonisation. In the case of Tokonda and Enda Amanuel it can even be assumed that the terraces were made before Italian colonisation, therefore the Eritreans must have known this method of soil conservation prior to the influence of the Italians.[35] The building of micro-dams has been propagated in the last decades, especially during the time of struggle by the Ethiopians and the EPLF who were suffering under the pressure of the catastrophic droughts. The dams seem to have proven their worth except in specific the case of Adi Kayeh. It is noteworthy, that some dams had obviously already been build under Italian and British occupation (see examples of Darho Caulos, Emba Derho and Shif-Shfit). The siltation problems seem to become an increasing challenge for these dams, now.

The travel accounts and photo comparisons evaluated in this thesis largely confirm the assumption that the vegetation in the Central Eritrean Highlands was not substantially more abundant a hundred years ago. Particularly in the former province of Hamasien it seems that apart of some single acacia shrubs and scattered areas with some juniper and *awliie* there was only very little vegetation present at the beginning of the Italian colonisation. Impressive illustrations of this arise from the examples of Asmara and Hazzega, where no trees at all can be found on the original pictures. An exception seems to have been the areas along ravines and in the valley of the Anseba River, these are reported to have been quite densely vegetated in the past, it seems that a certain amount of wood was indeed cut here during the last century. In the southern provinces of Seraye and Akele Guzay, the shrub vegetation has traditionally been denser than in Hamasien, this is reported already in travel accounts of the 19th century. On the other hand, the area seems to have been densely cultivated for centuries, which is also confirmed by the descriptions in the travel accounts and by some of the historical pictures. This

[35] This would not be unlikely taken in consideration that terraces are reported in the area of Ankober in the Ethiopian Highlands since, at least, the 1840s. They were built there to prevent erosion and also to make the work easier on steep hillsides normally too dangerous for oxen, they also expanded the amount of workable land in areas of high fertility (cf. McCann 1995:133-134).

makes it unlikely that there were ever large forests in the area. If one takes at face value the accounts of Rosen, Dainelli, Paoli and Littmann there were almost no forests in the southern part of the Eritrean Highlands apart from in some specific areas like the Kohaito plain and along riverbanks.

The allocation of concessions under Italian and British occupation, the illegal cutting of wood by the Ethiopians and locals and the feeling of scarcity created by the imposition of wood cutting restrictions have collectively induced the feelings in the Eritreans that a lot of forests had been destroyed and that the vegetation had been more abundant in their youth. This occurs even in areas, which have largely regenerated and recovered from the cutting of trees or in areas, which were never forested. In some areas it can also be seen, through the photo-comparison, that the shrub vegetation in the immediate surroundings of the villages has indeed decreased a little during the last century, which would confirm the claims of the local population that they now have to walk further than some decades earlier to find dry wood.

One of the most striking changes in vegetation derived from the photo-reconstructions is the spread of *beles*, a plant that has been totally integrated by the Eritreans and is popular because of its edible fruit and the fodder it provides for the animals. It seems that this plant was already wide spread in some areas of the Highlands and in Keren in Italian colonial times (see also Appendix A). Also impressive are the large plantations of eucalyptus, *berbere tselim* and other trees, which in many areas make the Highlands to appear even more vegetated today than a hundred years ago. While eucalyptus trees have been planted in some areas already at the very beginning of the Italian colonial time, it seems that the planting was increased during the 30-years-struggle, when the planting of trees was fostered by the EPLF as well as by the Ethiopians, and especially in the post-war period when tree planting received a symbolic function as an act of faith in the future of the country and its ability to prosper, and soldiers, students and national service members were all involved in the planting programmes. Even volunteers from abroad joined in the general attempts at 'greening' the nation. Even if they might have in parts ousted other plants or just taken the place of plants cut by local people for firewood, the increase of eucalypti, *berbere tselim*, acacias and sisal along with the spread of *beles* and other pioneer plants, confirms the thesis of McCann and Boerma, that the process of vegetation change in the Highlands was a dynamic one and that human habitations have continually altered the vegetation instead of simply removing it. Generally, it is in fact the forestation and soil conservation measures like eucalyptus plantations and terracing which provide the most outstanding changes in the landscape.

The erosional structures and the terracing, which can clearly be seen on some of the historical pictures, show also that erosion must have already been an important problem in Italian colonial times and therefore cannot be immediately linked to a catastrophic vegetation decrease which would have occurred during the last decades.

As regards the changes of the settlements, a significant growth of the villages and towns in the Central Highlands and the surroundings of Keren can be noted. With the exception possibly of Mendefera, this expansion of the settlements does not appear to have occurred at the expense of the vegetation; in most cases either low quality or agricultural land has been used. The vegetation often increased with the growth of the settlements within the village itself. Often trees have been planted in the village or town to provide an inviting atmosphere. An outstanding example is Asmara, which with its parks and palm trees bordering the roads has today the atmosphere of a Mediterranean resort, some hundred years ago this plain was totally bleak with no trees growing on it. A special example is also the town of Keren, under the influence of the Egyptians and especially the Italians it has changed from a simple Bilen village into a flourishing garden city with irrigated gardens where different fruits were grown as early as at the beginning of Italian colonisation. Furthermore the photo-comparisons show that while most of the settlements consisted of *aghdos* and *hidmos* hundred years ago, an increasing number of

*mereba* houses have been built since the time of the Italian colonisation. The *aghdo* houses of the local chiefs were formerly often clearly distinguishable due to their especially large shape. Today, the *aghdos* and *hidmos* have become quite rare and the *hidmos* present today are all quite old, they seem not to have been built since the 1970s. In some cases (like Emba Derho and Adi Kayeh) it appears that there was a transition from *aghdo*- to *hidmo*-settlements, before the houses built were *merebas.* As interviewees confirmed much less wood is used today for the construction of houses because of this change in preference. This gradual change in house construction and the planting of eucalypti at the beginning of the Italian colonialism illustrates that the population and Government of the time were well aware of the low level of wood resources. Generally (with the exceptions noted in chapter 3.3.4), the different government administrations seem to have dealt rather carefully with the wood resources. In some cases it can be noted that settlements or at least single houses were displaced (e.g. Adi Kayeh and Enda Amanuel) from strategically chosen locations, on a hillside or at the edge of a ridge, to a place, which was possibly at less risk of erosion than the former one and where there was more space and land available. The phenomenon that settlements built on ridges or hills providing better protection from invaders were deserted in the course of the last century as the risk of attacks had decreased and because there was more land available for the extension of the towns on flat land was also observed by Scheidegger (1998) in his photo-comparisons of locations in Ethiopia.

An interesting aspect regarding the evolution of the larger towns in the Highlands is that they are very much the construction of the Italians and were strongly influenced by them. The structure of the towns built by the Italians in the 1920s and 1930s, often after turning *aghdo*-villages into permanent settlements with stone houses, has often remained unchanged until today. The persistence of the roadways is worthy of note and other elements of infrastructure like forts, gardens and dams have remained intact and are still in use today. Even if tree planting, terracing, dam building and irrigation was fostered more intensively during the 30 years struggle and the post war period these methods were obviously already used by the Italians.

***Perception of the landscape changes by the Eritreans***

To ask the local population about the landscape and its evolution since their youth proved to be very useful, not only in understanding their perception of the changes but also in understanding the present situation of land use which may not be evident for foreigners. The local inhabitants provided information about the past situation, which could not be seen or was not evident on the historical pictures. The perception of the local people about their environment and development thereof is of course also of great importance, since (as illustrated in chapter 1.2.2) it is ultimately the concept of environment that people have in their mind (not necessarily the correct one) that influences their actions towards it. However, the comments of the people interviewed were very diverse and general conclusions must be taken only with great care. Some interviewees reported that almost nothing, apart from the *hidmos* being replaced by stone houses, had changed. Some of the interviewees had the impression that the climate had become dryer in the last decades. Some had the impression that the vegetation, especially wild olive and juniper, had decreased substantially since their youth, however, after further questioning they admitted that the vegetation had never been dense. For much of the population, the topic of woodland cover change was quite an emotional one and they would not deviate from their conviction that the vegetation had been much denser in their youth. Most of the interviewees indicated that it was the Ethiopians and the long war, which were to blame for the majority of the decrease in woodland, increased population pressure was also cited. The Italians were rarely mentioned as culprits, perhaps as most of the interviewees only remembered this time very vaguely or not at all. In Keren the older people even indicated that the Italians took care of the woodlands and that it was only destroyed afterwards. The strong conviction about a catastrophic

decrease of woodland was understandable in some cases where changes in the land cover was connected to a traumatic historic incidence as in Ona. Also in Asmara however, many people, even the younger ones, were perfectly sure that the woodland cover has dramatically decreased in the Highlands during the last hundred years and especially in the last decades ("we even learn this at school!"). Although it was made clear by the experience of Pauline Boerma that the topic was quite sensitive it was nevertheless a little surprising, that the hypothesis of this thesis (the wood cover decrease from 30% to less than 1% should be reconsidered) fell upon mostly deaf ears in Asmara. It can be hoped that the analysis of an aerial picture series taken of parts of the Eritrean Highlands dating from the 1960s, which provides stronger evidence with regards of quantitative landscape features (such as forest cover) along with investigations carried out by native Eritreans concerning their environmental history may finally help to break this persistent and widespread paradox.

### 5.1.2 To the hypothesis

Considering the photo-comparisons and the compilation of the travel accounts made in this thesis it is not possible to quantify the woodland cover in the Eritrean Highlands at the start of the Italian colonisation. The historical photographs used are too selective to make any general assessments. Therefore, a part of the hypothesis postulated in this thesis may be seen to be constructed in an unanswerable way, since the figure of woodland (30%) cannot be questioned with complete accuracy with the sources available. The historical photographs and the information supplied by the various literary sources, that wood was already scarce at the beginning of Italian colonisation and that measures were already taken at this time, tend to confirm however the assumption, that the Central Highlands were only scarcely forested at the beginning of the 20$^{th}$ century. Even if it is taken in consideration that the Gash-Barka area in the western lowlands and the eastern escarpment area, historically the most forested areas, are included in the figure of 30% woodland cover before Italian colonisation, and even if in some limited areas like the Kohaito plateau, important deforestation has indeed taken place the decrease in woodland from 30% to less than 1% during the last century seems quite questionable, as the Gash Barka area and the eastern escarpment are still quite densely wooded and the deforested areas were able, in parts, to regenerate.

The enormous gap in the figures of forests assessed before Italian colonisation and at the end of the 20$^{th}$ century is probably partially related to the inexplicit definition of 'woodland' or 'forest'. The feeling of scarcity of wood for fuel caused by the effective scarcity of trees and shrubs and also by the severe restrictions regarding the cutting of live wood together with the image of a pillaged and abused country, seems to have resulted in people firmly believing in the decrease of woodland from 30% to less than 1% without really interrogating what was actually to be understood by 30% forest cover and how plausible such an apocryphal decrease would be.

Since the photo comparisons have been made between two points of time only it is difficult to retrace how dynamic the environmental changes may have actually been. The comparisons show however, that while some shrub vegetation around the villages might have diminished, a lot of other trees and shrubs were planted and pioneer plants like *beles* and *hehot* have naturally propagated in many areas. The plantations of eucalypti, *berbere tsellim,* sisal and other plants in and around settlements, along the roads, in catchment areas and on the hills, which already started under the Italians, has finally substantially altered the appearance of the Highlands and resulted in some areas being even more densely vegetated today than a hundred years ago. The evolution of the settlements and the developments regarding house construction also provide evidence of a dynamism existing within the habitation methods of rural Eritreans.

### 5.1.3 Validity of the methodology chosen

This thesis shows that indeed, historic photographs offer a multitude of information concerning ancient dwellings, settlements, land use and vegetative cover, which a travel account could never supply with the same accuracy. Aspects are illustrated, for instance the terracing, which are not documented in literature. The immeasurable value of historic photographs as testimonies to past landscapes and land use, to past cultures and techniques and in the case of Eritrea also as part of the colonial history of Italy, makes it clear that the best possible documentation, evaluation and possibly eventually the publication of historical pictures on internet (improving their accessibility), is of the utmost importance. While the value of historical photographs as important historical sources can certainly not be questioned, the methodology of historical photo-monitoring with the exact reconstruction of the pictures (certainly useful and informative for the exact comparison of a certain location at two different points in time) can be very difficult and time-consuming. To reconstruct landscape pictures using vague indications regarding the location in an unknown surrounding and within a limited time span often proves to be nearly impossible. Even for the pictures reconstructed in this thesis, which were all taken close to settlements, it was sometimes necessary to walk for hours until the exact spot was located and in some cases this ultimately proved to be impossible. The fact that the reconstruction pictures used here were all taken during the dry season while many of the model pictures had been taken in the rainy season or shortly afterwards, also made an exact comparison very difficult. While it is on the one hand fascinating and of interest to compare exactly the same spot at two different times, the limitation of the photograph as regards information on wider landscape and land cover aspects also stands out clearly with the methodology of historical photo-monitoring. The fact that from some single pictures it is impossible to generalise and extrapolate on the general landscape remains the main problem of this methodology. Travel accounts, although they may be influenced more by the character, motives and intentions of the author, can give more information about the general aspect of a landscape in a certain area, especially concerning the background and circumstances of a certain landscape and land use. The mixed methodology chosen, with the review of historical travel accounts, travel guides, expert's reports, maps and secondary literature, and interviews made in the field alongside the reconstructions of the photographs proved to be very helpful in the research process. The writing of a field book, where general observations, names, statistics and information derived from interviews are noted is also indispensable.

## 5.2 Suggestions for further research

The retracing of environmental changes in Eritrea deserves much more attention and effort than was possible in this study. It would be especially desirable – and a personal hope of the author – that this thesis would incite native Eritreans, with their greater capacity and background knowledge, to investigate more profoundly the environmental past of their country. That an objective knowledge concerning the environmental history of the country is of great importance has been illustrated in chapter 1.2.2 and findings in this regard have certainly much more value (and much more potential to change the present paradigms and policies) if they come from within the Eritrean society itself. Many of the literary sources stored in the Research and Documentation Centre and in the Library of the Pavoni Mission in Asmara, which would certainly contain precious information on this subject, could not be evaluated due to time restrictions. Possessing only a rudimentary knowledge of the Italian and totally lacking knowledge of the Tigrinya language also proved a hindrance in this study.

It would also certainly be useful to compile and analyse the historic church manuscripts, these could provide interesting information regarding land transaction, land use and possibly also climate changes which might have influenced land use. Pollen analysis could also bring useful

information in this regard. Pollen analysis which has been carried out in the Highlands of Ethiopia show for instance, that the forest cover would have decreased in this area between ca. 600 and 200 years ago, probably in relation to a decrease in temperature (see Mussie 2003:18). The situation is probably similar in the Highlands of Eritrea. It seems in fact that only little is known so far about the climate history of Eritrea.

On the other hand it would also be interesting to study more carefully the exact impact of the Ethiopian occupation and war between 1960 and 1990, this is generally believed to have been the period with the most disastrous impact on environment. Photo-comparisons of photographs of the 1960s or 1970s with current reconstruction pictures would certainly be helpful in this regard. There must be much more photograph material available from the 60s and 70s, especially photographs taken by Eritrean photographers, compared to the colonial period, although it must be stressed that there must still be many colonial landscape pictures of Eritrea which have not been evaluated by either the author or by Boerma. Research in Eritrea e.g. in the archives of the churches and Missions as well as in Italy could be effective in this regard. The Biblioteca Reale of Turin is reported as possessing eight photographic albums of the Eritrean colony in the early 1890s (see Pankhurst 1996:24). Many photographs of Eritrea dating from the colonial time are also reported to be stored in the archive of the Società Africana d'Italia (see chapter 2.1.3). Furthermore, to shed light on the exact quantitative changes of vegetation cover since the 1960s, it would be useful to compare aerial photographs of that time with current ones. Aerial photographs can provide information on quantitative changes over a much wider area. Terrestrial photographs on the other hand have the advantage of providing much more detailed and also qualitative information on land use and land coverage and provide a much more detailed visual impression than an aerial photograph.

While there has been a focus on the environmental history of the Eritrean Highlands, so far, it would be very interesting also to conduct research concerning environmental changes in the Lowlands, although the historic sources available of this area are probably rather scarce.

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## *Photographic Archives:*

**Archivio Provinciale Cappuccini Lombardi**
Viale Piave, 2
I-20129 Milano
www.comunicare.it/luoghi/archivio

**Istituto Agronomico per l'Oltremare**
Via Antonio Cocchi, 4
I-50131 Firenze
www.iao.florence.it

**Museum für Völkerkunde Wien**
Neue Burg
A-1010 Wien
www.ethno-museum.ac.at

**Società Geografica Italiana**
Via della Navicella 12
I-00184 Roma
www.societageografica.it

# *APPENDICES*

# A: Historical photographs of Senafe

Senafe is the most southern significant village of the former province of Akele Guzay. It is situated close to the border of Ethiopia at an altitude of 2'400 metres and has been a popular motive for photographers since the earliest time of Italian colonisation due to the stunning scenery provided by the huge rocks on the southern boundary of the village (Denison, Paice 2002:193). For security reasons it was not possible to visit this place during the field studies. Some of the historical photographs of this area are published below with a short comment to give an impression of this site at the time of Italian colonisation.

**Figure A-1: "*La piana di Senafe*" (photographer unknown, published by the Missione Cattolica Asmara, before 1923. SGI, No. 349)**

***To figure A-1***

Picture A-1 was taken by an unknown photographer probably in the early time of the Italian era. It is stored in an album of the Catholic Mission of Asmara which was donated to the SGI in 1923. The view is from the north of Senafe towards the south.

The picture shows the village of Senafe which is situated on a small hill emerging from a plain, in the background are various high rock formations. The village appears to consist mainly of square Italian stone houses. In the foreground in front of the village, a vast, bleak plain can be seen. There are some white lines crossing the plain, probably paths, and a small river is meandering towards the village. Whether the plain is used for agriculture cannot be positively deduced from the picture, on the right of the photograph, there seem to some terraces. Apart from three or four single trees (seen to the left side of the village) and some dark spots on the field in the foreground, possibly indicating some grass vegetation, the whole area seems very bleak and almost totally lacking in vegetation.

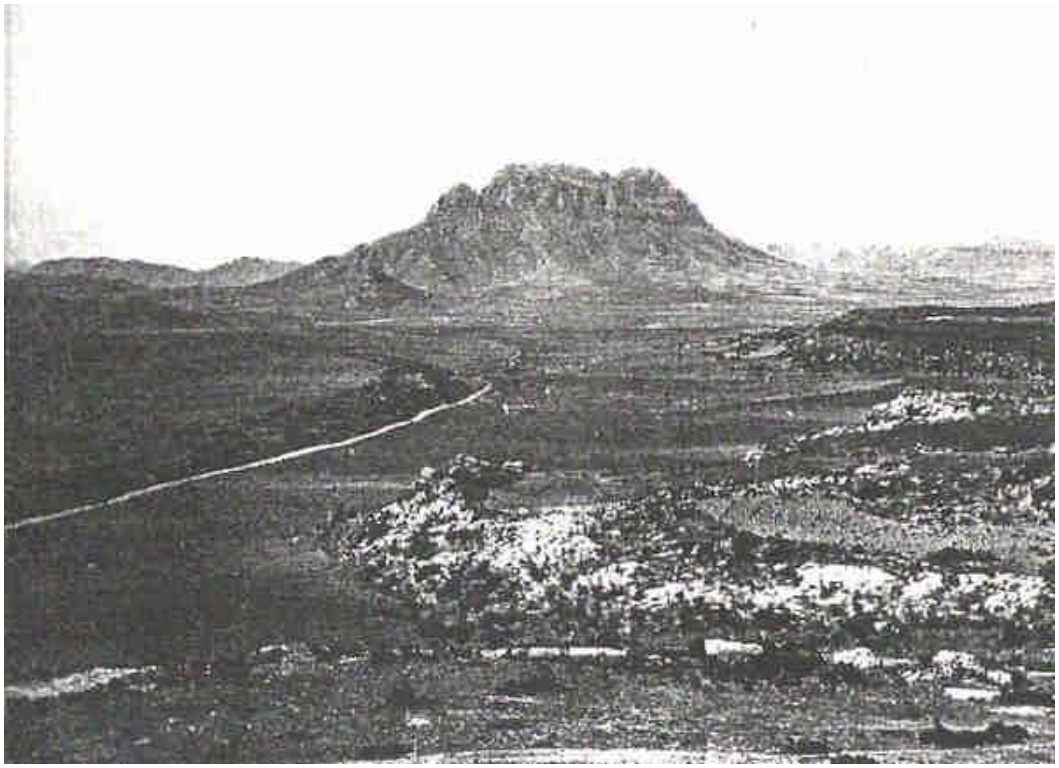

**Figure A-2: "*Ambe di Senafe*" 1 (photograph by Maugini/Giuliani 1930. IAO, ER 19)**

### *To figure A-2*

This picture was taken by Armando Maugini or by his companion Giuliani. The two Italians travelled in the southern part of the Eritrean Highlands in 1930. It seems that the picture was taken from an elevation, maybe from the small hill, on which the village is situated.

The picture shows the southern part of the plain on which Senafe is located, in the background is one of the characteristic high rock formations for which this area is famous. On the right side of the picture, various small rocky hills emerge from the plain. Terrace structures can be found on the slopes of the first of these hills. In the background of this hill several fields can also vaguely be distinguished by their differing shades. A small road crosses the plain on the left side of the picture. Along this road and between the rocks of the hills some small bunches of grass or small shrubs can be seen. However, in the whole area shown by the picture no tree vegetation can be found.

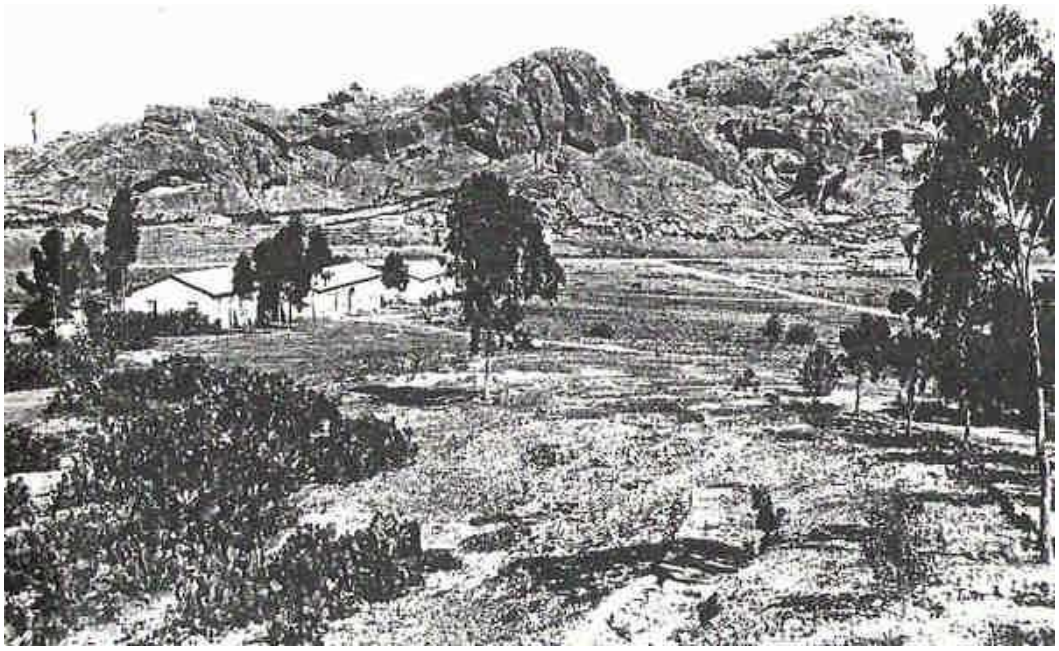

**Figure A-3: "*Ambe di Senafe*" 2 (photograph by Maugini/Giuliani 1930. IAO, ER 19)**

***To figure A-3***

This picture is stored in the same album of the IAO as the one shown by figure A-2 and was also taken by Maugini or Giuliani in 1930.

The photograph shows an Italian estate in the surroundings of Senafe with some high rocks in the background. In the foreground of the picture, a terraced field can be seen, its left side being covered with *beles* cacti. On the right side of the picture, several tall eucalyptus trees are growing. Immediately behind the terraced field a plain field stretches towards the rock formations in the background. On the left side of this field three Italian stone houses with pitched roofs can be seen, they are surrounded by more tall eucalyptus trees. Apart from the short grass, which is covering the fields, the eucalypti and the *beles* in the foreground provide the only vegetation which can be found in the picture.

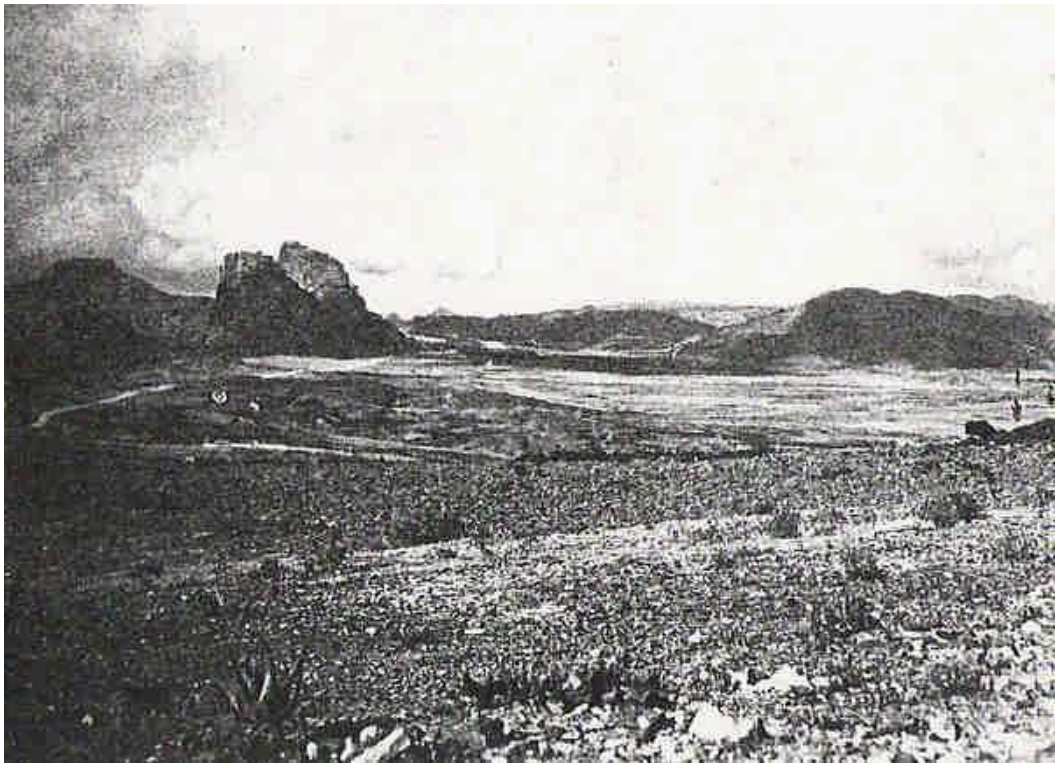

**Figure A-4: "*La conca di Senafe*" 1 (photograph by A. Maugini 1936. IAO, ER 22)**

### *To figure A-4*

This photograph was taken by Armando Maugini on his visit to Eritrea in 1936 and is stored in another album of the IAO in Florence.

The picture shows a plain, which is slightly undulating in the foreground and stretches towards high hills and rock formations in the background. The hills in the foreground are covered with small rocks. Some single small shrubs (maybe *hehot*) and cacti (sisal) are in evidence growing between them. The variations in the colour of the plain field in the middle distance of the picture suggest that this field may be used for agriculture, although this is not very clear. On the left side of the picture a road can be seen (possibly the same one as illustrated in figure A-2), which describes a bend and leads towards the rock formations in the background of the picture.

**Figure A-5: "*La conca di Senafe*" 2 (photograph by A. Maugini 1936. IAO, ER 22)**

### *To figure A-5*

Again this is a picture which was taken by Armando Maugini in 1936. It shows a similar extract of the surrounding area of Senafe as in figure A-1, however, it was taken from a position to the right and closer to the village.

The picture shows also the village of Senafe settled on a hill. It appears that more trees (probably mostly eucalypti) are now growing between the houses. A road which was already vaguely visible on figure A-1 is leading towards the village on the right side of the picture. The plain before the hill now seems to be intensively used for agriculture. The field in the foreground has been neatly terraced and seems to have been freshly ploughed. To the right side of these terraces the slopes of a rather high hill can be seen, these are covered with grass. Behind this hill further terrace structures are vaguely visible. Unfortunately the dark shadows obstruct the view of the plain in the middle distance, few details can therefore be detected on this field. However, especially in the foreground of the picture it can be seen, that several oxen or cows are grazing on the plain.

### *Conclusion*

The historical photographs of Senafe show, that the area was highly cultivated and terraced at least in the thirties (see especially figures A-2, A-3 and A-5). However, this was probably already the case at the beginning of the Italian era and even before this, similar large parts of the area of Akele Guzay which were used for agriculture since, at least, medieval times (see chapters 3.5.2 and 4.3.1). Obviously the plain in the foreground of the village was also used as grazing land for cattle. The pictures also illustrate that the area lacked tree vegetation at the very beginning of Italian colonisation. The only vegetation that could be found here during the Italian era consisted of short grass, small shrubs and some cacti, while eucalypti seem to have been planted by Italian colonisers as soon as they settled in this area. *Beles* was obviously already growing here during the Italian colonial period.

# B: Historical photograph of Asmara by Carlo Gastaldi

**“Baracamento Ascari, Villagio Asmara, La Porte del Diavolo, Villagio di Ras Alula” (photograph probably by C. Gastaldi , ~1900. SGI Album 116)**

# C: Citations of historical travel accounts and scientific reports in their original language

**THEODOR VON HEUGLIN**

**Reise nach Abessinien, den Gala-Ländern, Ost-Sudan und Chartum in den Jahren 1861 und 1862 (1868)**

„In 2,5 Stunden erstiegen wir von da aus auf steilen Pfaden die eben schon erwähnte nächste Terrasse bis zu dem von Az-Johannes kommenden kleinen Gebirgsbach. Qolqual-Euphorbien und Oliven treten hier in Menge auf, auch die schön weissblühende und durch ihr dichtes Laufdach ausgezeichnete Cordia habessinica, mehrere Arten von strauchartigen Echinops und Rumes, gelbblühende Zentaurien, eine buschartige Salvia“ (p. 124).

„Das Dorf Az-Johannes, das auf einer felsigen Anhöhe liegt, zwischen der und dem Letzten, höchsten, terrassenartigen Abfall des Hochlandes von Hamasien sich eine ziemlich baumlose 3 Meilen breite, gegen Süden etwas geneigte Ebene ausdehnt. Dort werden schon alle möglichen abessinischen Kulturpflanzen gebaut, ausser Lein, Gerste und Weizen namentlich Dagusa (Eleusine), Tef (Poa abessinica) und Nuk oder Nehuk (Guizotia olifera). (...) Von diesem Rand bis zur Stadt Tsazega selbst rechne ich eine Meile; die etwas wellige Hochebene ist sehr einförmig und öde, fast kahl, hier und da durch weisse Quarzkräte unterbrochen, um die krüppelige Mimosen und Rosenbüsche wuchern; doch zeigt die ganze Gegend Spuren von zeitweilger Bodenkultur; dazwischen Streifen von Hochmoor, Weideland mit Rumerbüschen“ (p. 125).

**GERHART ROHLFS**

**Meine Mission nach Abessinien auf Befehl Sr. Maj. des deutschen Kaisers im Winter 1880/81 (1883)**

„Die Gegend (um Tsatsega) ist grossgehügelt, manchmal mehr oder weniger mit Büschen bestanden. Vereinzelt erscheint nun auch der so echt abessinische Kandelaberbaum, Euphorbia kolqual. Im ganzen aber macht die Landschaft einen Eindruck von Kahlheit und Oede, denn wenn man auch auf zahlreiche (...) Wasserfäden und nach so schrecklichen Zeiten und Kriegen mit Staunen und Freude auf die grossen und schönen Rinderherden blickt, so erinnern einen doch immer und immer wieder die eingeäscherten Dörfer an die Schreckenszenen, welche sich vor kurzem hier abgespielt haben mögen“ (p. 140-141).

**MAX SCHÖLLER**

**Viaggio nell’ Eritrea (1896)**[36]

“Da quanto si può apprendere in Saganeiti puossi arguire che la civilizzazione ha fatto dei progressi rilevanti, e ne sono prova, la splendida chiesa della missione cattolica, la quale vista da lontane pare una chiesa europea, le nuove case accuratamente costrutte, e sopratutto la linea telegrafica che congiunge Saganeiti con Halai, Asmara e Massaua” (p. 214)

“Akrur è un villaggio relativamente piccolo, le cui abitazioni sono in modo assai singolare nascoste tra I massi di rocce. La sua pulizia, e l’agiatezza che esso dinota, destano una gradevole impressione, e dimostrano la benefica influenza della missione dei lazzaristi” (p. 215-216).

“Relativamente alla flora di questa regione destano particolare interesse gli olivi, e I magnifici cespugli di rose selvatiche, ricoperti di bianchi fiori odorosi” (p. 224).

[36] The initially german version of this book was unfortunately not available by the author.

**G. SAINT-YVES**

**A travers l'Erythrée italienne (1899)**

"Au moment où, après la longue montée de l'Arbaroba, par la grande route que dessine à flanc de colline de sinueux méandres, on débouche sur le plateau de l'Hamacién, le changement de décor est brusque, inattendu comme dans une féerie. Plus de montagnes boisées, plus de vallons alpestres, plus d'euphorbes-candélabres: une table qui se prolonge jusqu'à l'extrême limite de l'horizon, sans un arbre, presque sans broussailles, gazonnée, avec de ci de là des protubérances du sol affectant la même forme tabulaire, la même régularité géeometrique; c'est ce que les Italiens appellent l'altopiano, la haute plaine, le haut plateau, la voina-dega des Abyssins" (p. 275).

"Le fort de Bet-Maka, appelé fort Baldissera, est le plus important ouvrage fortifié de la colonie. Du haut du petit plateau de Bet-Maka, superposé au grand plateau de l'Hamasien, on découvre toute la contrée à une grande distance; la vue n'est limitée que dans la direction de Ghinda" (p. 277).

"Contrairement aux contreforts, la végétation arborescente est très rare sur le haut plateau ; il offre presque partout une plate-forme gazonnée, surmontée de petites collines de forme également tabulaire, auxquelles des broussailles donnent l'aspect d'une chevelure ébouriffée sur une tête carrée" (p. 356).

**ROSALIA PIANAVIA VIVALDI**

**Tre anni in Eritrea (1901)**

"Solo dall'alto (del Bet-Maka) si può cogliere, a un tratto, la varietà pittoresca e fantastica del panorama, animato da mandrie di buoi, di capre, di pecore, di asini, di muli, di cavalli, sparse al pascolo nelle conche e sui declivi; da coppie di buoi agiogati all'aratro…" (p. 30).

**FELIX ROSEN**

**Eine deutsche Gesandtschaft in Abessynien (1907)**

"Wer von Süden, von den fetten Hochebenen Tigres aus, Erythraea betritt, dem erscheint das Land, das Italien mit so vielen Opfern an Gut und Blut erworben hat, arm und kahl. Weite Plateaus ohne markante Bergformen dehnen sich, soweit das Auge reicht; Hochwald, der schon im nördlichen Abessinien selten ist, fehlt hier völlig und an die Stelle des Busches tritt niedrige, dornige Macchie. Doch der Boden ist fruchtbar, freilich fordert er, durch Jahrhunderte vernachlässigt, die Arbeit schwieliger Fäuste" (p. 490).

**RENATO PAOLI**

**Nella Colonia Eritrea (1908)**

"Il cavallo correva come il vento per una strada piana, tra campi verdissimi di grano, d'orzo e di taff. Il paesaggio, un po' triste nell'aspetto, ricordava la campagna romana: gli stessi campi seminativi senza confini, la stessa nudità del terreno spoglio di alberi, gli stessi letti sassosi ed asciutti di torrentelli non contenui dagli argini, le stesse molli ondulazioni del suolo; se non che le ambe con una linea inconsueta, piatta la sommità, brulli e scoscesi I fianchi pietrosi, chiudevano d'ogni intorno l'orizzonte. Come macchie di colore oscure spiccavano tra il verde delle messi nascenti, o si disegnavano sulle alture, dei villaggi indigeni, I quali da lontano sembravano pagliai, aggruppati intorno ad un tetto conico più grande, sormontato da una croce – la chiesa – presso un frondoso boschetto – il cimitero. (…) Per tutta la vasta vallata non compariva, ne un albero, ne un arbusto, che interrompesse l'aspetto uguale, desolato, austere dei campi verdeggianti e delle ambe regolari come figure geometriche. E tutto l'altipiano è così: chi l'ha veduto all'Asmara può dire d'averlo visto tutto. Poco più, poco meno fertile, l'altipiano presenta una uniformità che stanca e che rattrista. Ambe che rincorrono ambe; terreni ondulati, Verdi durante la breve stagione umida, rossastri, arsicci, polverosi

per tutta la lunga stagione asciutta. Qua e là magri agavi, rari cespugli di spini e di acacie, che resistono alla secchezza del clima" (pp. 196-197).

"Abbracciavo d'uno sguardo la magnifica conca, che, durante la stagione umida, si ammanta d'un verde velluto di erbe. S'immagini un anfiteatro di alti monti rocciosi, spogli di vegetazione arborea, rossicci. La platea è attraversata dal letto ciottoloso e arido d'un torrente, che serpeggia a fior di terra tagliando in due parti quasi eguali un grosso villaggio di tucul, alcuni di pietra, alcuni per la dolcezza del clima di vimini e di paglia. Nel centro della conca s'innalza come un pane di zucchero un colle, fortificato fino dal tempo degli egiziani. (…)Fuori del recinto, ai piedi del colle, si stendono in linea come soldati, entro siepi di fichi che a Cheren raggiungono un'altezza incredibile, I tucul degli accampamenti indigeni. Una strada in piano dal portone della cinta fortificata mena al paese: gruppo di case, alcune europee con tetti di lamiera, alter terminate all' araba con una terrazzo, attorno ad una piazza quadrata con alberi, che serve da mercato. (…) Oltre il paese, poco discosto, sopra una elevazione del suolo l'esile minareto e l'araba cupola d' una bianca moschea; a lato una capellina greca; più in là nella stessa direzione un cimitero musulmano.

Dalla parte opposta, ad un chilometro di distanza dal forte, addossati alle radici dell' anfiteatro, in fondo ad un vialone rettilineo, biancheggiano tra il vede degli alberi I fabbricati della missione, un tempo lazzarista, ora francescana. La chiesa, non bella, è dedicata a San Michele e fu ampliata dal defunto padre Callisto.

Per la nuda campagna e per le erbosi pendici sorgono qua e là enormi baobab, col tronco colossale (…) Macchie biancastre spiccano tra il verde dei prati, sul dorso aspro dei monti. Sono tombe bilene" (pp. 216-217).

"Ora in calessino, in direzione opposta a quella di Cheren, correvo verso il Mareb a Adi Ugri. Strada carrozzabile ampia e comoda, che soltanto in un punto discende con curve pericolose e pendenze tremende: paesaggio sempre eguale e tedioso, dale ambe geometriche, dai pianori Verdi coltivato a grano, a taff, dai burroni popolati di euforbie e d'olivi selvaggi; il Mareb, Più che fiume, solco profondo seminato di pozzanghere, entro cui sorge un albero di spettacolosa grandezza, il sicomoro di Debaroa" (pp. 276-277).

**GIOTTO DAINELLI**

**In Africa (Lettere dall'Eritrea). Parte Prima (1908)**

"Il terreno, qui nell'altipiano di Asmara (…) è ferracissimo, manca è vero, qualsiasi coltivazione o vegetazione arborea, certo per colpa degli uomini più che della natura ma in ogni modo, la forma stessa di piano, ampio e regolare, ha fatto si che l'alterazione, il disfacimento nelle rocce, del resto saldissime, sia grande e profondo: (…) un abastanza potente strato di terreno agrario, ricco di elementi propizii alle colture" (p. 33).

"Su per giù, fino ad Amba Derhò la strada corre proprio sull'altipiano di Asmara, cioè una superficie uniforme, quasi orizontale, leggermente inclinata verso sud-ovest, dalla quale qua e là si inalzano dei rilievi, mediocri e tronchi nella sommità ben estesa, che presenta, a sua volta, tali e quali i catteni del piano maggiore. La vegetazione arborea manca, salvo un cinffo pittoresco di alberi giganteschi presso al villaggio di Amba Derò; del resto sono bassi cespugli di salvia che profumano l'aria, e campi arati, e lunge distese di prati. (…)

Progredendo, le mediocri incisioni dei corsi d'acqua divengono un po più marcate, ed assumano l'aspetto di veri valloncini dove alla bassa vegetazione di prima si unisce qualche olivastro e qualche agave dai bei fiori aranciati. Poi le proporzioni dimiscuono di nuovo, e in breve, dopo avere attraversato vari villaggi dalle basse capanne coperte di frasche e di ferra, si giunge in parte nuovamente pianeggiante e di li a poco a Ad Teclezan" (p. 40).

"La strada (per Segeneiti) è più breve di quella per Cheren, ma anche più uniforme; da prima corre verso sud, attraverso alla pianeggiante distesa di Asmara dove non cresce un albero, ma dove la terra, nereggiante e grassa, di fresco arrata mostra come esse sia e più sarebbe propizia allo sfruttamento culturale anche intensivo" (p. 54).

"I dintorni di Saganeiti sono notevole boscosi e verdi: questo è il merito delle cure amorevoli e degli ordini severi del commissario Bruna, il quale, per favorire il rimboschimento di questi monti, proibisce senza eccezione e con estremo rigore il taglio non solo di piante ma pur di rami" (p. 61).

**Paesaggi Eritrei (1909)**

"L'orizzonte si mantiene sempre lo stesso e pare lontano, lontano, quasi all'infinito. Sono campi in lavoro, piantagioni di dura e di foraggi, pascoli verdi (…) non alberi, se si eccettui il gran sicomoro di Debaroà. E così fino a Adi Ugri, a Godofelassi e poi più oltre, a traverso tutto il Serae. Campi e pascoli sempre; sempre il piano uniforme" (p. 11).

**ADRIANO FIORI**

**Boschi e piante legnose dell' Eritrea (1909)**

"Nell'Eritrea quasi ovunque è possibile la vegetazione arborea, tranne nelle regioni deserte della Dancalia interna. Però, data la breve durata delle piogge, l'Eritrea non trovasi, salvo qualche vallata (come ad es. Fil-Fil, Ghinda, Saganeiti ecc.) nelle condizioni più favorevoli, e la sua vegetazione non può paragonarsi a quella delle regioni così tropicali umide, ma piuttosto a quelle della nostra zona mediterranea.

Quindi gli alberi sono di piccole dimensioni ed a tronco contorto, soltanto nel fondo delle valli, ove le radici trovano umidità nel sottosuolo, possono raggiungere dimensioni notevoli, cosi troviamo spesso il Tamarindo, alcune Acacie, il Baobab, il Mimusops Schimperi, il Diospyros mespili formis, I sicomori e poche altre specie, con individui spesso veramente colossali. Appena però ci allontaniamo dal fondo delle valli, l'accrescimento diviene lento e la riproduzione della specie non tanto facile, se ne gogli le piante grasse, che divengono spesso invadenti.

Tuttavia la nostra colonia sarebbe certamente quasi tutta boscosa anche nelle plaghe ora denudate, se non fosse intervenuto il fattore antropico a tutto svantaggio del bosco. Di ciò facilmente si possiamo convincere percorrendo l'Altipiano ed osservando come il diboscamento proceda per zone concentriche attorni ai villaggi" (p. 8).

**ENNO LITTMANN**

**Topographie und Geschichte Axums (1913)**

"Die ganze Hochfläche ist von Büschen und Bäumen bewachsen und glich einem Parke, ein Anblick, der in dem baumarmen abessinischen Hochlande dem Auge besonders wohl tat" (p. 24).

**HENRY DE MONFREID**

**Le drame éthiopien (1935)**

"A mesure qu'on s'élève, la végétation se rabougrit et quand ma voiture arrive sur le plateau, s'est la grande déception ! Plaine aride, brûlée de soleil, où le vent trop sec en cette saison d'hiver soulève des nuages de poussière. Après avoir admiré la belle végétation des moyennes altitudes, que n'espérait-on pas trouver en haut de ces grandes montagnes ! Hélas ! toute l'eau des pluies d'été s'est infiltrée. (…) Plus trace de végétation, sauf quelques eucalyptus, ces arbres à feuilles de carton, plantés par le gouvernement. Plus une herbe, plus rien ; la poussière et les pierres…" (p. 162).

"Plaine aride, un désert, me semble-t-il, tout recouvert de pierres. Mais, en été, les céréales y poussent à merveille. Dès les premières pluies d'avril, tout verdit et ces pierres sont soigneusement laissées en place par l'indigène pour conserver l'humidité de la terre. (…) nous atteignons l'extrémité des hauts plateaux de deux mille quatre cents mètres pour descendre dans la province de Séraé, à deux mille seulement. Là, le climat est moins rude, l'eau plus abondante, et la terre plus fertile" (pp. 174-175).

**A. MULAZZANI**

**Geographia della Colonia Eritrea (1935)**

"I vasti pianori dell'altipiano battuti dai venti sono generalmente scarsi di alberatura fuorchè nelle vicinanze dei paesi. Però nelle conche più basse e nelle vallate in terreno è rivestito di abbondante vegetazione arborea ed erbacea più o meno verdegiante. (…) Gli alberi più caratteristici della parte elevata dell'altipiano sono: le euforbie candelabre, gli olivi selvatici, il ginepro etiopico, alcune specie di sicomori, diverse specie di acacie" (p. 70).