



**Succow  
Stiftung**

# **ANALYSIS OF POTENTIAL OF FURTHER UNESCO-BIOSPHERE RESERVES IN ETHIOPIA**

GREIFSWALD, JUNE 2015  
(WITH UPDATES BY OCTOBER 2017)



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## **ANALYSIS OF POTENTIAL OF FURTHER UNESCO-BIOSPHERE RESERVES IN ETHIOPIA**

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## Foreword by Ministry of Science and Technology of Ethiopia

The Michael-Succow-Foundation, with support of the GIZ, BMZ, UNESCO, and the Ethiopian Ministry of Science and Technology produced this revised and validated version of '*Analysis of Potential of further UNESCO-Biosphere Reserves in Ethiopia*'.



Prof. Afework Kassu Gizaw

Ethiopia has to date successfully established five Biosphere Reserves. This potentiality analysis has the purpose of providing science-based information for further identification, establishment, and management of additional United Nations accredited sites in Ethiopia. Biosphere Reserves are places for the reconciliation of nature and development, places for sustainable human living. One needs not to seek further justification to participate in the Global Network of Biosphere Reserves in these times of over-utilization of our natural resources, rapid population growth, and periods characterized by imbalance of the global ecosystem carrying capacity.

Let me highlight the fact that Ethiopia has successfully worked to bring the Simien Mountains World Heritage Site back onto the list and off the list of World Heritage in Danger. This is a vivid testimony to the commitment of the Ethiopian federal and regional authorities, including the Ministry of Science and Technology and its Man and Biosphere (MaB) National Commission, as well as the Ministry of Culture and Tourism and the Ethiopian Wildlife Conservation Authority, the Permanent Delegation of Ethiopia at UNESCO, the National Commission for UNESCO, and other bodies, to work solemnly to achieve our plans.

Further to our efforts in Ethiopia, dialogues with our neighboring countries on cross-border Biosphere Reserve initiatives show our mutual quest for peaceful relations and respect, and support to the preservation of the natural eco-systems of the Horn of Africa. Our international cooperation shows that we are ready for global partnerships to achieve the goals.

Beyond Biosphere Reserves and World Heritage Sites, Ethiopia has also huge potential for other UN accredited sites, such as UNESCO Geoparks, FAO Globally Important Agricultural Heritage Sites, as well as Ramsar Wetlands. We do consider all of them important and relevant for the future of our country.

We hope other United Nations agencies will join our efforts towards the professional management of these very special places. We highly value the support from our friends and partners to make

our Biosphere Reserves functioning, for biodiversity purposes, and to develop urgently needed green economy-based jobs and income for our very young population.

Ethiopia has established the Tourism-Transformation-Board, as well as the Ethiopian Tourism Authority. Good management of United Nations sites will assist the development of tourism, especially eco-tourism. Biosphere reserves attract international and local tourists. The same is true for kindergartens, schools, colleges and universities, for young and old people to learn about best practices in action.

I invite readers of this potentiality analysis to work in close cooperation with the MaB National Commission to be able to synchronize our joint efforts professionally.. We do count on your full support to assist us in managing the existing five Biosphere Reserves, and at the same time to identify and establish additional ones in a timely and professionally phased approach under the leadership of the Ministry of Science and Technology.

Finally, on behalf of the Federal Democratic Republic of Ethiopia, I wish to thank Prof. Michael Succow and his co-workers for this excellent and highly valuable work in support of the United Nations Sustainable Development Goals, the World Network of Biosphere Reserves, the Africa Agenda 2063, and Ethiopia's Growth and Transformation Plan. I also thank the BMZ, GIZ and UNESCO for their guidance and support.



Prof. Afework Kassu Gizaw

State Minister, FDRE Ministry of Science and Technology

December 2017

## Foreword by UNESCO

It is my pleasure to provide a message in support of the '*Analysis of Potential of further UNESCO- Biosphere Reserves in Ethiopia*', produced by the Michael-Succow-Stiftung, in Greifswald, June 2015.

The Ministry of Science & Technology is Ethiopia's authority for Biosphere Reserves. It hosts the Man-and- Biosphere National Commission. The Government endorsement makes this document highly valuable as a guide for all BR stakeholders.

Ethiopia's first BR successfully listed was Kafa, in 2010, and the latest was Majang Forest, in 2017.

Sudan and Ethiopia have embarked on a dialogue towards a transboundary reserve, including the existing Dinder BR on the Sudanese side, and the Alitash National Park in Amhara.

The United Arab Emirates and Ethiopia backed a Biosphere Reserve Youth Excursion, with young professionals from Egypt, Ethiopia, Germany, Pakistan, Sri Lanka, Sudan, Uganda, United Arab Emirates, and United States of America. Something similar is planned between Turkey and Ethiopia.

A team of German and Ethiopian specialists (Ato Yohannis Zerihun, Robin Jahne, Maren Weber, Henning Schwarze and others) are producing a set of short films on Lake Tana, with the Ministry of Water, Irrigation & Electricity, the Austrian Development Agency, the German Embassy, UN Environment, and UNDP. This is the United Nations in Ethiopia 'delivering as one'. The private sector also recognized their role (Simien- Ecotours, ECOPIA, Blue Nile Resort Hotel, INTEWO and Ethiopian Airlines).

Jena's Carl-Zeiss-Schule visited the Yayu Biosphere Reserve in order to establish a school partnership. The first 'UNESCO Green Academy' was inaugurated in 2016 in Bahir Dar, supported by EOC-DICACand the Manfred-Hermesen-Stiftung. The Swedish National Commission and SIDA visited the site.

Obviously, other countries and the United Nations have a solid friendship with Ethiopia, including on the platform of Biosphere Reserves as United Nations accredited sites. With this in mind, we encourage supporters including UN agencies to let their activities take place inside Biosphere Reserves.

I wish to express my sincere thanks to Prof. Michael Succow, and his formidable team of nature conservationists for their highly professional work. I also wish to thank the BMZ, GIZ, notably Dr. Ueli Müller, Mr. Rolf Sprung, and Mr. Lakew Birhanu, for promoting this revised and validated new document.

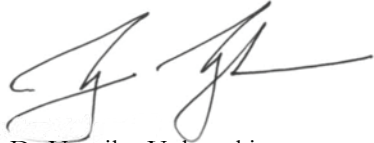
Many thanks are due to His Excellency, the State Minister, Prof. Afework Kassu, and his specialists, including Ato Dagim Adall, Ato Abdulrezak Oumer, Ato Anteneh Senbeta, and Ato Temesgen Tilahun, for their cooperation and synchronizing Biosphere Reserve management in Ethiopia. Biosphere Reserves fully contribute achieving every single one of the 17 UN Sustainable Development Goals - they are places for sustainable human living.

Finally thanks are due to Dr. Benno Boer and his team for catalyzing BR related activities in Ethiopia.



Dr. Yumilko Yokozeki

This validated document indicates a new phase of coordinated synergy. On behalf of UNESCO, I wish the Ethiopian people and their friends and partners the very best of success developing professionally functioning Models for Sustainable Human Living and Nature Conservation.



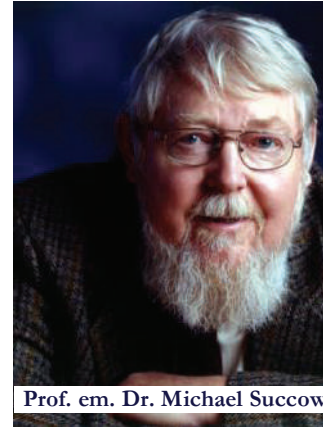
Dr. Yumiko Yokozeki

Officer-In-Charge for the UNESCO Liaison Office in Addis Abeba

## Preface

Forty years ago arose the idea from the UNESCO to develop a global network of large-scale protected areas for people and nature, in which the sustainable use of nature, our basis of life, is being realized exemplarily. Today, more than 600 biosphere reserves exist in more than 130 countries worldwide.

The German Federal Ministry for Economic Cooperation and Development and particularly the German Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) deserve appreciation for their efforts to increasingly emphasize the establishment of biosphere reserves as an important aspect of the German development cooperation. In this frame,



Prof. em. Dr. Michael Succow

Succow Foundation in 2014/15 received the assignment to elaborate the “Analysis of Potential for further UNESCO Biosphere Reserves in Ethiopia” in consultation with the Ethiopian government. Also before Ethiopian biosphere reserves were nominated with the support of the German development cooperation, in particular Kaffa Biosphere Reserve and Lake Tana Biosphere Reserve. Meanwhile, the fifth biosphere reserve is established in Ethiopia and appointed by UNESCO this year.

Our “Analysis of Potential for further UNESCO Biosphere Reserves in Ethiopia” is meant to generate stimuli for the realization of this globally important concept in Ethiopia. The study integrated social, cultural and ecological aspects in the overall assessment. Succow Foundation could gain the support of Dr. Dirk Bustorf as one of the leading German social anthropologists for Ethiopian cultures which enriches the social component of the study. In a country with more than 80 ethno-linguistic groups it is a particular challenge to sustain the livelihoods of the whole population including minorities and in particular to integrate those well in the development efforts of the country.

The sustainable use of nature is one the most important challenges of the current generations. We face the dilemma of being forced to use more and more of our nature in order to exist. But if we destroy nature, we ruin our own future. The narrowing pathway balancing between preserving and sustaining nature will only succeed for those societies that identify themselves and their economies as a part of nature.

I personally feel deeply connected to Ethiopia. In the time of the severe famines in the 1980s, I had the chance to work in the incredibly diverse and impressive country of Ethiopia. Initially, I worked as soil scientist to support the development of agricultural state farms. Afterwards I contributed to various nature conservation projects in the frame of UNESCO programmes.

The ancient country of Ethiopia with its enormous biodiversity and extraordinarily high number of endemic species as well as with its traditional pastoralist land use and farming practices, plays a crucial role in the preservation of the natural potential of our earth. Many of the cultivated plants that are grown worldwide today have their origin in Ethiopia. The need of our current time is to preserve these historically developed traditional cultural landscapes in order to sustain them for the future. The biosphere reserves under the UNESCO programme “Man and the Biosphere” have proved as a successful instrument globally. It is my

wish that this study will be distributed widely and will contribute to the establishment and development of more biosphere reserves in Ethiopia, Africa and in the whole world.



*Prof. em. Dr. Michael Succow*

# Content

- Executive Summary ..... 5
- I. Introduction..... 8
  - Background and Framework..... 8
    - Biosphere Reserve Approach..... 8
    - Biosphere Reserves in Ethiopia ..... 9
  - Objective ..... 10
  - Structure ..... 10
- II. Selection Procedure..... 11
  - Approach of Biosphere Reserve Development ..... 11
  - Selection Process of Study Areas ..... 11
  - Criteria List for Potential Biosphere Reserves ..... 13
  - Methods and Data Collection..... 13
- III. Detailed Description of Selected Areas ..... 15
  - High Prioritised Areas as Potential Biosphere Reserves in Ethiopia ..... 18
    - Borana National Park ..... 18
    - Nechsar National Park ..... 36
    - Awash National Park and proposed Hallaydeghe-Asebot National Park (Allideghi Wildlife Reserve) ..... 58
  - Medium Prioritised Areas as Potential Biosphere Reserves in Ethiopia ..... 76
    - Chebera-Churchura National Park..... 76
    - Asayita and Surrounding Lakes, Afar Region..... 86
  - Low Prioritised Areas and Areas considered as not suitable as Potential Biosphere Reserves..... 95
    - Low Prioritised Areas as Potential Biosphere Reserves..... 95
    - Areas Considered as Not Suitable as Potential Biosphere Reserves..... 97
- IV. Conclusion and Recommendations ..... 98
- V. Bibliography..... 101
- VI. Annex ..... 109



## List of Figures

Figure 1: Biosphere reserve zonation (Mehring and Stoll-Kleemann, 2010) .....	9
Figure 2: Study areas of the analysis of potential (Map by S. Busse).....	12
Figure 3: Yabello National Park and potential biosphere reserve area (dashed line) (Map by S. Busse) .....	19
Figure 4: Climate diagram Yabello, Ethiopia (Climate-Data.Org, 2015a) .....	20
Figure 5: Borana National Park.....	21
Figure 6: Ethiopian Bush Crow ( <i>Zavattariornis stresemanni</i> ) in Borana National Park (left), Abyssinian Ground-hornbill ( <i>Bucorvus abyssinicus</i> ) in IBA of Arero (right).....	23
Figure 7: Borana cattle (left) in Daritu community (right) .....	30
Figure 8: Nechsar National Park and potential biosphere reserve area (dashed line) (Map by S. Busse) .....	37
Figure 9: Climate diagram Arba Minch, Ethiopia (Climate-Data.Org, 2015b).....	38
Figure 10: Map of Nechsar National Park (Nechsar National Park administration; <i>comment by the authors: wrong scale</i> )	39
Figure 11: Wetlands of Lake Chamo (left) and riverine forest at Kulfo River (right) .....	40
Figure 12: Grant's Gazelle ( <i>Nanger granti</i> ) (left) and Burchell's Zebra ( <i>Equus quagga</i> ) (right) on grassland plains .....	41
Figure 13: Land use and anthropogenic pressure on Nechsar National Park (Stellmacher, 2012, p.21) .....	42
Figure 14: Koore people on the way to Arba Minch market for selling coffee (left), fisher man at lake Chamo (right) .....	48
Figure 15: Ranger station in Nechsar National Park (left), discussion with Abraham Marye, chief warden of Nechsar National Park (right) .....	54
Figure 16: Awash National Park and proposed Hallaydeghe-Asebot National Park with potential biosphere reserve area. The study area and results developed from another project by MSF 'Assessing the integration of Awash National Park and proposed Hallaydeghe-Asebot National Park into their surrounding landscape' (Map by S. Busse).....	59
Figure 17: Climate diagram Awash, Ethiopia (Climate-Data.Org, 2015c).....	60
Figure 18: Spotted Hyena ( <i>Crocuta crocuta</i> ) (left), Beisa Oryx ( <i>Oryx beisa</i> ).....	62
Figure 19: Arabian bustard ( <i>Ardeotis arabs</i> ) and Secretary Bird ( <i>Sagittarius serpentarius</i> ) .....	63
Figure 20: Proposed Hallaydeghe-Asebot National Park: overgrazed sites (left) and highway through the area (right).....	64
Figure 21: Afar house (left), goat pen (right) .....	69
Figure 22: Dry and wet season pastures used by different communities in the landscape. The study area and results developed from another project by MSF 'Assessing the integration of Awash National Park and proposed Hallaydeghe-Asebot National Park into their surrounding landscape' (Map by S. Busse).....	71
Figure 23: Chebera-Churchura National Park and potential biosphere reserve area (dashed line) (Map by S. Busse) .	77
Figure 24: Climate diagram Ameya, Ethiopia (Climate-Data.Org 2015d).....	78



Figure 25: Mountain forest of Chebera-Churchura National Park.....79

Figure 26: Elephant dung (left), herd of African Elephant (*Loxodonta africana*) (right) .....80

Figure 27: Range of African Elephant in Ethiopia (Blanc et al., 2007, p. 79).....81

Figure 28: National park administration office (left), house in Chebera Community (right).....83

Figure 29: Camels on Asayita Plains (left), semi-desert landscape east of Asayita (right) .....86

Figure 30: Potential biosphere reserve area around Asayita and Lake Abe wetland system (dashed line) (Map by S. Busse).....87

Figure 31: Climate diagram Asayita, Ethiopia (Climate-Data.Org, 2015e).....88

Figure 32: Nile Crocodile (*Crocodylus niloticus*) at Lake Gemeri (left), Dorcas Gazelle (*Gazella dorcas*) (right).....89

Figure 33: Afar woman in front of new built house (left), agro-pastoralism (right).....91

Figure 34: Proposed biosphere reserve in Djibouti (Hofmann, 2010, p. 49).....94

## List of Tables

Table 2: Selected areas and their prioritisation .....17

## Abbreviations

APF – African Parks Foundation

API – Abrasa Pastoralist Initiative

CBD – Convention on Biological Diversity

CRGE – Climate-Resilient Green Economy

EAE – Encyclopaedia Aethiopica

EIB – Ethiopian Institute of Biodiversity Conservation

EWCA – Ethiopian Wildlife Conservation Authority

GDP – Gross Domestic Product

GIZ – Deutsche Gesellschaft für Internationale Zusammenarbeit

GTP – Growth Transformation Plan

IBA – Important Bird and Biodiversity Area

IUCN – International Union for Conservation of Nature

MaB – Man and Biosphere

masl – meter above sea level

MoARD – Ministry of Agriculture and Rural Development

MoEF – Ministry of Environment and Forests

MoST – Ministry of Science and Technology

MSF – Michael Succow Foundation

NABU – Naturschutzbund Deutschland

NBSAP – National Biodiversity Strategy and Action Plan

NGO – non-governmental organisation

OFWE – Oromia Forest and Wildlife Enterprise

PFM – Participatory Forest Management

SNNPRS – Southern Nations, Nationalities and People's Regional State

UNDP – United Nations Development Programme

UNESCO – United Nations Educational, Scientific and Cultural Organization

# Executive Summary

In 2010 Ethiopia joined the World Network of Biosphere Reserves of the United Nations Educational, Scientific and Cultural Organization (UNESCO) with the successful nomination of its first two Biosphere Reserves following the UNESCO Man and the Biosphere (MaB) standards. A further two Biosphere Reserves have been successfully nominated in 2012 and 2015. Recently the fifth Biosphere Reserve ‘Majang Forest’ was approved by the International Co-ordinating Council of the MaB Programme. Based on these recent developments, the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) in Addis Ababa asked the Michael Succow Foundation (MSF) to analyse the potential for the development of further biosphere reserve areas in Ethiopia.

Ethiopia is assessed as a global biodiversity hotspot by the International Union for the Conservation of Nature (IUCN). At the same time, economic development, urbanisation and population growth increase the existing pressure on natural resource use, which affects in turn Ethiopia’s nature protected areas such as its 24 national parks. The concept of UNESCO BRs (within the Man and Biosphere (MaB) Programme) is a proven instrument to connect nature conservation and sustainable land use practices. BRs count as model regions that promote sustainable regional development and integrate the needs of local people, while they mitigate the loss of biodiversity. This is particularly appropriate in a culturally diverse country as Ethiopia, where more than 80 ethno-linguistic groups live, following a range of livelihood strategies including mixed agriculture, horticulture and pastoralism.

In this analysis of potential, possible biosphere reserve areas are therefore assessed against the UNESCO MaB criteria. The data collected provide a sound base for conducting detailed feasibility studies of prioritised areas.

**Selection of Potential Biosphere Reserve Areas:** Primarily areas around national parks were pre-selected to investigate their potential as biosphere reserves. This focus on national park areas was based on their high ecological value and current threat level through unsustainable resource use and sometimes missing legal frameworks or poor law enforcements.

The implementation of biosphere reserves around national parks would have several advantages:

- support conservation of national parks and their biodiversity values through buffer zones
- contribute to conserve larger areas around the national parks improving connectivity and the functioning of ecosystem services
- national park management will be embedded in sustainable regional development planning
- improve legal protection status of national parks which are to date without legal gazettement or whose boundaries are less respected
- improve the involvement of local communities in the day-to-day management of natural resources and biodiversity
- helps to bring sustainable income to local communities through improved biodiversity conservation
- helps to model the link between sustainable development and the need for conservation

After the pre-selection, a total of 17 areas were then assessed in detail for their suitability as biosphere reserves according to the following ecological and social criteria:

- biodiversity values, ecological threats and current state of the environment
- socio-economics, culture and land use practices of local communities
- relevant stakeholders and projects in accordance with the biosphere reserve concept
- administrative structures and political support for potential biosphere reserve development.

The analysis was undertaken from November 2014 to June 2015. Data collection comprised field assessments about biodiversity and ecological conditions of the study areas. Additionally ethnographic surveys about the socio-cultural situation were carried out. Interviews concerning ecological, social and political issues were performed with local and international experts, local community members and political authorities.

**Areas Prioritised as new Biosphere Reserves:** According to the analysis of the assessment criteria, the considered 17 areas were classified into the following categories: high (3), medium (2), and low-prioritised (6), as well as not suitable (6) areas.

The three high-prioritised areas are: Borana National Park (Oromia Regional State), Nechsar National Park (Oromia and Southern Nations, Nationalities and People's Regional State) and Awash National Park together with the newly proposed Hallaydeghe-Asebot National Park (and Allideghi Wildlife Reserve; Afar Regional State). All these areas are rich in biodiversity, including rare and endemic species and are suffering from ecological threats. Anthropogenic pressure and overuse of natural resources comprises overgrazing, deforestation, establishment of agricultural plantations, settlements, hunting and road kills. All study areas are used and inhabited by pastoralists, whose lifestyle has shaped the landscape for generations. Local pastoralists depend on land as natural resource for their livelihood. It is thus even more important to integrate their land use customs in biosphere reserve planning. The biosphere reserve approach might be an appropriate framework to create an area where traditional pasture management and habitat protection can be brought in line.

The two medium-prioritised areas are: Chebera-Churchura National Park and the area of Asayita and surrounding lakes in Afar Region. The area of Asayita and surrounding lakes also has significance for reconciling pastoralism and nature conservation as this is one of the most vulnerable areas of pastoralist living in Ethiopia. Being a potential habitat of endangered Wild Ass, it is both from ecological and social perspective that it is an important area to protect. This is particularly important as no protected area has been established there so far.

Chebera-Churchura National Park has an outstanding importance as one of the last retreat habitats for the African Elephant in Ethiopia. As the national park has not enough buffer zone for its elephants, further expansion, protection and corridor establishment of this area has to be strongly promoted.

The following six areas are identified as low-prioritised for different reasons: Simien Mountains National Park, Bale Mountains National Park, Maze National Park, Abijata-Shala National Park, Alatish National Park and Kafta-Shiraro National Park. However, this does not mean that these national parks will not benefit from biosphere reserve establishment in their surroundings. If the situations on the ground are

improving, priority for biosphere reserve establishment will also enhance. Mainly due to security situation, weak protected area governance or development of large-scale agricultural plantations, the following areas are considered as less suitable for biosphere reserve development at the moment. These include, Gambella National Park, Geraille National Park, Mago National Park, Omo National Park, Yangudi-Rassa National Park and Chew Bahir Wildlife Sanctuary.

**Current Situation of the Biosphere Reserve Approach in Ethiopia:** UNESCO-Biosphere Reserves are currently not manifested in any of the Ethiopian national laws at federal level. The five existing biosphere reserves are only gazetted by regulation developed by the respective regional states. Other forms of protected areas are designated regionally by regional proclamations and nationally in the ‘Wildlife Development, Conservation and Utilization Proclamation No. 541/2007’. The authors of this study highly recommend the inclusion of the biosphere reserve approach into the national laws at federal level. This would ensure more financial and political support for the five biosphere reserves as well as strengthen their functional sustainability. Including the approach in the national development agendas (e. g. Climate-Resilient Green Economy (CRGE) and Growth Transformation Plan (GTP)) would improve its recognition in the Ethiopian policy context. It would also have the advantage becoming one of the focal areas for the national and international biodiversity conservation agendas, for instance the Aichi Targets of the Convention on Biological Diversity (CBD). Another major weakness is the presence of different institutions with mandates for nature conservation in Ethiopia. The national administrations of national parks, biosphere reserves and forest priority areas are divided among different authorities: Ethiopian Wildlife Conservation Authority (EWCA), Ministry of Science and Technology (MoST), Ministry of Environment, Forestry and Climate Change (MoEFCC) and the respective regional authorities. The approaches of national parks and biosphere reserves have to go hand in hand and should have an equal position and legitimisation. Achieving this, both could be combined in practice in order to enhance protection of biodiversity and natural resources. Similar lessons can be drawn from other countries e.g. Amboseli National Park and Biosphere Reserve, Kenya, and Lake Manyara National Park and Biosphere Reserve, Tanzania. On the other hand, these different institutions and arrangements may not be enough to protect the natural resources of Ethiopia. The challenge may be on how to coordinate them to work together towards a common agenda.

**General Recommendations:** In a country like Ethiopia, establishment of biosphere reserves is an important approach for nature conservation and sustainable development in the future. Future biosphere reserve planning should even more focus on the practical integration of ecological conservation activities with sustainable land use customs of local people. The socio-ecological component is particularly needed in order to ensure local people’s livelihood which correlates with socio-economic stability and furthermore, to promote local acceptance for the biosphere reserve approach. This is particularly important in order to avoid mistakes from the past, when national parks were established without sufficiently integrating local perceptions. It is recommended to evaluate the establishment process, current status and management of existing biosphere reserves in Ethiopia while performing further research on possible biosphere reserves, i.e. in terms of feasibility studies. Lessons learned and participatory experience sharing on all governance levels should take place in order to prevent weaknesses that have occurred in the past biosphere reserve development. Realising new biosphere reserves should build on the learning process and experiences of the existing ones.

# I. Introduction

## Background and Framework

Located on the Horn of Africa, Ethiopia is assessed as global biodiversity hotspot by the IUCN. The country is characterised by a large number of different types of ecosystems and regions with hotspots of biodiversity, including Afromontane forests and grasslands, moist and dry savannahs, tropical forests, deserts and volcanic lowlands with salt lakes (Friis et al., 2010).

The population of Ethiopia is composed of more than 80 ethno-linguistic groups covering a broad spectrum of economic strategies including mixed agriculture, horticulture and pastoralism (MoARD, 2010). Despite economic growth, the country has huge problems of poverty and food insecurity. As one of the poorest countries world-wide, Ethiopia is confronted with a high population growth rate of 2.89 % and goes through a process of intensive urbanisation (UNDP, 2013). Therefore the pressure on the use of natural resources is rising. This affects the different types of protected areas, e.g. national parks, wildlife reserves, -sanctuaries and community conservation areas. The majority of Ethiopia's 15 national parks was found in the 1960s and 1970s (Table 1), in order to protect biodiversity and endangered species. Despite their longstanding existence, the boundaries of many national parks are not legally gazetted or officially designated. Social circumstances of local people were of little concern when national parks were established (Solomon Belay et al., 2007). Many protected areas do not have management plans, so that the current situation of the local communities is still unconsidered in several cases (EIB, 2005). Therefore the need and demand of the local people for natural resources such as fire wood, pastures and arable land, further increase the pressure of use on the national parks. The results are high deforestation rates, soil degradation, overgrazing and conversion to agricultural land in many national park areas (EIB, 2005).

## Biosphere Reserve Approach

A promising approach to meet the social-ecological problems of Ethiopia is the establishment of biosphere reserves, according to MaB-programme of the UNESCO (see Figure 1). Biosphere reserves are model regions promoting a sustainable socio-economic development and integrating the needs of local people, while they mitigate the loss of biodiversity.

### Functions of Biosphere Reserves:

- Conservation function: to preserve biodiversity including species, ecosystems, genetic resources and landscapes
- Development function: to promote sustainable economic and human development
- Logistic support function: to foster environmental education, research and monitoring relating nature conservation and sustainable development (UNESCO, 1996).



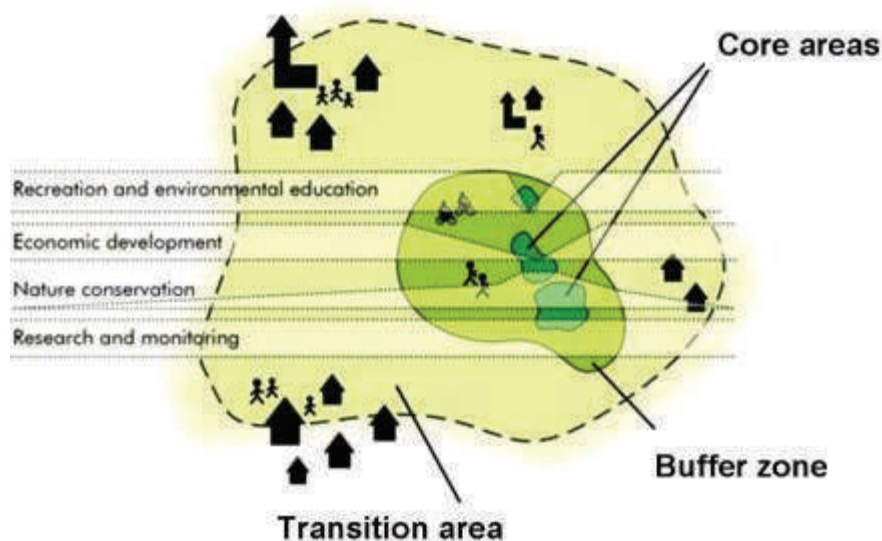


Figure 1: Biosphere reserve zonation (Mehring and Stoll-Kleemann, 2010)

### Zonation of Biosphere Reserves:

- Core area: there are one or more core areas in number, which are strictly protected for conserving biodiversity, monitoring and researching without disturbing the ecosystems
- Buffer zone: it usually encloses the core zone and is used for cooperative activities in accordance with ecological requirements, such as environmental education, research, recreation and ecotourism
- Transition area: it includes agricultural areas, settlements and other land use activities where different stakeholders and local population cooperate to manage and develop the area's resources sustainably (UNESCO, 1996).

## Biosphere Reserves in Ethiopia

The concept is well established and receives a broad support by several governmental ministries and authorities. Four biosphere reserves are already established: Kafa (2010), Yayu (2010), Sheka (2012) and Lake Tana, which is recently founded with assistance of Naturschutzbund Deutschland (NABU) and the Michael Succow Foundation (see zur Heide 2011). Recently the fifth Biosphere Reserve 'Majang Forest' was approved by the International Co-ordinating Council of the MaB Programme.

In Ethiopia, the MaB-programme is mandated by the MoST. Certain wildlife reserves, -sanctuaries and -controlled hunting areas are under the mandate of the EWCA. However, UNESCO-Biosphere Reserves are still not manifested in national law. They are only gazetted by proclamation in regional law. By contrast, other forms of protected areas are designated nationally in the 'Wildlife Development, Conservation and Utilization Proclamation No. 541/2007'.

## Objective

The objective of the present study was to identify the potential of further biosphere reserves in Ethiopia. Since the pressure on natural resources is increasing, a social-ecological approach is demanded and absolutely necessary to a) mitigate the loss of biodiversity, and to b) foster sustainable land use including the needs of local people and ethnic minorities. In this analysis of potential, possible biosphere reserve areas are prioritised concerning their socio-ecological suitability. Additionally, the collected data provide a basis to carry out detailed feasibility studies of prioritised areas.

## Structure

In the first chapter of this analysis of potential, an introduction is given which briefly describes the background and framework, including the approach of biosphere reserves, and the objectives of the study.

Chapter II deals with the approach of biosphere development, the selection procedure of the investigated areas and their prioritisation, the criteria list for potential biosphere reserves as well as the methods used in this study.

In chapter III the results of the areas as potential biosphere reserves are presented, which are classified in four categories according to the criteria list:

- high prioritised areas
- medium prioritised areas
- low prioritised areas
- areas considered as not suitable.

To give an overview about the results, all investigated areas and their prioritisation are outlined in a tabular summary (Table 1). Further on, the results of the high prioritised and medium prioritised areas are delineated and analysed in detail to provide a basis for further project development. Low prioritised areas and the areas that are considered as not suitable are shortly delineated in the following part.

Chapter IV leads to the final conclusion and recommendations.

## II. Selection Procedure

### Approach of Biosphere Reserve Development

For the consideration of potential areas the subsequent approach is used, comprising four ways to establish biosphere reserves in Ethiopia regarding the local objectives and circumstances (see ):

- I. Establishment of single biosphere reserves in areas without previous protection status (e.g. Asayita and surrounding lakes)
- II. Establishment of biosphere reserves around existing national parks (e.g. Nechsar National Park, Borana National Park, Awash National Park)
  - a) Creating buffer and development zones around national parks, integration of the periphery
  - b) Developing (parts of) national parks as core zones of new biosphere reserves
- III. Establishment of international transboundary biosphere reserves (e.g. Alatish National Park, Asayita and surrounding lakes)
  - a) Possibly around existing national parks (see b) by enlarging and combining two protected sites in one international transboundary area
  - b) Supporting the bilateral cooperation and unity of countries
- IV. Protection of the environment and livelihood of local communities (e.g. pastoralists in Borana National Park)
  - a) Supporting the socio-cultural integrity of local communities
  - b) Protection against present forms of land grabbing

### Selection Process of Study Areas

Based on ecological and social criteria, certain study areas were chosen in a pre-selection. Primarily areas around national parks were determined to be investigated as potential biosphere reserves. As national parks once were established due to their high biodiversity values, currently many of them are endangered through unsustainable resource use. Therefore it is worth striving for preserving them through a socio-ecological approach adapted on current social influences and growing demand for natural resources. Within the applied approach of biosphere reserves, national parks could be embedded in a sustainable regional development planning. Moreover, biosphere reserves could contribute to conserve larger areas around the national parks.

The respective study areas are illustrated in and summarised in Table 1.

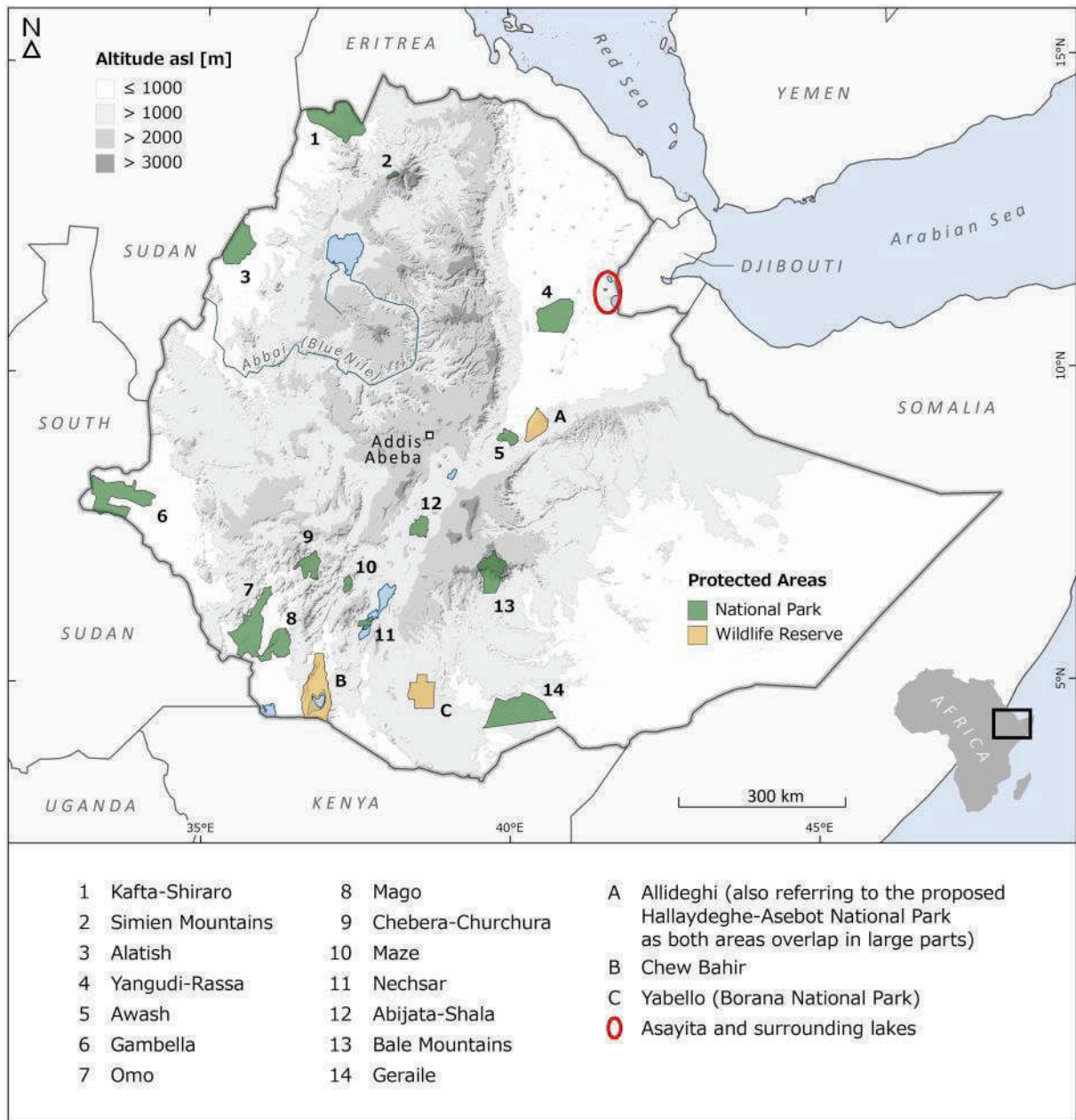


Figure 2: Study areas of the analysis of potential (Map by S. Busse)

## Criteria List for Potential Biosphere Reserves

Certain criteria were established by the authors of this study based on which the potential biosphere reserve areas are to be identified (see annex for detailed criteria list):

- the natural and physiographic endowments and biodiversity values as well as ecological threats and current state of the environment,
- a socio-cultural characterisation of the ethnic groups including their socio-political systems and related land use practices as well as the relation between culture and nature; additionally a comprehensive overview is given about the attitudes of the local people to nature conservation areas and associated possible conflicts of interests,
- the existence of projects in accordance with the biosphere reserve concept (e.g. sustainable land use, ecological tourism etc.),
- administrative structures and political support for the potential development of biosphere reserves (i.a. transboundary potential)
- relevant stakeholders and potential cooperation partners,
- the security situation in the project area.

In accordance with these criteria the potential biosphere reserve areas are evaluated and prioritised. The evaluation of the socio-ecological and environmental threats in the potential biosphere reserve areas is of particular importance. These criteria indicate the suitability, urgency and priority to address the protection of certain areas. Endangered areas require an urgent need for action to protect remained natural features and to secure the natural resources. In certain parts of the potential biosphere reserve areas, a sustainable use of natural resources is needed to ensure the livelihood of the local people.

The evaluation also considers the possibilities of biosphere reserves to provide shelter for ethnic groups and to stabilise their livelihood in rural areas. Biosphere reserves can create economic as well as non-tangible incentives for ethnic groups which promote local acceptance for the biosphere reserve approach.

To include the perspective of local people's livelihood situation and its influence on national parks or biosphere reserves, this study implied a socio-cultural and anthropological component as a special feature in protected area consulting.

## Methods and Data Collection

Field assessments of four weeks took place in December 2014 and March 2015. Data collection comprised ecological assessments about biodiversity, landscape structures and current conditions of the study areas. Additionally ethnographic surveys about the socio-cultural situation were done.

Interviews concerning ecological and social issues were performed with (see bibliography for list of interview partners):

- local experts, i.a. staff of national park administrations, scientists, non-governmental organisations (NGO)
- local community members
- national and local political authorities
- international experts and consultants.

Furthermore, rough inventories according to further criteria listed above were made in certain study areas.

Field data were complemented with a comprehensive literature research. For the geo-ecological classification of the study areas, the concept of agro-ecological zones was used (Ritler, 2005, also called agro-climatic zones in Azene Bekele-Tesemma, 2007).

## III. Detailed Description of Selected Areas

In the following chapter the results of the areas as potential biosphere reserves are presented, according to the four categories of prioritisation.

At first, all investigated areas and their prioritisation are outlined in a tabular summary (Table 1). Then the results of the high prioritised and medium prioritised areas are delineated and analysed in detail, followed by a brief description of the low prioritised areas and the areas that are considered as not suitable.



Selected Areas	Region (National Regional State)	Size and Year of Establishment	Category of Approach	Ecological Characterisation	Socio-cultural Characterisation
<b>High Prioritised Areas</b>					
Borana National Park	Oromia	3688.9 km <sup>2</sup> , 2011	II, IV	<ul style="list-style-type: none"> <li>- <i>Acacia-Commiphora</i> savannah and woodland, dry forests (<i>Juniperus procera</i>, <i>Olea europea</i> subsp. <i>cuspidata</i>)</li> <li>- Grevy's Zebra, Ethiopian Bush Crow, White-tailed Swallow, Prince Ruspoli's Turaco</li> </ul>	Borana Oromo (mainly pastoralists and recently also agro-pastoralists)
Nechsar National Park	SNNPRS	514 km <sup>2</sup> , 1974	II, IV	<ul style="list-style-type: none"> <li>- Extensive grassland, <i>Acacia-Commiphora</i> savannah and bushland, woodland, groundwater and riverine forest, parts of Lake Chamo and Lake Abaya</li> <li>- Lesser Kudu, Leopard, Lion, Hippopotamus, Lesser Flamingo, Pallid Harrier</li> </ul>	Guji Oromo (agro-pastoralists), the Kooro and the Gamo (both agriculturalists)
Awash National Park and proposed Hallaydeghe-Asebot National Park (Allideghi Wildlife Reserve)	Oromia, Afar	756 km <sup>2</sup> , 1966; 1832 km <sup>2</sup> , 1960s	II, IV	<ul style="list-style-type: none"> <li>- Arid/semi-arid xerophilous woodland, extensive grassland, savannah bushland dominated by <i>Acacia senegal</i>, <i>Chrysogon plumulosus</i>, <i>Sporobolus iocladius</i></li> <li>- Grevy's Zebra, Leopard, Lion, potential habitat for Wild Ass, Palearctic migratory bird species</li> </ul>	‘Afar, Issa Somali, Oromo subgroups Karrayu and Ittuu (all pastoralists and agro-pastoralists)
<b>Medium Prioritised Areas</b>					
Chebera-Churchura National Park	SNNPRS	1278 km <sup>2</sup> , 2005	II, IV	<ul style="list-style-type: none"> <li>- Grass savannah, montane and riverine forest with <i>Ficus</i> spp., <i>Combretum</i> spp., <i>Ehretia</i> spp., <i>Albizia</i> spp.</li> <li>- African Elephant, African Buffalo, Leopard, Hippopotamus, African Wild Dog</li> </ul>	Konta, Dawro, Chara (all agriculturalists combined with horticulture and animal husbandry)
Asayita and surrounding lakes	Afar	No protected area	I, III, IV	<ul style="list-style-type: none"> <li>- Desert landscape, rocky hills, few drought tolerant vegetation, freshwater and salt water lakes</li> <li>- Speke's Gazelle, Nile Crocodile, potential habitat for Wild Ass, Basra Reed Warbler, Palearctic migratory bird species</li> </ul>	Afar (mainly pastoralists), territory of the historical Sultanate of Awsa
<b>Low Prioritised Areas</b>					
Simien Mountains National Park	Amhara	412 km <sup>2</sup> , 1966	II	<ul style="list-style-type: none"> <li>- Afroalpine and afroalpine vegetation (e.g. <i>Lobelia rhyndopetalum</i>), dry evergreen montane forest</li> <li>- Gelada Baboon, Walia Ibex, Ethiopian Wolf</li> </ul>	Amhara, Tigray, Agaw (all agriculturalists with animal husbandry)
Bale Mountains National Park	Oromia	2471 km <sup>2</sup> , 1970	II	<ul style="list-style-type: none"> <li>- Afroalpine and sub-afroalpine vegetation, dry evergreen montane forest (<i>Hagenia abyssinica</i>, <i>Erica arborea</i>), bamboo forest, mires, lakes</li> </ul>	Arsi sub-group of the Oromo (agriculturalists with animal husbandry)

						<ul style="list-style-type: none"> <li>– Ethiopian Wolf, Giant Molerat</li> </ul>	
Abijata-Shala National Park	Oromia	887 km <sup>2</sup> , 1974	II		<ul style="list-style-type: none"> <li>– Savannah with <i>Acacia</i>, <i>Commiphora</i>- and <i>Euphorbia</i>-vegetation, deep crater lake (Shalla) and shallow lake (Abijata)</li> <li>– Great White Pelican (colony of 5000 birds), Greater and Lesser Flamingo</li> </ul>	<ul style="list-style-type: none"> <li>– Arsi sub-group of the Oromo (mainly animal husbandry, few agriculturalists)</li> </ul>	
Alatish National Park	Benishangu I-Gumuz	2665 km <sup>2</sup> , 2006	II, III, IV		<ul style="list-style-type: none"> <li>– Deciduous forest, bamboo forest, moist savannah, swamps, open grassland, semi-desert</li> <li>– possibly African Elephant, Leopard, Lion, Lesser Kudu</li> </ul>	<ul style="list-style-type: none"> <li>– Gumuz (shifting cultivators, agro-pastoralists), Amhara and Tigraya migrants (agriculturalists)</li> </ul>	
Maze National Park	SNNPRS	202 km <sup>2</sup> , 2003	II		<ul style="list-style-type: none"> <li>– Deciduous forest with <i>Combretum-Terminalia</i>, <i>Mopane</i> woodland, grass savannah</li> <li>– Swayne's Hartebeest, Oribi</li> </ul>	<ul style="list-style-type: none"> <li>– Kucha, Gamo (both agriculturalists with animal husbandry)</li> </ul>	
Kafta-Shiraro National Park	Tigray	5000 km <sup>2</sup> , 2007	II, IV		<ul style="list-style-type: none"> <li>– Dry evergreen montane deciduous forest with <i>Acacia-Commiphora</i> and <i>Combretum-Terminalia</i>, riverine forest</li> <li>– possibly African Elephant, Caracal</li> </ul>	<ul style="list-style-type: none"> <li>– Tigray, Amhara, Kunama (all agriculturalists with animal husbandry)</li> </ul>	
<b>Considered as Not Suitable</b>							
Gambella National Park	Gambella	5060 km <sup>2</sup> , 1973	II, IV		<ul style="list-style-type: none"> <li>– Deciduous forests with <i>Combretum-Terminalia</i>, riverine forests, grass savannah</li> <li>– Nile lechwe, White-eared Kob, African Buffalo, possibly African Elephant</li> </ul>	<ul style="list-style-type: none"> <li>– Nuer (pastoralists), Anuak (agriculturalists)</li> </ul>	
Mago National Park	SNNPRS	2162 km <sup>2</sup> , 1979	II, IV			<ul style="list-style-type: none"> <li>– Chai, (agro-pastoralists), Dizi, Me'en (both agriculturalists)</li> </ul>	
Omo National Park	SNNPRS	4068 km <sup>2</sup> , 1966	II, IV		<ul style="list-style-type: none"> <li>– Grass savannah, wooded grassland, riverine forest, <i>Euphorbia</i> thicket</li> <li>– African Buffalo, Lion, African Elephant, Gerenuk</li> </ul>	<ul style="list-style-type: none"> <li>– Hamer, Banna, Kara, Muguji, Aari (all agriculturalists with animal husbandry), Mursi, Bashada (both agro-pastoralists)</li> </ul>	
Geraille National Park	Somali	3858 km <sup>2</sup> , 2006	II		<ul style="list-style-type: none"> <li>– Grass savannah with <i>Acacia-Commiphora</i>, riverine forests</li> <li>– Lesser Kudu, Gerenuk</li> </ul>	<ul style="list-style-type: none"> <li>– Somali (mainly pastoralists)</li> </ul>	
Yangudi-Rassa National Park	Afar	4731 km <sup>2</sup> , 1977	II, IV		<ul style="list-style-type: none"> <li>– Semi-desert, deciduous forest with <i>Acacia-Commiphora</i>, <i>Acacia</i> savannah, extensive grassland</li> <li>– Soemmerring's Gazelle</li> </ul>	<ul style="list-style-type: none"> <li>– Afar, Issa (both pastoralists)</li> </ul>	
Chew Bahir Wildlife Sanctuary	SNNPRS	4212 km <sup>2</sup> , 1973	II, IV		<ul style="list-style-type: none"> <li>– Saline lake, <i>Acacia-Euphorbia</i> bushland, mixed broadleaved scrub with <i>Terminalia</i> spp. and <i>Acacia</i></li> <li>– possibly Grevy's Zebra</li> </ul>	<ul style="list-style-type: none"> <li>– Arbore, Borana Oromo, Hamar (pastoralists and agro-pastoralists)</li> </ul>	

Table 1: Selected areas and their prioritisation

# High Prioritised Areas as Potential Biosphere Reserves in Ethiopia

## Borana National Park

### Introduction

The Borana National Park was established in 2011, developed from the former Yabello Wildlife Sanctuary (established in 1985), and covers 3688.9 km<sup>2</sup> (pers. communication Nugusie Wata, 2015).

The landscape of Borana National Park and its surroundings comprise mainly *Acacia* savannahs and dry forests or woodlands. The altitude of the national park ranges from 1400 to 2000 masl.

**Location:** The national park is located in the Oromia National Regional State in the Borana Zone close to the zonal capital Yabello. It comprises three main area clusters (pers. communication Nugusie Wata, 2015):

- Yabello (990.9 km<sup>2</sup>; 05°06'37"N 38°33'20"E), including parts of the former wildlife sanctuary
- Sarite Plains (97.34 km<sup>2</sup>; 04°47'38"N 37°44'15"E)
- Dire (2601.78 km<sup>2</sup>), subdivided in Magado (1204 km<sup>2</sup>; 03°45'15"N 38°19'28"E), Gamado Mountain (1197 km<sup>2</sup>; 04°12'23"N 38°03'14"E) and Dida Sooda (200.78 km<sup>2</sup>; 04°12'38"N 38°23'53"E).

**Administrative:** The Borana National Park is administered by the Oromia Forest and Wildlife Enterprise (OFWE), the management is subjected to the Borana National Park Office in Yabello. Since the protected area was transformed from a wildlife sanctuary to a national park the boundaries are officially designated, but the national park is not yet legally gazetted.

Around the national park several Natural Forest Priority Areas are established by the Oromia National Regional State, i.a. Arero, Mega and Yabello. Furthermore, Yabello Sanctuary and Arero Forest are determined as Important Bird and Biodiversity Areas (IBA) by BirdLife International (Birdlife, 2015a, 2015b).

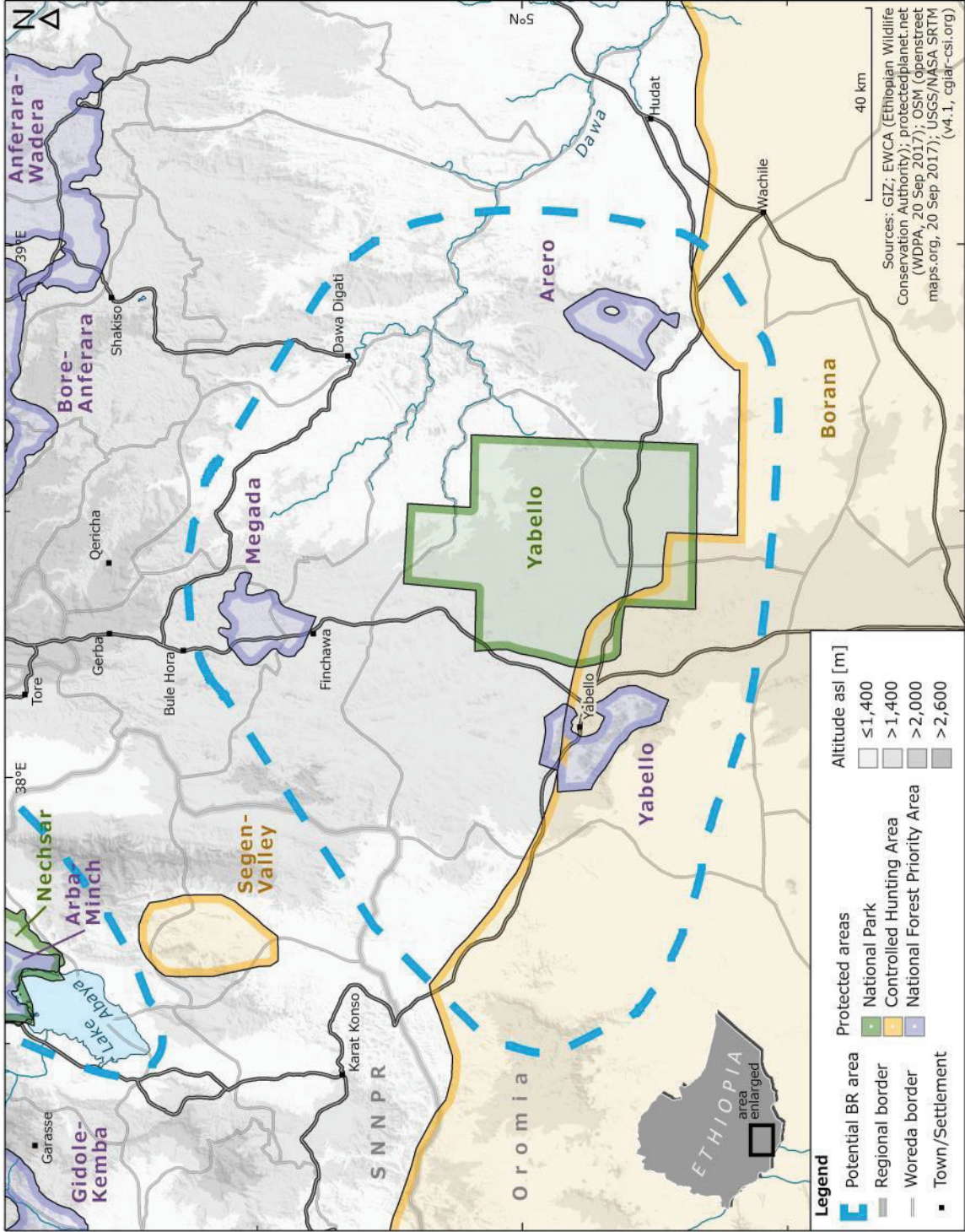


Figure 3: Yabello National Park and potential biosphere reserve area (dashed line) (Map by S. Busse)



## Ecological Situation

**Surroundings:** The areas surrounding the national park are developed to farmland and rangeland. Farmers are cultivating maize, wheat and tef in altitudes of 1,450 to 1,600 masl. The fields are rather smaller in size and often with stands of single *Acacia* trees. The rangelands are used by the Borana pastoralists since a long time (detailed description in the following subchapter).

**Climate:** The Borana National Park lies within the Dry Weyna Dega agro-ecological zone (Ritler, 2005, Azene Bekele-Tesemma, 2007). The area is characterised by a bimodal rainfall pattern. The main rainy season extends from March to May, a shorter rainy season occurs between September to October. The dry seasons occur between June and August and between November and February. The annual rainfall averages 500 mm in the lowlands and 700 mm in the highlands. The mean annual temperature is about 19 °C with monthly minimum and maximum of 12 and 29 °C respectively (Figure 4).

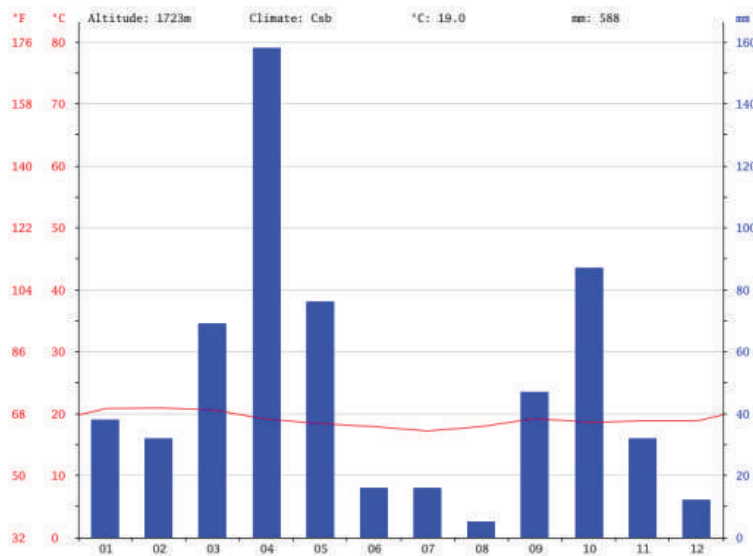


Figure 4: Climate diagram Yabello, Ethiopia (Climate-Data.Org, 2015a)

**Soils:** The *Dry Weyna Dega* agro-ecological zone is characterised by sandy and light brown yellow soils with rather low organic matter (Ritler, 2005, Azene Bekele-Tesemma, 2007). Particularly Chromic, Eutric and Luvisol are the dominated soil types in the Borana National Park and its surroundings (Reta Regassa, 2010).



Figure 5: Borana National Park

**Vegetation and Area Structure:** The dominant vegetation type in this area is classified by Friis et al. (2010) as *Acacia-Commiphora woodland and bushland proper* (see Box 1). It appears as savannah woodland which is dominated by *Acacia tortilis*, *A. brevispica*, *A. horrida* and *A. drepanolobium* as well as several subshrub and grass species on the ground layer (Borghesio and Giannetti, 2005). In this area the *Acacia-Commiphora woodland and bushland proper* is distributed in altitudes until 1500 or 1600 masl. The second most common vegetation type is *Dry evergreen Afromontane forest and grassland complex*, especially the subtype *Transition between Afromontane vegetation and Acacia-Commiphora bushland on the eastern escarpment* (Friis et al., 2010). It occurs on higher sites (1500 to 2000 masl) of the national park and its surroundings where dry forests of *Juniperus procera* and *Olea europea* subsp. *cuspidata* cover the hills (EWNHS, 2010). In some parts the forests appear as open dry forests and *Juniperus* woodlands. In lower areas the vegetation type *Combretum-Terminalia woodland and wooded grassland* with *Terminalia brownii* and *Balanites aegyptica* occurs between *Acacia-Commiphora woodland and bushland proper*.

#### Box 1: Vegetation types

##### *Acacia-Commiphora woodland and bushland proper*

Friis et al. (2010) has characterised this vegetation type with drought-resistant trees and shrubs with evergreen, often small leaves or even deciduous species. *Acacia-Commiphora woodland and bushland proper* is usually found on sandy soils. The light conditions on the ground are very good due to thin leaf canopies. Thus, the ground is covered with several subshrub species and herbaceous, grass species. This vegetation type has a high number of different species which do not occur in other Ethiopian vegetation types. In general *Acacia-Commiphora woodland and bushland proper* is to be found in northern, eastern, central and southern parts of Ethiopia, between 400 (900) and 1600 (1900) masl and under semiarid conditions.

##### *Dry evergreen Afromontane forest and grassland complex*

(Friis et al., 2010) delineates this vegetation type as a complex succession system of extensive grasslands, shrubs and trees to closed forest. Typical tree species are *Juniperus procera*, *Olea europaea*

subspec. *cuspidata*, *Podocarpus falcatus*. Four subtypes are defined by Friis et al. (2010):

- *Undifferentiated Afromontane forest,*
- *Dry single-dominant Afromontane forest of the Ethiopian highlands*
- *Afromontane woodland, wooded grassland and grassland*
- *Transition between Afromontane vegetation and Acacia-Commiphora bushland on the eastern escarpment.*

The *Dry evergreen Afromontane forest and grassland complex* is distributed in altitudes of 1800 to 3000 masl. Ever since the beginning of the agrarian development, the areas of *Dry evergreen Afromontane forest and grassland complex* are highly used for agricultural purposes. Therefore this vegetation type has become rare, reduced in size and turned rather into bushlands. Especially in the northern parts of Ethiopia the forest cover is diminished due to deforestation in order to establish arable land.

### ***Combretum-Terminalia woodland and wooded grassland***

This vegetation type is described by (Friis et al., 2010) with a plant composition of the eponymous genera *Combretum* (i.a. *Combretum adenogonium*, *C. hartmannianum*, *C. molle*, *C. rochetianum*) and *Terminalia* (i.a. *Terminalia laxiflora*, *T. macroptera*, *T. schimperiana*). Characteristic for this vegetation type are small to moderate sized trees with large deciduous leaves, i.a. woody species of *Acacia* and *Fabaceae*. *Acacia* trees occur mainly on flat ground of Vertisol soil types. The grass layer often is well developed with many species (i.a. *Hyparrhenia*, *Panicum* and *Pennisetum*) and high growth productivity. In the dry season the grass layer often is affected by fires because of the sprouting of perennial grass species to produce new biomass after burning. This vegetation type is mainly distributed in altitudes of 400 to 1,800 masl, generally in wide parts of Ethiopia, along the western escarpment of the Ethiopian highlands, from the border region between Ethiopia and Eritrea, the western parts of the Benshangul-Gumuz region, in the area between Keficho Shekicho Zone and South Sudan, South Omo Zone and Gambella Region. In the central, northern, south-western and eastern parts of the country *Combretum-Terminalia woodland and wooded grassland* occurs between *Acacia-Commiphora woodland and bushland proper* on the highlands.

**Wildlife:** The Borana National Park and its surrounding areas are very important for habitat conservation of endangered and endemic animal species.

In the grasslands and open woodlands of the *Acacia-Commiphora* vegetation type two zebra species, Burchell's Zebra (*Equus quagga*) and Grevy's Zebra (*Equus grevyi*), appear. As grazing species they prefer savannah habitats such as dry grasslands with sparse stocks of trees and watering places. Grevy's Zebra has very restricted habitats in Ethiopia. The Borana National Park and the proposed Hallaydeghe-Asebot National Park are the only protected areas that appear in the distribution range of Grevy's Zebra. Due to hunting and poaching the population size has been diminished in Ethiopia immensely, not more than 130 individuals are remaining. Therefore the species is assessed as *endangered* on the IUCN Red List (IUCN, 2015).



Furthermore the Borana National Park and its surroundings are habitat for other important wildlife species:

- Greater Kudu (*Tragelaphus strepsiceros*)
- Lesser Kudu (*Tragelaphus imberbis*)
- Guenther's Dik-dik (*Madoqua guentheri*)
- Common Warthog (*Phacochoerus africanus*)
- Grant's Gazelle (*Nanger granti*)
- Gerenuk (*Litocranius walleri*)
- Beisa Oryx (*Oryx beisa*)

Probably a remnant population of lions (*Panthera leo*) and Reticulated Giraffe (*Giraffa camelopardalis reticulata*) exist in the border area to Kenya (pers. communication Nugusie Wata, 2015, IUCN, 2015, ALERT, 2015).

**Birds:** At least 250 bird species are registered in the national park (Watt et al., 2005). The area is particularly famous for three highly important bird species, which are endemic to South Ethiopia: Ethiopian Bush Crow (*Zavattariornis stresemanni*), White-tailed Swallow (*Hirundo megalensis*) and Prince Ruspoli's Turaco (*Tauraco ruspolii*). After the IUCN Red List, the status of the Ethiopian Bush Crow is *endangered*, while the other two species are assessed as *vulnerable*. The Borana National Park is the only protected area within the distribution range of these species. This is particularly important as all three species have very small ranges of distribution due to their specialisation and high requirements on their habitats. For instance, the Ethiopian bush crow is restricted to around 5,000 km<sup>2</sup> in southern Ethiopia of which large parts belong to the Borana National Park. Its population is decreased by 80 % since the late 1980s because of habitat loss (Borghesio and Giannetti, 2005). Prince Ruspoli's Turaco is to be found in broadleaved woodland in altitudes of 1,100 to 1,800 masl, often in vicinity to fruit trees, e.g. *Ficus sycomorus*. Both the White-tailed Swallow and the Ethiopian Bush Crow require open terrain of *Acacia-Commiphora* in altitudes of 1,000 to 1,700 masl and 1,200 to 1,800 masl respectively, which is diminishing by overgrazing and bush encroachment in the national park and its surroundings. Populations of Somali Ostrich (*Struthio molybdophanes*) also occur in this area.

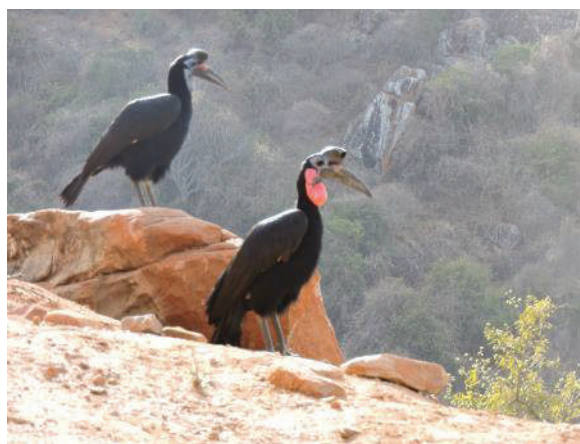


Figure 6: Ethiopian Bush Crow (*Zavattariornis stresemanni*) in Borana National Park (left), Abyssinian Ground-hornbill (*Bucorvus abyssinicus*) in IBA of Arero (right)

**Ecological Threats:** The IUCN Red List categorisation of the many above mentioned wildlife species is of concern. At least the status of Lesser Kudu, Gerenuk and Beisa Oryx is assessed as *near threatened*. While even Somali Ostrich and Lion are classified as *vulnerable* (IUCN, 2015). As the IUCN Red List shows, the

status of many species is critical which often relates to habitat loss. The habitats of the above mentioned species are endangered and therefore the species populations themselves are seriously affected.

The main problem related to habitat loss in the Borana National Park and its surroundings is the grazing pressure by livestock of local pastoralists (pers. communication Nugusie Wata, 2015). Like in entire Ethiopia, the number of livestock per household is increasing in this area (Samson Leta and Frehiwot Mesele, 2014). This development has several reasons. First of all, the general population growth in the country is a crucial issue. Ethiopia is confronted with a high population growth rate of 2.89 % (UNDP, 2013). Growing families often have the tendency to keep more livestock in order to ensure their livelihood and to support their children. Additionally, large herds are kept for cultural reasons (see following subchapter). In recent years the veterinary care of the livestock is improved so that the life expectancy, health and productivity of the animals are increasing. Furthermore the national demand for livestock products is increasing with a growing population. This is particularly important as the livelihood sector contributes around 16.5 % of the national Gross Domestic Product (GDP) and 30 % of agricultural employment (Samson Leta and Frehiwot Mesele, 2014). While the number of livestock is increasing, some pastoralist's grazing areas are reduced by fencing for scientific cattle breeding or used for agriculture. Due to this, many grass savannahs of *Acacia-Commiphora woodland and bushland proper* as well as of *Combretum-Terminalia woodland and wooded grassland* are overgrazed. The amount of cattle and the time period of grazing on one site are exceeding the land productivity. In some areas in and around the Borana National Park the *Acacia* savannahs show remarkable signs of degradation. Obviously young trees and seedlings are eaten by livestock, so that exclusively older *Acacia* trees at ages of around 80 to 100 years remain. The natural rejuvenation and the growth of young trees on the *Acacia* woodland are inhibited due to overgrazing. Furthermore, on many pastures the grass layer is grazed completely so that the bare soil is more vulnerable to trampling damages by cattle, goats and sheep as well as climatic influences, e.g. high precipitation in the rainy season. This leads to soil compaction, degradation and erosion. The quality of the pasture land therefore is being reduced, which is getting worse with increasing density of grazing livestock in the future.

Moreover, overgrazing also induces bush encroachment on the grazing sites. On bare soil with fragmented or damaged grass cover, shrub and bush species can establish themselves (Bikila Negesa et al., 2014). In Borana National Park and its surroundings the distribution of bush and shrub species like *Acacia drepanolobium*, *A. oerfota* and *A. mellifera* is increasing. Particularly *A. drepanolobium* seems to create severe problems as its expansion displaces grass species which could serve as fodder for livestock (pers. communication Nugusie Wata, 2015). The branches of *A. drepanolobium* have bulbous, hollow thorns that are occupied by symbiotic ants. This symbiotic relationship functions as protection against grazing by animals which fosters the expansion of *A. drepanolobium*. This species therefore is not suitable as animal fodder, but people use it for fencing instead. At the same time, the administration of the national park has difficulties to reduce and to regulate the fast expansion of *A. drepanolobium* by cutting young plants.

As a result of overgrazing and bush encroachment, the areas of suitable grazing land around the national park are decreasing continuously. The possibility of local pastoralists to find appropriate grazing sites is getting difficult in recent times. Although the Borana pastoralist communities maintain their own fenced pastures as grazing reserves in times of drought (*kaloo*, see following subchapter), there is a huge lack of

suitable grazing land especially in dry seasons. This is particularly important as the climate prediction for southern Ethiopian lowlands implies a decline of annual precipitation and more frequent occurrence of droughts (Viste et al., 2013) with significant consequences for the pastoralist communities (Pantuliano and Mike Wekesa, 2008).

The administration of the Borana National Park delineates the lack of suitable grazing land as the most severe management problem, since local pastoralists bring their livestock on grasslands within the park (pers. communication Nugusie Wata, 2015). It is not possible to prevent unauthorised grazing and to interdict the pastoralists using the grasslands in the national park due to the strong pressure on available pasture land. The national park administration pursues the strategy of negotiating with the local people to keep the livestock only on certain selected sites of the park if the grass resources on common pasture land are dwindling in the dry season. Additionally, when it comes to lack of fodder resources in times of severe droughts, rangers provide single trees to feed the livestock in protected areas. The national park administration assesses that the local communities have to be included in the management in order to find compromises about the conservation and the land use of the national park. Allowing controlled grazing in selected areas of the national park would prevent the grazing of livestock in the entire national park (pers. communication Nugusie Wata, 2015).

Also the vegetation type of *Dry evergreen Afromontane forest and grassland complex* is endangered by habitat loss. Even though the majority of the *Juniperus* forest in the national park is undisturbed, some parts of the Afromontane forests are degraded and transformed into open woodland. Particularly forests and woodlands in vicinity to villages and roads are under pressure of use (Borghesio et al., 2004). Although it is only allowed to collect dead wood as firewood, it is likely that local people cut single trees for construction purposes and firewood (pers. communication Nugusie Wata, 2015). Grazing of livestock also takes place in the *Juniperus* forests. In the dry season some pastoralist communities keep their livestock in moist mountainous forest areas (oral informants). Also in the Natural Forest Priority Areas around the national park, for instance in Arero, the impact on the forests by grazing and cutting of trees is significant (Borghesio et al., 2004). Grazing of domestic animals in the forests reduces natural forest rejuvenation and promotes bush encroachment on open sites. Under the aspect of dramatic deforestation in Ethiopia (less than 8 % of the Ethiopian forests remain today (Gatzweiler, 2005)), it is highly important to protect the extensive *Juniperus* forests in and around the Borana National Park. Several wildlife species mentioned above, i.a. the endemic Prince Ruspoli's Turaco, depend on these habitats (Borghesio et al., 2004, Watt et al., 2005).

## Socio-cultural Situation and Ethnographic Profile

**Introduction:** The sites of the Borana National Park are situated in different areas of the Borana zone of Oromia Regional State. The total population of the zone is 966,467. The rural population is above 91 % (CSA, 2008). Important urban centres are the administrative capital Yabello, Mega, and Moyale at the Ethio-Kenyan border. The zone is ethnically dominated by a Borana Oromo population. They include the Waata, a today culturally assimilated group of former hunter-gatherers and potters. Other important ethnic groups in the area are the Somali, Gabra, Garri, and Guji Oromo. Amhara, Konso and Burji

populations inhabit small pockets of land at higher elevations. Due to migration, conflict and the pastoralist livelihood of most groups, ethnic boundaries shifted throughout history and slightly continue to change. The ethnic territories overlap each other and pockets of different ethnic provenience are scattered all over the area. Several groups are transnational ethnic formations, such as the Borana, Gabra, Somali, Garri and (in small number) Burji who are present on both sides of the Ethio-Kenyan border, the Somali and Garri are also present in Somalia.

Most ethnic groups speak different languages of the Cushitic phylum. Only the Amharic speakers (Ethio-Semitic) are an exception. The Gabra are mostly Oromo-speakers while the Garri speak Oromo and Somali (Tigist Kebede Feyissa, 2014). In general, many people in the area are multilingual (Oromo, Somali, Amharic).

The Borana, Somali, Garri and Gabra have a transhumant pastoralist background. While Somali and Garri rely mainly on camels, Borana are cattle breeders. However, Borana gave up their former taboo towards camel rearing (Tigist Kebede Feyissa, 2014). Recently, due to state programmes, shrinking pasture and economic pressure many of the pastoralists are gradually shifting to agro-pastoralism. The Guji Oromo partially practiced agro-pastoralism already before.

Amhara, Konso and Burji settlers introduced agriculture in suitable areas at higher elevations. The socio-political systems of the pastoralists as well as agro-pastoralists are characterised by decentralised power, a segmented structure of clans and lineages, seniority based authority, cooperation in resource management and emphasis on territorial political identity. Till the second half of the 20th century, most Borana maintained traditional Oromo religion (cp. Bustorf, 2010). Very few converted to Orthodox Christianity. Islam becomes increasingly popular. In Kenya the majority is Muslim, as are the Somali, Garri and Gabra. Even for converts to Islam the traditional customs still play a strong role. Orthodox Christianity and, recently, Protestantism are established only among the other ethnic groups in the area (Bassi, 2003, pers. communication Oba-Smidt).

This chapter mainly focuses on the Borana due to their major presence in and around the national park. It needs further ethnographic investigation if and to which degree Somali, Guji Oromo, Amhara, Konso and Burji may be relevant stakeholders of a possible biosphere reserve which, of course also depends on its actual extension. Garri pastoralists are probably not present in the realm of a possible biosphere reserve but have to be mentioned here for the sake of completeness.

### ***Box 2: Historical background***

**Development until the Revolution:** The Borana area was conquered by Emperor Menilek II in 1897 in order to anticipate British Colonial advance from Kenya. Under the imperial Ethiopian state the Borana and other pastoralist groups of the area had no legal status other than that of landless and 'irrelevant' nomads (Amh. *zālan*). They had to pay tax for each animal that used the pasture which was considered possession of the state. Duties were paid in livestock, forest products and labour services. The Borana traditional salt production at the crater lake of Sooda near Dubluk and the trade was taxed. But until the 1960s 200 donkey loads remained tax free. In order to avoid tax, some Borana groups moved to Kenya (Haberland, 1963, Tigist Kebede Feyissa, 2014, Smidt, 2010). Only the usage of the



wells would be handled according to customary law. Amhara and other northern military colonists began cultivating suitable lands (mountains of Yabello, Arero, Mega, Teltale, some places along the Kenyan border and near Nagaallee) paying land tax to the government. After some years of usage, a farmer could obtain an official land title. Only difficult environmental conditions prevented the land from being put completely under cultivation by northern Ethiopian farmers as it happened in Arsi (Haberland, 1963).

The Borana rangelands were much larger in earlier times, but starting from 1910, Somali pastoralists moved gradually into the area. From the North the Guji and the Arsi and from the West the Hamar put pressure on the Borana lands. The insecurity during the Italian occupation led to various conflicts which boosted this tendency (Coppock, 1994, Tigist Kebede Feyissa, 2014). Interethnic territorial tensions occasionally flared up during the 20th century. During the Somalian invasion of Ethiopia in the late 1970s there was a major conflict between Borana and Somali. The drought of 1983/84 led to conflicts between Guji and Borana. In 1991 drought, the end of the Derg regime and weapons proliferation resulted in conflicts between Borana, Guji and Gabra and others (Coppock, 1994). Under the post-1991 federal system some former Borana areas were allocated to the Somali Regional State. Ethnic formations such as the Gabra and Garri had to opt either for an Oromo or Somali identity because no zonal administrations were specifically assigned to them. While most Garri opted for Somali identity, the Gabra identity is divided (Baxter, 2005, Tigist Kebede Feyissa, 2014). Interethnic tensions, such as those between Borana and Garri (esp. 2012), Borana and Gabra and between Guji and Gabra continue to exist until today. Among the reasons for this the “expansion of private grazing enclosures and violation of the traditional pastoralist settlement pattern or settling in areas where are supposed to be grazing areas or fall backs during the dry/drought times” (CARE and ELSE, 2008, Tigist Kebede Feyissa, 2014).

After the end of the Italian occupation, the Haile Selassie I government allocated grazing areas and water points to the different groups ignoring traditional intergroup relations, mobility patterns and usage rights. Different legal documents, including the Civil Code of 1960, confirmed the status of all unsettled or permanently uncultivated land as no man’s land and state property (Tigist Kebede Feyissa, 2014). Between 1964 and 1965 two livestock development pilot projects around Yabello and Arero were set up. They included the demarcation of dry season grazing areas for limited numbers of animals and the digging of water ponds. However, both projects failed: it was impossible to control the number of livestock in the project areas and the new ponds attracted pastoralists to dwell in their vicinity which led to the degradation of the pasture (Markakis, 2011).

**Development after the Revolution:** With the 1975 Land Reform pastoralist communal rights over land were given recognition while the land legally remained in the hands of the state. However, pastoralists were forced into associations of cattle producers according to their residence in one of the *madda* districts (see below) and traditional leadership in resource management was replaced by government-controlled leadership (Tigist Kebede Feyissa, 2014, Coppock, 1994). In the years 1973-81 another livestock development project was launched. It aimed at establishing new routes to highland markets. However, since the routes did not follow traditional patterns of movement they were not successfully implemented. In 1981 the Borana Integrated Rehabilitation Project aimed at famine relief

and the promotion of agriculture or agro-pastoralism. A third livestock development project from 1988 onwards again worked on new links to highland markets and on the improvement of livestock production. Part of it was also the attempt to limit the size of herds according to the carrying capacity of pasture. After the fall of the Derg regime all programmes came to an end (Markakis, 2011). The most important reasons for the failure of all these programmes were the exclusion of the local people in the planning process, the planning by experts more or less ignorant of local modes of production, social structure, indigenous knowledge and culture as well as of specific environmental circumstances. Plans and funds followed foreign concepts and the constraints. As Markakis (2011) puts it, the “projects focussed on livestock rather than on people”.

During the Derg period the government policy was to grant more land for agriculture, construct permanent water holes and establish veterinary services. Pastoralists had to form associations (PAs) of cattle producers. However, instead of enforcing usufruct land reform often usufruct rights were granted to individuals. Several ranches for livestock breeding were established on pastoralist lands with fenced grazing grounds. One of the ranches (Dheeda Tuyura Ranch) was founded within the area of the Yabello Wildlife Sanctuary. While Dheeda Tuyura is still state-owned, others are owned by private groups. The Sarite ranch is owned by the local community. The five main ranches together cover 33,805 ha and, therefore, contribute to the shrinking of free accessible Borana rangelands. For the wildlife, however, the ranches provide open space without competition with most pastoral cattle (Skinner, 2000, oral informants).

**Conclusion:** The historical process described here resulted in an ever accelerating general decrease of the grassland resources of the Borana and the pastoralists in general. As a consequence of this, traditional resource management may not be as ecologically balanced as before. The rangeland suffers from overgrazing, bush encroachment and general degradation. While in historical times pasture was abundant for everybody, today the land is increasingly rededicated to agriculture, used for permanent settlement schemes, fenced for private investment, put under environmental protection and, in general, regulated by state administration (Skinner, 2000). The shift to agro-pastoralism and smaller herds is not easily accepted by the pastoralists. To pick up alternative livelihood opportunities in towns or outside the region that would need better education is partially hindered by difficult access to schools above the elementary level (oral informants).

**The Borana:** Roughly, today’s the Borana rangelands are between Chew Bahir (Lake Stephanie) and River Sagan in the West and Northwest and Nagallee in the East. The northern boundary is north of Yabello, not too far from the northern periphery of the national park. To the south, the Borana areas reach far into Kenya with core areas around Marsabit and the River Tana. Both Ethiopian and Kenyan Borana maintain a common culture and identity.

**Socio-political System of the Borana:** The Oromo consider the Borana their ‘elder brothers’ or the ‘purest’ Oromo. Therefore, Borana still today play an important role for the ethnic identity of the Oromo nation as a whole and in certain ritual contexts. The socio-political system of the Borana is highly

complex. It combines organisation through kinship, territoriality and common interests. Social status and legal rights are ascribed according to gender, inheritance, merit and charisma, generation, and age.

Each level of the Borana society is administrated by a council of elders (*jaalaba* or *jaarsa*) with a chairman (*abbaa*). On all levels decisions are made by assemblies after thorough discussion and usually based on consensus. The Borana are divided into two major exogamous patrilineal groups (moieties). They are subdivided into clans (*gosa*) and lineages (*mana* and *balbala*) made up by extended families (*warraa*). However, for local socio-political organisation and management of natural resources territoriality is more important than the kinship ties which make up the cross-territorial networks. Therefore, clans are living interspersed with each other throughout the area. Territories are formed by hamlets (*ollaa*) constituting villages/places (*ardaa*) which form village clusters including their pasture (*dbeeda*). The *dbeedas* are grouped in ‘water districts’ (*madda*) (Leus, 1995, Markakis, 2011, Coppock, 1994). Within their respective *madda* residents have defined access rights. They are maintaining the communal wells (see below). In the early 1980s the administration gave some official status by mapping and using the *madda* as a basis for administration and tax collection (Coppock, 1994).

As a whole, the Borana ethnic group is traditionally administrated by the *gadaa*-system which is often interpreted as an example of traditional African democracy. Traditional spiritual authority, especially concerning the *gadaa* rituals, lies in the hands of *qalluu* highpriests. The *gadaa*-system is a cyclical generation-set system by which the Oromo used to organise their economic, political, military and spiritual life. Every eight years the ruling generation set (*luuba*) withdraws from power in favour of the next generation. Out of this generation set the new leaders are elected while the former ruling *luuba* is endowed with a more spiritual status. It was part of the *gadaa* system that youngsters were required to prove their manhood by killing enemies or dangerous wild animals. This regularly triggered interethnic conflicts and hunting. The *gadaa* generation-set-system is intertwined with a system of age-sets (*bariyyaa*-system) regulating certain social obligations. The highest authority of the ruling *luuba* is the *abbaa bokkunu* of the Borana. His seat is at a sacred site in Arero near Yabello. Under the recent policy of ethnic federalism the *abbaa bokkunu* plays an important role as mediator, traditional judge and legitimate representative of all Borana. His authority is acknowledged by the Borana of Kenya as well as the Ethiopian and Kenyan governments. In important cases he is allowed to go to Kenya in order to administer Borana customary law or to mediate between groups. According to informants it was planned to give to the *abbaa bokkunu* some symbolic leadership over the Borana National Park.

**Social and Economic Importance of the Borana Cattle:** Borana cultural values are strongly based on their pastoral way of life. Therefore, cattle are the property of highest prestige and most valuable means of exchange. With this cultural pattern the Borana form part of the so-called ‘cattle complex’ in Eastern Africa as described by Herskovits (1926) and have much in common with other pastoralist groups all over the region. Many aspects mentioned here for the cattle keeping Borana can be applied also for the Somali camel keepers who can be said to belong to a cultural ‘camel complex’ (Braukämper, 2010).





Figure 7: Borana cattle (left) in Daritu community (right)

The typical cattle kept by the Borana is the Boran Zebu variety of the *Bos indicus*. It is a high quality breed with high resistance to most indigenous livestock disease and tolerant to heat and general hardiness. It produces an excellent beef (Helland, 1987). However, the usual pastoral diet is not based on the meat of cattle but on cereals such as millet, maize or barley. Animals are usually not slaughtered to feed the family but on important social and ritual occasions or as sacrifice to the supernatural world. If meat is consumed in daily life it is mostly that of small livestock, such as goats and sheep. The family consumes cow milk and milk products. The drinking of the blood of living animals, as practiced by the Massai, is not allowed for Muslims and Christians and is generally rare. Cattle are needed for reproduction and serve as mobile symbolic as well as social and economic capital. Cattle are used as means for paying the bride-price and, according to traditional law, as compensation for homicide. Moreover, cattle play an esthetical and psychological cultural role. Individuals may develop emotional bonds to certain ‘favourite beasts’, give them a name, name themselves after them, pet and adorn them and sing songs about their beauty and character (Braukämper, 2010, Tigist Kebede Feyissa, 2014). The high value of cattle in all regards is increased again by its role as object of contention. Therefore, the most regular occasion for intergroup conflicts with other groups was (and partially is) mutual cattle raiding. In olden times, the more or less pure pastoralists of the area highly depended on their agriculturist and agro-pastoralist neighbours, who mostly live at higher elevations. They needed the cattle to be able to barter in order to acquire agricultural products. This resulted in almost classical exchange arrangements between lowland pastoralists and highland agriculturists. Today cattle it is mainly sold for money. Better roads and institutions (pastoral associations, wholesale buyers) allow access to the wider Ethiopian market in high quality breed, meat, and hides. Therefore, local production increasingly answers to demand from outside the area. Given the overwhelming cultural and economic importance of cattle described in this paragraph it is not astonishing that custom expects from all Borana “to try to have as many cattle as possible” (oral informant).

Borana customary law (*aadaa boraanaa*) originally has no concept of private ownership of land which is seen as a gift of *Waaqaa* (Oromo sky god) or Allāh/God. Each community (*ollaa*) follows a more or less regular cycle of transhumance shifting between pastures for the rainy season and pastures for the dry season. Household heads make seasonal agreements among themselves about their grazing strategy. A traditional pasture manager (*abbaa dbeeda*) mediates in cases of disagreement (oral informants). Lactating or weak cows and calves have priority. Herds already grazing in an area have priority over newcomers

(Coppock, 1994). The spatial order of the transhumant system is organised according to the respective environmental circumstances. While some have to follow more complex movement patterns, others simply have to move between one pasture area for the dry season and one for the rainy season. The herds of Daritu near Yabello, for instance, bring their cattle in the moist mountainous forest land (*baddaa*, here the Gombo forest) for the dry season and move to the open land (*dbeeda*) after the rains have begun (oral informants). Usually the *ollaa* serves as the ‘base camp’ where women, children and elders stay behind with lactating cows, calves, and small livestock while groups of young men go with the herds to the temporary cattle camps (*foora*) far from the *ollaa* (pers. communication Boru Shana, Leus, 1995). Most communities entertain fenced pastures as grazing reserves (*kaloo*) for times of drought. Calves and weak animals or breeding cows are permitted in the *kaloo* throughout the year. The Borana adopted the *kaloo* system from the Guji (pers. communication Boru Shana, Leus, 1995).

**Water and Wells:** The Borana distinguishes three different types of water sources, occasional water, temporary water, and wells. While occasional water in rain puddles or dry river beds etc. is freely accessible, like pasture, access to temporary water in natural or man-made ponds or basins for the collection of rain water is regulated and sometimes fenced. The most important water sources are the wells (*ellaa*). The management of access to and technical maintenance of wells is a critical concern of Borana communities. Moreover, the wells play a central role in Borana socio-political and spiritual life (Helland, 1982). There are ca. 35 locations in the central Borana plains, each with a number of wells. There are also several wells in the range around the different sites of the national park (e.g. Daritu, Dubluk and others).

In principle wells (*ellaa*) belong to particular clans claiming to be descendants of the people who dug them. However, often different clans may actually collaborate in the management and the labour of the watering of cattle. The ‘father of the well’ (*abbaa ellaa*) inherits the trusteeship over the well through the patrilineage. Rotation of the watering is regulated by a schedule fixed by the council of the users headed by a traditional water manager (*abbaa ireega*). The well council cannot reject any Borana from using the well but only arrange the moment and time span a herd is allowed to drink. In times of drought or the like allocation of unworkable watering hours (e.g., during the night) may limit usage. Herds with more than 200 head can be turned away for practical reasons (Helland, 1982, Coppock 1994, Tigist Kebede Feyissa 2014, oral informants). Negotiation of watering arrangements will take into account customary rights, kinship, and alliances as well as the environmental situation. Arrangements are governed through oral agreements employing flexibility in interpretation of rules, persuasion and competition. Agreements between clansmen and non-clansmen, and especially Borana and non-Borana, on the usage of pasture and wells may be highly contested. However, competition between Somali and Borana is alleviated due to the different watering needs of Somali camels and Borana cattle (Coppock, 1994, Tigist Kebede Feyissa, 2014, oral informants). People and animals are not restricted from moving to other *madda* districts and to use their wells with permission. In cases of drought or shortage of pasture all Borana have the traditional right to move with their herds wherever necessary. They are to be accepted as guests by their fellow Borana. Hospitality, at least in principle, will even give them priority at the water source. During times of severe dryness, however, *madda* may be closed to non-residents (Coppock, 1994, oral informants). If drought is severe Borana may cross the Ethio-Kenyan border in both directions in order to find better conditions, a practice tolerated by both states (oral informants).

## Infrastructural and Touristic Situation

From the infrastructural point of view, the area around Borana National Park is well accessible. Yabello as the economic centre of the region with several shops and accommodation facilities is situated on the main highway from Addis Ababa to the South of the country. Around the Borana National Park there are several paved roads which allow a good accessibility to interesting landscapes. For instance, this is important for the touristic development of the area. Tourists interested in nature and ecology could have the possibility to visit important wildlife habitats and diverse landscapes. Touristic offers could include wildlife observation, hiking tours and bird watching. Especially the important endemic bird species, Ethiopian Bush Crow, White-tailed Swallow and Prince Ruspoli's Turaco might attract ornithological interested tourists to visit Borana National Park and its surroundings. Interesting eco-touristic sites are Haro Bake, a lake 15 km north of Yabello where nice spots for watching water birds exist and Ange as one part of the national park's core zone. The area is promising for wildlife observation, i.a. Grant's Gazelle, Gerenuk, Beisa Oryx and Somali Ostrich (OFWE, n.d.). Another interesting spot is Sooda Plain, near Dubluk 70 km south of Yabello. There is a huge crater lake where salt mining by Borana people takes place. Also from the cultural point of view, the wells (*ellaa*) of the Borana pastoralists are worth seeing (e.g. Daritu, Dubluk and others).

## Political Commitment and Stakeholder Activities

In general the government of Oromia National Regional State supports the establishment of protected areas in their region. The local administration at the Borana National Park Office in Yabello highly supports the establishment of a biosphere reserve since the national park is already managed similar to a biosphere reserve in many ways (pers. communication Nugusie Wata, 2015).

For instance, the spatial differentiation of conservation and land use activities in the national park has a similar approach like the zonation of biosphere reserves. Due to lack of pasture land, local people are allowed to keep their livestock on certain selected sites in the park if the grass resources on common rangelands are dwindling in the dry season. The national park administration tries to include local people in the management of the national park and strives for compromises about the conservation of the area. Besides, the administration wants to convince the pastoralists to reduce their herds and gradually restructure the pure pastoralist economy to other economic sectors e.g. service and retail sector. The participation of local people appears also in the communication committee, where the national park administration discusses current management issues with representatives of the pastoralist communities and local authorities, i.a. Woreda Office of Culture and Tourism and the land use office of Borana Zone. Nevertheless, critical statements by local pastoralists implied that the establishment of the national park was not sufficiently participatory, since involuntary resettlements and restrictions of land use took place (oral informants, Daritu community).

The administration of the national park is quite engaged to involve the local business sector. A sponsoring principle is invented where local sponsors can support the national park with provision of e.g. signs and materials. In return the sponsors are mentioned in brochures of Borana National Park. Moreover, an ecotourism concept is planned to develop in future. The Borana National Park Office wants to establish a

cooperation for conservation and ecotourism purposes with Kenya, as the bordering area between Ethiopia and Kenya is still undisturbed and includes important wildlife habitats (of e.g. Reticulated Giraffes).

There is also some engagement by the civil society. One local NGO named Abrasa Pastoralist Initiative (API) is engaged in rural development of pastoralist communities in the region. The NGO SOS Sahel Ethiopia is currently running the project Building Resilient Pastoralist Communities (BRPC) in the Borana Zone to improve the pasture management, the access to markets for livestock products and the living conditions of pastoralist communities through enhanced income possibilities. Before that, SOS Sahel Ethiopia carried out the Borana Collaborative Forest Management Project, in which the Participatory Forest Management (PFM) approach was implemented in the forests and woodlands of Borana Zone (pers. communication Nugusie Wata, 2015, SOS Sahel Ethiopia, 2015).

Even if the Oromia regional government supports the establishment of conservation areas, there is a discrepancy of interests between the Borana National Park Office and OFWE, which administers the park on federal state level. It was mentioned that OFWE is operating mainly as a profit-oriented authority i.a. on plantation forestry. Key informants also mentioned that there is not sufficient attention on wildlife and habitat conservation. This should be increased.

## Conclusion and Evaluation of the Borana National Park as Prioritised Area for a Potential Biosphere Reserve

The authors consider Borana National Park and its surroundings of high priority for potential biosphere reserve development as they meet a number of ecological, socio-economic and other criteria (see annex for detailed criteria list).

**Ecological Assessment:** Borana National Park is of special importance in terms of habitat diversity and high number of rare and endemic animal species. But as a result of overgrazing and bush encroachment, the *Acacia-Commiphora* savannahs and the *Combretum-Terminalia* woodlands around Borana National Park are decreasing continuously. The large expansion of dry evergreen Afromontane forests with *Juniperus procera* and *Olea europea* subsp. *cuspidata* is still undisturbed and intact in many parts. But also this vegetation type is under pressure due to increasing grazing of livestock and firewood collection in the forests. For the preservation of the endangered and endemic animal species it is absolutely necessary to conserve the habitats and to prevent the progress of further fragmentation. The endemic bird species Ethiopian Bush Crow, White-tailed Swallow and Prince Ruspoli's Turaco might be the flagship species of the national park or even of a future biosphere reserve. These species would also play a very important role in ecotourism activities to attract visitors, as these birds only can be seen in this part of the world. As the administration of Borana National Park considers, there is a high potential to develop tourism offers for hiking, bird and wildlife watching under the label of a biosphere reserve.

**Socio-cultural Assessment:** Throughout history the state considered pastoralists in some way as an irregular phenomenon. Their land was never granted to them in the same way as it was granted to agriculturists. Development programmes often aimed at settling the 'nomads' and changing their lifestyle according to the worldview of non-pastoralist outsiders or even foreigners. The process of establishing a



biosphere reserve, and the framework it would provide, could help empowering pastoralist communities and support them in the necessary attempt to adapt their culture to a decrease in pasture and changing socio-economic conditions.

The Borana culture bears primary testimony of genuine Oromo culture and is therefore held in highest esteem by members of the largest ethnic group of Ethiopia. The refined socio-political system of the Borana, and especially the *gaada*-system with its cycle of elaborate ceremonies, is an outstanding example of traditional African democracy and genius. Moreover, Borana culture represents a peculiar case of the pastoralist cultures of the East African ‘cattle complex’. This complex of cultural traits lies at the very core of Borana identity and a base of socio-cultural resilience. However, the high cultural value of cattle in combination with economic factors and shrinking of pastoral lands led to a situation where the ecological balance is endangered. Therefore, the management of the national park and that of a possible biosphere reserve together with the Borana communities have to find ways to reconcile two conflicting tasks, (1) allowing the Borana to maintain their pastoralist culture and identity and adapt it to today’s situation, and (2) finding ways to manage the size and the movements of herds according to environmental as well as economic constraints. As the regional history (see Box 2) shows, most attempts to reduce herds by top-down government intervention failed because they were implemented without true participation of the pastoralists and without their full and informed consent. Another reason was the lack of alternative sources of income generation. Recently, in the latter issue, developmental programmes have been more successful by promoting the shift to agro-pastoralism. This is favoured by the fact that pure pastoralism under today’s economic and ecological circumstances becomes an increasingly problematic livelihood strategy. However, additional to pastoralism and agro-pastoralism other strategies, and the accordant preconditions such as better education for pastoralists, have to be developed. Moreover, there have to be real incentives. The process of establishing a biosphere reserve could open a new chance to reconcile and develop real collaboration with them on the terms of a common goal and balance of interests.

The Borana socio-cultural system with its decentralised decision making structures makes them potentially excellent counterparts for the necessary negotiations. Since these structures are consensus-based, the process might be time consuming. Even more, because pastoralists widely fear to additionally lose pasture in favour of protected areas, as it happened before. Nevertheless, there is no alternative to such a participatory process for a biosphere reserve to be feasible. In the area there exists a long tradition of a management of natural resources by finding compromises between the interests of different pastoralist groups and sub-groups. Institutions such as the ‘water districts’ (see above) as well as the traditional assemblies use functional mechanisms and possess a well-established legitimacy. They will support a successful implementation once a common goal has been developed. Furthermore, there are traditional concepts of land use, such as the *kaloo* (see above) that go in line with the idea of protected areas. As tested in an interview with Borana elders, a biosphere reserve could be accepted as a kind of ‘national *kaloo*’, i.e. a special area protected from too intensive usage for the common good.

Appealing to traditions and environmental responsibility, however, will not be sufficient. The process has to be accompanied by culture-sensible integrated community development and tangible incentives. Furthermore, if pastoralist communities agree to more regulated sizes and movements of their herds they should in response have binding protection from the further fencing and reduction of their grazing

grounds. The administration of the national park to some limited degree is already taking into account the needs of pastoralists to use resources of the park in times of drought. Moreover, there are considerations to allow regulated grazing. These are very positive signs showing a great potential for compromise and common action.

**Conclusion:** Beside the adequate ecological and socio-cultural situation as decisive criteria, the current management of the national park emphasises the suitability as biosphere reserve. On the one hand through the participation of local people and the local business sector, i.a. in the communication committee and the sponsoring system and on the other hand through the development of different conservation approaches in the national park area. The national park administration determined strictly conserved areas as well as certain patches where limited grazing activities by local pastoralists are allowed during extremely dry periods.

Moreover, the spatial constitution of the national park implies a suitability to develop the different clusters (Yabello, Sarite Plains and Dire/Magado/Gamado Mountain) as core zones with surrounding buffer zones in a biosphere reserve. The core zones thereby could comprise undisturbed parts of *Juniperus procera* and *Olea europea* subsp. *cuspidata* forests and *Acacia-Commiphora* savannahs. The surrounding areas with moderate grazing activities could be developed as buffer zones. Yabello and other larger villages, e.g. Daritu, could be included in the development zones of a potential biosphere reserve.

Including the national park in a biosphere reserve would ensure more likely its long-term conservation, as Borana National Park is not legally gazetted. The national park administration would advocate the establishment of a biosphere reserve as protected area that is anchored in the national law and which receives a regular monitoring.

To determine the actual suitability of a biosphere reserve requires further research and deeper analysis. Local initiatives like SOS Sahel Ethiopia and API could be included in further studies to prove the feasibility of a biosphere reserve.

## Nechsar National Park

### Introduction

The Nechsar National Park was established in 1974, originally in order to protect the endemic Swayne's Hartebeest (*Alcelaphus buselaphus* ssp. *swaynei*), and covers 514 km<sup>2</sup>.

Nechsar's landscape includes extensive grasslands, *Acacia* savannahs and bushlands, woodlands, groundwater and riverine forests as well as some parts of Lake Chamo and Lake Abaya. The park area comprises around 83 % of land surface and 17 % of water surface. The altitude ranges from 1,108 to 1,650 masl.

**Location:** Nechsar National Park is situated adjacent to the eastern outskirts of Arba Minch. According to the most recent administrative division, the Nechsar National Park, Lake Chamo and the southern and western parts of Lake Abaya are situated in the Gamo Gofa Zone of the Southern Nations, Nationalities and People's Regional State (SNNPRS). The northern and eastern parts of Lake Abaya and its eastern shore belong to two *woredas* of the Borana Zone of Oromia Regional State, Abaya Woreda and Galana Woreda. Within the SNNPRS several *woredas* and special *woredas* adjoin the two lakes, in Gamo Gofa Zone: Borodda Woreda, Merab Abaya Woreda, Arba Minch town, Arba Minch Zuraya Woreda; in Welayta Zone: Humbo Woreda; directly under SNNPRS: Amarro Special Woreda and Diraashshe Special Woreda. The most important urban centre near the Park is Arba Minch, the administrative capital of Gamo Gofa Zone with its university and touristic infrastructure. In the wider range around the Abaya-Chamo Basin are towns such as Chench, Soddo, Dilla, Jinka, Konso and Bule Hora/Hagere Maryam.

**Administrative:** The national park itself is under federal administration of EWCA, but the management is subjected to the Nechsar National Park Office in Arba Minch. Even if the boundaries of the national park are clearly defined, Nechsar National Park is not yet legally gazetted.

Large parts of the national park overlap with the Natural Forest Priority Area of Arba Minch which is situated on the land bridge between the lakes. Furthermore, Nechsar National Park and surroundings are classified as IBA.



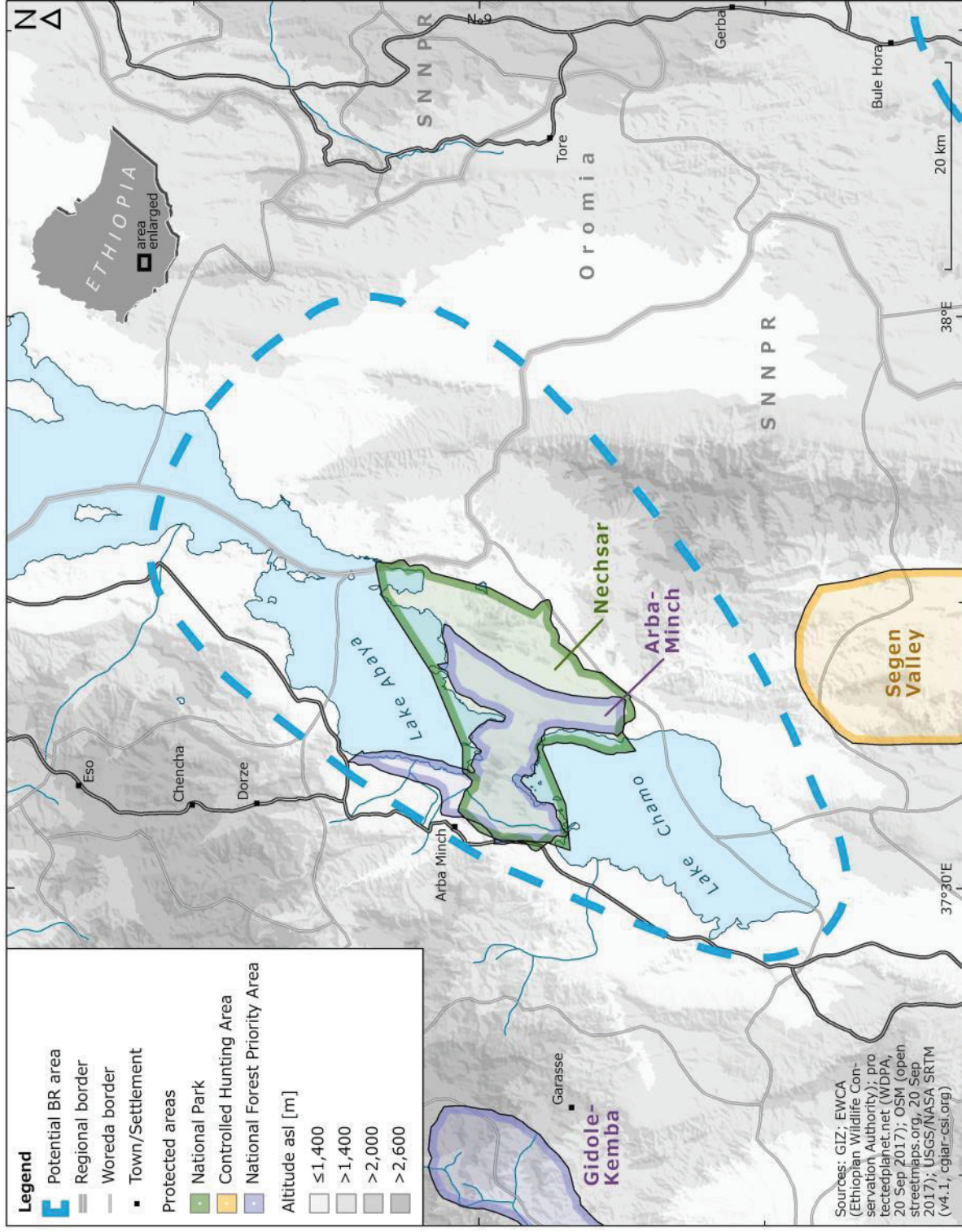


Figure 8: Nechisar National Park and potential biosphere reserve area (dashed line) (Map by S. Busse)

## Ecological Situation

**Surroundings:** The surroundings of Nechsar National Park are characterised by a mountainous landscape. In the East the park is bordered by the Amarro Mountains, the Guge Mountains are located west of Arba Minch. The eastern range of hills is characterised as pastoral landscape with wooded hillsides, wooded river valleys small remaining forest patches. The western range of hills is agriculturally influenced, mainly tef is cultivated. In lower areas, approximately below 1500 masl, sorghum is also grown. Large parts of the lakeshores of Lake Chamo and Lake Abaya are bordered by wetlands and riverine woodlands, which are often agriculturally used. A riverine forest is to be found on the south-western lakeshore of Lake Abaya, in vicinity to the Arba Minch airport.

**Climate:** The Nechsar National Park lies mainly within the *Dry Kolla* agro-ecological zone as well as in small parts in *Dry Weyna Dega* (Ritler, 2005, Azene Bekele-Tesemma, 2007). The area is characterised by a bimodal rainfall pattern, the main rainy season extends from April to May and shorter rainy seasons are expected between September and October. The dry seasons occur between June and August and between December and February. The annual rainfall averages 818 mm. The mean annual temperature is about 21.8 °C with monthly minimum and maximum of 14 and 30 °C respectively (Figure 9).

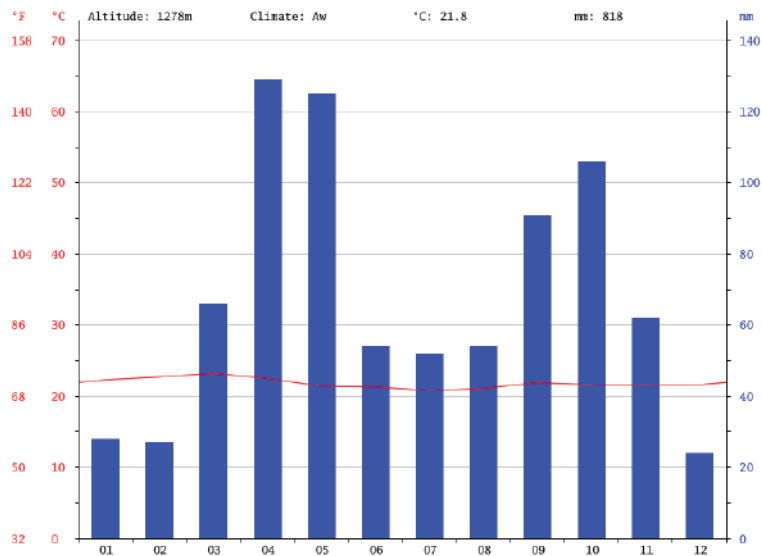


Figure 9: Climate diagram Arba Minch, Ethiopia (Climate-Data.Org, 2015b)

**Soils:** In general, the *Dry Kolla* and *Dry Weyna Dega* agro-ecological zones are characterised by yellow sandy soils and light brown soils (Ritler, 2005, Azene Bekele-Tesemma, 2007). But in large parts of the national park black cotton soils occur on the extensive grasslands. In the mountainous parts brown, loamy and calcareous soils developed from volcanic influences. The soils in the river valleys, riverine forests and wetlands are characterised by alluvial processes (Abraham Marye, n.d.).

**Vegetation and Area Structure:** The plant biodiversity of Nechsar National Park comprises a total of 306 species from 73 families and 198 genera, including 6 endemic species (Clark, 2010). The overall vegetation type in this area is classified by (Friis et al., 2010) as *Acacia-Commiphora woodland and bushland proper* (see Box 1).

It appears as savannah woodland and bush land which is dominated by:

- *Acacia tortilis*
- *Combretum* ssp.
- *Balanites aegyptiaca*
- *Terminalia brownii*
- *Acacia nilotica*
- *Dichrostachys cinerea*
- *Cadaba farinosa*

The bush lands largely extend on the land bridge between Lake Chamo and Lake Abaya and in the eastern parts of the national park adjacent to the grassland plains. In total they comprise an area of about 80 km<sup>2</sup>, which is around 15.5 % of the national park.

However, around half of the national park area (around 270 km<sup>2</sup>) is covered with extensive grasslands on large plains. The grassland plains in the centre of the park are the outstanding ecological feature of Nechsar National park. In dry seasons they turn into beautiful white-yellow fields, which gave Nechsar National Park its name. In Amharic language *Nech* means *white* and *Sar* means *grass*. The dominated grass species include:

- *Chrysopogon aucheri*
- *Cenchrus ciliaris*
- *Chloris roxburghiana*
- *Ischaemum afrum*

The plains extend in large parts at the centre of the national park area, between the land bridge and the eastern hillsides.

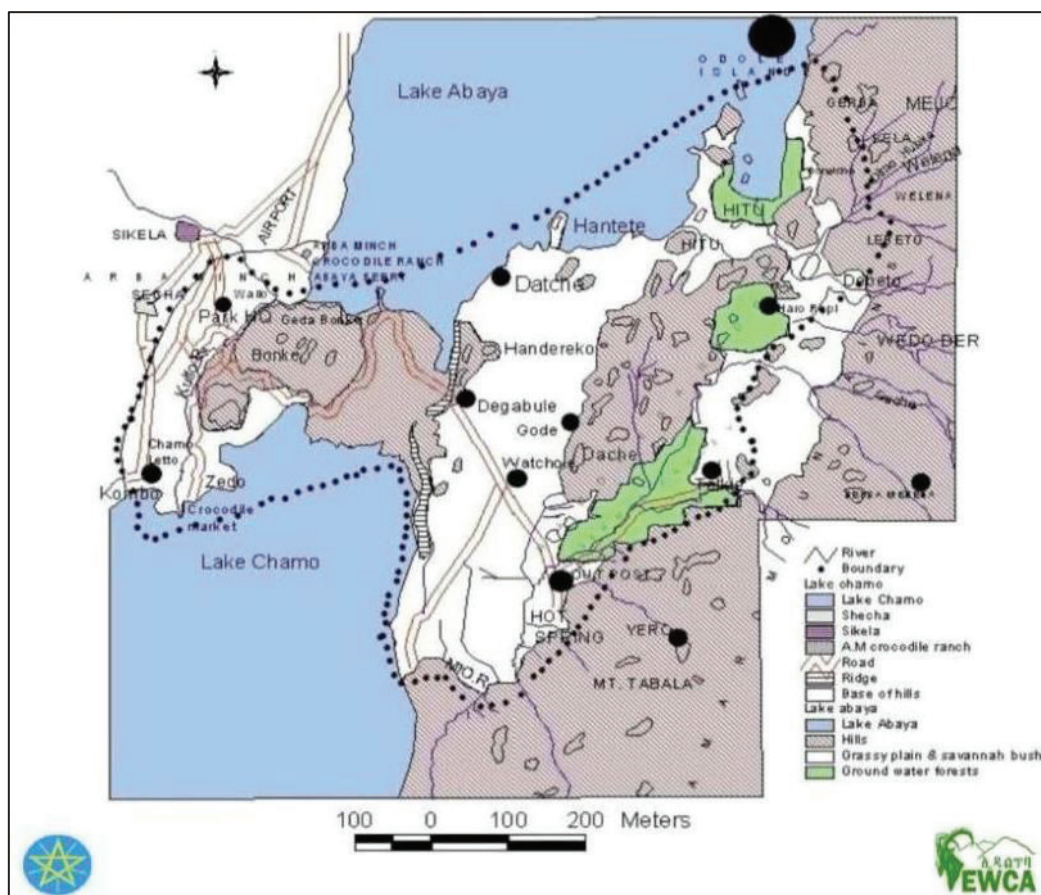


Figure 10: Map of Nechsar National Park (Nechsar National Park administration; comment by the authors: wrong scale)



Another unique feature of Nechisar National Park is the ground water forest in the Fourty Springs Area and at Kulfo River. The forest is located in the western national park area, between the park entrance and the river banks of Kulfo River. This type of riverine forest is to be found very rarely in East Africa. Only one of its kinds is known in Lake Manyara National Park, Tanzania. It is characterised by a very high level of ground water through the river nearby. The tree species composition is dominated by *Ficus sycomorus*, *Cordia africana*, *Garcinia livingstonei*, *Vepris dainellii*, *Vepris nobilis*, *Diospyros spp.* and *Trichilia emetic.* Furthermore, riparian forests occur at Sermale River in the eastern part of the national park and on the north-eastern shoreline of Lake Chamo. Major tree species in the forests are *Tamarindus indica*, *Terminalia brownii* and *Kigelia africana* (EWNHS, 2010). A total of 32 tree and 23 shrub species are recorded in the forests. The forests cover an area of around 67.5 km<sup>2</sup>, which is around 13 % of the national park. Even if the forest part in the national park is rather small, the ecological importance of this unique ecosystem is nationally significant due to Ethiopia's high loss of natural forests.



Figure 11: Wetlands of Lake Chamo (left) and riverine forest at Kulfo River (right)

Wetlands comprise about 8.5 km<sup>2</sup> (around 1.7 %) in the national park. They are particularly well developed at Lake Chamo where Kulfo River enters the lake. The vegetation is dominated by sedges, rushes, reeds, such as *Typha angustifolia*, *Phragmites sp.*, and grasses e.g. *Saccharum spontaneum*. In parts single trees occur, e.g. *Sesbania sesban* and *Aeschynomene elaphroxylon*. The wetland areas are constantly changing due to fluctuating water levels of the lakes and sedimentation from entering rivers that come from the highlands (Clark, 2010).

**Lakes:** The southern part of Lake Abaya and the northern part Lake Chamo lie in the national park area and comprise 15 % of the entire park area. Lake Abaya is with 1,160 km<sup>2</sup> the largest lake in the Ethiopian Rift Valley. 55 km of its southern shoreline fall within the national park. It has a maximum depth of 13 m. The red-brown colour of the lake comes from the high load of sediments with ferric oxide particles in the rivers that drain from the highlands. Lake Chamo is with 316 km<sup>2</sup> the second largest lake in the Rift Valley. 41 km of its northern shoreline belongs to the national park. The lake has a maximum depth of 14 m (Clark, 2010).

**Wildlife:** Because of many diversified ecosystems Nechisar National Park has high species diversity and belongs to the East African Biodiversity Hotspot (Girma Kelboro and Stellmacher, 2012). The Nechisar National Park is very important for habitat conservation of endangered and endemic animal species. This

is particularly important as the park is with its 514 km<sup>2</sup> rather small in size and therefore quite vulnerable by human encroachment and land use. The grassland plains are an important habitat for:

- Burchell’s Zebra (*Equus quagga*)
- Grant’s Gazelle (*Nanger granti*)
- Greater Kudu (*Tragelaphus strepsiceros*)

The flagship species Burchell’s Zebra is a selective grazer that needs large extended grasslands with appropriate grass species as well as watering places for drinking. Often their movements correlate with the availability of water. They move to grazing areas on the grass plains during the rainy season and concentrate close to rivers or lakes during the dry season (IUCN, 2015). In the Nechsar National Park zebras stay near the lakeshores of Chamo and Abaya during the dry seasons and move to higher grazing places on the plains during rainy seasons. Therefore Nechsar National Park is particularly suitable as habitat for Burchell’s Zebra. In former times also the endemic Swayne’s Hartebeest (*Alcelaphus buselaphus* ssp. *swaynei*) was to be found in the grasslands. Nechsar National Park was originally established in order to protect and to conserve this species. But due to hunting and poaching by local people, nowadays Swayne’s Hartebeest is apparently extinct in the national park (Nechsar National Park Administration). While Greater Kudus have a relatively wide range within the entire national park, the habitat of Lesser Kudus (*Tragelaphus imberbis*) is restricted to west of the plain grasslands in the bush land. Sightings of Spotted Hyena (*Crocuta crocuta*), Lion (*Panthera leo*) and Leopards (*Panthera pardus*) are rare.

Other common wildlife species in the national park are: Guenther's Dik-dik (*Madoqua guentheri*), Common Warthog (*Phacochoerus africanus*) and Grey Duiker (*Sylvicapra grimmia*). The forests are habitat for i.a. (Clark, 2010):

- Bushbuck (*Tragelaphus scriptus*)
- Vervet Monkey (*Chlorocebus pygerythrus*)
- Guereza (*Colobus guereza*)
- Defassa Waterbuck (*Kobus ellipsiprymnus* ssp. *defassa*)
- Grivet Monkey (*Chlorocebus aethiops*)

The wetlands are of major significance as breeding and nursery areas for fishes and crocodiles. Lake Chamo harbours numerous fish species, i.a. the endemic species *Labeo brunellii* and *Marcusenius annamariae*. The Nile Crocodile (*Crocodylus niloticus*) is another important flagship species. Crocodiles of 6 m length are to be found in Lake Chamo. The largest mammal species of Nechsar National Park, Hippopotamus (*Hippopotamus amphibius*) also lives in the lake and the wetlands.



Figure 12: Grant’s Gazelle (*Nanger granti*) (left) and Burchell's Zebra (*Equus quagga*) (right) on grassland plains

**Birds:** The wetlands also provide habitats for 25 % of the park’s avifauna. 25 of Somali-Massai Biome birds are recorded in the park (White, 1983). Species of global importance are (EWNHS, 2010):

- Lesser Kestrel (*Falco naumanni*)
- Pallid Harrier (*Circus macrourus*)
- Lesser Flamingo (*Phoenicopterus minor*)
- White-fronted Black Chat (*Myrmecocichla albifrons*)

The Nechsar Nightjar (*Caprimulgus solala*) is identified as a new bird species by a single wing from a road accident in 1995, but a living individual has never been seen.

**Ecological Threats:** The IUCN conservation status of several important species mentioned above is unstable and in problematic conditions. IUCN categorised following species as *near threatened*: Lesser Kudu, Leopard, Lesser Flamingo and Pallid Harrier. The conservation status of Lion and Hippopotamus are determined as *vulnerable*. The Swayne’s Hartebeest is locally extinct in the park. Firstly, the endangerment is due to high loss of habitat and habitat fragmentation by anthropogenic resource extraction (Girma Kelboro and Stellmacher 2012). The national park itself has a very small area of 514 km<sup>2</sup>. Resource extraction in the long term has stronger impacts on smaller areas that cannot buffer themselves sufficiently against degradation. Moreover, fragmentation leads to the reduction of habitat patches which do not maintain the required areal sizes for the target species.

Nechsar National Park is mainly threatened by wood gathering from the forests, overgrazing of the grassland plains, farming at Sermale River, hunting of wildlife and settlement expansion (see Figure 13). Moreover, overfishing and sedimentation of the lakes are influencing the aquatic habitats of Nechsar National Park (pers. communication Abraham Marye, 2015).

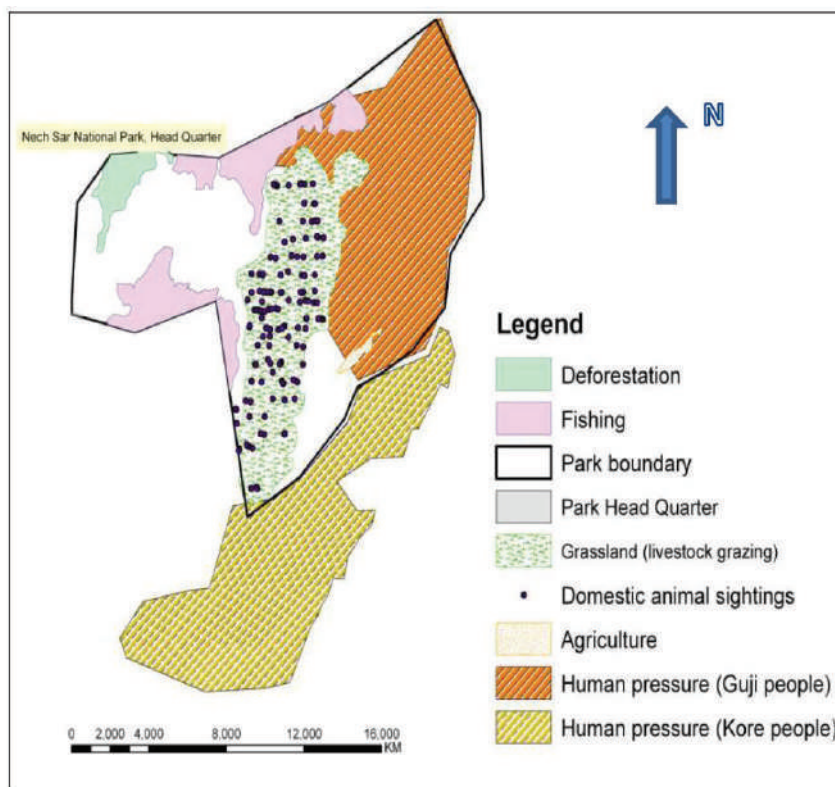


Figure 13: Land use and anthropogenic pressure on Nechsar National Park (Stellmacher, 2012, p.21)



According to Aramde Fetene et al. (2014) the forests, woodlands and the grasslands in Nechisar National Park are the most endangered ecosystem types with highest level of conversion and fragmentation by anthropogenic activities. The forest area has decreased from 31.97 km<sup>2</sup> to 20.13 km<sup>2</sup>, and the grassland area has been reduced from 76.52 km<sup>2</sup> to 21.79 km<sup>2</sup> between 1985 and 2013, respectively. While the mean patch sizes of forest and grassland decreased dramatically, the number of patches has more than doubled (Aramde Fetene et al., 2014).

Mean patch size	1985	2013
Forest	0.46 km <sup>2</sup>	0.14 km <sup>2</sup>
Grassland	0.77 km <sup>2</sup>	0.1 km <sup>2</sup>

The forests are endangered by firewood collection and deforestation mainly by Arba Minch dwellers who sell wood in the town (pers. communication Abraham Marye, 2015). Furthermore, farming activities in the riverine forests and wetlands of Sermale River reduced the forest cover. Because of its special importance as unique and exceptional ecological feature, the ground water forest at Kulfo River has a high conservation value. Particularly under the aspect of increasing deforestation in Ethiopia (Gatzweiler, 2005), it is highly important to protect the rare riverine forest habitats in Nechisar National Park.

The grasslands are influenced by cattle grazing of local communities, mainly by Guji people. They have been settled in the eastern parts of the park ever since its establishment, increasing settlement fosters habitat fragmentation (see following subchapter). The growing and unsustainable number of cattle overrates the capacity of the grasslands. Besides, the living and health conditions of the animals decrease due to lack of fodder and grazing land. The grassland plains are overgrazed which leads to soil degradation and bush encroachment by thorny shrub species, e.g. *Acacia drepanolobium* that is inedible to animals. On fragmented or damaged grass cover, shrub and bush species can establish themselves by which the area and quality of the grassland is reduced (Bikila Negesa et al., 2014). Overgrazing fosters fragmentation of the grassland habitats. Grassland species like Burchell's Zebra, Grant's Gazelle and Greater Kudu are therefore endangered through habitat loss (Aramde Fetene et al., 2014). The spatial competition of cattle and wildlife leads also to contaminate livestock diseases, e.g. tick attack of Burchell's Zebra (Abraham Marye, 2015). Hunting of wildlife is still a problem of the park management. For instance, in order to prevent a re-establishment of the park many wild animals were killed by Guji people, especially Swayne's Hartebeest which had been an important reason of the Park's establishment (Abiyot Negera Biressu, 2009, oral informants).

For instance, it is claimed that Swayne's Hartebeest was hunted by Guji people because the national park was founded i.a. to protect the habitat of this species. As the Guji people were against the existence or rigid regulation of the park, they tried to ensure their living in the park through exterminating the target species (pers. communication Abraham Marye, 2015).

The lake ecosystems of Abaya and Chamo are influenced firstly by sedimentation through the entering rivers and secondly by overfishing. The rivers coming from the highlands are loaded with sediments that silt up the lake ecosystems. Sediment load is caused by increasing soil erosion in the highlands through deforestation and conversion to agricultural land (Schütt et al., 2002). The silted areas at the lake shores are used for agriculture by local farmers. The lake areas therefore are decreasing over time (pers.

communication Dereje Elias, 2015). Fishing is regulated by licences given to local fishing cooperatives. But principally one company buys up large portions of fish from the cooperatives to sell in Addis Ababa. Due to the diminished fish supply on the market in Arba Minch, unauthorised fishing is induced. Local people go fishing, especially in Lake Chamo, to sell fish on local markets (pers. communication Abraham Marye, 2015). But exceeding of the allowed fishing rates fosters overfishing by which endemic species like *Labeo brunellii* and *Marcusenius annamariae* are endangered.

## Socio-cultural Situation and Ethnographic Profile

**Introduction:** The area around the two lakes from their islands and shores to the margins of the surrounding highlands is an area with an extraordinary ethnic diversity. The three big ethnic formations around the Nechisar National Park are the Guji Oromo, the Koore and the Gamo. The Gamo are constituted by diverse groups speaking different Omotic languages. They have diverging historical backgrounds and differ to some degree in their cultural features. Among the Gamo the Ganta are the most relevant group for this study because of their direct neighbourhood to the park. Other Gamo groups in the wider range of the two lakes are the Dorze, Ochollo, Dokko, Borodda, Harro, Bayso and Zargulla-Zayse. A smaller ethnic group living adjacent to Lake Chamo are the Diraashsha. The ethnically mixed population of Arba Minch is another important stakeholder of the park. Assuming that a possible biosphere reserve would not include the northernmost coast of Lake Abaya, the Wolaytta are not discussed in this chapter.

Corresponding to the ethnic diversity the linguistic situation is as well characterised by diversity. Various languages categorised under the North Omotic and East Omotic language clusters are spoken by the Gamo groups. Different Highland East Cushitic and Lowland East Cushitic languages are present as well. In general, many people in the area are multilingual, speaking their local language, Amharic and neighbouring languages. However, the smaller languages (e.g. Harro and Bayso) are highly endangered.

Religious distribution is likewise manifold. A general tendency is, however, that the various local traditional religions are constantly losing ground while Protestantism is spreading all over the region. Especially among the Guji Islam also has a growing membership. In the context of traditional socio-political institutions, such as the *gadaa* system of the Guji or the ritual kings or chiefs of Gamo and Koore, some elements of traditional religions may survive the religious change. In this context, there may be the possibility that traditional sacred groves typical for traditional religions will be further protected. The majority of the Gamo and Koore follows the Ethiopian Orthodox Church which was introduced into the region for the first time already in the 16<sup>th</sup> century. Subsequently, Orthodox Christianity turned into a syncretistic socio-religious system while oral history maintained the memory of ancient church sites (and church forests) which were kept sacred. By the late 19<sup>th</sup> century Orthodox Christianity was again imposed upon the population by the northern Ethiopian administration. Among the Koore, especially, Christianisation was a slow process that lasted until the second half of the 20<sup>th</sup> century. In Arba Minch the majority is Protestant, followed by Ethiopian Orthodox Christianity, Islam and traditional beliefs (Wolde Gossa Tadesse, 2005b, Amborn, 2003, Awoke Amzaye, 1985, oral informants).

Due to the climatic, ecological and topographical conditions of the Abaya-Chamo Basin and surrounding highlands three traditional livelihood strategies converge in the area around the Nechsar National Park, agriculture, fishery and pastoralism/agro-pastoralism. In different ways all communities intensively interact in order to have their share in the resources provided by the highlands, the lowlands and the lakes. Together they form overall economic networks which includes mutuality as well as competition. These networks are strongly interconnected with the Ethiopian centre as recipient of commodities and origin of policy impulses. The Nechsar National Park and the city of Arba Minch are both situated right in the middle of this zone of manifold interaction. While the park is supposed to be more or less empty of people – which is not the case – the city is a congested urban area and a hot spot of development.

### **Box 3: Historical background**

**Early Development:** When the area was conquered by Emperor Menilek II in the late 1890s agriculturist Gamo and Koore groups probably had no permanent settlements in the lowlands part of which they were cultivating already. The Ethiopian rule then allowed and promoted the intensification of agriculture in the lowlands. Especially the cultivation of cotton was enforced by the new rulers. Before, interethnic conflicts, especially with pastoralists, and the hot and humid climate had made life in the lowlands difficult for agriculturist highlanders. Now, since pastoral lands were considered as ‘no man’s land’ (see chapter on socio-cultural situation of the Borana), these areas were divided among northern Ethiopian military colonists and local lords cooperating with the occupants. The military colonists settled all over the area. Parts of the Diraashshe were driven from their land around Gidole to make space for an Amhara town to control the whole region. The Ethiopian state superimposed its exploitative system of land tax and forced labour (*gabbar* system) upon the entire peasantry. The local elite was deprived from some of their political power and reduced to state officials and tax collectors. Pastoralists had to pay tax for each animal. The Ethiopian rule opened opportunities for long distance trade, e.g., in coffee and cotton (Wolde Gossa Tadesse, 2005c).

**The Guji and the Park:** A historical question relevant for the Nechsar National Park has always been if the Guji pastoralists have any historical rights on its area. The Guji claim to have used the pasture and lived on the Irgansa plain, which today is the core of the park, for many generations, as graves of ancestors in the park area indicate. Elders even say that until the 1950s, before the foundation of Arba Minch, even places in today’s urban areas (Siqalla and Secha) were Guji land. Concerning the Irgansa plain and the isthmus between the lakes the historical presence of Guji pastoralists is confirmed (see Haberland, 1963, Asebe Regasa Debelo, 2012, oral informants). The foundation of Arba Minch, however, started on agricultural land confiscated from the Gamo in the 1960s. Before, in 1955 a community development farm had been established by the imperial government. Its aim was to introduce mechanised cultivation of cotton and other crops. In 1959 Arba Minch replaced Chencha as administrative capital of Gamo Gofa (Wolde Gossa Tadesse, 2003).

In 1967 the establishment of the Nechsar National Park was proposed in the area of the Irgansa plains and on the isthmus. Although it took until the Revolution until the park was established, for the Guji access to natural resources was already restricted to some extent in the 1960s. However, only in 1974 the Nechsar National Park was founded (but not gazetted) as such. In 1982 the Derg government

forcefully evicted ca. 2000 Guji pastoralists from the park, burning down houses and crops, killing cattle and shooting on citizens. This traumatising event led to distrust towards government and park authorities as it is still observable today (Asebe Regasa Debelo, 2012, Abiyot Negera Biressu, 2009). As soon as the Derg regime had lost its grip on the local people in 1991 the Guji returned into the park. They did this partially to avoid an ethnic conflict with the Konso and other people living near places where they had fled to after their eviction. Farmers from the Koore entered into the Park as well (Abiyot Negera Biressu, 2009, oral informants).

In the 1990s parts of the two lakes were included into the park. In 1996 a new discussion process among the park management and other stakeholders started that aimed at the resettlement of the park's human inhabitants. However, no positive result could be reached. Some Guji elders were talked into accepting resettlement while others strictly opposed to leave their ancestral lands. Finally, political disagreement among the Oromia Regional State and the SNNPRS led to an end of the discussion. The Guji were meant to be resettled to Tore area in Oromia. The reason was that the SNNPRS, under whose jurisdiction park belonged, did not want to have Oromo settling in its territory because the Southern State wanted to avoid the Oromia administration to interfere into its concerns. Since no progress was made, the EU froze the budget allotted to the development of the park (Asebe Regasa Debelo, 2012, Abiyot Negera Biressu, 2009, focus group discussion).

The next attempt to improve the situation of the park was in 2004 when the park management was given to the African Parks Foundation on the base of a private-public partnership. According to its own proclamation, African Parks aims at the economic sustainability of its parks and sees participation of local people and partnership with local communities as an important means of success. It planned to fence the park and to introduce elephants and buffaloes. As a precondition African Park expected the SNNPRS administration to resettle the inhabitants of the park. However, the way the administration tried to clear the ground for the realisation of African Park's ideas was unacceptable in terms of human and citizen's rights. According to Refugee International, in December 2004 the SNNPRS police burned down 463 temporary Guji houses and forced people to move to the margins of the park. The government, however, did only admit the resettlement of 980 Koore families. Other sources speak of 1,000 Koore households having been resettled (Abiyot Negera Biressu, 2009, Asebe Regasa Debelo, 2012, oral informants, focus group discussion).

Since the resettlement process encountered fierce resistance and negotiations between government and Guji had not been successful after two years, African Parks started direct negotiations with Guji representatives. Finally, an agreement was signed which redefined the park's boundaries in a way that some space was given for a regulated use by the Guji. The usage of the park's hot springs and salt lick were permitted and the Guji could now use the old pasture as a grazing reserve for cases of drought. However, in 2008 African Parks withdraw from the management of the park because their agreement with the Guji was not sanctioned by the government. The disagreement between Oromia and SNNPRS over their boundaries and the difficulties between government and Guji could not be solved. After the withdrawal of African Parks the presidents of the two regional states de facto confirmed the boundaries agreed upon by Guji and African Parks (Abiyot Negera Biressu, 2009).

**Agriculturists – Gamo, Koorete and others:** Agriculture is the dominant livelihood strategy in the Chamo-Abaya area. The pastoralist lands especially on the eastern and western lowlands of Lake Abaya are gradually shrinking already since the establishment of Ethiopian rule in the late 19<sup>th</sup> century. The agriculturist groups of relevance for the study are the Gamo, the Koore and the Diraasha.

The Gamo are a cluster of groups speaking different North and East Omotic languages inhabiting the Gamo highlands west of the Rift Valley as well as the western shores of the lakes Abaya and Chamo. The traditional Gamo districts or groups around the two lakes and the adjacent highlands were Shara, Ochollo, Dorze, Chench, Done, Ezo, Borodda, Ganta and Zargulla-Zayse.

The Koore (also known as Amarro or Koorete) are the inhabitants of the northern Amarro Mountains east of Lake Chamo and the southern Lake Abaya. They are the direct eastern neighbours of the Nechsar National Park and the Guji Oromo. The Koore speak an East-Omotic language. In today's administrative division most of their area belongs to the Amarro Special Woreda. The population of the *woreda* is 149,384 according to the census of 2007 (CSA, 2008).

The Diraashsha (also known as Gidole) speak a Lowland East Cushitic language. They live in the area between the eastern flanks of the Gardula Mountain ridge and on the southern shore of Lake Chamo. The Diraashsha Special Woreda has a population of 142,678 (CSA, 2008).

**Socio-political Systems of the Agriculturists:** The socio-political systems of the agriculturist groups discussed in this chapter share many common features. However, each of them has several peculiar cultural features which could only be revealed in an in-depth ethnological study which is not intended here. Agriculture results in economic surplus on the one hand and the need for coordinating complex group labour undertakings (e.g., building of terraces) on the other hand. In the study area both factors, as well as cultural influences from northern and south-western Ethiopia, favoured the development of certain types of socio-political systems. They can be generally described as segmented clan and lineage societies with social stratification. The largest and most powerful social group are the commoners who are agriculturists and are further differentiated by seniority of clans. They are led by hereditary chiefs and councils combining political power with legislation, jurisdiction, and ritual or religious responsibilities. The chiefs often have inherited a certain spiritual charisma which gives them an important ritual role in the maintenance of fertility and favourable climate. The chiefs and council elders are the traditional guardians of the ecological equilibrium.

**Socio-political Systems of the Gamo:** The Gamo as a whole had no common political administration before the Ethiopian conquest by the end of the 19<sup>th</sup> century. Traditionally, their political structure is based on between 40 and 55 autonomous territorial units (*dere*) which correspond to some extent with recent administrative boundaries of the *woreda* or sub-*woreda* level. The *deres* are subdivided into neighbourhoods (*guta*) and hamlets. Clans and lineages are not limited to certain neighbourhoods and some are present all over the *deres* of Gamo country. Each *dere* had a hereditary 'king' (*kawo*; *kaati* among some groups), a chief claiming to descent from the founder of the community. The *kawo* has important ritual responsibilities such as the prevention of misfortune and sacrificing. His political role is however limited. The most important political bodies are the assemblies of the elders or senators (*halaqa*) on the *dere* and *guta* levels. They still today serve as mediators and guardians of customary law (*woga*) and are



endowed with certain ritual responsibilities. Gamo traditional society was stratified. The majority were agriculturists who, together with the weavers, formed the upper stratum of commoners. The lower stratum was made up by endogamous occupational groups of potters, smiths, and tanners who were not permitted to own agricultural land; a situation that changed with the Land Reform of 1975. Land is usually inherited through the patrilineage. Members of senior clans or chief's families tend to have more land with better quality but also this changed partially through the Land Reform. Markets places, assembly places and sacred groves traditionally play an important role in the socio-political system. Some of these places are inherited through certain families who are in charge of the annual rituals taking place there (Wolde Gossa Tadesse, 2005b, 2005a, oral informants).

**Socio-political Systems of the Koore:** Prior to the Ethiopian conquest in 1896/97 the Koore formed an independent petty state under a 'king' or chief (*kaati*) who also acted as a rainmaker. Part of the Koore area, however, seems to have been dominated by the neighbouring Burji ethnic group (Amborn, 2003, Awoke Amzaye, 1985). Today, the modern administrative system recognises many features of the traditional society and customary law. The king still is as an important authority. The kingdom is divided into 23 territorial units (*daynete*) led by local administrators (*dayna*) who were accountable to two *awajjos*, the highest dignitaries under the *kaati*. The *kaati* also has a council of advisors (*bulatene*) (Awoke, 1985). Koore society is subdivided into more than 50 patrilineal clans which are subsumed under two exogamous marriage classes (moieties). The clans are led by hereditary leaders (*kashache*) with ritual duties (Amborn, 2003). Traditionally, two agriculturist groups, the Koorese and Kanae, constituted a social stratum of commoners. They considered themselves as 'pure' while they despised the endogamous occupational groups who were formerly not permitted to own land (Mana, potters and tanners; Wogache, smiths (Straube in Haberland, 1963, Amborn 2003, Awoke Amzaye, 1985). Land is inherited through the patrilineage and usually owned by male members of the community. Agricultural land is in possession of families but not individuals. The lands of the families of the king and other traditional officials were huge before the Land Reform. Virgin land becomes the possession of the first cultivator. Pasture areas are owned by the community as a whole. Here also wood and grass can be cut by all community members. The irrigation systems are maintained by the community. Water is divided by the chief of water (*waatsi maaga*) (Awoke Amzaye, 1985).



Figure 14: Koore people on the way to Arba Minch market for selling coffee (left), fisher man at lake Chamo (right)

**Socio-political Systems of the Diraashshe:** Traditional Diraashsha social organisation was based on clans and lineages as well as territorial units. Society was stratified according to seniority of clans and occupation; the agriculturists being the commoners. Similar to the Konso, Burji and Ochollo, the Diraashsha developed dense urban-like settlements, terraces and irrigation systems for intensive agriculture. The ruler was a hereditary chief priest (*daama*) who also acted as a rainmaker. After the Ethiopian conquest, the Diraasha lost part of their original territory (especially towards Lake Chamo) to northern soldier-settlers who were rewarded by Menilek with the allocation of land (Amborn, 2005, Haberland, 1963).

**Livelihoods of the Agriculturists and their Use of Natural Resources:** Differences in agricultural systems in the Chamo-Abaya area are not related to ethnic denomination but rather to climatic and ecological conditions. Cultural differences, however, are to be observed in the settlement patterns. While most ensete cultivators tend to settle in scattered hamlets, or clusters of hamlets, other agriculturists settle in dense urban-like villages similar to the ‘traditional towns’ of the Konso. Since the Ethiopian conquest and then after the villagization programmes of the Derg government, however, the common Ethiopian market-and-roadside settlement pattern strongly influenced the situation everywhere.

For orientation, three topographical zones can be roughly identified in the Chamo-Abaya area, the low flatlands (around 1,100-1,300 masl) from the coasts of the lakes to the feet of the mountains, the slopes of the mountains (between 1,200 and 2,100 masl) and the highlands (above 2,000 masl). All agriculturists keep small livestock and some cattle. Especially ensete cultivators need cattle dung as fertiliser. Additionally, they exchange agricultural products for pastoralist products. Such relations of economic exchange are historically well established especially between the Koore and Guji.

The Gamo and Koore practice a diversified economy which basically combines intensive agriculture (with crop-alternating on permanent fields) with horticulture, ensete cultivation and cattle-keeping. Along the shores of the lakes and on the islands Gamo also make their living as fishers (esp. Ganta, see below) or come to the lakes for seasonal fishing (e.g., Zayse-Zargulla, Abbink, 2014). In some areas above 1,500 masl, at steep slopes, some agriculturists use traditional terracing and drainage systems (e.g., Borodda, Ochollo, Koorete, Diraashsha; cp. Amborn, 2005). In cultural history they are related to the urban-like settlements of the Burji and Konso. Mountain pastures are traditionally used by some highland groups (e.g., Dorze).

The Gamo and Koorete agriculturists produce barley, wheat, tef, maize, ensete, peas, beans, cabbage, red and green peppers, yams, sweet potatoes, wild tuber roots, and pumpkin. Eucalyptus and bamboo are grown as building material and for commerce. In the highlands and on the slopes the Koore have a strong emphasis on ensete cultivation as a major feature of their economic strategy. In the lowlands the Gamo cultivate cotton, maize, millet, sorghum, eleusine. Along the western shore of Lake Abaya fruits (bananas, mangoes, lemons and avocados) are important cash crops on irrigated fields. The Koore use the lowlands to cultivate barley, wheat, tef, sorghum, maize, eleusine, safflower, cotton, lemon, citrus medica, bananas, ensete, sugar cane, chat, yams, taro, sweet potatoes, pumpkin, capsicum pepper, ginger, onions, garlic. Coffee is grown in lower elevations by Gamo and Koore (Straube, 1963).

Some Gamo groups and the Koore developed an economic strategy that uses the climatic and ecological advantages of both, highland and lowland areas. The traditional districts of Ochollo, Chench, Done and

Ezo, for instance, have territory from the mountains down to Lake Abaya, the Zayse-Zargulla as well have some lowland territory. Originally, in order to avoid the threat of pastoralist raids and to escape the hot climate, they had no permanent settlements in the lowlands (Straube, 1963). Today, however, settlements can be found along the Arba Minch-Soddo road (Wolde Gossa Tadesse, 2005b, Straube, 1963, Freeman, 2005, Abbink, 2014). The Koore, likewise, gradually expanded their fields down to the foot of Amarro Mountain, after the threat of Guji raids had declined as a result of the Ethiopian conquest. The tendency to extend to lower altitudes can still be observed today and leads to tensions with the Guji. Due to the favourable climate, enough water, and better conditions for ploughing the lowland allows for two harvests per year (Amborn, 2003, Straube, 1963).

The Gamo, and especially the Dorze, have been famous in Ethiopia for their weaving tradition for generations. To some extent, also the Koore have a weaving tradition. Cotton is produced in the lowlands along Lake Abaya and on lowland fields around the Amarro Mountain. It is processed to become high quality textiles by members of different Gamo groups (e.g., Dorze, Ochollo and Dokko). The Gamo are also engaged in long distance trade with textiles and other commodities, especially fruits (esp. Ochollo). Moreover, they are an important rural-to-urban migrant group in Addis Ababa. Under the name 'Dorze' (but not necessarily Dorze by origin) many of them make their living as weavers in the Shirro Meda district. Many Gamo families are trans-localised having family members in the countryside as well as in the capital. Typically, the women in such families manage the rural household while the men leave to the towns in search of wage labour or for trade (Straube, 1963, Wolde Gossa Tadesse, 2005a, Freeman, 2005, Awoke Amzaye, 1985).

**Fishery and the People of the Lakes:** There are basically three communities living on the islands and the coasts of the two lakes, the Ganta, Bayso and Harro. Additionally, fishermen from different ethnic and linguistic backgrounds use the two lakes for fishing. The fishing grounds of the Ganta are the Lake Chamo and in the southern bays of Lake Abaya. They are direct neighbours of the national park. The Harro are fishermen and, traditionally, hippopotamus hunters living on the islands of Gangule and Dana at the north-western coast of Lake Chamo. On Lake Abaya the Harro share the island of Gidichcho and the mainland vis-à-vis with the Bayso. They speak an Ometo language. The Bayso are agriculturists and weavers. Their language belongs to the Lowland East Cushitic family. They keep small livestock on Gidichcho Island. The cattle they own is given for keeping to the Guji pastoralists on the mainland (Poissonnier, 2003a, 2003b). The islanders respected the *qaalluu* high-priest of the Guji (Haberland, 1963).

Transport on the lakes is traditionally carried out with boats made of Balsa wood (Amh. *Ambach*, *Aeschynomene elaphroxylon*). Today also motorised metal and wooden boats are used. Fishing with nets is traditionally not known by the Harro. Fishermen used fishing-rods. For hippopotamus, hunting harpoons were used (Poissonnier, 2003a, 2003b). Nowadays, nets are commonly in use.

During the Derg rule fishermen were obliged to join fishing cooperatives. They are still today functional as private associations and the only legal way to have fishing rights. They are not ethnic-based but based on common interest. Membership de facto became hereditary. Commercial fishing is concentrated on Lake Chamo which today has more fish and less crocodiles and hippos than Lake Abaya. The fishing practice of the cooperatives is strongly regulated and net width is controlled by the administration. However, illegal fishing and the usage of nets with small net loops is prevalent on Lake Chamo. One

reason is that the cooperatives sell their fish mainly to large customers such as big hotels and wholesale buyers who sell the fish in Addis Ababa for good profit. On the local market fish is expensive and scarce although it is part of the traditional diet for many. This situation creates opportunities for illegal fishermen. According to a member of the administration, the policing of Lake Chamo is almost impossible since the illegal fishermen are mobile with their boats. They camp on islands or in bays and can move away whenever necessary. During seasonal shortage of fish violent conflicts may break out between illegal fishermen some of which are said to be criminals from the town who hide from persecution (oral informants).

**Agro-pastoralists – the Guji:** The Guji are southern Oromo agro-pastoralists inhabiting wide rangelands reaching from Lake Abaya in the West to Negelle in the East. To the North they border to the Arsi and Sidaama and to the South they live among the Borana. The Guji groups, who alone are relevant here, live on the eastern coast and hinterlands of Lake Abaya from the River Gidabo in the north to Lake Chamo, including the Nechisar National Park. Recent administrative division has put them under the Borana and Gamo Gofa Zones as well as Amarro instead of the Guji Zone. There are two Guji groups, the Alabdu Guji in the north (Abaya Woreda) and the Uruga Guji (Galane Woreda) in the south. In the Northwest of the Amarro Mountains the latter live mixed with the Koore. They also live in and around Nechisar National Park, and further south at the eastern coast of Lake Chamo. Access to this lake, however, is today restricted by the park administration (Haberland, 1963, Abiyot Negera Biressu, 2009). The following paragraph focuses on the Guji of Galane Woreda and Nechisar in particular since it is not to be expected that a possible biosphere reserve would include the north-western coast of Lake Abaya.

**Socio-political System of the Guji:** The socio-political system of the Guji resembles that of the Borana (see chapter on socio-cultural situation of the Borana) but differs in the details. Its basic features are patrilineal clans and lineages, political organisation in territorial units not according to kinship ties, a *gadaa* generation class system, a system of age-sets (*hariyyaa*) and division into two major exogamous patrilineal groups (Akaku and Dalata moieties). On all levels, council of elders are of great importance in decision making. The Uruga Guji have their own *gadaa* rule and an *abbaa gadaa* as highest ranking traditional political head. Centres of the *gadaa* rituals are Gomole and Adola. The high-priest of the old Oromo religion of the Guji had his seat in Wonago (near Dilla). Due to an interruption in the time of the Derg, the *gadaa* institutions lost some of their influence but still play an important role for the Guji identity and social organisation (Baxter, 2005, Haberland, 1963, Abiyot Negera Biressu, 2009). In the oral and written historical sources as well as in recent ethnic stereotyping the Guji are described as dangerous warlike people. Until the second half of the 20<sup>th</sup> century, the Guji were moving with their cattle everywhere in the hot low grasslands along the eastern and northern coasts of the lakes. Earlier they even used to come to the western shores. There was regular peaceful exchange of goods between agriculturists and pastoralists. However, at certain times the Guji ambushed caravans or attacked settlements. They did this in times of drought or for other economic reasons but also due to a cultural feature connected to the *gadaa* system. In order to be accepted as a full man endowed with the right to marry, every male member of the society had to kill an enemy or a dangerous animal and present the trophies to his group. This led to regular military and hunting campaigns of members of the same generation class which were led by the ‘father of war’ or *abbaa duula* (Haberland, 1963).



**Livelihood of the Guji and their Use of Natural Resources:** The Guji in the Chamo-Abaya area are mostly agro-pastoralists. There are few pure pastoralists since generations. However, the Guji maintain a pastoralist ideology centred around cattle as symbolic and economic capital (see chapter on socio-cultural situation of the Borana). Today's Guji have a mixed economy combining crop cultivation with animal husbandry. The latter still is of greater importance. The herds consist of cattle, sheep, goats and horses. They are the main source of the social status of their owners. According to traditional opinion, a man without cattle cannot be considered a true Guji. Milk and milk products are an important part of the usual diet. Leather is a basic material in every household. While the meat of small livestock is consumed by the families, the cattle is mostly sold on the market to obtain cash. Arba Minch is the main cattle market and the demand of the urban population and the regional market triggers the livestock production of the Guji. However, due to series of droughts where many cattle were lost and as an adaption to the increasing loss of pasture (e.g., in Nechsar National Park) the Guji adopted agriculture as a supplement strategy. They cultivate barley, pulses and ensete in higher altitudes and maize and tef in the valleys. In some highland areas they also grow ensete but the Guji of the study area who mainly inhabit lowlands traditionally purchase ensete products from the Koore. Bee keeping is practiced by poorer Guji but now restricted by park rules. In the Nechsar area the lands most suitable for agriculture lie in the Sermale valley where irrigation allows two harvests a year. There the Guji and Koore cultivate maize, sorghum and fruits, coffee and vegetables on plots owned by individual households (Abiyot Negera Biressu, 2009).

Agricultural lands are individual possessions. Additionally each household owns a fenced grazing reserve (*kaloo*) for calves and weak cows. Pasture and water resources, however, traditionally were usually considered by the Guji as communal grazing land. This was especially true for the Nechsar area which provided for the cattle the waters of two lakes, abundant grazing grounds and salt lick. Before the national park restricted the movements of the pastoralists, their herds and temporary settlements rotated according to environmental circumstances. In the wet season, when the Sermale River valley was infested with tsetse flies and malaria, they used the Nechsar plains whereas in the dry season they moved to the Sermale River valley (Abiyot Negera Biressu, 2009). Today the Nechsar Guji have only a minimum of legal pasture between the slopes of the Amarro Mountain, the park and the cultivation area of Sermale. Most watering places are forbidden to be used. Likewise, the way to the Lake Chamo whose water is considered good for the health of the cattle is prohibited. There is only one watering place at Lake Abaya left. Controlled burning in order to encourage fresh grass to grow and to eliminate ticks that irritate cattle, zebras and Swayne's Hartebeest alike is not allowed anymore. The settlement area was transferred to the margins of the park (Asebe Regasa Debelo, 2012). (Abiyot Negera Biressu, 2009) Today, many young Guji from the lakes and the park area move to Arba Minch in search of better education and better livelihood.

**Arba Minch:** The growing population of Arba Minch (74,843 in 2007, CSA, 2008) is ethnically, linguistically and religiously mixed. It mirrors the diversity of the SNNPRS and the Chamo-Abaya area in particular. The biggest part of inhabitants belongs to the Gamo people since the city is the administrative capital of Gamo Gofa Zone. However, there is also a large Guji population in the city which is concentrated in the so-called Guji Sefer. Arba Minch benefits immensely from the surrounding natural resources. The region is a very productive agricultural area whose importance extends beyond the regional market. Cattle production is significant as well. Tourism is another important factor not only due to the fact that the city is the gate to Nechsar National Park, but also because the touristic routes from Jinka,



Konso and Chew Bahir (Lake Stephanie) meet here. The hotels of Arba Minch are therefore crucial for the whole region. The city depends on the national park since it relies on its water sources (the '40 springs' that gave the city its name). Moreover, the park is the main source of fuel wood, construction material and fish. Most urban households have no other opportunity than cooking on fire since gas is too expensive. Due to constant rural-to-urban migration, the city has a growing number of urban poor. For many of them, especially women, collecting wood in the national park is an important opportunity for income generation (Girma Kelboro et al., 2013). Although this practice is illegal, it is carried out almost openly.

### Infrastructural and Touristic Situation

Nechsar National Park is well accessible as it is situated in direct vicinity to Arba Minch city which lies on a main highway. The infrastructural situation in the city sets good conditions for tourism development in the national park and its surroundings. The national park itself is accessible by car, boat or by foot. The park administration is improving the narrow gravel road that is crossing the national park in order to provide better access for cars. Today only all-terrain vehicles are able to drive through the park to its remote eastern areas. Moreover, boat trips on Lake Chamo are provided to see the crocodiles (so called *crocodile market*) and waterfowl. On foot, the national park is visitable with guided hiking tours combined with stays on campsites overnight. Beside the *crocodile market*, Hippopotamus, Grant's Gazelle and the large herds of Burchell's Zebra on the extensive grassland plains can be seen. Also the ground water forest and spring areas are of touristic interest. In close cooperation with locals and ethnographers some spots of cultural or historical value in and around the park (e.g. monoliths) have the potential to be developed into places of touristic interest.

In 2014, almost 25,000 visitors came to Nechsar National Park. Compared to 2002 (3,029 visitors), the touristic interest on the national park has increased immensely (Abraham Marye, 2014). In order to involve the local people on the growing touristic development of the national park, the park administration is supporting the local people in establishing an association for ecotourism. Further projects of the park administration with local people are planned (pers. communication Abraham Marye, 2015).

### Political Commitment and Stakeholder Activities

The local administration at the Nechsar National Park Office in Arba Minch highly supports the establishment of a biosphere reserve around the national park (pers. communication Abraham Marye, 2015). The national park administration has discussed the general approach and even has considered the possibility of a biosphere reserve around Nechsar National park since almost two years. As Abraham Marye, the chief warden of the national park, has deep experience in the development of biosphere reserves from another project in Ethiopia (proposed Lake Tana Biosphere Reserve), he is highly engaged to share his knowledge in the case of Nechsar. The park administration tries to involve as many local stakeholders as possible in order to discuss the possibilities for a biosphere reserve on a broad basis. In this context, political stakeholders, scientific institutions and the local economic sector, such as tourism,

are invited to delineate their perceptions, proposals and assessments (pers. communication Abraham Marye, 2015, Saleh Seid, 2015, Dereje Elias, 2015).

Political decision makers from the Arba Minch city administration, Gamo Gofa zonal administration as well as from the regional governments are consulted. As Nechsar National Park lies in two different regional states, namely Oromia National Regional State and SNNPRS, both governments have concerns about the national park area. For further protected area development, the regional governments are formally and legally responsible. Concerning scientific institutions, Arba Minch Agricultural Research Centre and Arba Minch University are involved in the discussion about a possible biosphere reserve. Cooperation between Arba Minch University and Nechsar National Park administration is initiated and a Memorandum of Understanding is drafted. From the local economic sector, tourism agencies and hotel owners are concerned. Moreover, other stakeholders are involved, such as local schools, the Chamo Environmental Protection Club as well as the local associations of tourist guides, fishery, honey production and ecotourism (pers. communication Abraham Marye, 2014, 2015).



**Figure 15: Ranger station in Nechsar National Park (left), discussion with Abraham Marye, chief warden of Nechsar National Park (right)**

The administration of Nechsar National Park is highly engaged to promote the communication process with local communities. Both the communities who live adjacent to the national park and the communities who live unauthorised within the park are consulted. Abraham Marye wants to include them in the discussion process in order to ask for their perceptions and problems as well as to identify their dependence on the national park. He is convinced that fair compromises have to be found concerning their livelihood, resource use and settlement in the national park. Alternative income possibilities have to be created in order to reduce the pressure on natural resources in Nechsar National Park. The national park administration therefore is supporting, for instance, the local associations for ecotourism and honey production. Furthermore the park administration developed a cut and carry system of grass in the national park. By regulation of the park administration local people can cut grass in order to sell on local markets (pers. communication Abraham Marye, 2015)

## Conclusion and Evaluation of the Nechsar National Park as Prioritised Area for a Potential Biosphere Reserve

The authors consider Nechsar National Park and its surroundings of high priority for potential biosphere reserve development as they meet a number of ecological, socio-economic and other criteria (see annex for detailed criteria list).

**Ecological Assessment:** Firstly, the area of the Nechsar National Park is of special importance in terms of habitat diversity and high number of rare and endemic animal species. The landscape values of the riverine and ground water forests as well as of the extensive grassland plains are of outstanding importance due to their scarcity and ecological threat. The vicinity of Arba Minch city and those settlements, which are tolerated within the national park, foster the human impact on the park's natural resources. The forests in the West of the park are particularly under threat through tree cutting and firewood collection by city dwellers. The settled Guji community in the national park is mainly responsible for the excessive grazing activities and overgrazing on the grassland plains. Both ecosystems suffer from continued degradation and overuse; they are critically endangered and have to be conserved as habitat for rare species (i.a. Lesser Kudu, Lion and Leopard). For the preservation of the endangered and endemic animal species it is absolutely necessary to conserve the habitats and to prevent the progress of further fragmentation.

The following species are the flagship species of the national park and even of a future biosphere reserve. These species would also play a very important role in ecotourism activities to attract visitors:

- Burchell's Zebra (*Equus quagga*)
- Nile Crocodile (*Crocodylus niloticus*)
- Hippopotamus (*Hippopotamus amphibius*)
- Lion (*Panthera leo*)

As the administration of Nechsar National Park already initiated, there is a high touristic interest for hiking, bird and wildlife watching.

**Socio-cultural Assessment:** The area of Nechsar National Park and its surrounding with its exceptional ethnic, cultural and linguistic diversity and its variety in livelihood systems and life styles is worth preserving in its uniqueness and diversity. It is especially interesting here, how agriculture, fishery, and pastoralism/agro-pastoralism interact to constitute one integrated socio-economic system, and how features such as egalitarianism and traditional kingship have influenced each other and formed the cultural landscape. The different dialects and languages, some of which being endangered, are in need of protection. The growing of the city of Arba Minch and its recent development are both an opportunity and a great challenge for the cultures and livelihoods of the population. A biosphere reserve could support the adaption to the recent socio-economic change by empowering the local people and enforcing their cultural and economic resilience.

The history summarised above shows that the Nechsar National Park was never implemented in a way fully considering the social and cultural needs of the local people (see the events in 1982, 2000, 2004, 2008 mentioned above). As can be judged from the on-going discussions and disagreements, the basic conflicts between the different ethnic groups, between the people and the park administration, and between different institutions were not solved in a sustainable way. Moreover, the way the national park was established and politically consolidated created an unnecessary conceptual dichotomy between natural

protection and livelihood necessities which was not part of the traditional cultural outlook. In a participatory process of developing a biosphere reserve this dichotomy, as manifest in different pro- or contra-park approaches, could be reconciled in a broader and more flexible framework. In order to win the local population as supporters of a biosphere reserve and in order to make it politically feasible the process of its establishment should be accompanied by clearly identifiable benefits for the locals today living in and around the park, such as

- Fully acknowledged land rights for the Guji that are sufficient to allow them maintaining socio-cultural features of pastoralist lifestyle as well as developing and expanding their agricultural activities.
- Agreements between the different groups on rights of usage in the Sermale valley, strengthening of traditional reciprocity between pastoralists and agriculturists
- Clearly defined rights of usage for sufficient and accessible watering points, mineral springs and cattle tracks inside the park and/or practicable solutions outside
- Better access to drinking water
- Improvement of health infrastructure
- Improvement of the educational infrastructure for the Guji and other people around the park
- Improvement of public transport infrastructure
- Better job opportunities in the park management (rangers, guides, administration) and eco-tourism, and creating alternative sources of income
- Reconciling the fishing regime in order to allow controlled fishing for the local market
- Development of alternative income sources for the urban firewood collectors and alternatives to firewood usage
- Involvement of traditional authorities (*gadaa*, hereditary chiefs) in the awareness creation in environmental ethics.

**Conclusion:** As Nechsar National Park is with its 514 km<sup>2</sup> rather small in size, it is quite vulnerable by human impact. It is thus all the more important to create a buffer zone around the national park that integrates sustainable land use activities. The approach of a biosphere reserve might be the appropriate framework to promote alternative resource use for local communities in a buffer zone, i.a. for sustainable grazing and forest use. The current national park administration has already evolved a proposal of zonation for core and buffer zones. The proposal for core zones includes major parts of the national park, especially the ground water forest at Kulfo River, the riverine forest at Sermale River, the woodlands on the land bridge, the wetlands at the lake shores, as well as the islands of Lake Chamo and the peninsulas of Lake Abaya. The grassland plains only could be considered as core areas if the grazing and settlement activities could be relocated from the national park. Regarding this, the proposal includes considerations about grazing land and settlement areas for the Guji people. The national park administration suggests certain areas adjacent to the north-eastern boundary of Nechsar National Park that would have a better quality for grazing purposes anyway.

However, an actual relocation of people from the park can only be considered if full and informed consent of all household heads can be reached and only after sufficient alternative areas are already legally

approved and practically prepared. Previous experiences (see Box 3) have shown that this demand note has to be made in this context.

Furthermore, the proposal for the buffer zone considers the following:

- In the East (and South-east): a belt of three to four kilometres between the current national park boundary and the mountain range; and parts of the mountain forests as well as horticultural and agricultural areas on the western slopes of the Amarro Mountains in order to support the Koore people who cultivate forest coffee and ensete, as two traditional sustainable economic strategies connected to important cultural values
- In the South: large parts of Lake Chamo and its wetlands, including the forests on the eastern shore line
- In the North: large parts of Lake Abaya and its wetlands beyond the current national park boundary
- In the West: the riverine forest and the wetlands at the shore line of Abaya

The urban area of Arba Minch and its surroundings with farm land could be integrated in a development zone. Besides, the development zone should enclose the whole buffer zone area. However, it is highly important that any zonation proposal ensures the access and passage of local people living in the East of the national park to watering points, mineral springs and Arba Minch city. Beside the Guji people, the Koore people have to cross the park from the eastern mountain range to Arba Minch to sell the coffee on the market that they cultivate in the forests. Including the national park in a biosphere reserve would ensure more likely its long-term conservation, as Nechsar National Park is not legally gazetted. The national park administration would advocate the establishment of a biosphere reserve as protected area that is anchored in the national law and which receives a regular monitoring. To prove the feasibility of a biosphere reserve, it is highly recommended to integrate the national park administration in the considerations and to refer to the zonation proposal of Abraham Marye, the chief warden of the national park.



## Awash National Park and proposed Hallaydeghe-Asebot National Park (Allideghi Wildlife Reserve)

### Introduction

Awash National Park was established in 1966 as the first gazetted Ethiopian national park (gazettement in 1969 with 756 km<sup>2</sup>). In 2015 it was re-gazetted and reduced in size (590 km<sup>2</sup>) due to encroachment by surrounding land users. Allideghi Wildlife Reserve was established in the late 1960s when most of Ethiopia's wildlife protected areas were designated and covers 1832 km<sup>2</sup>. In 2014 it was re-demarcated and newly proposed as Hallaydeghe-Asebot National Park, but not gazetted yet (Fanuel Kebede et al., 2012). In terms of their ecological, socio-cultural and ethnographic situation the Awash National Park, the Allideghi Wildlife Reserve and the proposed Hallaydeghe-Asebot National Park, all located in close distance in the Middle Awash area, are treated together in this study.

The landscape in the semi-arid area is characterized by a mosaic of wooded grassland, shrub and wood lands with *Acacia* and thorn bush. It includes intact grasslands as well as degraded pastures with unpalatable forbs, aromatic herbs and large areas of bare land. The altitude of Awash National Park ranges from 750 masl up to the peak of the dormant volcano Mount Fantale on 2007 masl. The plains of proposed Hallaydeghe-Asebot National Park<sup>1</sup> are located on around 850 masl, besides Mount Asebot rises up to 2,539 masl.

**Location:** The parks are located where the Great Rift Valley joins the Afar Triangle (see Figure 16). The Awash National Park is situated in Awash Fentale Woreda (Zone 3, Afar Regional State) and Fentale Woreda (East Shewa Zone, Oromia Regional State). The proposed Hallaydeghe-Asebot National Park is located 50 km further north in Amibara Woreda (Zone 3, Afar Regional State) and in Miesso Woreda<sup>2</sup> (West Harage Zone, Oromia Regional State). The most important urban centres in the area are Metehara and Awash. In and around the proposed Hallaydeghe-Asebot National Park and Awash National Parks there are several small agro-pastoralist settlements as well as seasonal camps.

**Administrative:** The Awash National Park itself is under federal administration of EWCA, but the management is subjected to the Awash National Park Office in Gotu. The proposed Hallaydeghe-Asebot National Park is also under administration of EWCA with a local administration office in Andido, managing the Allideghi Wildlife Reserve likewise.

BirdLife International determined Awash National Park as IBA *in danger*, due to its ecological threats (Birdlife, 2015d).

The management situation of Awash National Park and proposed Hallaydeghe-Asebot National Park is challenging. Awash National Park is heavily invaded. Nowadays almost no area within the park

<sup>1</sup> When proposed Hallaydeghe-Asebot National Park is named in this study it is also referred to the Allideghi Wildlife Reserve as both areas overlap in large parts.

<sup>2</sup> Probably the proposed Hallaydeghe-Asebot National Park is also located in Gumbi-Bordede Woreda (West Harage Zone, Oromia Regional State), but the new *woreda* boundaries are not known yet.

corresponded to the legal non-use status due to grazing of livestock. The implementation rate of the last management plans was not very high due to a shortage of funds, lack of capacity and undefined areas of responsibility. The management in proposed Hallaydeghe-Asebot National Park is being established since few years, the administration is thus still building relationships to governmental authorities and the local communities. As it is not gazetted it has no legal basis and no management plan yet. Hence, law enforcement is only possible to a limited extend, the work between proposed Hallaydeghe-Asebot National Park and the pastoralist communities is still on awareness creation.

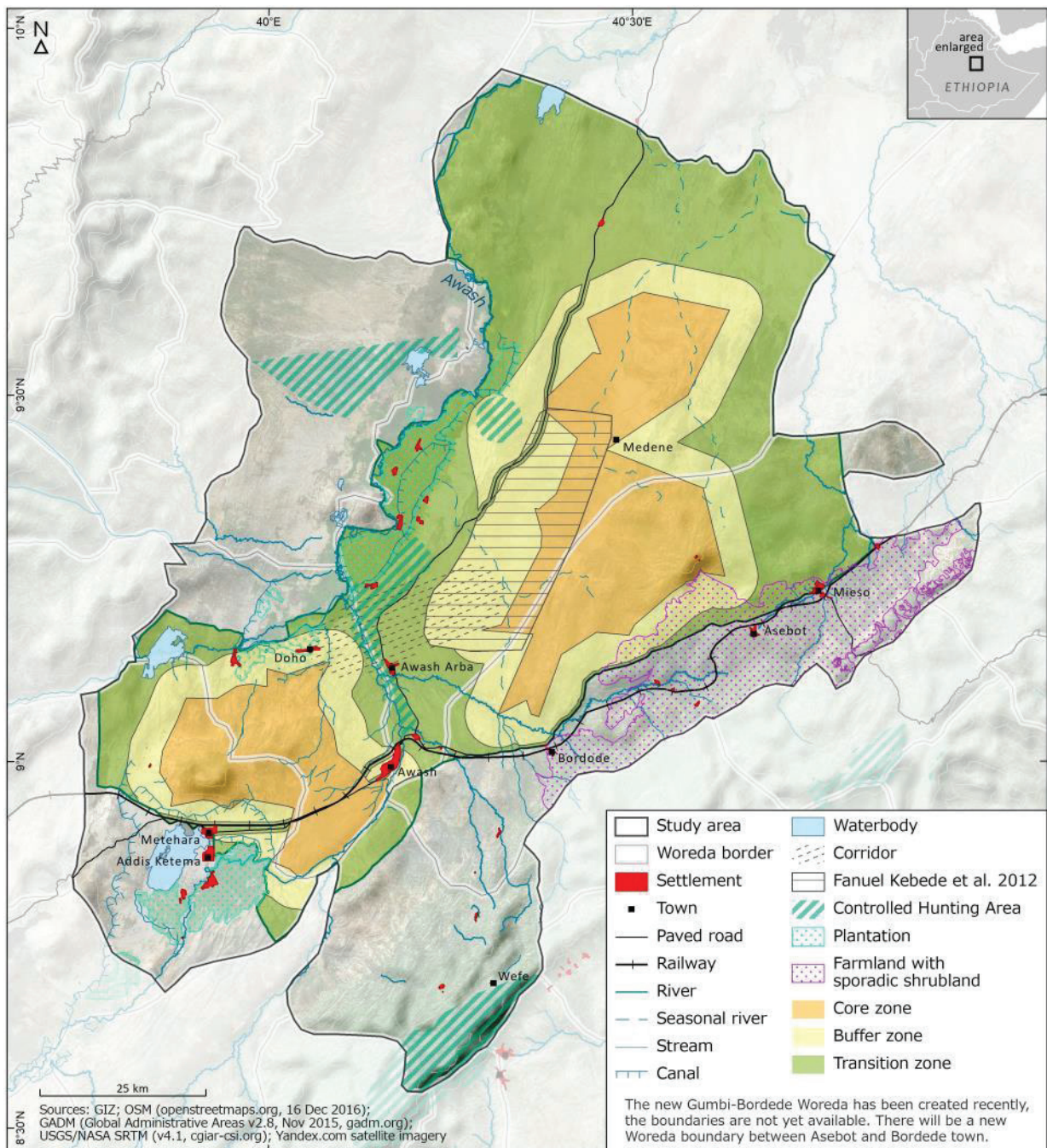


Figure 16: Awash National Park and proposed Hallaydeghe-Asebot National Park with potential biosphere reserve area. The study area and results developed from another project by MSF ‘Assessing the integration of Awash National Park and proposed Hallaydeghe-Asebot National Park into their surrounding landscape’ (Map by S. Busse)

## Ecological Situation

**Surroundings:** The surroundings of Awash National Park and the proposed Hallaydeghe-Asebot National Park are characterised by livestock grazing lands, bush lands, grasslands and agricultural sites. Most areas are severely overgrazed but single grazing reserves with sufficient grass resources remained. Farmers are cultivating mainly tef and rarely sorghum. Commercial plantations for sugar cane and cotton production are established in the area. The strong frequented highway from Addis Ababa to Djibouti crosses the South of Awash National Park and the eastern boundary of the proposed Hallaydeghe-Asebot National Park.

**Climate:** The Awash-Hallaydeghe protected areas lie mainly within the *Dry Kolla* agro-ecological zone as well as in parts in *Dry Weyna Dega* (Ritler, 2005, Azene Bekele-Tesemma, 2007). The area is characterised by a bimodal rainfall pattern, the main rainy season extends from July to August and shorter rainy seasons are expected between February and May. The dry seasons occur between July and August and between October and January. The annual rainfall averages 567 mm. The mean annual temperature is about 25.8 °C with monthly minimum and maximum of 13.8 and 36.5 °C respectively (Figure 17).

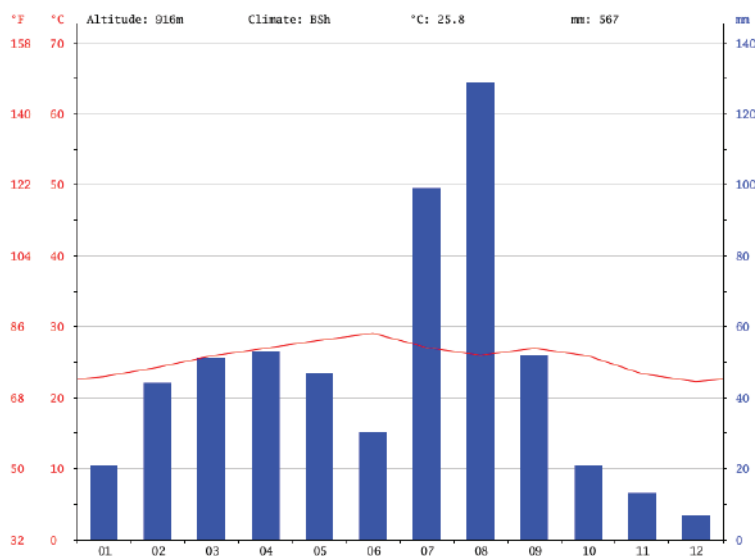


Figure 17: Climate diagram Awash, Ethiopia (Climate-Data.Org, 2015c)

**Soils:** The soils are fertile and of volcanic origin (Behnke and Kerven, 2011). In large parts of the national park Vertic Cambisols and Calcic Cambisol occur (Almaz Tadesse Kebede, 2009). Vertisols (Black cotton soil) of different thickness, clay content and depth of soil cracks are also found all over the area by the researchers in this study.

**Vegetation and Area Structure:** The overall vegetation type in this area is classified by Friis et al. (2010) as *Acacia-Commiphora woodland and bushland proper* (see Box 1). It appears as arid and semi-arid xerophilous woodlands, extensive grasslands and savannah bush lands which are dominated by *Acacia senegal*, *A. mellifera*, and *A. nubica* as well as several subshrub and grass species on the ground layer. Single trees of *A. tortilis* also occur. The dominated grass species on the grassland plains include *Chrysopogon plumulosus* and *Sporobolus iocladius* (Fanuel Kebede et al., 2012).



The Awash National Park is dominated by bush lands and grasslands. In the West of the park, Mount Fantale stands out from the landscape as it is thousand meters higher than the surrounding area. Its crater is 350 m deep and 3.5 km in diameter. In the South-east there are wide savannah grasslands, called Ilala Sala Plains. Hot springs with small pools along the river are located in the North of the park. A Doum palm forest (*Hyphaene*) is surrounding this area. The southern boundary of the park is formed by the Awash River. The river has its origin near Ginchi, 90 km West of Addis Ababa and ends in Lake Abe in the Afar Depression. At the southern tip of the national park there are the Awash Waterfalls followed by the Awash River Gorge. Remnants of riverine forests and woodlands enclose this area.

The proposed Hallaydeghe-Asebot National Park has extensive grassland plains with savannah woodland that border the high mountain chain with Mount Asebot in the East. Beside grass species, forb species can be found increasingly in the plains, e.g. *Abutilon* spec., *Solanum* spec., *Blepharis edulis*, *Leucas* spec./*Orthosiphon pallidus*. In the surroundings of Mount Asebot the vegetation type *Dry evergreen Afromontane forest and grassland complex* occurs, which differentiates in the following subtypes: On the lower escarpments of Mount Asebot the vegetation type of *Transition between Afromontane vegetation and Acacia-Commiphora bushland* occurs with scattered shrubs and trees (e. g. different *Acacia* species), followed by the type *Afromontane woodland, wooded grassland and grassland* (with e. g. *Olea europaea* subsp. *cuspidate*, *Acacia abyssinica*) further up. On higher altitudes of Asebot mountain (starting from 1800 masl) the type *Undifferentiated Afromontane forest* with old grown trees of *Juniperus procera*, *Olea europaea* subsp. *cuspidate* and *Podocarpus falcatus* can be found.

The exotic bush *Prosopis juliflora* is increasingly occupying the plain along the road and livestock paths.

**Wildlife:** The Awash National Park and the proposed Hallaydeghe-Asebot National Park are very important for habitat conservation of endangered and endemic animal species.

In the grasslands and open *Acacia* woodlands of the proposed Hallaydeghe-Asebot National Park the *endangered* Grevy's Zebra (*Equus grevyi*) appear (230 individuals remain in Ethiopia; (IUCN, 2015)). As described above, Borana National Park and the proposed Hallaydeghe-Asebot National Park are the only protected areas that appear in the distribution range of Grevy's Zebra.

Furthermore the area is habitat for other important wildlife species, i.a.:

- Greater kudu (*Tragelaphus strepsiceros*)
- Lesser kudu (*Tragelaphus imberbis*)
- Beisa oryx (*Oryx beisa*)
- Gerenuk (*Litocranius walleri*) (only in pHANP)
- Soemmerring's gazelle (*Nanger soemmerringii*)
- Klipspringer (*Oreotragus oreotragus*)
- Common bushbuck (*Tragelaphus scriptus*)
- Defassa waterbuck (*Kobus ellipsiprymnus* ssp. *defassa*)
- Salt's dik-dik (*Madoqua saltiana*)
- Common warthog (*Phacochoerus africanus*)
- Black-backed jackal (*Canis mesomelas*)
- Common jackal (*Canis aureus*)
- Serval cat (*Leptailurus serval*)
- Spotted hyena (*Crocuta crocuta*)
- Caracal (*Caracal caracal*)
- Guereza (*Colobus guereza*)
- Anubis baboon (*Papio Anubis*)
- Hamadryas baboon (*Papio hamadryas*)
- Grivet monkey (*Chlorocebus aethiops*) (only in the proposed Hallaydeghe-Asebot National Park)

Sightings of Lion (*Panthera leo*) and Leopards (*Panthera pardus*) are rare. In former times Wild Ass (*Equus africanus*) occurred in the area of the proposed Hallaydeghe-Asebot National Park. But due to hunting and loss of habitats, it is already locally extinct in that area and is only rarely to be found in some parts of the Danakil Depression (pers. communication, Siege, own observation). On the IUCN Red List it is categorised as *critically endangered*.



Figure 18: Spotted Hyena (*Crocota crocuta*) (left), Beisa Oryx (*Oryx beisa*)

**Birds:** The Awash-Hallaydeghe protected areas have special ornithological importance, as the areas have high species diversity and are significant as resting place for migrating Palearctic bird species. Over 460 bird species are registered in the Awash National Park, i.a. bustards, chats, sunbirds, ostriches, storks and birds of prey. Around half of the Somali-Massai Biome bird species are recorded in the park (White, 1983). Of particular note are:

- Gillett's lark (*Mirafraga gilletti*)
- Boran cisticola (*Cisticola bodessa*)
- Bristle-crowned starling (*Onychognathus salvadorii*)
- Black-faced Sandgrouse (*Pterocles decoratus*)
- Ashy Cisticola (*Cisticola cinereolus*)
- Somali fiscal (*Lanius somalicus*)
- Star-spotted nightjar (*Caprimulgus stellatus*)
- Somali Ostrich (*Struthio molybdophanes*)
- Arabian bustard (*Ardeotis arabs*)

The endemic species Yellow-throated Seedeater (*Serinus flavigula*) and Sombre Chat (*Cercomela dubia*) are only to be found in a small area due to their specialisation and high requirements on their habitats, in Awash National Park they are around Mount Fantale. The Awash-Hallaydeghe protected areas are the only ones within the distribution range of these species. Also Arabian Bustard (*Ardeotis arabs*) and Secretary Bird (*Sagittarius serpentarius*) occur in the Awash-Hallaydeghe protected areas. After the Red List of the IUCN, the status of the Yellow-throated Seedeater is *endangered*, the Arabian Bustard is categorised as *near threatened* while the Secretary Bird is assessed as *vulnerable* (IUCN, 2015).





Figure 19: Arabian bustard (*Ardeotis arabs*) and Secretary Bird (*Sagittarius serpentarius*)

**Ecological Threats:** The situation of the landscape of Awash-Hallaydeghe area is very critical which seriously affects the wildlife populations. The Acacia woodland (e.g. *Acacia tortilis*) is reduced to a minimum and is hardly to be found in intact conditions. All savannah ecosystems and rangelands are under huge anthropogenic pressure: they are either cleared for agriculture, industrial plantations and infrastructure development or affected by overgrazing through livestock farming and thus bush encroachment. This resulted in the medium to high degradation of the grasslands in most areas, particularly around roads and settlements but also in parts of the protected areas.

The IUCN Red List categorisation of important wildlife species is alarming: the status of Lesser Kudu, Beisa Oryx and Gerenuk is assessed as *near threatened*, Soemmerring's Gazelle and Lion are even classified as *vulnerable* (IUCN, 2015). Due to its productive soil and climate conditions, the Middle Awash area is exposed to intensive land use, such as large-scale irrigation agriculture (e.g. sugar cane and cotton). Approximately in 2014-2015, drillings for measuring the water level were done by Ethiopian authorities in the area of the proposed Hallaydeghe-Asebot National Park due to its agro-economic potential. Establishing plantations within the protected areas would highly endanger its wildlife populations.

Moreover, the agricultural expansion leads to lack of grazing land and thus to shortage of fodder resources. Governmental monoculture plantations, particularly of sugar cane and cotton, nowadays occupy large parts of former grazing lands of local pastoralists (Behnke and Kerven, 2011). Several local pastoralists were forced to change their income structure and lifestyle towards settlement and agro-pastoralism. Settlement of local pastoralists led to a shift from transient pastoralism to a system of permanent pastures so that grazing livestock (mostly camel, cattle and goat) is concentrated in certain areas (see following subchapter). The utilisation pressure affects also Awash National Park and the proposed Hallaydeghe-Asebot National Park, the last retreats for wildlife. Grazing takes place on large expansions and seasonal pastoralist settlements that are tolerated rather than permitted, are to be found in both protected areas. The grasslands within and around the protected areas cannot regenerate after intensive grazing with high density of livestock and the harmonious relationship between pastoralism and wildlife is being disrupted (Almaz Tadesse Kebede, 2009). The entire area of grassland is declining continuously as well as the grass seed bank in the soil is probably reducing on many sites. On bare land self-regeneration of the seed bank is hardly possible even if the area is closed for land use in the wet season. Overgrazing of grasslands leads to a change in plant communities from a dominance of perennial

grasses to annual grasses and further to a dominance of unpalatable forbs. Slightly to moderately grazed sites are dominated by perennial grasses. If grazing pressure increases, perennial grasses are destroyed and do not have enough time to develop seeds. Only the faster annual grasses can still establish. Under heaviest grazing pressure, also these annual grasses are eaten before they can develop seeds and areas of bare soil are increasing. Only unpalatable forbs establish and can easily spread. Lately the native perennial forb *Abutilon* spec. rapidly encroached the Hallaydeghe plains and has now spread enormously on the expense of perennial grasses, favoured by the effects of overgrazing and drought.

Overgrazing and soil degradation also favour bush encroachment as seeds from invasive species can germinate easily on open soil conditions where the sward is injured. A fast bush encroachment by the native species *Acacia nubica*, *A. mellifera* and *A. senegal* is currently observed as well as by the exotic species *Prosopis juliflora*. The immense distribution of the invasive species *Prosopis juliflora* further intensifies the shortage of grazing land and endangers the livelihood of local pastoralists. Introduced in the 1970s to Ethiopia as resource for fire wood, the fast distributing *Prosopis juliflora* caused an irreversible displacement of the natural vegetation, loss of habitats and biodiversity (Almaz Tadesse Kebede, 2009). Dispersal is mainly done by seed eating livestock, so that grazing lands are particularly affected by the invasion. Also certain parts of the protected areas are affected by *Prosopis juliflora*. Moreover, some rangelands in and around Awash National Park are affected by the exotic plants *Parthenium hysterophorus* and Rubber wine (*Cryptostegia grandiflora*).

Overgrazing, agricultural expansion and invasion of exotic species has resulted in a loss of natural vegetation and landscape destruction in the Middle Awash area. Wildlife populations are constantly pushed to unsuitable and less safe habitats. As described above, increasing dry seasons and shortage of rainfall will exacerbate these circumstances.

Intensifying road traffic on the highway between Addis Ababa and Djibouti increasingly causes killings of wildlife by accident. Since there are no sufficient watering place in Hallaydeghe area, animals have to cross the highway to get access to water, i.a. at the Bilen wetland and fresh water source in the north-west of the wildlife reserve. Furthermore, hunting of wildlife by local people, e.g. shooting of carnivores to protect livestock and killing of Grevy's Zebra for medicinal use, endangers the wildlife populations (Almaz Tadesse Kebede, 2009, Fanuel Kebede et al., 2012).



**Figure 20: Proposed Hallaydeghe-Asebot National Park: overgrazed sites (left) and highway through the area (right)**

## Socio-cultural Situation and Ethnographic Profile

**Introduction:** The ethnic groups in the wider area around the proposed Hallaydeghe-Asebot National Park and Awash National Park are the Afar and the Issa Somali as well as two Oromo subgroups, the Karrayuu and Ittuu. All groups speak languages of the East Cushitic language family. The area of the proposed Hallaydeghe-Asebot National Park is used as grazing ground by Afar as well as Issa. While the Afar mainly occupy the south-western and central parts of the Hallaydeghe plains, the territories of the Issa are a bit further to the Northeast. There are regular conflicts between the two groups. The Karrayuu Oromo have their main territories to the south-west of Amibara and include the Awash National Park. The Ittuu Oromo live mainly south-east of the park in West Harage Zone. The Ethio-Semitic-speaking Argobba ethnic group is neighbouring the Middle Awash area in the highlands west of the Awash Valley. In bigger towns there is an ethnically mixed population with the different local groups and Amhara.

A great majority of the population follows Islam. Traditionally, the local Islamic folk-religion is characterised by the influence of mysticism (Sufism). Holy men (*shaykhs* with the title of *am*) are of great (also political) importance and their graves serve as focal points of piety. However, modern Islamic fundamentalism is recently winning ground, especially in towns. The few Orthodox Christians are mainly found among the Argobba and among Amhara town's people. The very few Evangelical Christians are among the educated ethnically mixed urban population. Among the Oromo there is still some influence of the traditional *Waaqefata* belief.

The dominant livelihood strategies of Afar and Issa as well as of the Karrayuu and Ittuu are pastoralism and agro-pastoralism. In some areas of Middle Awash large-scale irrigation projects allow agricultural production. However, a considerable portion of the workers on such schemes does not originate directly from the area. Agricultural encroachment leads to the shrinking of pastoralist pasture and of area for wildlife. Within the boundaries of the proposed Hallaydeghe-Asebot National Park, for example, a huge area of 290 km<sup>2</sup> is now farm land (Fanuel Kebede et al., 2012). The Argobba are highland agriculturists and traditional partners of economic exchange with the lowland pastoralists.

The Awash River is the main resource for pastoralist as well as agricultural economy of the region. Throughout history the river and the adjacent areas were in the focus of conflict and competition over territories, grazing lands and wildlife. Another economic backbone of the region is the road from Addis Ababa via Adaama and Awash to Semera and Djibouti.

### **Box 4: Historical background**

**The Sultanate of Áwsa:** The Middle Awash area formed part of the realm of the Sultanate of Áwsa, one of the four *badó* of the Afar. Its history is shaped by its location at the caravan route between Inner Ethiopia and the coast and by the fertility of the valley and the waters of the River Awash. The caravan route was secured by mutual arrangements between Ethiopian rulers and the Afar sultanates. In 1888 the sultan of Áwsa signed a treaty with the Italians which made his area an Italian protectorate and was a precondition for the establishment of Eritrea as an Italian colony. The area came under Ethiopian rule after a battle in 1896 (Morin, 2003). The Sultan of Áwsa was formally reduced to an Ethiopian administrator but could keep his role as guardian of the caravan route until the Ethiopian revolution.

The Afar could keep a relatively independent status.

**Interethnic Conflicts:** Interethnic conflicts between Afar, Issa and Oromo in the Upper and Middle Awash area have a long history. Part of them are based on the traditional conflict patterns of mobile pastoralists in competition over resources, supremacy and warrior ethics, part of them are deeply rooted in the history of the Áwsa sultanate and diverging interpretations of history in general. However, due to the strategic location of the region they were often also proxy wars in geostrategic power struggles, be it over control of the coastal areas, be it that a national unity of the Afar or the Somali may not perceived as advantageous by regional players (Mu'uz Gidey, 2009). During the Italian period, for example, the Issa sided with the Italians and were equipped with machine guns against their neighbours. After the war the massive presence of firearms remained to be a problem. The post-war government further triggered the interethnic conflict by randomly including different ethnic groups into the same districts. Pastoralist territories were rarely demarcated according to agreement of all groups involved. The land resources of the Awash Valley in the same time became increasingly scarce due to agricultural encroachment, wildlife protection and demographic pressure. Under the Derg the conflicts between Afar and Issa continued since government control became weak under the conditions of civil war. Still today the interethnic situation is tense and the pressure on the land is again increasing. As a result of the overall conflict, the Issa have expanded their territories. They are also present in the Hallaydeghe area (Mu'uz Gidey, 2009).

**Development in the Middle Awash Area:** The development of the Awash Basin began south-west of the proposed Hallaydeghe-Asebot National Park with the foundation of the Wonji Sugar Plantation in 1951. The Karrayuu who were using the area as a summer pasture were forcefully expelled from their lands by the military. Since then, the pastoralists gradually adopted agriculture as additional economic strategy (Gascon, 2007).

In 1962 the Haile Selassie I government established the Awash Valley Authority in order to coordinate and administer the development of the natural resources of the Upper and Middle Awash. This agency granted land to concessionaries, conducted surveys, prepared plans and programmes, and authorised third parties to construct manage and administer infrastructural projects, etc. This was possible on the legal base that pastoralist land, in contrary to cultivated land, had 'no owner' other than the state. The development of the area was financed by investments of foreign capital (USAID, World Bank, etc.) and enabled by know-how from Britain, Israel, USA, The Netherlands and Italy. Coordinated by the Awash Valley Authority large irrigation projects for cotton and sugar cane production were set up along the river and took away areas for traditional flooded grazing, the most important pastoralist land for the dry season. The only Afar-owned irrigation scheme was the cotton plantation of Sultan Alimirah of Áwsa in the Awash Delta and the Lower Plains. The policy of the Afar leaders was to cultivate as much land as possible in order to protect the Afar land from foreign/outsider use. However, the Afar and the other groups did not have much influence (Flood 1975). In 1966 the Awash National Park was founded on the pastoralist lands of the Karrayuu. The situation of pastoralists worsened in a series of major droughts in 1971 and 1974, and by the influx of agriculturist migrants after the Revolution. The Derg regime continued the irrigation schemes as state-run cooperatives (cp. Samuel Tefera Alemu, n.d.).



**The Afar:** The Afar ethnic group (historically called Danakil) inhabits the so-called Afar Triangle, a region which is divided among Ethiopia, Eritrea and Djibouti. In Ethiopia, they number around 1,276,374 or 1.73% of the total population (CSA, 2008). Most of them live in the Afar Regional State. They speak a Lowland East Cushitic language.

**Social-political System of the Afar:** The social organisation of the Afar is based on patrilineal kinship and a segmentary system of lineages and clans (*kedô*). Members are organised in age-groups (*fi'ma*) which serve as bodies of solidarity and social control. The clans are the primary socio-political unit in that they form a common juridical body with collective responsibility in matters of crime, blood revenge and compensation, as well as intra- and inter-clan conflicts and their reconciliation. They also enforce the Afar customary law (*mad'â*) which is used along with the sharia law (Morin, 2003).

Historically, the Afar lived under four 'sultanates' (*badô*), namely Tajura, Rahayto, Awsa and Biru. They were ruled by hereditary paramount chiefs (*amóyta* or *suldaan*). Each *badô* is subdivided into sub-districts/clan confederations (*dintó*) constituted by confederate chiefdoms and clans. The Ethiopian Afar are under the traditional authority of the *suldaan* of Awsa, an office that today still exists. The *suldaan's* seat is Asayita near the Djibouti border. The recent sultan lost most of his coercive power to the Ethiopian state authorities but still acts as the highest traditional representative of the Afar and is very influential. Although Afar society has strong egalitarian traits, it is traditionally divided into two status groups historically originating from political coalitions of clans, the Asahyamára (the 'Reds') and Adohyamára (the 'Whites'). The 'Reds' see themselves as to be higher-born. However, such status differences do not lead to differences in culture or livelihood strategies (Morin, 2003, Morin et al., 2003).

**The Issa:** The Issa (written 'Ciise' in Somali) historically belong to the Diir clan federation of the Somali. They speak a Northern Somali dialect. They are the dominant ethnic group in Djibouti which is controlling the government and the ruling party of the country. They also live in the coastal areas of Awdal, the northernmost district of Somaliland, and in the northern part of Ethiopia's Somali Regional State (Landinfo, 2011, Ambroso, 2002). The Issa mainly maintain a traditional pastoralist and agro-pastoralist economy with camels, cattle, and small livestock.

**Social-political System of the Issa:** Similar to other Somali sub-groups the socio-political system of the Issa is structured as a complex segmentary system of patrilineal exogamous lineages and clans (*reer*). Clans may cooperate in genealogically linked clusters of clans (clan-families) in peaceful as well as military matters but, in general, political cohesion is relatively weak above clan-level. Accordingly, the clan is the primary source of social identity for its members. The Issa are a group of seven clans. They are hierarchical in status, the clans of the Abgaal cluster having been the most privileged group (Morin, 2007). The lowest socio-political and judicial body is the so-called *diyya*-paying group, i.e. the group which pays or receives 'blood compensation' (*diyya*) in livestock or money in case of homicide. Agreements are made in assemblies (*shir*) (Hoehne, 2010).

The traditional political and spiritual leader of the Issa is chosen from a family belonging to the Wardiiq clan. He is endowed with the title of *ugaas* and is considered a rainmaker (*rooble*). Oral tradition claims that the *ugaas* is a descendant of the Muslim holy man *aw* Barkhadle, probably identical with the founder of the Walashma dynasty (13th to 15th century) of the Sultanate of Ifat. Today, the *ugaas* still has some authority



as a mediator, ritual head and guardian of the customary law (*bera*) of the Issa (Morin, 2007, 2010). Certain clans claim descent from Muslim holy men and form a special ‘holy lineages’ which are by tradition mostly engaged in agriculture (Hoehne, 2010).

The clan is the major landholding unit. When members of a clan move with their herds to the land of other clans they have to ask for permission. This may be legally facilitated by alliance or group ‘adoption’. Such adoption led to the Somali heterogeneity of clans and segregation of ‘nobles’ (*bilis*) and ‘commoners’ (*boon*). Craftsmen again form separate groups which historically were held in a servile status (Hoehne, 2010).

**The Karrayuu and Ittuu Oromo:** The Karrayuu and Ittuu are sub-groups of the Barentuu branch of the Oromo. The Karrayuu directly live in and around the Awash National Park. Historically, the Karrayuu and Ittuu are allies but their relationship to the Afar and Argobba is often characterised by hostility.

**Social-political System of the Karrayuu and Ittuu Oromo:** The Karrayuu and Ittuu have a patrilineal system of clans, sub-clans, lineages and extended families. More important than kinship affiliation is residence or membership of a territorial herding group (*gandaa*), respectively. Each level of the socio-political system is led by a council of elders (*jaarsa*) headed by a leader (*damina*) who acts as mediator and is also responsible for negotiation of questions of natural resource management. While livestock is owned by individual families, the pasture is communal. The leader of a herding group, the *abbaa gandaa*, and his council would decide on the time of moving the herds, the grazing area (*ona*), the composition of the herd, and communal labour. The traditional environmental management structures, however, were weakened by interference of the different governments.

The *gadaa*-system of generation sets (see chapter on the socio-cultural situation of the Borana) that traditionally rules the social organisation of the Oromo is still functional to some degree among the Karrayuu, at least as far as the main rituals are concerned (Girum G. Alemu, n.d., Debela Goshu Amante, 2014, James and Lafforgue, n.d.).

**Livelihoods and their Use of Natural Resources:** Most people of the Afar, Issa, Karrayuu and Ittuu Oromo are either pastoralists or agro-pastoralists. Additional sources of income are agricultural wage labour in plantations, and the selling of firewood and charcoal. Opportunities for income generation in the tourism sector or related fields do not play a great role for locals. The Karrayuu were pure pastoralists while the Ittuu were agro-pastoralists. In the last decade most Karrayuu had to shift to agro-pastoralism. The pastoralists keep livestock (camels, cattle, goats, sheep and donkeys) mainly for milk production and wealth accumulation. In many areas camels are predominant. The Karrayuu who were cattle keepers had to adopt raising camels instead as a reaction to series of draughts. Big livestock is usually kept as mobile capital and its meat is rarely consumed in the family’s daily life. Butter and hides are used to barter with agriculturists, for e.g. sorghum. Camels and cattle are an important part of the dowry. Sometimes they are stolen from neighbouring groups to be used for that purpose. In cases of manslaughter or murder they serve as a means of compensation to be paid to the victim’s family. As explained in the ethnographic chapter on the Borana, the value of cattle and camels by far exceeds the economic dimension as indicated by the singing of songs of praise for individual animals. Therefore, in inter-group conflicts, raiding large

livestock is the traditional way to in the same time humiliate the enemy and increase the wealth and prestige of one's own group (Almaz Tadesse Kebede, 2009, Morin, 1996).

Pure pastoralism requires mobility of herds and people. According to season, herders follow old established migration patterns in order to find pasture and water. The pastoral rangelands, in general, are considered commons (Afar: *wanô*) by each group and subject to temporary tenancy agreements (Afar: *'isô*). Rights of access to water are owned and managed by clans. According to the traditional pattern of transhumance, the area of the plains with its non-permanent ponds and streams served as the pasture for the rainy season. In the dry season the herds were moved to places with permanent access to water (e.g., to Awash River and around the hot springs) (Almaz Tadesse Kebede, 2009, Morin, 2003).



Figure 21: Afar house (left), goat pen (right)

**Development and Socio-Economic Change:** During the last ca. 30 years the general livelihood strategy and life style in the Middle Awash area have changed significantly. The majority of people do not anymore practice pure pastoralism but agro-pastoralism or agriculture. Beginning in 1962 the first irrigated cotton plantations were established and the Awash-Gewane road was constructed. Great parts of the area were turned into agricultural land. Since then, the extension of the Middle Awash pastoral rangelands – and, as a consequence, space for wildlife – is constantly decreasing and pastoral mobility is more and more restricted. In the same time, boreholes were drilled at different places and allowed the development of a new lifestyle for the pastoralists. Reasons for the decrease of rangelands are the expansion of cotton plantations and agricultural land in general, and the establishment of private or private-public ranches. The proposed Hallaydeghe-Asebot National Park and the Awash National Park as well restricted the movements of pastoralists and deprived them from some of their traditional rights. The regular interethnic conflicts between Afar and Issa as well as Afar and Karrayuu were another important factor that contributed to the shrinking of rangelands. In order to avoid violent encounters and loss of cattle through raids, buffer zones between the two groups in the proposed Hallaydeghe-Asebot National Park area, are not used as pasture till today. Likewise, policy makers may conceptualise the Awash National Park as an interethnic buffer zone. Additionally, the area is widely invested with the epidemic neophyte mesquite shrub (*Prosopis juliflora*) which overgrew former grazing land, watering points and paths. Its poisonous thorns confine people and cattle to the open areas. However, mesquite wood is used for charcoal making and became an important supplementary source of income (Almaz Tadesse Kebede, 2009, Zeraye Mehari Haile, 2008, Debela Goshu Amante 2014, Gascon 2003).

As a consequence of the shrinking pasture, and as a reaction to a series of severe droughts, the pastoralists started to settle permanently near the boreholes of the area during the first decade of the 21st century. In general, permanent settlements are a relatively young phenomenon among the pastoralists of the area. Instead of moving with their herds they now stay around the boreholes throughout the year. Some have adopted agriculture, commerce or wage labour, additional to livestock keeping (Almaz Tadesse Kebede, 2009, Zeraye Mehari Haile, 2008). In order to adapt to the new situation, the pastoralists changed the patterns of their annual movements. During the dry season many herds graze in range of the boreholes and stay in the *boma* of the nearby settlements overnight (see Figure 22). Intensified grazing is noticed on the Hallaydeghe plains and Fentale Mountain as these pastures are higher frequented the whole year. Children and the elderly stay at the boreholes with weak animals, while part of the human population moves with the herds to protect them against raids. They live in temporary satellite settlements. After the cotton harvest many pastoralists bring their herds to the plantation area to feed from the fields (Almaz Tadesse Kebede, 2009). The Karrayuu, Ittuu and Afar have a system of grazing reserves (*kaloo*) which are kept aside for the driest times. This system helps the herds to survive long dry seasons. Admittedly, the plantations of Wonji and Lake Beseka as well as the Awash National Park have limited the pasture of the Karrayuu herds considerably. No wonder that the pastoralists mostly do not respect more of the park than its core area (Debela Goshu Amante, 2014, Franks, 2003). Another strategy of the Karrayuu to overcome shortage of pasture is to move their herds in a very large range. Since the way to the north and north-east is blocked by other ethnic groups (Argobba, Afar, Issa), they would bring their herds in the dry season deep into Oromo country, even as far as the Arsi Lake's region. On their way they usually do not have conflicts with the local agriculturists, such as the Tuulama and Arsi Oromo, because they would not stay long with their camels and they would come after the harvest and therefore not destroy any fields (Debela Goshu Amante, 2014).



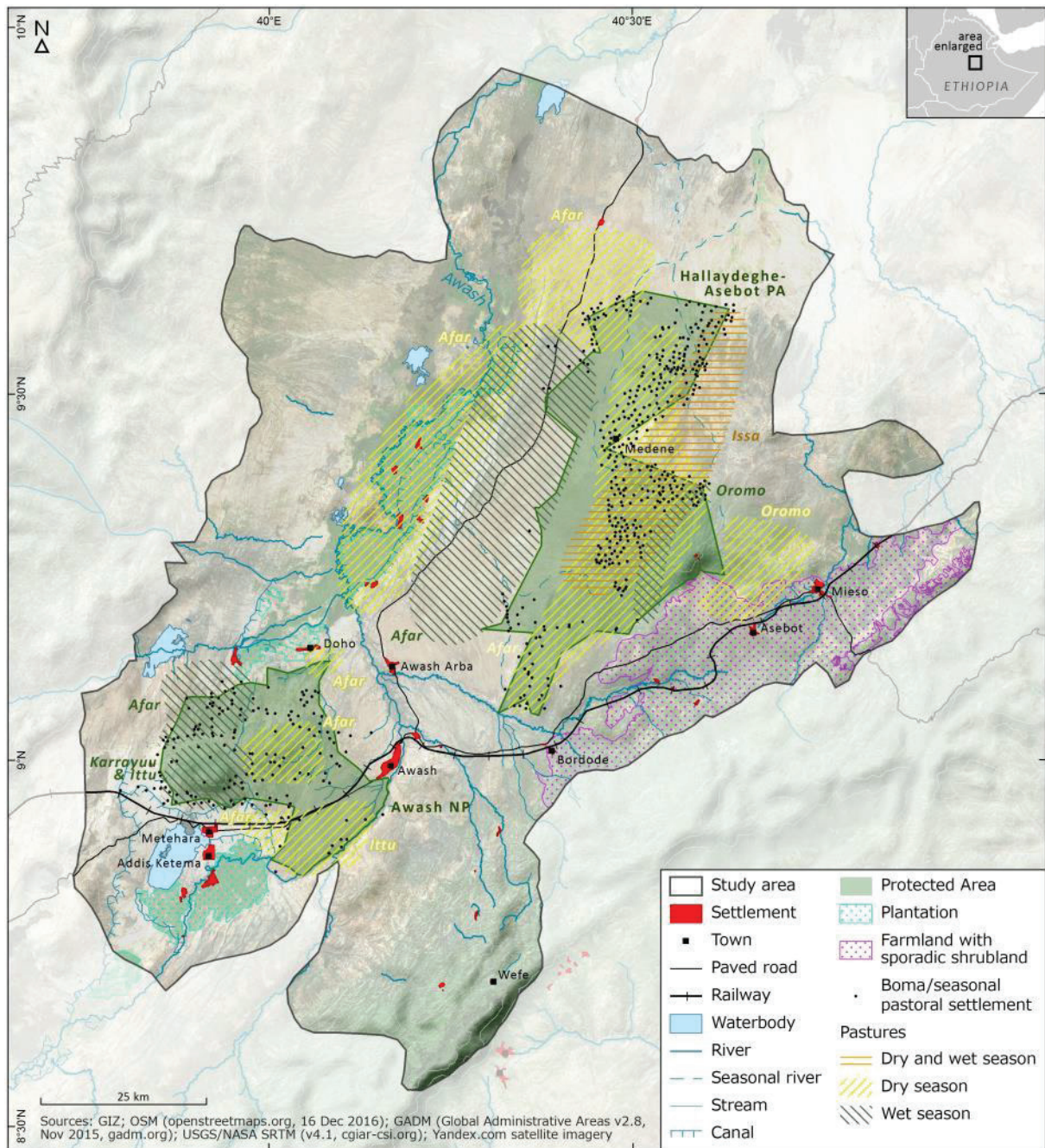


Figure 22: Dry and wet season pastures used by different communities in the landscape. The study area and results developed from another project by MSF 'Assessing the integration of Awash National Park and proposed Hallaydeghe-Asebot National Park into their surrounding landscape' (Map by S. Busse)

### Infrastructural and Touristic Situation

Both Awash National Park and the proposed Hallaydeghe-Asebot National Park are well accessible through the highway from Addis Ababa to Djibouti. Since Awash National Park is the first Ethiopian national park, it has a special touristic importance and a long history of tourism development. Tourists can undertake guided hiking tours with stays on campsites in Gotu or Filwuha overnight. Of particular touristic interest are the Ilala Sala Plains to see Beisa Oryx and Soemmerring's Gazelle, Mount Fantale, the

Awash Waterfalls and the hot springs. The extensive grasslands and open *Acacia* woodlands in the proposed Hallaydeghe-Asebot National Park are attractive to see the endangered Grevy's Zebra. Both protected areas are appealing for ornithological interested tourists, as the area has high bird species diversity and significance as resting place for migratory birds.

### Political Commitment and Stakeholder Activities

Experts from EWCA support the approach of a biosphere reserve in the Awash-Hallaydeghe area under certain circumstances. A biosphere reserve in this landscape could encompass the (proposed) national parks as core areas, surrounded by buffer zones to support the protected areas (pers. communication Siege).

Since Awash National Park and the proposed Hallaydeghe-Asebot National Park are under immense pressure from the surrounding land use stakeholders, i.a. agricultural sector, transport sector, local farmers and pastoralists, it is very difficult for both park administrations to ensure the habitat protection. Local staff members of the administration of the proposed Hallaydeghe-Asebot National Park therefore support the development of a biosphere reserve in order to better protect the wildlife habitats and to create a buffer zone around the sensitively grassland plains (pers. communication Seid, 2014). Staff members of the Awash National Park administration also plead for a buffer zone around the national park (pers. communication Shiferaw Mensistie, 2014). It was mentioned that under the approach of a buffer zone, sustainable land use and alternative income possibilities for local pastoralists and farmers could be established, e.g. cut and carry system for grass resources, production of handcraft and honey (pers. communication Shiferaw Mensistie, 2014). The participatory development of a buffer zone could ensure grazing sites for the pastoralist communities (see following conclusion).

There is also some engagement by the civil society. The NGO Farm Africa works since several years on participatory rangeland management in the area. They support the local pastoralists in improving the rangeland conditions. Experts from Farm Africa also stated positively to the biosphere approach that could include participatory rangeland management in the buffer zone.

### Conclusion and Evaluation of the Awash National Park and the proposed Hallaydeghe-Asebot National Park as Prioritised Area for a Potential Biosphere Reserve

The areas of the Awash National Park, the proposed Hallaydeghe-Asebot National Park and its surroundings are prioritised and assessed as potential biosphere reserve by the authors of this study (see Figure 16). The evaluation of the area is oriented towards the criteria for the determination of potential biosphere reserve areas (see annex for detailed criteria list).

**Ecological Assessment:** In first place, Awash National Park is of special importance as it is Ethiopia's first legally gazetted national park. The area of Awash-Hallaydeghe is significant in terms of high species diversity, in particular of bird species due to its function as resting place for migrating bird species from the northern hemisphere.



Rare and endangered bird species are:

- Yellow-throated seedeater (*Serinus flavigula*)
- Sombre chat (*Cercomela dubia*)
- Secretary bird (*Sagittarius serpentarius*)
- Arabian bustard (*Ardeotis arabs*)

The landscape values of the extensive grassland plains are of outstanding importance due to their scarcity and ecological significance as IBA, as habitat for the flagship species Grevy's Zebra, as potential territory for the highly endangered Wild Ass and other rare wildlife species:

- Lesser kudu (*Tragelaphus imberbis*)
- Leopards (*Panthera pardus*)
- Lion (*Panthera leo*)
- Soemmerring's gazelle (*Nanger soemmerringii*)

But the ecological threat is immense through increasing human pressure: settlement, commercial and subsistence agriculture, overgrazing by livestock, hunting, road traffic on the Addis Ababa-Djibouti highway, tree cutting, and distribution of the invasive *Prosopis juliflora*. The grassland plains in Awash National Park and the proposed Hallaydeghe-Asebot National Park suffer from continued degradation and overuse, as local pastoralists are restricted to even declining grazing sites around (see below).

The progressive agricultural expansion is endangering the surroundings of Awash-Hallaydeghe. It pushes the conflict over access to land and water with local people and exacerbates the scarcity of wildlife habitats. Recently, drillings for measuring the water level were done in the proposed Hallaydeghe-Asebot National Park on behalf of Ethiopian authorities. Possibly, new plantations are planned to grow in the area (pers. communication Seid, 2014). But it is absolutely advised not to establish monoculture plantations of cash crops within the wildlife reserve or in direct vicinity to the protected areas. The integrity of the protected areas itself and buffer zones around have to be ensured, in order to conserve the habitats of concerned wildlife. Plantations would exacerbate not only the water scarcity for local people, but also worsen the access to watering places for wildlife. As Behnke and Kerven (2011) emphasise, pastoral production systems of local people would produce returns per hectare equal to or greater than those from irrigated monoculture plantations, e.g. of cotton or sugar cane, which often are subsidised by the Ethiopian Government.

**Socio-cultural Assessment:** The socio-cultural and livelihood situation of the Awash-Hallaydeghe area is mainly a result of the natural gifts provided by the river Awash with its valley and tributaries and by the importance of the region as a corridor of trade and transport between the Ethiopian interior and the Red Sea Coast. Middle Awash is a contact zone of the Ethiopian agrarian highland cultures, represented by the Argobba agriculturists, and the pastoralist and agro-pastoralist cultures of the Red Sea riparian people, Afar and Issa, and East African pastoral Oromo. Moreover, the area has become a target zone of state-owned, private and foreign agricultural development and business as well as of environmental protection efforts. This overall situation led to a general shrinking of pasture and makes the Middle Awash a highly contested terrain. However, a well-managed process of establishment of a biosphere reserve could help reconciling the diverse interests of the local population, companies, institutions and the state. While national parks are often seen as buffer zones separating hostile ethnic groups, a biosphere reserve could develop the common interests of the pastoralist/agro-pastoralist groups by creating opportunities for the forming or consolidating of common institutions. In principle, the livelihoods of the pastoralist/agro-pastoralist groups of the area do not depend on ethnicity but on the ecological and economic conditions.

Their cultures and socio-political systems are different but they also share many values, including the Islamic faith and pastoralist values and way of life. The long history of interethnic contact also created complementary forms of mediation mechanisms and resource management agreements that can be further developed according to modern needs and conditions. Towards the state, the investors and environmental protection agents etc., and the change they are bringing into the area, all pastoralist/agro-pastoralist groups may have similar positive and negative expectations. Therefore, a successful process of biosphere reserve establishment has to organise the diverging stakeholder's interests by leaving nobody behind.

- The process has to be accompanied by a permanent interethnic peace process oriented towards the existing shared values and livelihood necessities.
- Agreements on the patterns and actual necessities of annual transhumant movements should be monitored by local institutions which include all concerned stakeholders and reconcile the interests of pastoralist/agro-pastoralist resilience and environmental protection.
- In times of severe climatic or ecological hazards food security cannot be sacrificed to environmental protection. Therefore, socio-economic resilience has to be strengthened in order to prevent situations where natural resources have to be used in an unsustainable way for survival. This includes improvement of access to water, health, education, transport etc. and development of additional sources of income.
- The pastoralist/agro-pastoralist population should be empowered to be able to better negotiate their interests with agro-industrial companies and state actors.
- Pastoral rangelands cannot be considered as 'no man's land' but at least part of it should be given some status of protection against agricultural expansion.
- Instead of a general promotion of agriculture, there should be detailed research on the question in which local cases traditional pastoralist natural management is more sustainable and in which local cases a shift to agro-pastoralism is more advantageous. The ecological as well as social impact of agricultural expansion has to be critically assessed by a holistic and independent research.
- Involvement of traditional authorities (*gadaa*, hereditary chiefs) in the awareness creation in environmental ethics.

**Conclusion:** As the area is under immense human pressure, Awash National Park and the proposed Hallaydeghe-Asebot National Park are quite vulnerable by further impact. It is thus all the more important to create a buffer zone around both areas that integrates sustainable land use activities, including grazing and agriculture. Considering a biosphere reserve including Awash National Park and the proposed Hallaydeghe-Asebot National Park has to be proven in detail, since there is not enough data available to give certain recommendations in this study. The core zones might include intact areas of the proposed Hallaydeghe-Asebot National Park and Awash National Park, i.a. parts of the Ilala Plains. Buffer zones might be established as ecological corridors between both areas. The buffer zone should also contain the watering places at the Bilen wetland and fresh water source, in order to provide access to fresh water for wildlife. Furthermore, it was delineated by certain experts of EWCA, that the current controlled hunting area Bilen Hertele might be included in the development zone. At present, the revenues from the hunting licences go to the regional government of Afar. Within a biosphere reserve approach, the hunting licenses

might transfer to the biosphere reserve administration to participate local communities on the income (pers. communication Siege). Above all, the traffic situation on the highway has to be calmed to prevent further wildlife accidents.

Possibly, the approach of a biosphere reserve might be the appropriate framework to create an area around Awash-Hallaydeghe where traditional pasture management and habitat protection can be reconciled. Combining both issues in one biosphere reserve might be a chance to support pastoralist living.

A biosphere reserve in Awash-Hallaydeghe landscape could encompass the (proposed) national parks as core areas, surrounded by buffer zones consisting of, among others, participatory rangeland management areas, community conservation areas and wildlife corridors, surrounded by a transition area.

As a result, recommendations for action focus on participatory buffer zone management around Awash National Park and the proposed Hallaydeghe-Asebot National Park. Approaches of community cooperation should base on the customary system of the local pastoralists, as these are the strongest institutions of local grazing management. To minimize the land use pressures on the protected areas themselves, the areas around have to provide better conditions and options for the local population alternatively (i. a. grazing resources and water supply). Recommended measures and programs thus include:

- Participatory rangeland management: The responsibility and the user rights for defined grazing sites are transferred to the local pastoralist communities. Being responsible for the conditions of their resources creates ownership for these sites among the community members. Improved rangeland sites that are integrated in the surrounding landscapes of Awash National Park and the proposed Hallaydeghe-Asebot National Park strengthen the connectivity between the protected areas and facilitate wildlife crossing.
- Community conservation areas: i. a. development of a community conservation area on the Hallaydeghe plain. It should be designed as a conserved area with grazing regulations and obligations of the pastoralists to protect the wildlife.
- Fodder plot establishment: sowing and harvesting of grass species for community-based production of livestock fodder.
- Rangeland rehabilitation measures: e. g. construction of circular and ripping rain-harvesting structures in order to collect rain water and increase the soil moisture content for improving the growth of grass and seedlings, additional grass sowing and bush removal activities.
- Alternative livelihoods creation: further developing functional value chains of livestock fattening and production/selling of milk and the cultivation of herbs and spices.

In general, a change of landscape governance is needed including multi-stakeholder and inter-sectorial cooperation. UNESCO Biosphere Reserves could provide the framework for balancing land-use conflicts and integrating above mentioned recommended measures.

# Medium Prioritised Areas as Potential Biosphere Reserves in Ethiopia

## Chebera-Churchura National Park

### Introduction

The Chebera-Churchura National Park is established in 2005, developed from the former Kulo Konta Controlled Hunting Area, and covers 1,278 km<sup>2</sup> (EWNHS, 2010, Figure 23).

Chebera-Churchuras's landscape includes mountainous forests, riverine forests, woodlands and grasslands. The altitude ranges from 550 up to 1,700 masl (Demeke Datiko and Afework Bekele, 2013a).

**Location:** The Chebera-Churchura National Park is located in the SNNPRS at the boundary between the Konta Special Woreda and the *woredas* of Tocha and Isara of Dawro Zone. The northern neighbour of Konta is Jimmaa Zone (Oromia Regional State), Kafa Zone (SNNPRS) lies to the West. The southernmost boundary of the Park is defined by the Omo River and, south of it, Selango Woreda (South Omo Zone) and Melekoza Woreda (Gamo Gofa Zone, both SNNPRS). The Park is called after the two adjacent *qebeles* Chebera and Churchura. The main entrance to the Park at Chebera can be reached via the small town of Ameya, the administrative capital of Konta Special Woreda. There is no major town near to the park. The population of the Konta Special Woreda is 91,743, the population of Tocha Woreda is 103,419 and that of Isara Woreda is 65,751 (CSA, 2008).

**Administrative:** Chebera-Churchura National Park is administered by the regional government of SNNPRS, but guarding and management is subjected to the national park office in Chebera. The area was transformed from a controlled hunting area to a national park. Chebera-Churchura National Park is legally gazetted.



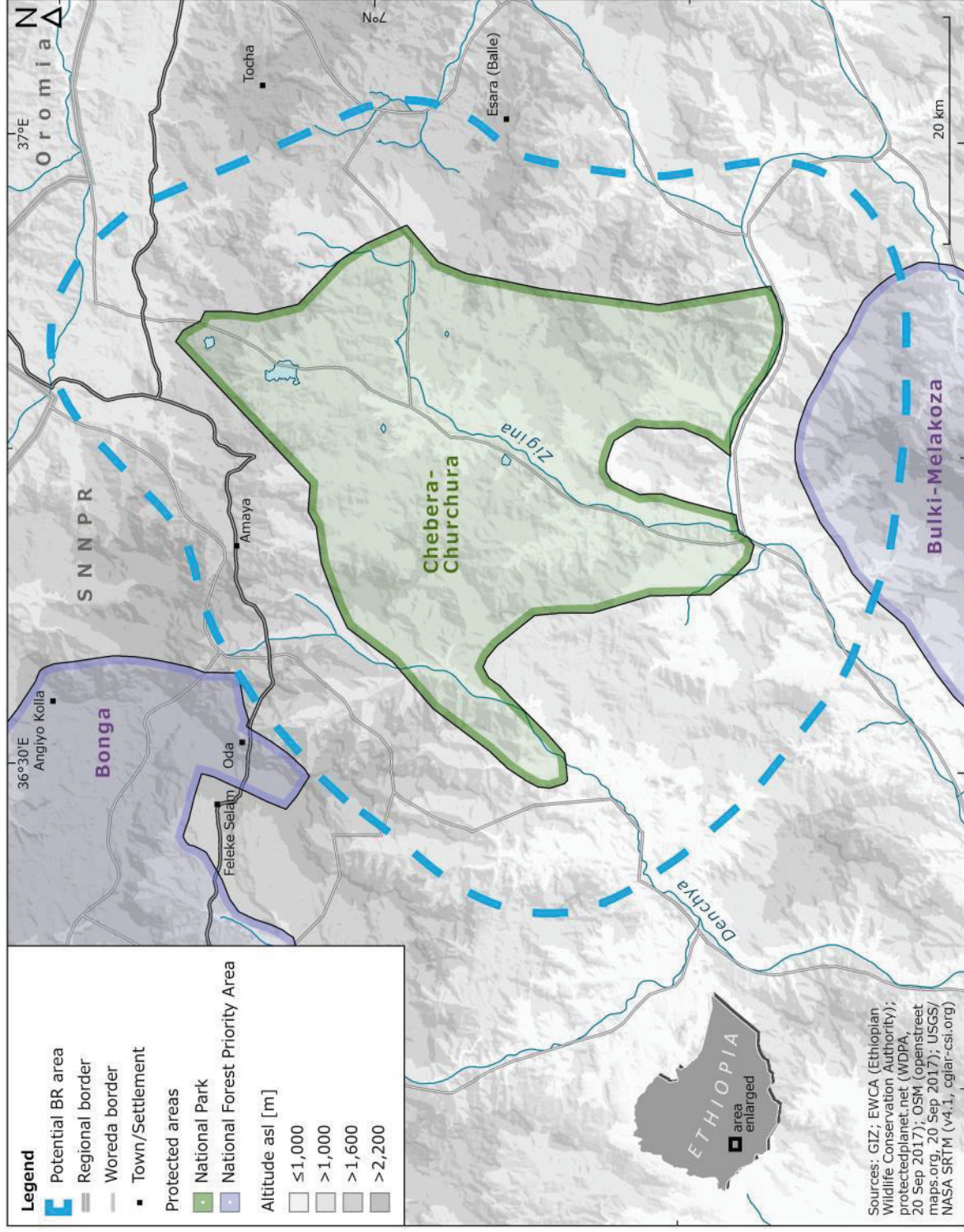


Figure 23: Chebera-Churchura National Park and potential biosphere reserve area (dashed line) (Map by S. Busse)



## Ecological Situation

**Surroundings:** The surroundings are characterised by a mountainous landscape with large forest areas. In the South of the park the Omo River borders the national park. Farmers in the area cultivate cereals, coffee and root crops. Land-use includes also grazing, grass cutting and fire wood collection (Demeke Datiko and Afework Bekele, 2013a).

**Climate:** The park lies mainly within the agro-ecological zones *Wet Kolla* and *Wet Weyna Dega* (Ritler, 2005, Azene Bekele-Tesemma, 2007). The rainy season extends from March to October and the dry seasons occur between November and February. The annual rainfall averages 1749 mm. The mean annual temperature is about 17.9 °C with monthly minimum and maximum of 9.5 and 27 °C respectively (Figure 24).

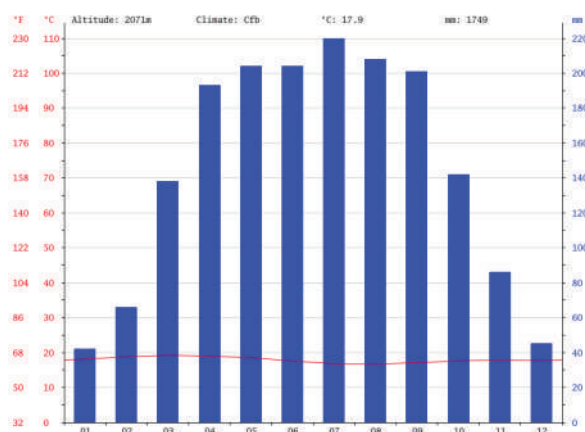


Figure 24: Climate diagram Ameya, Ethiopia (Climate-Data.Org 2015d)

**Soils:** In general, the *Wet Kolla* and *Wet Weyna Dega* agro-ecological zones are characterised by red clay soils (Ritler, 2005, Azene Bekele-Tesemma, 2007).

**Vegetation and Area Structure:** The overall vegetation types in this area are classified by Friis et al. (2010) as *Dry evergreen Afromontane forest and grassland complex* as well as *Combretum-Terminalia woodland and wooded grassland* (see Box 1). Grasslands cover the largest portion of the park, dominated by *Pennisetum purpureum* and scattered trees. In the eastern and north-western highlands of the national park there are mountainous forests, dominated by *Podocarpus falcatus*, *Juniperus procera* and broad-leaved tree species. The forests have important non-timber forest products such as coffee, coriander, pepper and honey. Riverine forests occur along the rivers, e.g. Zigina River, that are characterised by i.a.:

- *Albizia grandibracteata*
- *Chionanthus mildbraedii*
- *Arundo donax*
- *Grewia ferruginea*
- *Aspilia mossambicensis*
- *Ebretia cymosa*

In the southern parts of the national park, woodlands are to be found with:

- *Acacia brevispica*
- *Combretum collinum*
- *Maytenus arbutifolia*
- *Terminalia brownii*

In the national park there are several incised river valleys, perennial streams and four smaller crater lakes (Demeke Datiko and Afework Bekele, 2013a).



Figure 25: Mountain forest of Chebera-Churchura National Park

**Wildlife:** Primarily it is to be mentioned that the Chebera-Churchura National Park is one of the last retreat areas for the highly endangered African Elephant (*Loxodonta africana*) in Ethiopia (see Figure 27 ). The current IUCN African Elephant Status Report describes 634 definite counts and 920 possible numbers of African Elephant on a range of 13,000 km<sup>2</sup> in Ethiopia. Like as in entire Africa, Ethiopian elephant populations are highly endangered due to poaching for ivory (Blanc et al., 2007). The African Elephant therefore is assessed as *vulnerable* on the IUCN Red List (IUCN, 2015). In 2001, 60 individuals were investigated in Chebera-Churchura that are resident in the park throughout the year (Chago et al., 2001 cited in Blanc et al., 2007). But official staff from the national park reported 460 individuals, referring to a later investigation (Girma Timer, 2005). Current observations by staff members estimate increasing numbers of elephants. Possibly, mobile elephant populations migrate from the Omo River Valley to Chebera-Churchura, as their habitats in Omo National Park are being endangered and destroyed through dam construction and conversion in monoculture plantations (pers. communication Workneh Wonde Woju, 2015).

Chebera-Churchura has one of the highest wildlife densities in Ethiopia. Following wildlife species occur (Demeke Datiko and Afework Bekele, 2013b):

- Greater Kudu (*Tragelaphus strepsiceros*)
- Lion (*Panthera leo*)
- African Wild Dog (*Lycaon pictus*)
- Spotted Hyena (*Crocuta crocuta*)
- Hippopotamus (*Hippopotamus amphibious*)
- Black-backed Jackal (*Canis mesomelas*)
- African Buffalo (*Syncerus caffer*)
- Serval Cat (*Leptailurus serval*)
- Common Warthog (*Phacochoerus africanus*)
- Caracal (*Caracal caracal*)
- Leopard (*Panthera pardus*)
- Defassa Waterbuck (*Kobus ellipsiprymnus* ssp. *defassa*)
- Anubis Baboon (*Papio Anubis*)

**Birds:** The national park is home of around 140 bird species, of which 5 are endemic (EWNHS, 2010).

**Ecological Threats:** In times of the Kulo Konta Controlled Hunting Area, elephants were hunted in this area. But the decline of African Elephants leads to establish a national park to conserve the populations of Chebera-Churchura (EWNHS, 2010). The national park administration stated that

elephant population is stabilising nowadays. But occasionally there are conflicts of local people with elephants and buffalos entering in the villages and gardens adjacent to the park (oral informants, Chebera community). Conflicts happen due to the fact that there is a close proximity between people and wildlife since no buffer zone around the national park exists. As well conflicts occur because of predator attacks on livestock in the local villages (Demeke Datiko and Afework Bekele, 2013b). Improvement of livestock husbandry, such as herding during the day and keeping the livestock in enclosures during the night, might minimise predation risk and conflict potential in order to reduce a) economic expenses through herd losses and b) killings of wildlife by local people.

Beside the critical IUCN Red List status of the African Elephant, the status of Hippopotamus is assessed as *vulnerable*, African Wild Dog is classified as *endangered*, and Leopard is *near threatened*.



**Figure 26: Elephant dung (left), herd of African Elephant (*Loxodonta africana*) (right)**

Parts of the grasslands in the national park are used as grazing lands for livestock by local people (pers. communication Abraham Marye, 2015). As grazing species, African Buffalo depends on extensive grasslands. If grazing increases, African Buffalo would suffer further from habitat loss. Beside grassland use, the extraction of other non-timber forests products by local people, e.g. honey, spices, and wild coffee in the national park should be monitored in order to prevent overuse (EWNHS, 2010).



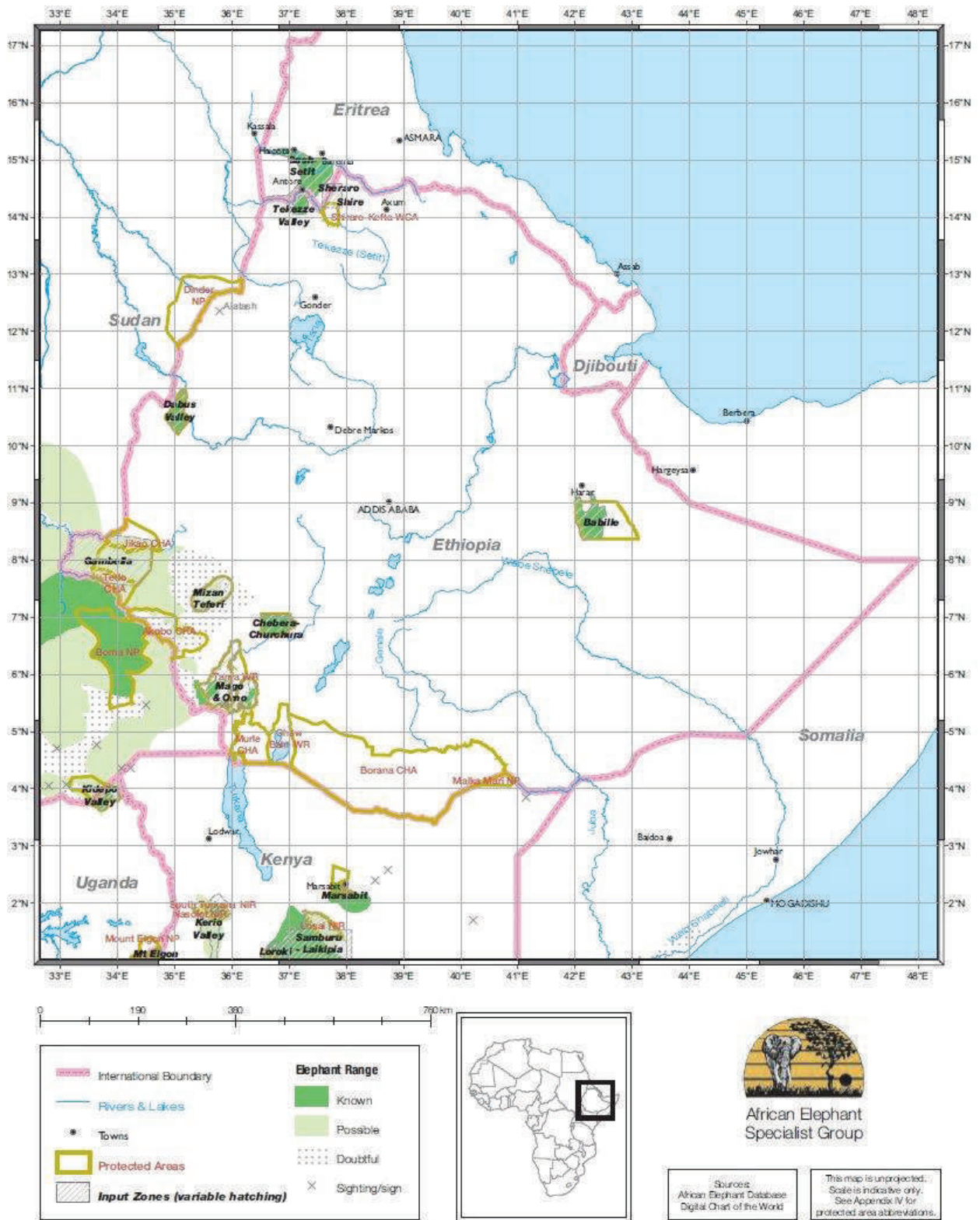


Figure 27: Range of African Elephant in Ethiopia (Blanc et al., 2007, p. 79)

## Socio-cultural Situation and Ethnographic Profile

**Introduction:** The population around the Chebera-Churchura National Park is composed of three ethnic groups, the Konta, the Dawro and the Chara. The latter are a small group living in the southern parts of Konta Special Woreda and Kafa Zone. All three groups speak languages of the North Omoto branch of the Omotic language family. They have many cultural similarities and close historical ties. Due to the remoteness of their areas, the Konta and Chara belong to the ethnographically least studied societies in Ethiopia.

Today, Protestantism has the greatest following in the area. Orthodox Christianity is the second biggest denomination. Traditional religions are still influential, especially among the Chara.

**Socio-political Systems:** The traditional socio-political organisation of the Konta, Dawro and Chara societies can be characterised as stratified chiefdoms with features of sacred kingship. Historically they were under strong influence of the Kafa and Welaytta kingdoms. The Konta, Dawro and Chara were ruled by hereditary chiefs or kings (*kawo* or *kaati*; Chara: *taati*) endowed with ritual obligations and spiritual powers. The kings were assisted by councils of ministers and lower officials. The seat of the king of Konta was on a hill near Chebera, not far from the entrance of the national park. The societies were stratified by different social status groups composed of different clans and lineages. The highest status is held by the royal lineage. The farmers make up the majority of land-owning commoners (*maalla*). Below the stratum of the agriculturist commoners are the smiths (*wogaache* or *wogaaciya*), tanners (*degella*), potters (*manna*) and, considered as the lowest, the hunter-gatherers (*manjja*). Members of the lower strata were given only land of lower quality soils. The *manjja* had no right to own land. The commoners and the royalty traditionally held slaves (*ayilliya*) captured from neighbouring ethnic groups. However, the entire region was itself an important source of slaves, for the Kafa and Jimmaa kingdoms and later the Ethiopian emperors. Especially the Chara considerably suffered from enslavement. Their polity was less centralised than the other two. After the Ethiopian conquest of the region in 1891, the Amhara established themselves as a land-holding class above the commoners (Data Dea, 2005, 2007, Bustorf, 2007, Abbink, 2003, Dubale Gebeyehu, 2012).

**Livelihood Systems:** The Konta, Dawro and Chara practice different forms of mixed agriculture and horticulture combined with animal husbandry. Variations in livelihood strategies depend mainly on the respective agro-climatic situation and not on a specific ethnic group while social status is decisive. Homesteads and gardens are mainly on the slopes. Some areas are highly productive. The USAID index categorises the areas as the 'Dawro-Konta maize and root crop livelihood zone' of the 'central midlands and lowlands' of southern Ethiopia. This implies dependence on crop production by nearly 90%, one of the highest rates in the Southern State. The selling of livestock and milk products is of major importance for income generation. Very poor households depend on members who leave the area for migrant work, e.g., during the coffee harvest in Jimmaa (USAID, 2005).

Ensete cultivation is central to all living at higher elevations. They are cultivated in gardens near the houses together with vegetables such as cabbage, potatoes, sweet potatoes, taro, pulses, as well as spices (e.g. cardamom). On the fields, behind or around the gardens, tef, barley, maize, eleusine, and sorghum are grown. Many of the crop varieties are indigenous. Cash crops are coffee, bananas, mangoes and other



fruits as well as cotton. Hoe and digging-stick are mostly used in horticulture while the oxen plough is used on the grain fields. Traditionally single trees are left standing in fields and gardens in order to give shade, fertilise the soil, mark boundaries or, formerly, as dwellings of spirits. Farmers also keep herds of cattle and small livestock. Cattles of individual owners may be herded together in common grazing areas (Data Dea, 2005, 2007, Bustorf, 2007, Abbink, 2003, Dubale Gebeyehu, 2012, personal observations).

The social group of the *manjja* traditionally lived in forest areas from forest products (honey, game, firewood collection, charcoal making etc.) and woodwork production. They are also musicians who play for payment. After the Land Reform gave them the opportunity to own land, some engaged agriculture while many preferred to continue their life in the forests. With the establishment of the national park the *manjja* people of the area had to leave the forest and abandon their traditional life style. Forest protection did not protect the people of the forest (Data Dea, 2005, 2007, Bustorf, 2007, Abbink, 2003, Dubale Gebeyehu, 2012, oral informants).

**Park and People:** Since the establishment of the Chebera-Churchura National Park is very recent, the relation between people and park is not much studied. Families in the park area (in Shaba Kella and Gembela) had to leave there hamlets and land and were compensated with land in nearby areas, especially in Delba. In the *qebelas* around the park, committees were established to regulate the use and access of the park's resources (mainly honey). Locals claim that poaching is only done by 'outsiders' crossing the region. Studies and local informants report of regular human-animal conflicts, especially with elephants and carnivores. People feel left alone by the government with these problems (Demeke Datiko and Afework Bekele, 2013b, oral informants).



Figure 28: National park administration office (left), house in Chebera Community (right)

### Conclusion and Evaluation of the Chebera-Churchura National Park as Sub-Prioritised Area for a Potential Biosphere Reserve

Chebera-Churchura National Park and its surroundings are assessed as important protected area by the authors of this study (see Figure 23). The area is not primarily recommended as potential biosphere reserve, but an integrated approach of human-nature relation is needed to ensure the important presence

of the national park also in future. This could be as well an adapted national park approach with well-developed buffer zone.

The evaluation of the area is oriented towards the criteria for the determination of potential biosphere reserve areas (see annex for detailed criteria list).

**Ecological Assessment:** Primarily, Chebera-Churchura National Park has an outstanding importance as retreat habitat for the African Elephant and as one of the last mostly undisturbed wilderness areas in Ethiopia. The continuous area of mountain forests, riverine forests and grasslands of the national park have special importance as connected ecosystems and habitats for several wildlife species that become rare in Ethiopia, i.a. Leopard, Hippopotamus and African Wild Dog.

Moreover, the rivers, perennial streams and crater lakes in the national park, i.a. Zigina River as tributary to the Omo River, are highly important for the hydrological system of the Omo catchment area.

**Socio-cultural Assessment:** The remote area surrounding the Chebera-Churchura National Park is home of three small ethnic groups, the Konta, the Dawro and the Chara. They belong to the least studied societies in Ethiopia and, due to the fast modernisation process, social, cultural and religious change, are endangered to lose part of their cultural heritage. Their traditional socio-cultural systems were fascinating examples of so-called 'African primary states', i.e. they had developed some degree of political centralisation and social complexity. The traditional economic and livelihood system of the Konta, the Dawro and the Chara shows an almost ideal case of a diversified agrarian strategy with elements of agroforestry, horticulture, ensete culture and animal husbandry. The *manija* hunter-gatherer complemented this system by using the gifts of the forest, such as honey, herbs and game. Any approach of environmental protection, be it the national park approach or a biosphere reserve approach, in the area can only be successful by closely cooperating with the local people and seeking to get their full and informed consent. Given the remoteness of the area, nature can only be protected if local people themselves want to fulfil the role of guardians of the forest and wild animals. Otherwise poachers, often acting on behalf of outsiders or foreigners, will easily intrude. The traditional agricultural knowledge is necessary to develop further a sustainable use of resources. The good will of the local population cannot only be based on their environmental 'awareness' but needs backing by concrete advantages and economic benefits through improvement of health care, education, infrastructure and sustainable eco- and culture tourism. Moreover, trans-disciplinary and participatory ecological-cultural research on solutions of human-animal conflicts and other human-environment conflicts are necessary.

**Conclusion:** Regarding the ecological and socio-cultural criteria, Chebera-Churchura National Park and its surroundings would have a high potential as biosphere reserve. However, at present the area is not necessarily to be prioritised because the population and land use pressure seems to be relatively weak. Furthermore, many problems could be solved by local reconciling mechanisms and participation of local communities in the management of the park and its surroundings.

However, it is to be mentioned that the data basis about Chebera-Churchura National Park is not sufficiently examined due to shortage of time for deeper field assessments, i.a. about stakeholders and settlement development in southern park areas.

Chebera-Churchura National Park has an outstanding importance as one of the last retreat habitats for the African Elephant in Ethiopia. As the national park has not enough buffer zone for its elephants, further expansion, protection and corridor establishment of this area has to be strongly promoted.

Therefore any further conservation initiative, be it the advancement of the national park approach through buffer zone development or a biosphere reserve approach should be established. As mentioned above, local people must be included in further protection efforts to keep the human-nature relation in balance. The authors of this study emphasise the ecological importance of Chebera-Churchura and highly recommend further investigations about the possibilities for participatory conservation.

## Asayita and Surrounding Lakes, Afar Region

### Introduction

Currently, there is no protected site that comprises the full range of the potential biosphere reserve area. However, around Asayita lie the eastern extensions of the Mille-Sardo Wildlife Reserve. The border region to Djibouti around the lakes Afambo, Gemberi, Abbe and Abhe is determined by BirdLife International as the IBA Lake Abhe Wetland System, ranging 440 km<sup>2</sup> (Birdlife, 2015e).

The area is characterised as desert landscape intermitted by rocky hills and only sparse vegetation. The lakes are surrounded by wetlands and extensive salt pans. The altitude at the lakes and on Asayita Plains ranges from 240 to 380 masl (EWNHS, 2010).

**Location:** The area of interest in which partly a potential Afar Biosphere Reserve could be proposed is located in the three eastern woredas of Zone 1 of Afar Regional State, Eli Daar (Elidar), Asayita and Afambo. The area borders to the Addis Ababa-Djibouti highway in the North, to Djibouti in the East, to Dubti Woreda in the West, and to the Somali Regional State in the South. The population of Eli Daar is 79,491, but the biosphere reserve would only concern the very south of this district. Asayita Woreda has a population of 47,210. Afambo's population is 24,129 (Census of 2007, in CSA 2008). Asayita (16,048 inhabitants) is the main urban centre in the area.



Figure 29: Camels on Asayita Plains (left), semi-desert landscape east of Asayita (right)



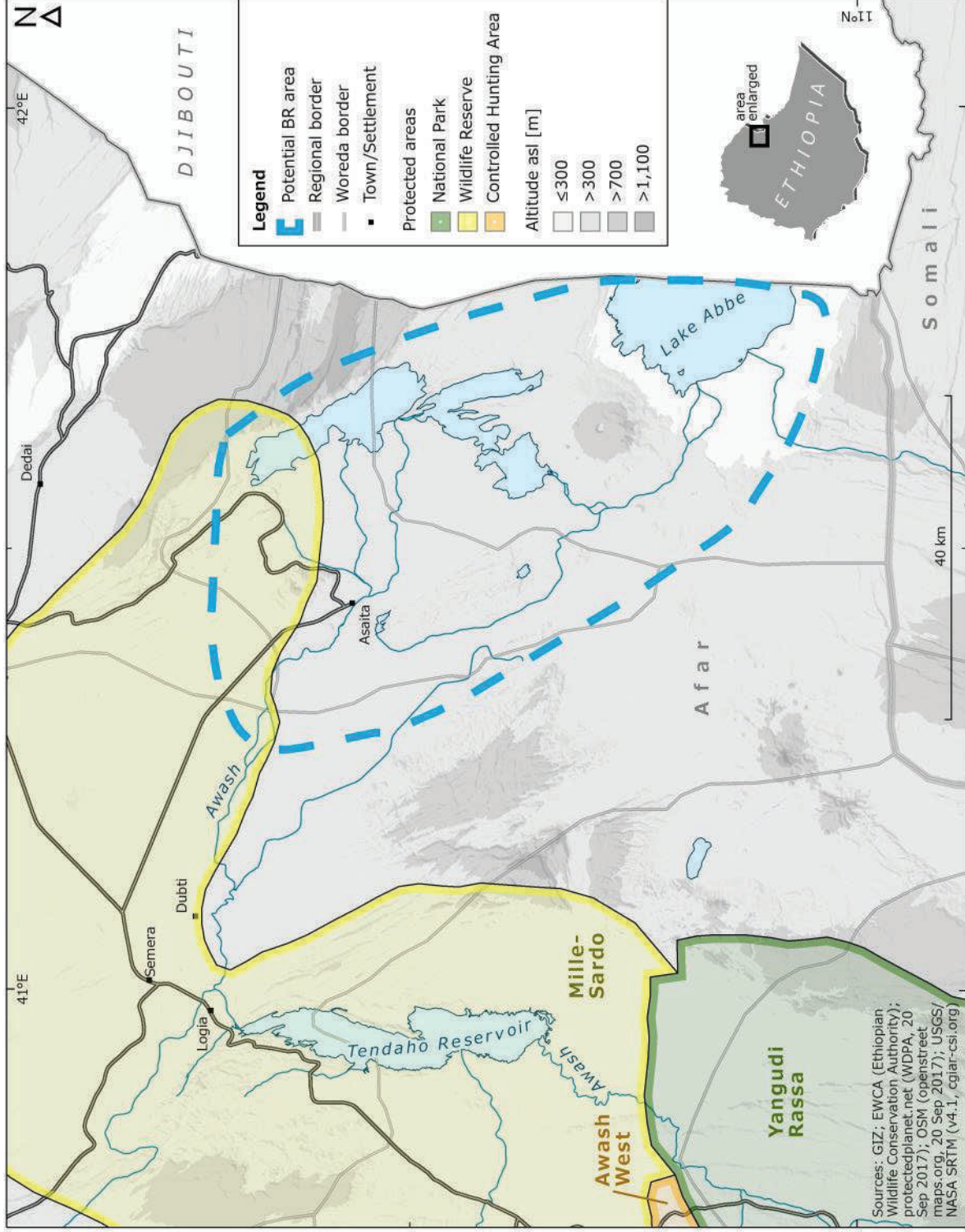


Figure 30: Potential biosphere reserve area around Asayita and Lake Abe wetland system (dashed line) (Map by S. Busse)



## Ecological Situation

**Surroundings:** The surroundings are mainly desert landscapes, sparsely populated and used by pastoralists as grazing areas. However, in Dubti district a new dam and irrigation schemes are constructed for sugar cane and cotton plantations.

**Climate:** The area lies in the *Dry Bereha* agro-ecological zone (Ritler, 2005, Azene Bekele-Tesemma, 2007). Rain occurs mainly in August, the annual rainfall averages 144 mm. The mean annual temperature is about 28.7 °C with monthly minimum and maximum of 19 and 39.6 °C respectively (Figure 31).

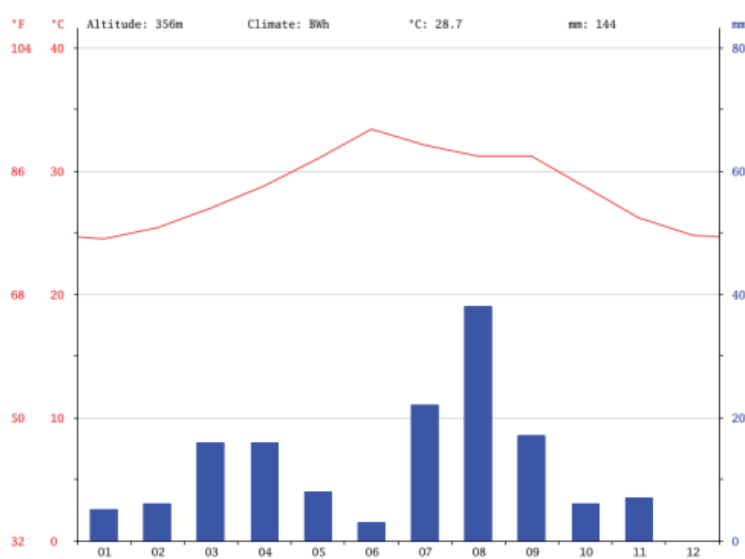


Figure 31: Climate diagram Asayita, Ethiopia (Climate-Data.Org, 2015e)

**Soils:** In general, the *Dry Bereha* agro-ecological zone is characterised by silty and sandy soils, Aridsols and Rigosols (Ritler, 2005, Azene Bekele-Tesemma, 2007).

**Vegetation and Area Structure:** The overall vegetation types in this area are classified by Friis et al. (2010) as:

- *Acacia-Commiphora woodland and bushland proper* (see Box 1)
- *Desert and semi-desert shrub land*
- *Salt lakes - open water vegetation*
- *Salt pans, saline/brackish and intermittent wetlands and salt-lake shore vegetation*

Major parts of this area are desert and semi-desert landscapes with few or any vegetation. Particularly drought tolerant plant species occur as well as bushes and trees are rather small grown. On the Asayita Plains *Salvadora persica*, *Dobera glabra* and occasionally stunted trees of *Acacia nilotica* adjacent to water pans are to be found (EWNHS, 2010).

Around the chain of the salt lakes Afambo, Abbe and Abhe salt-tolerant vegetation and wetlands occur. Lake Abhe and Lake Afambo are connected by internal flows. Lake Abhe used to cover 340 km<sup>2</sup> with surrounding salt flats of 110 km<sup>2</sup>. The mean depth is 8.6 m, although the water-level is gradually declining due to droughts and water extraction for cotton and sugar cane plantations upstream. The Awash River

enters the Lakes Abhe and Afambo on the north-western shores and is the only fresh water source of the lakes (Birdlife, 2015e). Lake Gemberi is a fresh water lake, which is bordered at its western shore by expansions of *Prosopis juliflora*. The invasive species *Prosopis juliflora* dominate a large range, creating immense problems as it occupies grazing lands of pastoralists and supersedes natural vegetation (see chapter on ecological situation of Awash National Park and the proposed Hallaydeghe-Asebot National Park). Fields of agro-pastoralists are situated around Asayita and the lakes Gemberi and Afambo (mentioned below).

**Wildlife:** The areas around Asayita and the lake systems are very important for habitat conservation of endangered wildlife species as the anthropogenic impact in the surrounding environment is increasing. Wildlife species include (EWNHS, 2010):

- Hamadryas Baboon (*Papio hamadryas*)
- Spotted Hyena (*Crocuta crocuta*)
- Speke's Gazelle (*Gazella spekei*)
- Nile Crocodile (*Crocodylus niloticus*)
- Hippopotamus (*Hippopotamus amphibius*)
- Dorcas Gazelle (*Gazella dorcas*)
- Beira (*Dorcatragus megalotis*)
- Lion (*Panthera leo*)

At Lake Gemberi a huge number of crocodiles occur, probably as there is no fishing done. In former times Wild Ass (*Equus africanus*) occurred on Asayita Plains. But due to hunting and loss of habitats, it is already locally extinct in that area and is only rarely to be found in some parts of the Danakil Depression (see chapter on ecological situation of Awash National Park and the proposed Hallaydeghe-Asebot National Park).



**Figure 32:** Nile Crocodile (*Crocodylus niloticus*) at Lake Gemberi (left), Dorcas Gazelle (*Gazella dorcas*) (right)

**Birds:** This particular area has a special ornithological importance with its high bird species diversity and its significance as resting place for migrating Palearctic bird species. Over 20,000 migrating birds and waterfowl are to be found around the lakes in spring and autumn. Of particular note are:

- White-faced Whistling Duck (*Dendrocygna viduata*)
- Little Egret (*Egretta garzetta*)
- Great White Pelican (*Pelecanus onocrotalus*)
- Basra Reed Warbler (*Acrocephalus griseldis*)

Furthermore, significant numbers of Somali-Massai Biome bird species are recorded in the area (White, 1983). On Asayita Plains Common Ostrich (*Struthio camelus*) occurs.

**Ecological Threats:** As one of the most arid places in Ethiopia, this area suffers immensely from water scarcity. The ground water level is declining continuously. Water is the most existential factor of local people's livelihood and for the survival of wildlife and birds. This is particularly important as the climate prediction for Ethiopia implies a more frequent occurrence of droughts with significant consequences for the pastoralist communities (Pantuliano and Wekesa, 2008, Viste et al., 2012).

Shortage of water is even exacerbated through the expansion of agricultural plantations. Cotton and sugar cane monocultures in Dubti district as well as the plantations of the Tendaho Sugar Factory in Asayita are irrigated by the Awash River. Water extraction from the Awash upstream, creates intensified water scarcity downstream (e.g. around Asayita and the lakes), where local people depend on sufficient water supply from the Awash as source of potable water, for small scale irrigation and for their livestock. Furthermore, the Awash River downstream is polluted from pesticides and other chemicals used in the cotton plantations and factories upstream (Afar Pastoralist Development Association, 2015). The water level and the water quality of the lakes are declining continuously which also endangers the ecosystem stability and habitats of migrating birds and waterfowl. Therefore it is highly important to consider ecological impacts and rural people's existential need for water when new plantations and irrigation project are planned, such as the Tendaho Dam.

Due to drought events, water scarcity and establishment of agricultural plantations, grazing lands of pastoralists decline in number and quality. Remaining grazing areas are used more frequently and tend to be overgrazed.

As described in the chapter on the ecological situation of Awash National Park and the proposed Hallaydeghe-Asebot National Park, the fast distributing *Prosopis juliflora* caused an irreversible displacement of the natural vegetation, loss of habitats and biodiversity (Almaz Tadesse Kebede, 2009). The immense distribution of the invasive species *Prosopis juliflora* in this area intensifies the shortage of grazing land and endangers the livelihood of local pastoralists. Dispersal is mainly done by seed eating livestock, so that grazing lands are particularly affected by the invasion.

The human impact and loss of habitat effects the status of several important species mentioned above. The IUCN Red List categorised following species as *vulnerable*: Beira, Dorcas Gazelle, Hippopotamus and Lion. Basra Reed Warbler and Speke's Gazelle are assessed as *endangered*. The Wild Ass, which is already locally extinct in this area is determined as *critically endangered* (IUCN, 2015).

## Socio-cultural Situation and Ethnographic Profile

**Introduction:** The possible biosphere reserve would be situated in the traditional area of the Afar ethnic group and the territory of the historical Sultanate of Awsa. In the towns along the major roads to Buree and Djibouti there are also Amhara, Argobba and Oromo people. The Afar speak an East Cushitic language. Islam is the religion of a large majority. Of major cultural importance in the area is the town of Asayita, the old capital of the Awsa Sultanate. Its roots go deep into history. The last dynasty of the Awsa sultans (*amóyta*) was founded in the 18<sup>th</sup> century. Awsa became tributary to the Ethiopian emperor in 1896 but could keep semi-independence until the Ethiopian revolution. Traditional irrigated agriculture is prevalent in the area since centuries, to some degree. The last sultan, Ali Mirah Hanfare, played an

important role in the economic development of his country by propagating an expansion of irrigated, and partially mechanized, agriculture on his large properties (Morin, 2003c). Today, his son plays a role as a traditional authority and mediator. Asayita lost its status as Afar capital to Samara in 1995.

**Socio-political System:** More details on the culture and socio-political system of the pastoralist section of the Afar are discussed in the chapter on the socio-cultural situation of Awash National Park and the proposed Hallaydeghe-Asebot National Park.

**Livelihood Systems:** In the area of the potential biosphere reserve most Afar practice agro-pastoralism with irrigated or rain-fed fields. While, in principle, their socio-political system is similar to that of the pastoralists, among agro-pastoralist Afar possession of land creates more social segmentation and stronger hierarchies. The northern and easternmost parts of the potential biosphere reserve are dominated by pastoralists. Here, access to pasture and water is free according to customary regulations. In the agro-pastoralist areas in Asayita and Afambo land is individually owned and demarked. Landless farmers would rent land from landowners for share cropping. Land is inherited through the patrilineage (HEA, 2015). Local development agencies complain that development activities are implemented without regard to traditional authorities and customary laws protecting the environment from overuse. The Afar pastoralists possess a profound knowledge of weather patterns and the capacity of environmental resources. Moreover, certain areas (*desso*) are traditionally reserved for times of severe drought (Afar Pastoralist Development Association, 2015).



**Figure 33: Afar woman in front of new built house (left), agro-pastoralism (right)**

Most parts of Asayita and Afambo belong to the Awsa areas of the ‘Awsa ke Gewane Agropastoral Livelihood Zone’ while the eastern parts of these districts together with Eli Daar are subsumed under the ‘Eli Daar Pastoral Livelihood Zone’. In Eli Daar the Afar pastoralists keep mainly camels, sheep and goats because the climate is not suitable for cattle. Camels are the base for economic success and social prestige. Camel milk plays an important role in the daily diet. Additional to livestock products, pastoralists consume maize, wheat and sorghum which they purchase on the market. Selling livestock at markets such as Yallo, Chiffra and, especially, Asayita town contribute most to the family’s income. Additional sources of income are selling of firewood, palm, and hand-made mats. Forms of self-employment are salt mining and salt transportation by camels (HEA, 2015). The livelihood situation of the Awsa area is characterized mainly by irrigated and rain-fed agriculture combined with rearing of cattle, sheep and goats. The main



agricultural products are maize, haricot beans, sesame, sorghum and dates. Cereals brought at the market supplement the diet. Dates production and renting out camels as animals of burden are of special importance for income generation. Both state and private farms (cotton, recently sugar cane) provide seasonal income opportunities. The population of both livelihood zones partially relies on food aid (HEA, 2015, Markakis, 2011).

**Development Problems:** Currently, agriculture is intensified and expanded further. In the Asayita area and in the neighbouring Dubti district a new dam and irrigation schemes are constructed for the plantation of sugar cane and cotton. Pure pastoralism is discouraged wherever agriculture is possible while settlement is encouraged by the government. Especially traditional dry season grazing areas along rivers get lost for the pastoralists in favour of cultivation. This leads to overuse of the remaining pasture. However, in rural areas and far from the main roads the development of infrastructure (roads, health care, education, tourism etc.) is still on a very low level. Lack of pasture and loss of herds due to animal diseases and drought in the last years led to the impoverishment of many pastoralists. They now intensify charcoal production and wood selling (Afar Pastoralist Development Association, 2015, Bradt Ethiopia Travel News, 2015).

### Conclusion and Evaluation of Asayita and Surrounding Lakes as Sub-Prioritised Area for a Potential Biosphere Reserve

The areas around Asayita and the surrounding lakes are assessed as sites worth protecting by the authors of this study (Figure 30). But it is to be mentioned that the data basis about Asayita and the surrounding lakes is not sufficiently examined primarily due to the inaccessibility of the area south of Lake Gemeri, including the lakes Afambo, Abbe and Abhe. Therefore this particular area cannot primarily be recommended as potential biosphere reserve. However, the authors of this study emphasise the ecological importance of this area and highly recommend further investigations about the possibilities for participatory conservation in order to ensure especially the vulnerable livelihoods of pastoralists.

The evaluation of the area is oriented towards the criteria for the determination of potential biosphere reserve areas (see annex for detailed criteria list).

**Ecological Assessment:** The ecological bottleneck in the first place is the water scarcity and declining water level of the lakes and the ground water. The regression of the lakes is to be studied more detailed, however the presumed impacts on local people's livelihoods and bird diversity are strong. As BirdLife International emphasises, this area is existential as resting place for 20,000 migrating birds every year. In terms of global bird species diversity, Ethiopia has a high responsibility to ensure this habitat. Besides, the Asayita Plains have been the habitat for the *critically endangered* Wild Ass. Reintroducing this species in that place would be worth striving for in order to prevent its extinction as it is displaced to marginal areas at Danakil Depression.

As mentioned above (see chapter Awash National Park and proposed Hallaydeghe-Asebot National Park), the degradation of ecosystems and grazing lands by the invasion of *Prosopis juliflora* is alarming and needs further actions.



More ecological studies have to be carried out in the remote and unknown area around the lake ecosystems, salt flats and wetlands which probably have high ecological values and scientific potential.

**Socio-cultural Assessment:** A potential Afar biosphere reserve would be located in the historical and cultural core areas of the Afar pastoralist and agro-pastoralist civilization, the territory of the Sultanate of Awsa. Moreover, the area is a zone of intensive development activities. The trade and traffic between Ethiopia and Djibouti which is passing through the area is ever increasing and brings some economic opportunities which are, however, not fully exploited yet. Along the Awash River and its tributaries irrigation schemes and damming are still expanding and, wherever possible, pure pastoralism is discouraged and limited in its mobility. Often traditional authorities and customary environmental laws against overuse of resources are ignored by external development agencies. Pastoralists face animal diseases and drought, lack of infrastructure and poverty. Important points that enable success of such an undertaking would be similar to those listed for the Awash-Hallaydeghe area).

**Conclusion:** The area of Asayita and surrounding lakes is not primarily recommended as potential biosphere reserve. Situated in a very remote area, it suffers from existential problems such as water scarcity and insecurity of local people's livelihood. As the focus of actors in the region (i.a. United Nations World Food Programme) is rather on humanitarian support than on nature conservation, the development of the biosphere reserve approach as first conservation activity might become challenging. Nevertheless, regarding the ecological and socio-cultural criteria, Asayita and surrounding lakes would have a high potential as biosphere reserve. However, it is to be mentioned that the data basis about this area is not sufficiently examined primarily due to the inaccessibility of the area south of Lake Gemeri, including the lakes Afambo, Abbe and Abhe.

As hardly any protected area is established in this area, it would not receive any protection against activities destroying habitats and endangering livelihoods of local pastoralists, for instance infrastructure development and conversion in agricultural plantations.

Possibly, the biosphere reserve approach might be the appropriate framework to create an area where traditional pasture management and habitat protection (i.a. for migrating birds, Wild Ass) can be reconciled. Potential biosphere reserve activities should focus on issues related to the lake (i.a. dynamics of water regression), extraction of ground water and sustainable pasture management. A biosphere reserve should mainly provide a framework that gives the local population the chance to participate in the planning of the future of the area.

Located in the border region to Djibouti, the area has transboundary potential if Djibouti would concretise its plans to establish a biosphere reserve around Lake Abhe (Hofmann, 2010). This would contribute to regional cooperation and to the reduction of potential water conflicts.

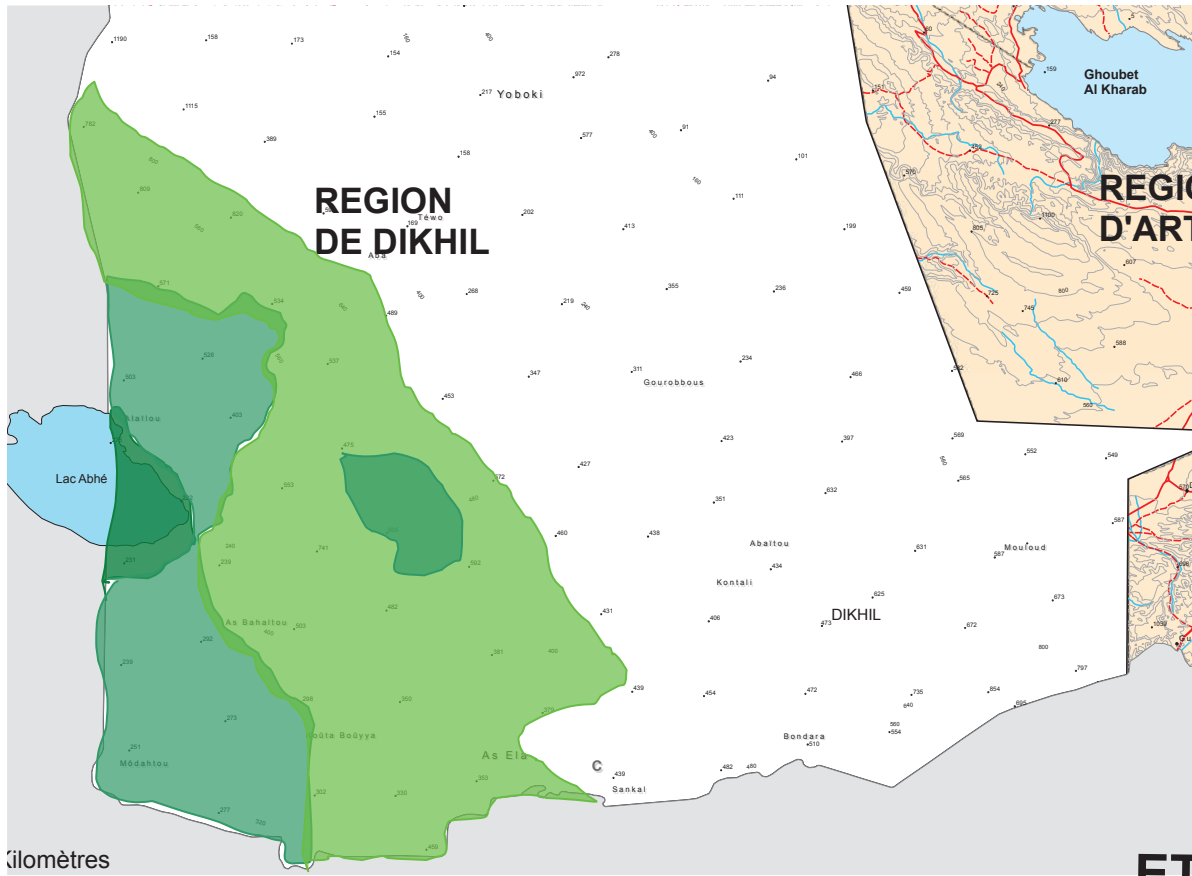


Figure 34: Proposed biosphere reserve in Djibouti (Hofmann, 2010, p. 49)

The authors of this study emphasise the socio-ecological importance of Asayita and surrounding lakes and highly recommend further investigations about the possibilities for participatory conservation.

# Low Prioritised Areas and Areas considered as not suitable as Potential Biosphere Reserves

## Low Prioritised Areas as Potential Biosphere Reserves

These areas are classified as low prioritised, according to the approach and the criteria list for potential biosphere reserves. In the following, the arguments for their classification are listed briefly.

### Simien Mountain National Park

- Afroalpine and afroalpine vegetation, dry evergreen montane forests; characteristic species *Lobelia rhynchopetalum*, *Festuca gilbertiana*, *Rosularia simensis*, *Dianthus longiglumi*, *Erica arborea*
- High threat: settlement, overgrazing, encroachment, cultivation
- High potential as biosphere reserve regarding the ecological and socio-cultural criteria → but at present the area is not necessarily to be prioritised, the focus should be on adapted buffer zone management and strengthening the national park and UNESCO-Natural World Heritage status
- Comprehensive scientific research and management support done by Swiss and Austrian development cooperation → currently, political and practical implementation of elaborated management recommendations must be applied (e.g. resettlement strategy)
- Many stakeholders involved in conservation and management process
- Probably in-depth political and financial support of the national park approach by the German development cooperation in future

### Bale Mountains National Park

- Afroalpine and sub-afroalpine vegetation, dry evergreen montane forests, bamboo forests, mires, lakes; characteristic species *Juniperus procera*, *Hagenia abyssinica*, *Hypericum revolutum*, *Erica arborea*
- High threat: overgrazing, human settlement, population growth, logging and cultivation
- High potential as biosphere reserve regarding the ecological and socio-cultural criteria (particularly the southern parts with intact Haremma forest, *Erica* belt and the village Rira) → but at present a biosphere reserve is not necessarily to be prioritised, the focus should be on adapted buffer zone management and strengthening the national park status and application for UNESCO-Natural World Heritage
- Comprehensive scientific research and management support done by Frankfurt Zoological Society → currently, political and practical implementation of elaborated management recommendations are to be applied

- Many stakeholders and financing institutions involved in conservation and management process, e.g. EWCA, OFWE, SOS Sahel/Farm Africa, Frankfurt Zoological Society, Oxford University, European Union and German development cooperation
- Probably in-depth political and financial support of the national park approach by the German development cooperation in future

### Abijata-Shala National Park

- Savannah with *Acacia*-, *Commiphora*- and *Euphorbia*-vegetation, deep crater lake (Shalla) and shallow lake (Abijata), important habitat for birds, huge pelican and flamingo colonies; characteristic species: *Acacia tortilis*, *A. seyal*, *A. senegal*, *Balanites aegyptica*
- High threat: settlement, road construction, deforestation, overgrazing
- Highly degraded national park, no priority as biosphere reserve → size of the national park should be reduced to comprise only the lakes, their shore areas and the land bridge in between in order to protect the bird habitats and some *Acacia* savannah, settled areas should be excluded

### Alatish National Park

- Deciduous forests, bamboo forests, moist savannah, swamps, open grasslands, semi-desert; characteristic species: *Combretum molle*, *C. rochetianum*, *Terminalia spp.*, *Boswellia papyrifera*
- Medium threat: low population pressure in the park, but increasing demographic pressure around the park due to on-going influx of migrants through resettlement programmes (e.g. Amhara, Tigrayans)
- At present a biosphere reserve is not necessarily to be prioritised as the population pressure is not that strong, but due to its ecological importance it is recommended to proof the suitability of a biosphere reserve later on → preventing demographic problems by increasing population pressure and potential agricultural development of larger plantations
- Transboundary potential with Dinder National Park and Biosphere Reserve in Sudan

### Maze National Park

- Deciduous forests with *Combretum-Terminalia*, *Mopane* woodlands and grass savannahs; characteristic species: *Colophospermum mopane*
- Low threat: no agriculture possible, but grazing activities, bush fire
- At present a biosphere reserve is not necessarily to be prioritised as the national park approach is suitable for this landscape

### Kafta-Shiraro National Park

- Dry evergreen montane deciduous forests with *Acacia-Commiphora* and *Combretum-Terminalia*, riverine forests
- High to medium threat: deforestation, sesame production, little gold mining activities by local people, military camps in vicinity to the national park, bush clearing by fire
- Weak data basis, the area is therefore not necessarily to be prioritised as biosphere reserve → but due to its ecological importance and endangerment of African Elephant populations it is recommended to proof the suitability of a biosphere reserve later on
- *Comment by the authors: the area was not visited due to shortage of time in the project frame*

## Areas Considered as Not Suitable as Potential Biosphere Reserves

The areas that are assessed as not suitable for current biosphere reserves development and the reasons therefore, are listed in the following:

- Gambella National Park: refugee camps of around 200,000 people (according to the United Nations Refugee Agency) in direct vicinity of the national park, unstable security and demographic situation
- Mago National Park and Omo National Park: agricultural development of large-scale plantations for sugar cane, dam construction, destruction of large parts of the national parks, political and security situation currently unstable → but support and severe protection needed due to ecological importance and endangerment of wildlife populations and the livelihood of local people
- Geraille National Park: contraband activities, low governance structure, weak management, corruption
- Yangudi-Rassa National Park: security situation unstable, severe conflicts between local groups of Isar and Afar
- Chew Bahir Wildlife Sanctuary: low governance, populations of Grevy's Zebra probably locally exterminated, overgrazing



## IV. Conclusion and Recommendations

**Political Status of Biosphere Reserves:** In Ethiopia, UNESCO-Biosphere Reserves are currently not manifested in any of the national laws at federal level. The five existing biosphere reserves are only gazetted by regulation developed by the respective regional states. Other forms of protected areas are designated regionally by regional proclamations and nationally in the ‘Wildlife Development, Conservation and Utilization Proclamation No. 541/2007’. The authors of this study highly recommend the inclusion of the biosphere reserve approach into the national laws at federal level.

This would have following advantages:

- improved financial, economic and political support and recognition of biosphere reserves
- sustainability of the biosphere reserves in terms of management, conservation and fulfilling their functions
- inclusion of biosphere reserves in the national agenda, i.a. in conservation and development strategies (e.g. National Biodiversity Strategy and Action Plan (NBSAP), CRGE and GTP)
- biosphere reserves would become focal areas concerning Ethiopia’s contribution to international biodiversity conservation agendas, e.g. CBD.

**Mandated Institutions of Nature Conservation:** Another major weakness is the presence of different institutions with mandates for nature conservation in Ethiopia. The national administrations of national parks, biosphere reserves and forest priority areas are divided among different authorities: Ethiopian Wildlife Conservation Authority (EWCA), Ministry of Science and Technology (MoST), Ministry of Environment, Forestry and Climate Change (MoEFCC) and the respective regional authorities. The approaches of national parks and biosphere reserves have to go hand in hand and should have an equal position and legitimisation. Achieving this, both could be combined in practice in order to enhance protection of biodiversity and natural resources.

Related to the prioritised areas of this study, the implementation of biosphere reserves around national parks would have several advantages:

- support conservation of national parks and their biodiversity values through buffer zones
- contribute to conserve larger areas around the national parks improving connectivity and the functioning of ecosystem services
- national park management will be embedded in sustainable regional development planning
- improve legal protection status of national parks which are to date without legal gazettelement or whose boundaries are less respected
- improve the involvement of local communities in the day-to-day management of natural resources and biodiversity
- helps to bring sustainable income to local communities through improved biodiversity conservation
- helps to model the link between sustainable development and the need for conservation.

**High Prioritised Areas as Potential Biosphere Reserves:** In this study, primarily areas around national parks were considered, due to their high ecological value and their endangerment at the same time. According to the approach and the criteria list (see annex for detailed criteria list), three high prioritised areas are determined: Borana National Park (Oromia Regional State), Nechisar National Park (Oromia and Southern Nations, Nationalities and People's Regional State) and Awash National Park and proposed Hallaydeghe-Asebot National Park (with Allideghi Wildlife Reserve; Afar Regional State).

All these areas are rich in biodiversity, including rare and endemic species and are suffering from ecological threats. This comes from anthropogenic pressure and overuse of natural resources: overgrazing, deforestation, establishment of agricultural plantations, settlements, hunting and road kills.

The areas have in common being characterised by the living of pastoralist groups. As ever before, the landscape has been influenced by their grazing traditions. Local pastoralists depend on land as natural resource for their livelihood. It is thus even more important to integrate their land use customs in biosphere reserve planning.

The approach of a biosphere reserve might be the appropriate framework to create an area where traditional pasture management and habitat protection can be brought in line. This is particularly worth striving for, as there is no biosphere reserve in Ethiopia so far that addresses the issue of pastoralism and includes pastoralist groups. Likewise, Almaz Tadesse Kebede (2009) emphasises that “the contribution of mobile pastoralism for the protection of the environment has not been well recognised and appreciated” in Ethiopia. Combining both issues in one biosphere reserve might be a promising chance to support pastoralist living.

**Medium Prioritised Areas as Potential Biosphere Reserves:** The significance reconciling pastoralism and nature conservation stands also for the area of Asayita and surrounding lakes, as this is one of the most vulnerable areas of pastoralist living. Being a potential habitat of *critical endangered* Wild Ass, it is both from ecological and from social perspective an important area to protect. Particularly since there is rather no protected area established yet.

Chebera-Churchura National Park has an outstanding importance as one of the last retreat habitats for the African Elephant in Ethiopia. As the national park has not enough buffer zone for its elephants, further expansion, protection and corridor establishment of this area has to be strongly promoted.

**Low Prioritised Areas and Areas considered as not Suitable as Potential Biosphere Reserves:** According to the approach and the criteria list, following areas are identified as low prioritised: Simien Mountain National Park, Bale Mountains National Park, Maze National Park, Abijata-Shala National Park, Alatish National Park and Kafta-Shiraro National Park. However, this does not mean that these national parks will not benefit from biosphere reserve establishment in their surroundings. If the situations on the ground are improving, priority for biosphere reserve establishment will also enhance.

Mainly due to security situation, weak protected area governance or development of large-scale agricultural plantations, the following areas are considered as less suitable for biosphere reserve development at the moment. These include, Gambella National Park, Geraille National Park, Mago National Park, Omo National Park, Yangudi-Rassa National Park and Chew Bahir Wildlife Sanctuary.

**General Recommendations:** In a country like Ethiopia, establishment of biosphere reserves is an important approach for nature conservation and sustainable development in the future. As this study explicitly followed an ecological and a social approach, it is recommended by the authors to integrate the assessments of a) valuable species, landscapes and their threats, and of b) local people's land use customs in biosphere reserve planning. The social component is particularly needed in order to ensure local people's livelihood which correlates with socio-economic stability and furthermore, to promote local acceptance for the biosphere reserve approach. Without really considering the needs of local people and having their acceptance for the biosphere reserve development, similar weaknesses from the past would occur when national parks as well as biosphere reserves were established without sufficiently integrating local perceptions.

It is recommended to evaluate the establishment process, current status and management of existing biosphere reserves in Ethiopia while performing further research on possible biosphere reserves, i.a. in terms of feasibility studies. Lessons learned and participatory experience sharing on all governance levels should take place in order to prevent weaknesses that have occurred in the past biosphere reserve development. Realising new biosphere reserves should build on the learning process and experiences of the existing ones.

## V. Bibliography

- Abbink, Jon. (2003). Cara. In: Uhlig, Siegbert, ed. *EAE* vol. 1. Wiesbaden: Harassowitz, pp.684-685.
- Abbink, Jon. (2014). Zayse and Zargulla Ethnography. In: Uhlig, Siegbert and Bausi, Alessandro, eds. *EAE* vol. 5. Wiesbaden: Harassowitz, pp.171- 173.
- Abiyot Negera Biressu. (2009). Resettlement and Local Livelihoods in Nechsar National Park, Southern Ethiopia. M.Phil. University of Tromsø: Faculty of Social Science.
- Abraham Marye. (n.d.). Official leaflet of Nechsar National Park. EWCA [Ethiopian Wildlife Conservation Authority], ed.
- Abraham Marye. (2014). Welcome To Spectacular Natural and Cultural Attractions and Source of Art, Top Fertile Land and Flourishing Arbaminch and its Vicinities. Presentation.
- Afar Pastoralist Development Association, 2015. *Challengers of Environmental Protection*. [Online] Available at: <http://www.apdaethiopia.org/Envipro.html> [Accessed 26.05.2015].
- ALERT [African Lion and Environmental Research Trust] (2015). – *ALERT - African Lion & Environmental Research Trust*. [Online] Available at: [www.lionalert.org](http://www.lionalert.org) [Accessed 25.06.15].
- Almaz Tadesse Kebede. (2009). *Sustaining the Allidegbi Grassland of Ethiopia. Influence of Pastoralism and Vegetation Change. All Graduate Theses and Dissertations, Paper 309*. Ph.D. Logan: Utah State University.
- Amborn, Hermann. (2005). Diraassa. In: Uhlig, Siegbert, ed. *EAE* vol. 2. Wiesbaden: Harassowitz, pp.168-169.
- Ambroso, Guido. (2002). Pastoral Society and Transnational Refugees: Population Movements in Somaliland and Eastern Ethiopia, 1988-2000. New Issues in Refugee Research. Working Paper No. 65. Brussels: UNHCR.
- Aramde Fetene, Kumelachew Yeshitela, Prasse, Rüdiger and Hilker, Thomas. (2014). Study of Changes in Habitat Type Distribution and Habitat Structure of Nech Sar National Park, Ethiopia. In: *Ecologia*, 4 (1), pp.1-15.
- Asebe Regassa Debelo. (2011). Contested Terrains: Conflicts Between State and Local Communities over the Management and Utilization of Nech Sar National Park, Southern Ethiopia. In: *Journal of Sustainable Development in Africa* 13, 5, pp.49-65.
- Asebe Regassa Debelo. (2012). Contesting Views on a Protected Area Conservation and Development in Ethiopia. In: *Social Sciences* 1, pp.24–46.
- Awoke Amzaye. (1985). *The Kore of Amarro*. B.A. Thesis. University of Addis Ababa: Department of History.
- Azene Bekele-Tesemma. (2007). *Useful Trees and Shrubs for Ethiopia - Identification, Propagation and Management for 17 Agroclimatic Zones*. Nairobi: RELMA in ICRAF Project.

- Bassi, Marco. (2003). Boorana [Ethnography]. In: Uhlig, Siegbert, ed. *EAE* vol. 1. Wiesbaden: Harassowitz, pp.605-607.
- Baxter, Paul T.W. (2005). Gabra [Ethnography]. In: Uhlig, Siegbert, ed. *EAE* vol. 2. Wiesbaden: Harassowitz, pp.604-606.
- Baxter, Paul T. W. (2005). Guggi. In: Uhlig, Siegbert, ed. *EAE* vol. 2. Wiesbaden: Harassowitz, pp.903-904.
- Behnke, Roy and Kerven, Carol. (2011). *Replacing Pastoralism with Irrigated Agriculture in the Awash Valley, North-Eastern Ethiopia: Counting the Costs*. Addis Ababa.
- Bikila Negesa, Bedasa Eba, Samuel Tuffa, Barecha Bayissa, Jaldesa Doyo, and Nizam Husen. (2014). Control of Bush Encroachment in Borana Zone of Southern Ethiopia: Effects of Different Control Techniques on Rangeland Vegetation and Tick Populations. In: *Pastoralism - a SpringerOpen Journal*.
- Birdlife. (2015a). *Birdlife Data Zone – Yabello Sanctuary*. [Online] Available at: <http://www.birdlife.org/datazone/sitefactsheet.php?id=6298> [Accessed 30.06.2015].
- Birdlife. (2015b). *Birdlife Data Zone – Arero Forest*. [Online] Available at: <http://www.birdlife.org/datazone/sitefactsheet.php?id=6299> [Accessed 30.06.2015].
- Birdlife. (2015c). *Birdlife Data Zone*. [Online] Available at: <http://www.birdlife.org/datazone/geomap.php?r=i&c=68> [Accessed 30.06.2015].
- Birdlife. (2015d). *Birdlife Data Zone – Awash National Park*. [Online] Available at: <http://www.birdlife.org/datazone/sitefactsheet.php?id=6262> [Accessed 30.06.2015].
- Birdlife. (2015e). *Birdlife Data Zone – Lake Abe wetland system*. [Online] Available at: <http://www.birdlife.org/datazone/sitefactsheet.php?id=6242> [Accessed 30.06.2015].
- Blanc, J., Barnes, R., Craig, G., Dublin, H., Thouless, C., Douglas-Hamilton, I. et al. (2007). African Elephant Status Report 2007: An update from the African Elephant Database. In: *Occasional Paper Series of the IUCN Species Survival Commission No. 33*, pp.276.
- Borghesio, Luca, and Giannetti, Fabio. (2005). Habitat degradation Threatens the Survival of the Ethiopian Bush Crow *Zavattariornis Stresemanni*. In: *Oryx*, 39 (1), pp.44-49.
- Borghesio, Luca, Giannetti, Fabio, Kariuki Ndang'ang'a and Anteneh Shimelis. (2004). The Present Conservation Status of Juniperus Forests in South Ethiopian Endemic Bird Area. In: *African Journal of Ecology*, 42, pp.137-143.
- Bradt Ethiopia Travel News. (2015). *Lakes Gummare, Afambo and Abbe*. [Online] Available at: <https://bradtethiopiaupdate.wordpress.com/tag/lake-afambo/> [Accessed 25.06.15].
- Bustorf, Dirk. (2007). Kullo Konta. In: Uhlig, Siegbert, ed. *EAE* vol. 3. Wiesbaden: Harassowitz, pp.449.
- Bustorf, Dirk. (2010). Oromo Religion. Uhlig, Siegbert and Bausi, Alessandro, eds. *EAE* vol. 4. Wiesbaden: Harassowitz, pp.64-65.
- Braukämper, Ulrich. (2010). Pastoralism. In: Uhlig, Siegbert and Bausi, Alessandro, eds. *EAE* vol. 4. Wiesbaden: Harassowitz, pp.121-122.



CARE INTERNATIONAL in Ethiopia and ELSE [Enhanced Livelihoods in Southern Ethiopia]. (2008). *Peace Building Conference between Borana, Guji, & Gabra Communities, December 2008, Yabello*. [Online] Available at:

[http://www.disasterriskreduction.net/fileadmin/user\\_upload/drought/docs/Peace\\_building\\_conference\\_report.pdf](http://www.disasterriskreduction.net/fileadmin/user_upload/drought/docs/Peace_building_conference_report.pdf) [Accessed 30.06.2015].

Clark, D. L. (2010). *An Introduction to the Natural History of Nech Sar National Park*. Addis Ababa: The Royal Netherlands Embassy through Ethiopian Wildlife and Natural History Society.

Climate-Data.Org. (2015a). *Klima: Yabelo – Klimadiagramm, Temperaturdiagramm, Klimatabelle – Climate-Data.Org*. [Online] Available at: <http://de.climate-data.org/location/762159/> [Accessed 30.06.2015].

Climate-Data.Org. (2015b). *Klima: Arba Minch – Klimadiagramm, Temperaturdiagramm, Klimatabelle – Climate-Data.Org*. [Online] Available at: <http://de.climate-data.org/location/3066/> [Accessed 30.06.2015].

Climate-Data.Org. (2015c). *Klima: Awash – Klimadiagramm, Temperaturdiagramm, Klimatabelle – Climate-Data.Org*. [Online] Available at: <http://de.climate-data.org/location/31659/> [Accessed 30.06.2015].

Climate-Data.Org. (2015d). *Klima: Amaya – Klimadiagramm, Temperaturdiagramm, Klimatabelle – Climate-Data.Org*. [Online] Available at: <http://de.climate-data.org/location/765705/> [Accessed 30.06.2015].

Climate-Data.Org. (2015e). *Klima: Asaita – Klimadiagramm, Temperaturdiagramm, Klimatabelle – Climate-Data.Org*. [Online] Available at: <http://de.climate-data.org/location/32102/> [Accessed 30.06.2015].

Coppock, D. Layne (1994). *The Borana Plateau of Southern Ethiopia: Synthesis of Pastoral Research, Development and Change, 1980-91*. Addis Ababa: International Livestock Centre for Africa.

CSA [Central Statistical Agency]. (2008). *Summary and Statistical Report of the 2007 Population and Housing Census*. Addis Ababa: Population Census Commission.

Data Dea. (2005). Dawro. In: Uhlig, Siegbert, ed. *EAE* vol. 2. Wiesbaden: Harassowitz, pp.114-115.

Data Dea. (2007). Konta. In: Uhlig, Siegbert, ed. *EAE* vol. 3. Wiesbaden: Harassowitz, pp.492.

Debela Goshu Amante. (2014). *Traditional Camel Management as an Adaptation Strategy to Ecological Changes: the Case of Karrayyuu Oromo of Ethiopia*. M.A. Thesis. Tromsø: The Arctic University of Norway: Faculty of Humanities.

Demeke Datiko and Afework Bekele. (2013a). Species Composition and Abundance of Small Mammals in Chebera-Churchura National Park, Ethiopia. In: *Journal of Ecology and The Natural Environment*, 5 (6), pp.95-102.

Demeke Datiko and Afework Bekele. (2013b). Conservation challenge: Human-carnivore Conflict in Chebera Churchura National Park, Ethiopia. In: *Greener Journal of Biological Sciences*, 3 (3), pp.108-115.

Dubale Gebeyhu. (2012). *Social Hierarchy, Status, and Life of the Manas in Dawuro, South-west Ethiopia*. Hawassa.

EIB [Ethiopian Institute of Biodiversity Conservation]. (2005). *National Biodiversity Strategy and Action Plan (NBSAP)*. Addis Ababa.

- EWCA [Ethiopian Wildlife Conservation Authority]. (n.d.). Awash National Park, Ethiopia [Official information brochure].
- EWNHS [Ethiopian Wildlife and Natural History Society]. (2010). *A Glimpse at Biodiversity Hotspots of Ethiopia: The Essential Directory for Environment and Development*. Yilma D. Abebe, ed. Addis Ababa.
- Fanuel Kebede, Afework Bekele, Patricia D. Moehlman, Paul H. Evangelista. (2012). Endangered Grevy's Zebra in the Alledeghi Wildlife Reserve, Ethiopia: Species Distribution Modeling for the Determination of Optimum Habitat. In: *Endangered Species Research* (17), pp.237–244.
- Flood, Glynn. (1975). Nomadism & Its Future: The 'Afar. In: *RAIN [Royal Anthropological Institute of Great Britain and Ireland]* (6), pp. 5.
- Franks, Phil, Abdurahiman Kubsa and Million Gebreyes. (2003.) *Awash Conservation and Development Project Phase II Mid Term Evaluation Report Prepared by: Final Draft*. [Online] Available at: <http://www.norad.no/globalassets/import-2162015-80434-am/www.norad.no-ny/filarkiv/ngo-evaluations/awash-conservation-and-development-project-phase-ii-mid-term-evaluation.pdf> [Accessed 26.06.2015].
- Freeman, Dena. (2005). Dokko. In: Uhlig, Siegbert, ed. *EAE* vol. 2. Wiesbaden: Harassowitz, pp.187-188.
- Friis, Ib, Sebsebe Demissew and van Breugel, Paulo. (2010). *Atlas of the Potential Vegetation of Ethiopia*. Copenhagen: The Royal Danish Academy of Sciences and Letters.
- Gascon, Alain. (2007). Mätähara. In: Uhlig, Siegbert, ed. *EAE* vol. 3. Wiesbaden: Harassowitz, pp.859-860.
- Gascon, Alain. (2003). Awaš. In: Uhlig, Siegbert, ed. *EAE* vol. 1. Wiesbaden: Harassowitz, pp.400-401.
- Gatzweiler, F. W. (2005). Institutionalising Biodiversity Conservation - The Case of Ethiopian Coffee Forests. In: *Conservation and Society* (3.1), pp. 201-223.
- Girma Kelboro and Till Stellmacher. (2012). Contesting the National Park Theorem? Governance and Land Use in Nech Sar National Park, Ethiopia. ZEF Working Paper Series, Working Paper 104. University of Bonn: Department of Political and Cultural Change, Center for Development Research.
- Girma Kelboro, Till Stellmacher and Volker Hoffmann. (2013). *Urban Needs and Protected Areas: Interfaces between Arba Minch Town and Nech Sar National Park in Southern Ethiopia*. Tropentag, September 17-19, 2013. Agricultural Development within the Rural-urban Continuum. Stuttgart-Hohenheim.
- Girma Timer. 2005. *Diversity, Abundance, Distribution and Habitat Association of Large Mammals in the Chebera Churchura National Park, Ethiopia*. M. Sc. Thesis, Addis Ababa University, Addis Ababa.
- Girum G. Alemu. (n.d.). *Vertical and Horizontal Dimensions in the Governance of Adaptation: Interactions between Agro-pastoralists and the State in the Ethiopian Dry Lands*. [Online] Available at: <http://www.adaptgov.com/wp-content/uploads/2012/10/Adaptation-Governance-Alemu-Müller-Mahn-1.pdf> [Accessed 26.06.2015].
- Haberland, Eike. (1963). *Galla Süd-Äthiopiens*. Stuttgart: W. Kohlhammer Verlag.

- Helland, Johan. (1982). Social Organization and Water Control among the Borana. In: *Development and Change* 13, pp.239–58.
- HEA Website [Household Economy Approach and Cost of the Diet]. *Afar Livelihood Zones. Eli Dare Livelihood Zone (LZ4)*. [Online] Available at: <http://www.heawebsite.org/download/file/fid/293> [Accessed 21.05.2015].
- Herskovits, Melville J. (1926). The Cattle Complex in East Africa. In: *American Anthropologist*, New Series, 28 (4), pp. 633-664.
- Höhne, Markus. (2010). Somali Ethnography. In: Uhlig, Siegbert and Bausi, Alessandro, eds. *EAE* vol. 4. Wiesbaden: Harassowitz, pp. 702-705.
- Hofmann, Martin. (2010). Programme Homme et Biosphère (MaB) de l'UNESCO à Djibouti - Analyse, Stratégie et Plan d'Action (draft). Paris: UNESCO.
- IUCN [International Union for Conservation of Nature]. (2015). *The IUCN Red List of Threatened Species*. [Online] Available at: [www.iucnredlist.org](http://www.iucnredlist.org) [Accessed 12.06.2015].
- James, Constantine and Lafforgue, Eric. (n.d.). *Gadaa, Africa's Top-secret Ceremony*. [Online] Available at: <http://ericlafforgue.com/wp-content/uploads/Karrayyu-Gada.pdf> [Accessed 01.06.2015].
- Kassa Negussie Getachew. (2001). *Among the Pastoral 'Afar in Ethiopia: Tradition, Continuity and Socio-economic Change*. Addis Ababa: International Books & OSSREA.
- Landinfo. Country of Origin Information Centre. (22.07.2011). *Report. Somalia: Language Situation and Dialects*. [Online] Available at [http://www.landinfo.no/asset/1800/1/1800\\_1.pdf](http://www.landinfo.no/asset/1800/1/1800_1.pdf) [Accessed 28.04.2015].
- Leus, Ton. (1995). *Borana Cultural Dictionary. A Borana Book for the Study of Language and Culture*. Schijndel.
- Liliehalm, R. J., Leader-Williams, N., Mekbeb E. Tessema and Zelealem T. Ashefani. (2008). Community Attitudes towards Wildlife Conservation in Ethiopia. In: *Rethinking Protected Areas in a Changing World: Proceedings of the 207 GWS Biennial Conference on Parks, Protected Areas, and Cultural Sites*, pp.287-292.
- Markakis, John. (2011). *Ethiopia. The Last Two Frontiers*. London: James Currey.
- Mehring, Marion & Stoll-Kleemann, Susanne. (2010). Principle and practice of the buffer zone in biosphere reserves: from global to local – general perspective from managers versus local perspective from villagers in Central Sulawesi, Indonesia. In: Tschardt et al. (Eds): *Tropical rainforests and agroforests under global change*. Springer Publication, Berlin, 413-429.
- MoARD [Ministry of Agriculture and Rural Development]. (2010). *Ethiopia's Agricultural Sector Policy and Investment Framework 2010-2020*. Addis Ababa.
- Morin, Didier. (2003). Afar. In: Uhlig, Siegbert, ed. *EAE* vol. 1. Wiesbaden: Harassowitz, pp.115-119.
- Morin, Didier. (2003). Asayta. In: Uhlig, Siegbert, ed. *EAE* vol. 1. Wiesbaden: Harassowitz, pp.363.
- Morin, Didier. (2003). Awsa. In: Uhlig, Siegbert, ed. *EAE* vol. 1. Wiesbaden: Harassowitz, pp.406-407.
- Morin, Didier and Getachew Kassa. (2003). 'Adohyammára and 'Asahyammára. In: Uhlig, Siegbert, ed. *EAE* vol. 1. Wiesbaden: Harassowitz, pp.103-104.

- Morin, Didier. (2004). *Dictionnaire historique 'Afar* (1288-1982). Paris: Karthala.
- Morin, Didier. (2007). 'Issa. In: Uhlig, Siegbert, ed. *EAE* vol. 3. Wiesbaden: Harassowitz, pp.218-219.
- Morin, Didier. (2010). Ugaas. In: Uhlig, Siegbert and Bausi, Alessandro, eds. *EAE* vol. 4. Wiesbaden: Harassowitz, pp.1015-1016.
- Morin, Didier. (1996). Afar Praise Poetry: Orowwah. In: *African Languages and Cultures*. Supplement 3, *Voice and Power: The Culture of Language in North-East Africa. Essays in Honour of B. W. Andrzejewski*, pp.269-274. [Online] Available at: <http://www.jstor.org/stable/586667> [Accessed 29.04.2015].
- Mu'uz Gidey. (2009). *The Issa-'Afar Conflict in the Post-1991 Ethiopia*. M.A. Thesis. Addis Ababa University: School of Graduate Studies, Institute for Peace and Security Studies.
- OFWE [Oromia Forest and Wildlife Enterprise]. (n.d.). Borana National Park. Official information brochure.
- Pantuliano, Sara and Mike Wekesa. (2008). *Improving Drought Response in Pastoral Areas of Ethiopia*. London: Humanitarian Policy Group; Overseas Development Institute.
- Poissonnier, Nicole. (2003a). Bayso Ethnography. In: Uhlig, Siegbert, ed. *EAE* vol. 1. Wiesbaden: Harassowitz, pp.509-510.
- Poissonnier, Nicole. (2003b). Harro Ethnography. In: Uhlig, Siegbert, ed. *EAE* vol. 1. Wiesbaden: Harassowitz, pp.1038-1039.
- Poissonnier, Nicole. (2005). Gidicco. In: Uhlig, Siegbert, ed. *EAE* vol. 2. Wiesbaden: Harassowitz, p.790.
- Reta Regassa. (2010). *Distribution, Population Status and Diurnal Activity Pattern of Burchell's Zebra (*Equus burchelli*, Gray, 1824) in Yabello Wildlife Sanctuary, Southern Ethiopia*. M.Sc. Thesis. Addis Ababa: University School of Graduate Studies.
- Samson Leta and Frehiwot Mesele. (2014). Spatial Analysis of Cattle and Shoa Population in Ethiopia: Growth Trend, Distribution and Market Access. In: *SpringerPlus*, 3 (1), p.310.
- Samuel Tefera Alemu. (n.d.). Enclosing the commons: Coping strategy to socio-ecological challenges by Ethiopian pastoralists. Kyoto University.
- Schütt, Brigitta, Förch, Gerd, Seleshi Bekele and Thiemann, Stefan. (2002). Modern Water Level and Sediment Accumulation Changes of Lake Abaya, Southern Ethiopia - A case Study from the Northern Lake Area. In: *Sustainable Management of Headwater Resources, Research from Africa and India*.
- Skinner, Djihan. (2000). *Rangeland Management for Improved Pastoralist Livelihood: the Borana of Souther Ethiopia*. M.A. Thesis. Oxford Brookes University.
- Smidt, Wolbert. (2010). Salt. In: Uhlig, Siegbert and Bausi, Alessandro, eds. *EAE* vol. 4. Wiesbaden: Harassowitz, pp.500-503
- Solomon Belay, Aklilu Amsalu and Eyuaem Abebe. (2012). Awash National Park, Ethiopia: Use Policy, Ethnic Conflict and Sustainable Resources Conservation in the Context of Decentralization. In: *African Journal of Ecology* (51.1), pp.122-129.

- SOS Sahel Ethiopia. (2015). [Online] Available at: [www.sossahel.org.et](http://www.sossahel.org.et) [Accessed 25.06.15].
- Straube, Helmut. (1963). *Westkuschitische Völker Süd-Äthiopiens*. Stuttgart: W. Kohlhammer Verlag, pp.215-219.
- Tigist Kebede Feyissa. (2014). *Conflicts among Pastoralists in the Borana Area of Southern Ethiopia: the Case of Borana and Garri*. Master Thesis. University of Tromsø.
- UNDP [United Nations Development Programme]. (2013). *Human Development Report*. New York: UNDP.
- UNESCO [United Nations Educational, Scientific and Cultural Organization]. (1996). *Biosphere Reserves: The Seville Strategy and the Statutory Framework of the World Network*. Paris: UNESCO.
- USAID [United States Agency for International Development], ed. (2005). *Ethiopia Southern Nations, Nationalities and People's Region (SNNPR): Overview of Livelihood Profiles. SNNPR Follow-On to Regional Livelihoods Baseline Study*. [Online] Available at: [http://pdf.usaid.gov/pdf\\_docs/pnadi867.pdf](http://pdf.usaid.gov/pdf_docs/pnadi867.pdf) [Accessed 25.06.15].
- Viste, Ellen, Diriba Korecha and Sorteberg, Asgeir. (2013). Recent Drought and Precipitation Tendencies in Ethiopia. In: *Theoretical and Applied Climatology*, 112 (3-4), pp.535-551.
- Watt, A. et al. (2005). Birds of the Yabello Sanctuary, Southern Ethiopia. In: *Project Yabello 2005: Effect of Habitat Alteration on Ethiopian Endemic Birds. A Joint Expedition to Southern Ethiopia by the University of Glasgow and the Ethiopian Wildlife and Natural History Society*.
- White, F. (1983). Somali-Massai Regional Center of Endemism. *The Vegetation of Africa, a Descriptive Memoir to Accompany the UNESCO/AETFAT/UNSO Vegetation Map of Africa (3 Plates, Northwestern Africa, Northeastern Africa, and Southern Africa, 1:5,000,000)*. Paris: UNESCO.
- Wolde Gossa Tadesse. (2003). Arba Menc. In: Uhlig, Siegbert, ed. *EAE* vol. 1. Wiesbaden: Harassowitz, pp.316-317.
- Wolde Gossa Tadesse. (2005a). Dorze. In: Uhlig, Siegbert, ed. vol. 2. Wiesbaden: Harassowitz, pp.196-197.
- Wolde Gossa Tadesse. (2005b). Gamo Ethnography. In: Uhlig, Siegbert, ed. *EAE* vol. 2. Wiesbaden: Harassowitz, pp.678-680.
- Wolde Gossa Tadesse. (2005c). Gamo Gofa. In: Uhlig, Siegbert, ed. *EAE* vol. 2. Wiesbaden: Harassowitz, pp.680-681.
- Wolde Gossa Tadesse. (2010). Ocollo. In: Uhlig, Siegbert and Bausi, Alessandro, eds. *EAE* vol. 4. Wiesbaden: Harassowitz, pp.6.
- Zeraye Mehari Haile. (2008). *Invasion of Prosopis juliflora (SW.) DC and Rural Livelihoods. The Case of 'Afar Pastoralists at Middle Awash Area of Ethiopia*. M.Sc. Akershus: Norwegian University of Life Sciences: Department of International Environmental and Development Studies.
- Zur Heide, Friedrich et al. (2012). *Feasibility Study for a Lake Tana Biosphere Reserve, Ethiopia*. Bonn: BfN [Bundesamt für Naturschutz].



## Interviews and Personal Communication

Abraham Marye. (17.03.2015). Chief park warden Nechsar National Park. Personal communication. Arba Minch, Ethiopia.

Boru Shana. M.A. Social Anthropology. Personal communication. Addis Ababa, Ethiopia.

Chebera community, oral informants. (20.03.2015). Personal communication. Chebera, Ethiopia.

Dereje Elias. (17.03.2015). Arba Minch University. Personal communication. Arba Minch, Ethiopia.

Focus Group Discussion with five members of the Department of Social Anthropology. (03.12.2014). Personal communication. Arba Minch University, Ethiopia.

Jaatanii Diidaa Haroo. M.A. Urban Management, author of a book on Borana customs (*Jaanaa. Haaromsa Aadaa fi Seenaa Booranaa*. Kitaaba Duraa V-I, Finfinnee, Oromiya 2014). Personal communication. Yabello, Ethiopia.

Mahamouda Ahmed Gaas. (12.12.2014). State Minister of MoST [Ministry of Science and Technology]. Personal communication. Addis Ababa, Ethiopia.

Nechsar National Park Administration. (17.03.2015). Personal communication. Nechsar National Park, Ethiopia.

Nugusie Wata. (14.03.2015). Chief park warden Borana National Park. Personal communication. Yabello, Ethiopia.

Oba-Smidt. Ph.D. Social Anthropology, expert in Borana ethnohistory. Personal communication. Chikage, Yabello and Mekelle, Ethiopia.

Saleh Seid. (17.03.2015). M.A. Culture and Environment in Africa. Arba Minch University, Personal communication. Arba Minch, Ethiopia.

Seid. (10.12.2014). Park warden Allideghi Wildlife Reserve. Personal communication. Allideghi Wildlife Reserve, Ethiopia.

Shiferaw Mensistie. (10.12.2014). Park warden Awash National Park. Personal communication. Awash National Park, Ethiopia.

Siege, Ludwig. (09.12.2014). GIZ [Deutsche Gesellschaft für Internationale Zusammenarbeit]-IS [International Service]. EWCA, Project "Sustainable Development of the Protected Area System of Ethiopia" (SDPASE). Personal communication. Allideghi Wildlife Reserve, Ethiopia.

Workneh Wonde Woju. (20.03.2015). Park warden Chebera-Churchura National Park. Personal communication. Chebera-Churchura National Park, Ethiopia.

## VI. Annex

### Criteria List for Potential Biosphere Reserves

Criteria	Aspects
<b>Ecological and Socio-cultural Situation</b>	
Ecosystem, habitat and genetic biodiversity	<ul style="list-style-type: none"> <li>– Existence of protected areas (conservation measures, staff, money, patrols, donors etc.)</li> <li>– Existence of internationally recognized conservation areas/objects (e. g. World Heritage Sites, Ramsar Sites, IBA)</li> <li>– Ratification of global conservation conventions (e.g. CBD)</li> <li>– Biodiversity data (IUCN Red List species, endemics)</li> <li>– Traditional landscapes, traditional used plant species and crop varieties</li> </ul>
Ecological threats	<ul style="list-style-type: none"> <li>– Degree of biodiversity loss, decrease of population sizes and species numbers</li> <li>– Degree of fragmentation and habitat loss</li> <li>– Impact of climate change</li> <li>– Infrastructure/industrial development plans, governmental/private investment programmes for the target region</li> <li>– Degree of human intervention/influence</li> </ul>
Socio-cultural situation	<ul style="list-style-type: none"> <li>– Ethnic composition</li> <li>– Languages (e. g. dwindling languages &lt; 1 Mio speakers)</li> <li>– Particular historical cultural heritage</li> <li>– Living traditions and techniques</li> <li>– Traditional land use (e. g. crop varieties, medicinal plants)</li> <li>– Traditional relation between culture and nature</li> <li>– Household composition and average</li> <li>– Income structure (incl. gender aspects)</li> <li>– Socio-economics of land use</li> <li>– Education</li> <li>– Population density</li> <li>– Tenure, land rights</li> <li>– Healthcare provision</li> </ul>
<b>Economic Situation</b>	
Tourism/touristic development	<ul style="list-style-type: none"> <li>– Overall tourism situation, offers and strategy of the region</li> <li>– Indication and potential for ecotourism (interesting sites of natural and cultural importance, guidance by associations/protected area administration)</li> <li>– Infrastructure, accessibility</li> </ul>
Land use	<ul style="list-style-type: none"> <li>– Current (characteristic) land use, agriculture/livestock, forestry</li> <li>– Existence of land management and regional plans (regional and land use planning)</li> <li>– Political engagement in sustainable rural development</li> </ul>
Innovative character of the region	<ul style="list-style-type: none"> <li>– Planned or existing innovative economic projects in accordance with the biosphere reserve concept (sustainable development)</li> <li>– Potential cooperation partners</li> </ul>
Economic composition and infrastructure	<ul style="list-style-type: none"> <li>– Industry and business sector composition</li> <li>– Local/regional production schemes and value chains</li> <li>– Water and energy supply and provision</li> </ul>

Science and Monitoring	
Science	<ul style="list-style-type: none"> <li>– Scientific institutions (governmental/non-governmental)</li> <li>– (planned) implementation of research projects and applied science</li> <li>– National and international science cooperation</li> </ul>
Civil Society and Networks	
Civil society and NGOs	<ul style="list-style-type: none"> <li>– NGO engagement and implemented/planned projects</li> <li>– Potential cooperation partners</li> <li>– Population structure (social capital)</li> <li>– Commitment of civil society and organisation in local NGOs/groups/associations</li> </ul>
Networks, participation and communication platforms	<ul style="list-style-type: none"> <li>– Structures of information and participation of local population by NGOs/groups/governmental authorities</li> <li>– Networks and communication platforms</li> </ul>
Legal basis and Finance	
Legal basis	<ul style="list-style-type: none"> <li>– Anchoring of biosphere reserve principles and zonation categories (core and buffer zone) in national law</li> <li>– Spatial legal exclusions (e. g. military areas, border areas)</li> </ul>
Administration units	<ul style="list-style-type: none"> <li>– Number and size of administrative units (municipalities, provinces, states) and settlements</li> </ul>
Political support	<ul style="list-style-type: none"> <li>– Political support and engagement for the development of a biosphere reserve in the area</li> <li>– Financial support by governmental authorities for the development of a BR</li> </ul>
International attention/appreciation	<ul style="list-style-type: none"> <li>– International donor engagement in the region</li> </ul>
Other	
Security situation	<ul style="list-style-type: none"> <li>– Safe accessibility and living conditions in the area</li> </ul>
Transboundary potential	<ul style="list-style-type: none"> <li>– Possibilities for protected area cooperation with bordering countries</li> </ul>







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