Chapter 29
Establishment of the Lake Tana Biosphere Reserve within the UNESCO World Network of Biosphere Reserves

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Abstract In June 2015, the Lake Tana Biosphere Reserve was officially nominated as a new addition to the World Network of Biosphere Reserves under the UNESCO Man and the Biosphere program (UNESCO 1971). This official recognition of Lake Tana and its immediate surroundings as a UNESCO Biosphere Reserve was the culmination to date of a process which had started many years previously. This chapter describes why a Lake Tana Biosphere Reserve was proposed, the UNESCO Biosphere Reserve approach, the geographic description of the Lake Tana Biosphere Reserve, and why a biosphere reserve is a good solution for the Lake Tana Region. It explains the process followed to prepare the Lake Tana region to become a UNESCO Biosphere Reserve, including stakeholder contributions to the application/nomination process, vision and goals of the Lake Tana Biosphere Reserve, and its zonation. Finally, it discusses what will be needed for the successful management of the Lake Tana Biosphere Reserve, including a description of the Reserve management structure and the challenges faced in fulfilling the BR mandate of integration and networking.

Keywords Ethiopian biosphere reserve · Multi-stakeholder governance structure · Participatory biosphere reserve development · Multi-scale management framework · Biosphere reserve zonation

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29.1 Introduction

In June 2015, the Lake Tana Biosphere Reserve was officially nominated as a new addition to the World Network of Biosphere Reserves under the UNESCO Man and the Biosphere program (UNESCO 1971). This official recognition of Lake Tana and its immediate surroundings as a UNESCO Biosphere Reserve was the culmination to date of a process which had started many years previously. Concerned individuals, public institutions, government representatives, scientists and NGOs joined forces over their concern about the evident environmental decline and deterioration of the basis for local livelihoods and future prosperity of one of Ethiopia's most important cultural and natural landscapes—the Lake Tana region.[1]

The idea to make the Lake Tana region a biosphere reserve (BR) was already born in 2005, when a group of regional experts from various disciplines (environmental protection, land management, fisheries and tourism) concluded in a regional workshop that a BR would be the best tool to address the already then existing severe environmental threats (zur Heide 2012). In 2006, the Regional Environmental Protection, Land Administration and Use Authority (later BoEPLAU) delivered a study about "Lake Tana and its Environs: Conservation, Utilization, Development and Threats". In it, a zonation model, including seasonal closures around river mouths and wetlands, was sketched out. The Bahir Dar Abay (Blue Nile) River Millennium Park was established in 2008 by the ANRS government as a category IV IUCN protected area. It stretches from the outlet of the Blue Nile to the Tis Abay waterfalls, covering an area of 4729 ha. In 2009 the Bureau of Culture, Tourism and Parks Development of ANRS finalized a study on the Protected Area Potential Assessment in and around Lake Tana. In this study, the possibility of establishing a Biosphere Reserve was again considered a good way forward as a framework to integrate human development with conservation for the Lake Tana region.

Concurrent with these regional governmental initiatives, the first two Ethiopian biosphere reserves were being prepared for nomination. The successful nomination of Kafa and Yayu forest biosphere reserves in 2010 was followed by negotiations between the Ministry of Science and Technology, UNESCO and conservation partners. The common understanding that emanated from these negotiations, laid out in an MOU, was to establish the biosphere reserve approach in other suitable locations in Ethiopia to tackle some of the most pressing problems of ecological degradation and development. Lake Tana was subsequently identified as the most suitable and urgent site for a next Ethiopian biosphere reserve.

[1]"Lake Tana Region" is a term differently cited in literature. It has no fixed boundaries. Lake Tana Region is a part of Lake Tana watershed and includes the lake as well as areas with strong ecological, cultural and socio-economic linkages to the lake. This is the sense in which I use the term "Lake Tana Region" in this chapter. Data provided in studies sometimes refer to the watershed, sometimes to the region. Only little data specifically for the area of the Lake Tana Biosphere Reserve exist to date.

In 2012, the Nature and Biodiversity Conservation Union (NABU), a German-based NGO, started the implementation of the project "For People and Nature—Establishment of a UNESCO Biosphere Reserve at Lake Tana, Ethiopia" through its Ethiopian sister organization NABU Ethiopia. The project was funded by the Ministry for Technical Cooperation (BMZ), Germany, and NABU, and gets scientific support from the Michael Succow Foundation. The ANRS government, represented by five signatory Bureaus including BoCTPD and BoEPLAU, adopted the project and process as part of its strategy for a sustainable future of the region and facilitated the submission of the BR application to UNESCO in September 2014 through the federal Ministry of Science and Technology.

In this chapter, I describe the process that led to this nomination. I will trace how the different stakeholders came together, why a Biosphere Reserve in line with the UNESCO criteria is considered an appropriate management approach for the protection and development of Lake Tana and its environs, and what the requirements are for a sustainable management and development of the Lake Tana Biosphere Reserve.

29.2 Why Was a Lake Tana Biosphere Reserve Proposed?

29.2.1 The UNESCO Biosphere Reserves Approach

Biosphere reserves are sites to demonstrate innovative approaches to living and working in harmony with nature. One of the primary objectives of BRs is to achieve a sustainable balance between conserving biological diversity, promoting economic development, and maintaining associated cultural values. BRs are also seen as learning sites for regional scale sustainable development, and therefore science, learning and networking play a key role in biosphere reserves. Correspondingly, the three main functions to be fulfilled by BRs are conservation, development and logistic support function (UNESCO MAB Programme). In June 2015, 20 new sites, including the Lake Tana Biosphere Reserve, were recognized and added to this World Network, making it a total of 651 sites in 120 countries named Biosphere Reserves by UNESCO's Man and the Biosphere (MAB) Programme in 2015.

Contrary to still prevailing misconceptions, biosphere reserves are thus not exclusive nature "reserves", as the name may suggest. They are regional models for sustainable (human) development in which biodiversity and ecosystems conservation is a cross-cutting and cross-sectorial issue. It is based on the notion that for any sustainable social and economic development, ecosystem integrity and its capacity to provide ecosystem services are a prerequisite (zur Heide 2012).

In the light of the current debate on the Green Economy to harmonize economic activities with the ecosystem´s long-term capacity to provide resources, biosphere reserves can also be considered to be *Model Regions for a Green Economy* (GIZ 2011). The Green Economy concept also aims at harnessing the potential to

generate economic opportunities from biosphere reserves in the primary, secondary and tertiary sector, through e.g. ecotourism and economizing various ecosystem services that derive from biodiversity conservation.

Provided that an area fulfils some baseline biological criteria which qualifies it for inclusion in the World Network of Biosphere Reserves, the cornerstones of biosphere reserve establishment and management are participation, zonation and designated management mechanisms. Detailed criteria for the designation of UNESCO Biosphere Reserves are laid out in the Statutory Framework of the World Network of Biosphere Reserves (UNESCO 1996). They include (1) *Ecological and cultural criteria*, such that the area must be of significance for biological diversity conservation and include a mosaic of ecological systems and human interventions. (2) *Appropriate size and zonation*, whereby legally protected core zones are devoted to long-term protection, buffer zones are surrounding or contiguous to core areas, and the remaining transition areas, where sustainable resource management methods are developed and promoted. And (3) *Participatory and specifically designated management mechanisms*, which secure the involvement and participation of a suitable range of stakeholders in the design and carrying out of the functions of a biosphere reserve. In addition, provisions should be made to manage human use and activities in the buffer zone, a management policy and plan exists as well as a designated management authority. Programs for research, monitoring, education and training are established.

29.2.2 Geographic Description of the Lake Tana Biosphere Reserve

Lake Tana is the largest lake of Ethiopia and belongs to the ten largest lakes in Africa. It lies in the Amhara National Regional State (ANRS) in the Northern Ethiopian highlands and is one of the highest situated lakes in Africa. Lake Tana is the source of the Blue Nile River which contributes around 85% to the river Nile. Lake Tana and its surroundings host unique ecosystems with a high biodiversity especially of bird and plant species and is a bird wintering ground of global significance. A number of plant, bird, and fish species are endemic to the region, rendering Lake Tana region part of the Eastern Afromontane Biodiversity Hotspot. Beside its natural history, the Lake Tana Region also harbours a centuries-old agricultural and cultural history.

The Lake Tana Biosphere Reserve (LTBR) incorporates the lake itself and its immediate environs, including the whole mosaic of landscapes and habitats, ranging from wetlands to forests, from near-pristine to highly degraded, including a major urban center and small rural settlements (Fig. 29.1). Its total area coverage is 6 972 km^2, of which 3 042 km^2 represent aquatic surface and 3 930 km^2 terrestrial. Administratively, it covers 137 Kebeles (communities), which belong to 10 Woredas (districts).

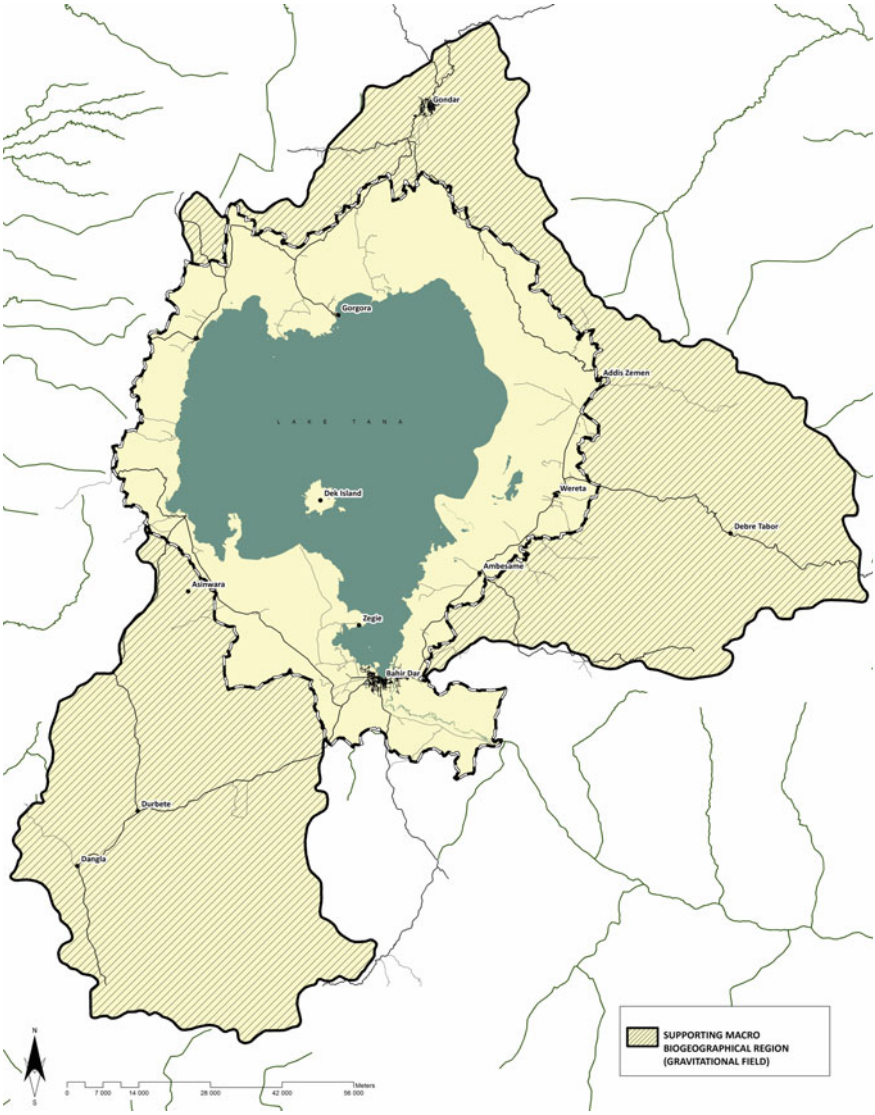

Fig. 29.1 Map showing the outline of Lake Tana Biosphere Reserve (*stippled line*) within the Lake Tana Watershed/Lake Tana Sub-Basin (adapted from FDRE application to UNESCO 2014)

Due to the heterogeneity of the area, the LTBR includes a great number of core zones and consequently buffer zones (Fig. 29.2). The 78 core zones of the LTBR mainly consist of aquatic and riparian habitats with little human disturbance, including remnants of papyrus reed beds, as well as patches of remaining natural forest. These are often situated around churches on islands and the mainland.

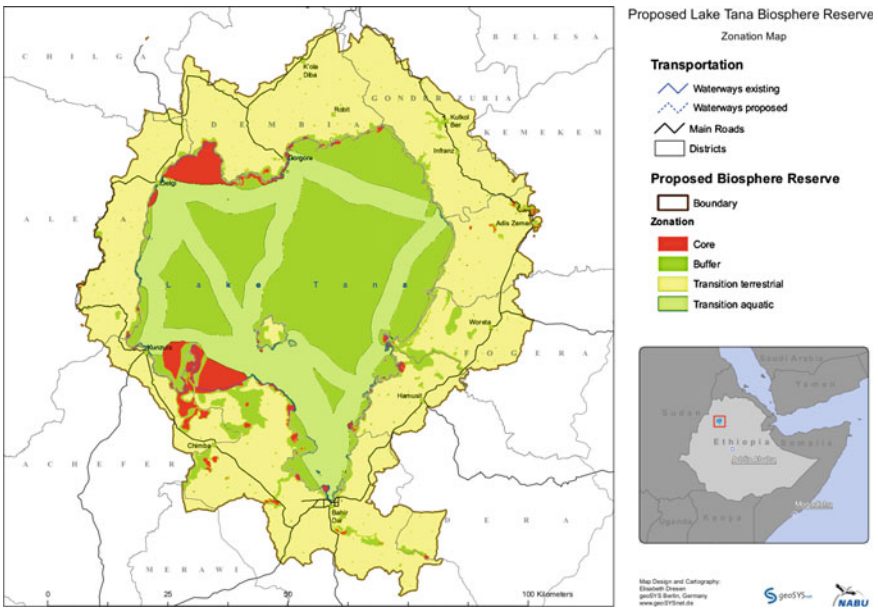

Fig. 29.2 Map showing the zonation of the Lake Tana Biosphere Reserve representing Core, Buffer and Transition zones as presented in the application to UNESCO; adapted from FDRE 2014

The buffer zones often surround core zones, but are also found independently in areas which play key roles for conservation, ecological restoration and functioning as ecological corridors, but where human activity is prevalent. These areas are focus points for community conservation schemes in tandem with restoration and regeneration activities in the management of the BR.

The transition zone of the LTBR comprises some parts of the water body of the lake, as well as extensive agricultural land and settlements, including Bahir Dar, the capital of the Amhara National Regional State. The Core Zone comprises 228 km^2 (3.3%), Buffer zone 1882 km^2 (27.0%), and the Transition zone 4681 km^2 (67.1%) (FDRE 2014).

29.2.3 Why Is a Biosphere Reserve a Good Solution for the Lake Tana Region?

Lake Tana Region is part of the Ethiopian Highlands and includes one of the highest situated lakes in Africa. In the context of the East-African Highlands, the proposed biosphere reserve will be the first of its kind in the biosphere reserve network. Until June 2015, there were three biosphere reserves in Ethiopia: Yayu (2010), Kafa (2010) and Sheka (2012). All three previously existing Ethiopian

biosphere reserves are situated in the south-west of the country and dominated by forest ecosystems. Main objectives in these biosphere reserves are the conservation of the rain forests and genetic diversity of the coffee plant as well as the sustainable use of coffee species. The Lake Tana region, in contrast, is characterized by historical agricultural land use systems, a dense population, in parts highly degraded landscapes, but also remnants of unique aquatic, wetland and forest ecosystems. In this sense, the region takes a special position within the network of Ethiopian biosphere reserves (Fähser et al. 2015).

The Lake Tana region represents a network of complex, overlapping and sometimes contradicting interests, mostly centered around the lake ecosystem and the ecosystem services it provides. It combines internationally and locally important cultural history (e.g. world heritage sites), good conditions for agriculture (fertile soils and water availability), is part of a globally important biodiversity hotspot, a major Ethiopian and African water source with a need for local human development and poverty reduction. The biosphere reserve approach is uniquely suitable to tackle this situation by providing an integrative management approach which relies on the existing strong administrative structures and scientific capacity in the region.

The Lake Tana region has a centuries old cultural and agricultural tradition. Due to its fertile soils, year-round water supply form the surrounding highlands and tributary streams to the Lake, and the overall moderate climatic conditions, cereal crop production and small scale livestock rearing have been practiced in the region for centuries. The dominant agricultural system still practiced today is the smallholder agriculture.

At the same time, the lake and its many islands have provided refuge for religious life of the Ethiopian Orthodox Tewahido Church. Many orthodox churches and monasteries were established on islands, peninsulas and along the lake shore. At that time, much of the Lake Tana region was still covered with indigenous forest. The forest immediately surrounding the orthodox churches play an important part in the orthodox faith and the religious life of the church community and are therefore protected from most destructive activities, such as logging. Instead, the church communities have traditionally used forest resources in a non-destructive way, such as coffee production. Nowadays, the remaining indigenous forest in the area can be found almost exclusively surrounding churches. The average size of church forests near Lake Tana is several hectares, for example 5.2 ha for church forests in the South Gondar administrative zone northwest of Lake Tana (Cardelús et al. 2013).

The fragmented character of the Lake Tana region visible today, with its many small fields, dotted human settlements and remnant forest patches, is a legacy of these past and current human activities. However, the landscape and ecosystems of Lake Tana and its environs have not only played an important role for human activities, but they also provide habitats for animal and plant diversity of global importance.

In recent years, the intensified use of the resources of the Lake itself—above all water—have increased the pressure on the natural life support system of the region. Water, the basic defining element of the character and importance of the Lake Tana Region, has become increasingly valuable for electricity production and large scale

irrigation at national and even international level. Fish, which used to be moderately exploited through traditional fisheries, has increased in market value and is being exported to neighbouring Sudan. Fishing methods have become more efficient and without strong regulations are likely to cause the complete collapse of fish stocks within the next 5–10 years (e.g. de Graaf et al. 2006; Tewabe 2013).

It is clear that additional protection for the natural life support system of the region has become necessary to safeguard the basis for future economic activity and health for the population as well as to preserve global biodiversity. At the same time, prevailing poverty, a lack of infrastructure and public services in the region, must be addressed.

Beside the natural and cultural treasures, the Lake Tana region also owns high academic and administrative capacities. It lies in the Amhara National Regional State (ANRS), one of ten states that together constitute the Federal Democratic Republic of Ethiopia (FDRE). The two largest cities of ANRS are on and close to the lake shore: Bahir Dar and Gondar. The ANRS is governed by a regional president, its cabinet of technical Bureaus, and a state assembly. Beside their administrative tasks, the Bureaus are also involved in research through attached research institutes, such as the Amhara Regional Agricultural Research Institute (ARARI). Additionally, three universities are found in or nearby the LTBR: Bahir Dar University, Gondar University and Debre Tabor University.

These are ideal conditions to have stakeholder contribution and involvement in the BR nomination and management process.

29.3 Preparation of the Lake Tana Region to Become a UNESCO Biosphere Reserve

Following the UNESCO principles, the successful establishment, management and development of a biosphere reserve is closely linked to active stakeholder participation (e.g. Seville Stragey, UNESCO 1996, and Madrid Action Plan, UNESCO 2008). The process that culminated in the nomination of the Lake Tana Biosphere Reserve by UNESCO in June 2015, was driven by local, national and international stakeholders from the beginning. At various stages throughout the process, many other stakeholders contributed to the design of the Lake Tana Biosphere Reserve.

29.3.1 Stakeholder Contributions to the Application Process

The key administrative government structures promoting the establishment of a Lake Tana Biosphere Reserve were the national MAB Committee, headed by the Ministry for Science and Technology (MoST) and the Amhara National Regional State government, mainly through its Bureau of Culture, Tourism and Parks Development

(BoCTPD) and Bureau of Environmental Protection, Land Administration and Use (BoEPLAU). From the beginning of the process, they were supported by two German-based conservation NGOs, the Nature Protection and Biodiversity Conservation Union (NABU) and the Michael Succow Foundation (MSF).

In 2007, NABU started its activities in Ethiopia with a project working towards nature conservation, regional development and the set-up and effective implementation of protected areas. Following a delegation travel to potential biosphere reserve sites as part of this project, NABU, MoST and UNESCO signed a trilateral Memorandum of Understanding (Umbrella MoU) in November 2009. The aim of the agreement was to work towards the protection of biodiversity and the use of natural resources from the perspective of sustainable development and conservation of cultural heritage. The contracting parties agreed to work towards the establishment of a national network of biosphere reserves in Ethiopia (zur Heide 2012).

With the support of NABU, Ethiopia applied for BR designation for Kafa in 2009, and received the official UNESCO nomination as Kafa Biosphere Reserve in 2010. In order to further facilitate and support the establishment of biosphere reserves in Ethiopia NABU, in accordance with the Umbrella MoU, invited international experts to Ethiopia, including the Michael Succow Foundation, for an in-depth evaluation of areas previously identified as potential biosphere reserves (zur Heide 2012). Consequently, the Michael Succow Foundation facilitated the realization of a feasibility study for the Lake Tana Region analysing opportunities and threats to becoming a UNESCO Biosphere Reserve. The German Federal Agency for Nature Conservation financed the study.

While conducting the feasibility study, zur Heide (2012) sought active involvement of a wide range of local stakeholders. This included several expert and community workshops, which prepared the ground for shaping the future Lake Tana Biosphere Reserve. First proposals on future zonation, on overarching objectives of a Lake Tana Biosphere Reserve, on development approaches, and on the most immediately needed nature protection measures were gathered in these workshops and documented in the feasibility study (zur Heide 2012). In this way, the feasibility study also bundled the voices of individual champions for a Lake Tana Biosphere Reserve, including for example academic researchers from the Bahir Dar University.

Backed by the results of the feasibility study, NABU and Michael Succow Foundation secured funding from the German Ministry for Technical Cooperation (BMZ) in order to support the ANRS and federal governments to prepare the Lake Tana region for the application as biosphere reserve. This NABU-led project, called "For People and Nature—Establishment of a UNESCO Biosphere Reserve at Lake Tana, Ethiopia", started in February 2012 and ended in December 2015. The project was implemented by NABU in cooperation with MSF.

The implementation of the project "For People and Nature" was closely coordinated with the ANRS government through the involvement of the technical bureaus, their associated research institutes and their structures down to Kebele (community) level. This cooperation was sketched out in a project agreement which was signed at the start of the project in 2012 between NABU and five technical Bureaus, referred to

as the partner bureaus for the project. These five bureaus are the Bureau of Culture, Tourism and Parks Development (BoCTPD), Bureau of Environmental Protection, Land Administration and Use (BoEPLAU), Bureau of Agriculture (BoA), Bureau of Water Resource Development (BoWRD) and the Bureau of Financial and Economic Development (BoFED). Beside the facilitation by regional administrative structures for the implementation of the project activities, this working modality also aimed at providing institutional sustainability of the process.

The project "For People and Nature" consisted of four main components. The components were designed in order to prepare the Lake Tana region administratively for the application as UNESCO Biosphere Reserve, to pilot local projects on sustainable development, and to continue publicity, networking and scientific support activities for the region (Table 1). The implementation of these components was pursued through sub-contracting and partnering with a whole range of institutions and experts, including the partner bureaus, national and international consultants, academic institutions, non-governmental organizations and private companies.

Beside the direct involvement as sub-contractors for project activities, private, non-governmental, civil society and academic stakeholders have been integrated in the process towards the establishment of the Lake Tana Biosphere Reserve in the form of general and expert workshops and through the establishment of "focal persons" within institutions, such as universities. One of the main channels for the participation of communities in the design of the future biosphere reserve has been the participative zoning of the Biosphere Reserve, according to the UNESCO BR zoning scheme supporting core, buffer and transition zones.

Table 1 The four main components and corresponding sub-components of the project "For People and Nature—Establishment of a UNESCO biosphere reserve at Lake Tana, Ethiopia"

Component	Sub-components
1. BR development	1.1 Developing the BR administration 1.2 Participative zoning of the BR 1.3 Development of a BR Management and Business Plan 1.4 Implementation of the Management Plan 1.5 Proposal to UNESCO for official recognition of Lake Tana region as a Biosphere Reserve
2. Development of ecotourism and of regional products for alternative income generation	2.1 Development and promotion of ecotourism 2.2 Public-private partnership for the development and marketing of regional natural products
3. Conservation and use-concepts / sustainable resource management	3.1 Integrated wetland management 3.2 Reforestation and sustainable management of church forests 3.3 Development and testing of soil-friendly agriculture (conservation agriculture)
4. Communication and public relations (regional, national, and international) and interlinking with research projects	

29.3.2 Lake Tana Biosphere Reserve Zonation

The concept of zonation with strictly protected core zones, restricted-use buffer zones and transition zones for development activities lies at the heart of the UNESCO Biosphere Reserve approach. The zonation includes also the determination of the outer boundaries of the Biosphere Reserve. As mentioned above, first expert proposals for a suitable zonation for the Lake Tana Biosphere Reserve were forwarded during stakeholder workshops conducted as part of the feasibility study. These varied considerably, some including for example the whole Lake Tana watershed, some including the whole Lake as core zone, and all the riversides as buffer zones. Most of these proposals were made from scientific viewpoints. Subsequently, under the project "For People and Nature", an extensive and iterative process was conducted with expert input, community input, administration input to arrive at the final zonation proposal presented in the UNESCO application (Fig. 29.2).

The participative zonation process was carried out by the Bureau of Environmental Protection, Land Administration and Use (BoEPLAU), and facilitated by the NABU project staff. The various expert proposals and additional considerations of realities on the ground, such as management efficiency and potentially conflicting development projects, were combined into one proposed zonation map. This map provided the basis for the discussions with communities led by BoEPLAU experts.

In the Kebeles which were likely to contain core or buffer zones of the Lake Tana Biosphere Reserve, Kebele Zonation Committees with up to 16 members were formed and trained. The members of the Zonation Committees included Woreda experts, Development Agents, Kebele managers, community and religious representatives. The training was supported by a specifically developed training manual, outlining the UNESCO principles of biosphere reserve zoning and the reasons why Lake Tana is suitable to become a biosphere reserve.

After the training, the Zonation Committees were then presented with the expert proposals for core and buffer zones referring to their specific Kebele. At the same time, committee members contributed additional local information, for example on existing area closures. Through discussions and site visits, terrestrial core and buffer zones were locally agreed upon. Due to logistic difficulties, the aquatic zonation proposal is based on expert input only. For a reasonable zonation of the water body, it was suggested to assign boat transport routes, harbours and the most populated shorelines as the transition zone. The remaining area of the lake is designated buffer or core zone (see Fig. 29.2).

The reality of the participative zonation process as described above unrolled quite differently in the different Kebeles. In general, designation of an area as core zone met with the highest doubts from the side of the community. In several cases, proposed core zones were changed to buffer zones. In some Kebeles, some long-standing land use disputes within the community or between community interests and the administration were brought to the surface again through the

zonation process. Many site visits and conflict resolution approaches were necessary to finally reach an agreement for some of the disputed areas.

The GPS data for the core and buffer zones were collected in the field by members of the Zonation Committees with Woreda expert support. This approach to the participative zonation process yielded a great many small core and buffer zones. Finally, some of the very small and neighbouring core zones were given a common name. Through this process the final number of core zones as listed in the legal document granting strict protection to these areas (Lake Tana Biosphere Reserve Regulation, ANRS 2014) numbers 78.

29.3.3 Vision and Goals of the Lake Tana Biosphere Reserve

The vision for the Lake Tana Biosphere Reserve that emerged during several stakeholder workshops and as stated in the Management Plan (Fähser et al. 2015) is:

> For our sustainable future – Lake Tana, People and Nature

The detailed objectives and goals of the Lake Tana Biosphere Reserve are elaborated in the BR nomination application (FDRE 2014) and the Management Plan (Fähser et al. 2015). They are aligned with the three functions of biosphere reserves: conservation, development and logistic support.

At Lake Tana, the conservation foci lie on the regeneration of the lake itself by reducing sedimentation and eutrophication, on the protection of the remaining wetlands, and on the preservation and extension of natural forests. Furthermore, erosion in agricultural areas shall be reduced through soil friendly agriculture with a focus on soil protection and regeneration of the humus layer. This is the basis for a vast number of ecosystem services. The protection of rare and threatened species like the endemic *Labeobarbus* fish species, bird species, mammals, tree and other plant species is of high significance in the area of the biosphere reserve (Fähser et al. 2015).

Reduction of poverty, the creation of alternative and more diverse options for livelihoods, and ensuring food-security are the most urgent development goals in the region (Fähser et al. 2015). Soil- and environmentally friendly agriculture, regional product development and promotion of eco-tourism together with community-implemented natural resource management are the main focus areas to achieve these development goals sustainably.

In the region of this new biosphere reserve, a lot of educational and research activities have been established already through government programmes, regional as well as national and international universities. Coordination of these activities and alignment with biosphere reserve requirements, where applicable, should be supported and enhanced. This applies, for instance, to research and monitoring on erosion, nutrient transfer into the lake, and eutrophication of the lake (Fähser et al.

2015). Such coordination of research efforts in and around the Lake Tana Biosphere Reserve can greatly enhance the impact and relevance of focussed scientific enquiry for society and policy development.

29.4 Requirements for Successful Management of the Lake Tana Biosphere Reserve

Biosphere Reserves are seen by UNESCO to fulfil a key role as study sites and examples for sustainable development realized on a regional scale. This makes an integrated planning framework across disciplines and scales essential in order to guide development, land and natural resource use within the biosphere reserve. As BRs are instruments for integrated management of socio-ecological systems, their management needs to address regions comprehensively: abiotic and biotic factors (climate, water, soil, and landscape in its entirety, etc.), the local communities (cultures, traditions, knowledge, heritage, etc.), their practices (fishing, forestry, agriculture, livestock breeding, tourism, etc.) and the institutional and legal settings within which they act. Consequently, BR management involves many different interventions at many different levels at the same time, for example: protecting individual species, improving the water cycle, supporting the marketing of agricultural products, training local communities and monitoring.

In the Lake Tana region, a great number of policies and projects which aim at safeguarding the natural resources for current and future development and development initiatives have already been formulated or instigated. Examples are the Tana and Beles Integrated Water Resources Development Project, the Amhara Forest Proclamation, or the Lake Tana Tourism Development Strategy. On the other hand, there are activities and projects which threaten to undermine the biosphere reserve objectives and ecosystem integrity and are contra-productive to other interventions. For example, some envisaged irrigation schemes in or close to the wetlands bear the risk of undermining the IFAD project objective of rehabilitating the wetlands. Some plans for the intensification of agriculture would help to improve agricultural productivity but may undermine fish productivity and lake water quality (zur Heide 2012). Given this background, the need and potential for creating synergies, avoiding duplications and providing pro-active conflict resolution (between stakeholders and between policies) is high in the Lake Tana region. In order to be called “successful”, the Lake Tana Biosphere Reserve management must become the central player in the process of integration of policies and activities affecting the natural resource base and human development in the Biosphere Reserve area and its gravitational field.

Clearly, the management elements to achieve this goal must be evidence-based, participatory and transparent (e.g. UNESCO 1996). Since each biosphere reserve has its unique setting of social, political, environmental and legal factors, the detailed management structure of a given BR has to be suitable within that specific

context. Several key elements of the Lake Tana Biosphere Reserve management have already been established, and others are proposed for future establishment. Since the Lake Tana Biosphere Reserve is the first BR in the Amhara National Regional State, the distribution of responsibilities and working modalities amongst the management elements will be part of an adaptive management and learning process, which has to be monitored and evaluated after an initial period.

29.4.1 Lake Tana Biosphere Reserve Management Structure

UNESCO clearly states that a dedicated management unit is central to successful biosphere reserve management (UNESCO 1996). Equal emphasis is put on the establishment of a local consultative framework, in order to promote the participation of the population. For the Lake Tana Biosphere Reserve, structures carrying out the tasks of a dedicated management unit as well as elements of a consultative framework have been established and started their activities (Fig. 29.3). However, the network of management elements is not yet complete and the working modalities and detailed responsibilities are still to be elaborated further.

During the process of LTBR development, a *Biosphere Reserve Management Unit (BRMU)* has been established in 2012 within the Bureau of Culture, Tourism and Parks Development (BoCTPD). Through the Lake Tana Biosphere Reserve Regulation (ANRS 2014), passed by the ANRS government in November 2014, the BoCTPD has received the legal mandate to manage and develop the LTBR. By end 2015, the BRMU had two full-time staff members and two part-time staff members. The core task of the BRMU is the facilitation of all processes and projects concerning LTBR development through, for example, networking, lobbying and mobilization activities, as well as publicity for the BR. For example, the BRMU facilitated the zonation process, the submission of the UNESCO application via the national MAB committee, and the drafting of the Lake Tana Regulation.

A *Biosphere Reserve Council (BR Council)* has been established in 2013. The BR Council is the highest stakeholder representation structure foreseen in the LTBR governance structure. It currently has 43 members, the majority of which are representatives of the state administration from regional to Woreda level, but some academic, NGO, community and religious representatives are also included. It is foreseen that the BR council meets on a half-yearly basis. The main role of the Council as stated the guideline for its establishment (BoCTPD 2013) is to "encourage the participation of major stakeholders in addressing challenges of Lake Tana and facilitate properly different developmental activities in/around Lake Tana". Additionally, the BR Council shall "advise the project For People and Nature" and "give direction or decision on required issues that facilitate the implementation of the project". Mobilization and public awareness creation is another objective of the council.

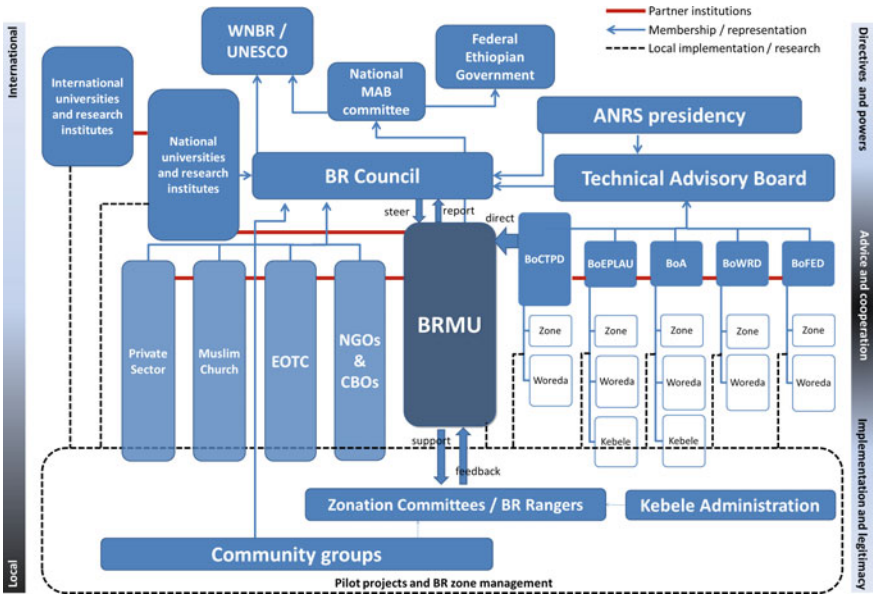

Fig. 29.3 Organigram of the foreseen governance structure for the Lake Tana Biosphere Reserve. According to the LTBR Regulation, the BoCTPD has the mandate to administer the LTBR. In 2012, a BRMU was established under the BoCTPD, which is expected to be strengthened with additional human and financial resources. The LTBR Technical Advisory Board is not yet established but proposed to replace the project steering committee. At the time of the LTBR inauguration, the BR Council membership was slightly more weighted towards bureau/administration representation than suggested by this figure. After establishment of the Technical Advisory Board, the memberships and mandates of BR Council, BoCTPD and the Technical Advisory Board have to be adjusted to ensure complementarity and avoid conflicting mandates. This adjustment remains one of the challenges for successful LTBR management (see Sect. 29.4.1)

In relation to the project "For People and Nature", *BR project steering committees* have been established at regional, zonal and woreda level. In these steering committees, BR focal persons from the partner bureaus are represented as well as the central administration (presidency at regional level, Woreda Manager at Woreda level). In particular the woreda steering committees have played a key role in the participatory zonation process, and have facilitated some pilot project activities. Due to their active role, it is foreseen to maintain the Woreda steering committees for long-term, locally imbedded BR management. The regional level project steering committee as such might cease to exist after the end of a BR establishment follow-up project.

In place of the regional level steering committee, a new structure, the Lake Tana Biosphere Reserve *Technical Advisory Board*, is expected to be established as a permanent element of the LTBR management. Like the project steering committee, the Technical Advisory Board will encompass representatives of the five partner bureaus as well as the concerned zonal and city administrators. The exact mandate

of the Technical Advisory Board is still to be determined. Its existence is foreseen to strengthen integration of BR activities across the concerned sectors, their policies and workplans. The Technical Advisory Board might also be mandated to steer and monitor the management of the BR on behalf of the ANRS presidency. In that case, the establishment of yet another governance element, a secretariat of the Technical Advisory Board, would become necessary.

At community level, *Kebele Zonation Committees* were established during the participatory zonation process (see Sect. 29.3.2). Through the training and active participation in the local zonation activities, the members of the committees represent a valuable source of knowledge and capacity for community-level BR management. An extension of the Zonation Committee mandate to community-level BR awareness and management activities would be an important step towards the establishment of a local consultative framework, as foreseen in the Statutory Framework for the World Network of Biosphere Reserves (UNESCO 1996).

Further Challenges for the Establishment of the BR Management Structure

A main challenge for establishing an effective BR management system will be to adapt existing and future management elements to the broader governance network. The aim is to create an effective structure, which nonetheless operationalizes the principles of participation and consultation, and also considers equity of the benefits that might accrue via the BR—tangible as well as non-tangible ones.

In this respect, the Lake Tana Biosphere Regulation gives a clear mandate to the BoCTPD to set up adequate structures and mechanisms: "The Bureau shall […] put in place a mechanism in which the community inhabiting the biosphere reserve would amply benefit in terms of social and economic aspects as a result of conservation of development of same as well as follow up and ensure its implementation thereof [sic]" (LTBR Regulation Part III, Article 8.2.B). And "The Bureau may issue specific directives necessary for the full implementation of the provisions of this regulation" (Part IV, Article 12).

On the one hand, this means to further fine-tune the responsibilities and mandates of the various existing and future management elements in order to make them complementary and avoid duplications or gaps. On the other hand, management processes which are effective and reflect the BR management principles need to be established and implemented. In particular decision making rules and communication procedures need to be clear, understood, and simple. In line with this, an adaptation of membership to the various committees might have to take place. For example, if the Kebele Zonation committees are to be maintained and transformed into community BR management committees, they can form a key part of the local consultative framework. However, currently the only institutionalized routes which exist to carry community-level opinions and decisions towards the higher BR decision bodies, i.e. the BR Council or the future Technical Advisory Board, is via the government administration structures. To have a participatory community-led management system, decision-making structures and processes

outside the governmental bodies need to be established or integrated. This could, for example, be achieved through creating Woreda-level stakeholder platforms and respectively adding 10 Woreda community representative members to the BR Council.

Similarly, the decision powers and responsibilities of the BR Council with respect to the envisaged Technical Advisory Board have to be clearly defined. As the highest stakeholder representation body, the BR council should have a significant weight in taking strategic decisions. This can be achieved by describing and following clear processes of decision making between the three highest BR management elements: the BR Council, the Technical Advisory Board and the BRMU. Feedback loops need to be included in the decision making processes.

In order to achieve the actual goal of sustainable development for the Lake Tana Biosphere Reserve, integration and efficiency needs to be established not only within and between the BR management elements, but on a much broader scale with regional, national and international partners and stakeholders.

29.4.2 Challenges Towards Fulfilling the BR Mandate of Integration and Networking

A biosphere reserve is most of all a management framework to promote innovative and locally appropriate solutions to sustainable development. A main task is the creation of synergies across different organisational and technical sectors. The working modalities through which the dedicated BR management team must achieve this is mostly by functioning as a broker and moderator: a broker of knowledge, access to resources, and ideas and a moderator between policies and stakeholders (see also Table 2).

The establishment of a representative management structure (Ref. Sect. 29.4.1) provides a good basis for the BR management team to be successful in their role as broker and moderator. Further than that, the BR management staff need to have the relevant technical knowledge and communication skills, but also the opportunity or even right to access relevant information. Therefore, the BR management would be strengthened considerably by the formalization of information exchange processes with key stakeholders. For example, in the planning process for infrastructural developments within or close to the BR, the consideration of effects on BR core zone integrity should be mandatory, similar to or as part of an Environmental Impact Assessment. This information exchange between planning agencies or technical bureaus and the BR management can be secured through its formalization.

In the case of the Lake Tana Biosphere Reserve, an important step towards successful integration of policies and activities will be the establishment of the Technical Advisory Board, where the most relevant regional bureaus are represented. However, the integration of initiatives from the private sector and civil

Table 2 Proposals to strengthen LTBR management

Proposal	Desired effect	Challenges
The BR establishes a central platform for Lake Tana Region knowledge management	The BR becomes the main point of contact for interested parties requesting information (scientific, xstatistical, narrative) about the Lake Tana region. The BR has an overview of all documented information and directs requests for detailed information to the relevant institution.	- Financial, human and technical resources - Pro-active support from relevant stakeholders
Provide financial support and flexibility to the dedicated BR management unit	The basic BR management is financially secured in the long-term and allows for long-term BR planning. The BR team can be flexible and react immediately to external funding opportunities or can quickly provide funds to BR initiatives	- Draw up an appropriate institutional setting to allow for financial independence and flexibility with partial state funding and third-party funding - Political will to secure long-term financial support
Ease regulations for business establishment with BR backing	More small and innovative businesses with sustainable business plans will start up, increase economic activity in the BR and improve local livelihoods	- Different regulations need to be adapted according to type of business - Long political and bureaucratic process
Transparency of finances and decision taking	Yearly plans, financial reports as well as minutes of Task Force and BR Council meetings are made publicly available via the BR website and upon request. This will strengthen trust, participation and a feeling of ownership by the stakeholders	- Adopting an organizational culture of transparency - Maintaining and updating an appropriately designed BR website
Give veto-right on developments within and close to the BR to the BR management	The BR management has an effective tool for pro-active management towards the BR goals.	- Overcome the perception that "development is good at any price" - Devolution of power to the BR management
Establish a national BR network	Active exchange and learning between Ethiopian BR experiences and common lobbying for national and BR support improves understanding and support for BRs	- Funding - Clear goals of an Ethiopian BR network

society is not yet given significant weight. For long-term economic and social sustainability the opportunities for cooperation with these sectors must be strengthened.

A smaller but equally important role of the BR management team will be the protection of core zone and ecosystem integrity through application of laws. On the one hand, this protection refers to unofficial intrusions of core zones. Those are likely to be incidental local events. Such cases are followed up retrospectively through community procedures or, in grave cases, legal procedures. More important, however, is the prospective protection of core zones and ecosystems in relation to planned, official activities. In the strongest case, this would require the possibility of the BR team to stop developments and bindingly request suitable adaptations of the plans to comply with BR regulations. This kind of "veto-law" for developments within the BR area exists for some other BRs in the world. It provides a very powerful tool for BR management, but needs strong political will to be introduced.

It lies at the hands of the BoCTPD to put in place appropriate internal organisational arrangements to make the BRMU functional, for example through the number of staff dedicated to it and powers given to them. Political will is necessary, however, to ensure the long-term viability of the BR through the commitment to provide the basic financing for its management. In this respect, the prospects for the Lake Tana Biosphere Reserve are encouraging. In the Lake Tana Biosphere Reserve regulation, the mandate for the LTBR management is clearly given to a government body, the BoCTPD. This implies that funds will be made available for the BoCTPD by the regional government to carry out its mandate. As a minimum, the BoCTPD's internal budget has to be adapted so as to apportion funds for LTBR management.

29.5 Conclusions

The early involvement of stakeholders and the prominent role of government institutions in the development of the Lake Tana Biosphere Reserve have led to a very positive starting situation for the future BR management. The dedicated LTBR management unit, the envisaged Technical Advisory Board, is anchored within existing administrative structures, elements of a local consultative framework exist, and a lot of BR capacity, in- and outside the administration, has been built up during the process. Management challenges remain mainly in filling management structure gaps, in setting up effective processes and in providing the necessary finances and powers to the management elements in order to secure long-term viability of the Lake Tana Biosphere Reserve.

An efficient governance structure with active stakeholder involvement at all levels will provide the best basis to address the challenges of ensuring ecological integrity and human development within the LTBR, as described above, in the respective BR documents (see Box 1) and throughout this book.

Box 1. Core Documents of the proposed Lake Tana Biosphere Reserve

The Lake Tana Biosphere Reserve Regulation

This regional-level law called "The Lake Tana and its Environs Biosphere Reserve Delineation and Administration Determination, Council of Regional Government Regulation No. 125/2014" was passed by the ANRS cabinet in November 2014 and gazetted in March 2015. It is the core legal document of the Lake Tana BR. It consists of four main parts and three annexes:

Part I General (includes mainly definitions of terms);
Part II Designation, Delineation and Boundaries of the Core Zones along with the prohibited activities therein;
Part III Objective and Administrative Condition of the Biosphere [Reserve];
Part IV Miscellaneous Provisions (includes penalties and additional powers of the BoCTPD);
Annex 1 Description of List and Geographical Direction of Core Zones (provides names and GPS coordinates for the 78 core zones)
Annex 2 Width [size in ha] of core zones and list of Kebeles in which they are found;
Annex 3 List of Kebeles incorporated in the Biosphere [Reserve]

Through this Regulation, the LTBR core zones have obtained a legally protected status, the Bureau of Culture, Tourism and Parks Development has been given the mandate to administer the LTBR as well as the power to issue further directives deemed necessary for its successful implementation.

The UNESCO application document for the Lake Tana Biosphere Reserve

A document of over 200 pages, following the UNESCO nomination format, was submitted by the Ethiopian national MAB committee to the MAB secretariat at the end of September 2014. The document contains detailed descriptions of all aspects of the future BR - abiotic and biotic factors, the local communities, institutional and legal settings, as well as goals and strategies for the BR. A core aspect of the application is the BR Plan, showing the proposed zonation. The application document had been signed by all implied Woreda administrations,as well as the Regional Presidency and the partner bureaus.

The LTBR Management Plan

A management plan for the initial 5-year period of the Lake Tana BR is being developed with stakeholder participation (workshops, interviews, commenting). The plan describes the main management goals for the future Lake Tana Biosphere Reserves. It contains concise descriptions of the currently most pressing problems to be addressed terms of conservation, development and logistic support for the Lake Tana Region. It further provides eight clear 5-year management goals and the corresponding actions that will help to achieve these goals. The table of contents of the plan have been presented to and approved by the BR Council in July 2014.The exact

description of the goals and corresponding activities, budgets, timeline and monitoring activities are to be worked out in early 2015 and presented to the BR Council for revision and approval.

The BR Council guideline

A guideline for the establishment, mandate and membership of the Lake Tana Biosphere Reserve Council was drawn up by the BRMU, discussed and passed by the BR Council in its constituting session in December 2013. The Name of the guideline is "Guideline to establish Council to the proposed Lake Tana Biosphere Reserve". It is a guideline that is valid under the BoCTPD's mandate to administer the LTBR.

The Lake Tana Biosphere Reserve is amongst the largest BRs in terms of its total size. Considering size, population numbers, logistic and political realities on the ground, it was not possible to include the entire macro biogeographical area, the Tana sub-Basin, into the biosphere reserve. However, it is imperative to understand that the well-being of the larger area is a key requirement for the long-term viability of the Lake Tana Biosphere Reserve (FDRE 2014). Accordingly, the efficient governance of the complete Tana sub-Basin towards environmental sustainability is a key interest of the Lake Tana Biosphere Reserve management.

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