

## The Role of National Park Development in 'Recovery from Disaster' Habtemicael WELDEGIORGIS, Eritrea

**Key Words:** National Park, Park Management, Biodiversity, Ecotourism, Green Belt, Sustainable Development

### SUMMARY

Eritrea is a part of the Horn of Africa and the East African Highland's global biodiversity hotspots. It benefits from a range of globally unique and significant ecosystems. Hundred years ago about 30% of Eritrean land was covered by forests. The Semienawi and Debubawi Bahri Green Belt area, located in the eastern sub-humid escarpment houses some of the remaining tropical coniferous and broad-leafed forest. In addition, it is home to many mammal and bird species.

During the last 100 years, and in particular during the 30 years of Ethiopian colonial rule, Eritrea heavily suffered from habitat loss, depletion of forests and wild animals, environmental degradation, as well as reduction in ecosystem resilience. Climate change, directly or indirectly attributed to human activities, resulted in habitat loss and has become the greatest threat to wildlife. This alarming trend of high environmental disruption has to be reversed or at least checked.

After the independence of the country (1991), the Government of Eritrea gave high priority for the development of a national park in the Semienawi and Debubawi Bahri Green Belt area. And as a continuation of its efforts, in October 2013, it embarked upon a 'Project of Integrated Protected Area System for the Conservation of Biodiversity and Mitigation of Land Degradation'. With this initiative in mind, this paper will discuss the role of sustainable national park development in the Green Belt region, as an intervention for 'recovery from disaster'. The discussion will include introductory background, sustainable biodiversity of the national park, mitigation of land degradation, ecotourism development, capacity development and concluding remarks.

# **The Role of National Park Development in ‘Recovery from Disaster’**

**Habtemicael WELDEGIORGIS, Eritrea**

## **1. INTRODUCTORY BACKGROUND**

### **1.1 Brief Overview on Global Protected Areas**

Park areas have a long history. Historians attribute to India for the protection of natural resources over 2,000 years ago (Holdgate, 1999, in IUCN, 2002, p. 5). The Sumerians of Mesopotamia are credited for the establishment of the first parks for hunting by wealthy people during 2300’s BC. But, the first parks that had national character, probably appeared in Europe during the 1200’s AD and in colonial North America in the 17<sup>th</sup> C (World Book, 1994, pp. 168-69). In Europe protected areas for hunting for the rich and powerful existed 1000 years ago. Protection of special places also occurred among the traditional communities in the Pacific and parts of Africa. However, modern parks originated in Australia, Canada, South Africa, New Zealand and the USA in the 19<sup>th</sup> C. In the 20<sup>th</sup> C, the idea of national parks spread world-wide. In 2002 about 44,000 sites met the International Union for Conservation of Nature (IUCN) criteria for national parks (IUCN, 2002, p.8). Today, protected areas are in their tens of thousands globally. A Protected Area is an area of land and/or sea especially dedicated to the preservation and maintenance of biodiversity (BD), and natural and cultural resources, managed through legal and other effective means (IUCN, 1994, p. 10).

### **1.2 Brief Country History of Forest and Wildlife**

Historically Eritrea was home to abundant tropical vegetation and diverse wild mammals, including elephants, buffalos, giraffes, lions, leopards, warthogs, roan antelopes, greater kudu, wild ass, Nubian ibex, gazelle, cheetah, etc. Eritrea is also considered as the ‘centre of origin’ for a number of crop species such as chickpea, taff, sorghum, sesame and finger millet and a centre of diversity for barley and wheat (Vavilov, 1997, pp. 108-11, in MoA, 2002, p.55). But these abundant natural resources have been depleted in the course of long history of human activities and natural calamities.

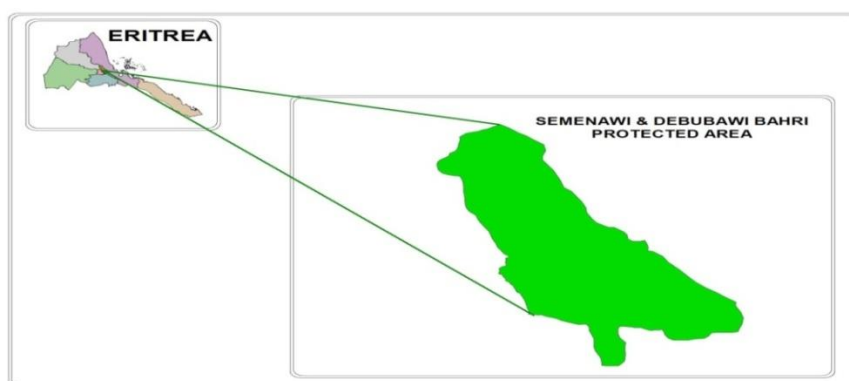
A century ago about 30% of Eritrea’s land was covered by forest; with abundant tropical vegetation. In 1952 the forest cover decreased to 11%, in 1960 to 5% and in 1995 to 1% or less (MoA, 2002, p. 58). There are 22 ‘endangered tree species’, such as baobab, desert date, myrrh, sycamore, African prune, croton, tamarind, etc. Most of the wildlife species, similar to that of the natural vegetation, were decimated beyond recovery. At present there are no traces of buffalo, cheetah, lion and roan antelope (MoA, 2002, p. 55).

It is believed that during the long successive colonial periods (1890 – 1991) about 2.5 million big and medium trees were cut from the Green Belt region alone, for the purpose of building traditional houses (National Park Proposal, 1999, p. 12). Studies also confirmed that charcoal was being exported to the neighbouring countries, mainly to Yemen (MoA, 1995, p. 10). Moreover, during the

1990's, about 3,600 tons of dry wood was annually harvested for cooking purposes. These factors greatly aggravated the destruction of the forest and wildlife.

During the Ethiopian rule (1962-1991), forest destruction was accelerated by the nullification of reserves, unwise land-use system, expansion of agriculture, rapid increase of livestock, cutting of trees for fuel wood and construction of traditional houses. In the 30 year War of Liberation (1961-1991), Ethiopian troops mercilessly cleared the remnant trees and shrubs for building fortifications and trenches and hunted wild animals (GoE, 1995, p. 58). The Liberation Fronts' also cut trees for the building of trenches and underground houses. These factors contributed to drastic climate change and habitat loss, posing a big threat to BD.

### 1.3 The Development of National Park of Semienawi and Debubawi Bahri



Adapted from the Department of Environment, 2015

Based on broad characteristics of moisture and temperature, natural vegetation cover, soils and land-use, the Semienawi and Debubawi Bahri with an area of 129,000 ha is clustered in the Green Belt area of the sub-humid Eastern Escarpment Zone of Eritrea. It is one of the six major agro-ecological zones of Eritrea, and constitutes 0.8% of the country's land area. The escarpment has an average gradient of 8-100%, altitude of 600-2600 meters above sea level, precipitation of 700-1100 mm, mean temperature of 16-27°C, and potential evapo-transpiration of 1600-2000mm (Gebru et al, 1997, pp. 7-10).

Unlike the other parts of the country, the Green Belt is characterized by two rainy seasons that attribute to its distinctive ecological features. This Green Belt region was once known for its 'feature luxuriant vegetation' (MoA, 2002, p. 59) rich with diverse wildlife. Now, the natural vegetation consists of discontinuous forest dominated by *Olea Africana*, *Juniperus procera*, *Carissa edulis*, *Terminula brownie*, *Mimusops kummel*, *Combretum molle*, *Anogeisus leiocarpus* (RELMA, 2002, p. 8) and remnants of mixed evergreen tropical highland forest and derivatives of bush land in sparse densities. There are also few eucalyptus plantations.

The dominant crops grown along the escarpment include maize, sorghum, barley and Irish potato, and livestock consisting of cattle, goats, sheep, camel and donkeys. There are also commercial plantations which grow coffee, fruits like orange, lemon, banana, papaya, etc. At present, wild animals, like leopard, greater kudu, warthog and duiker are found.

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During the Italian colonial rule (1928-40), the Green Belt was one of the three established protected areas with the purpose of conserving wildlife in the northern highlands and western lowlands. Initially, the Italian colonial administration had made attempts banning the cutting of trees. However, the initiative was abandoned when it later gave land concessions for agriculture with a motive of getting cash returns from the sale of wood. Concomitantly, permits to establish sawmills were also lavishly granted during the 1930s. By 1947, there were 55 sawmills and wood processing factories established (MoA, 2002, pp. 63-64).

Presently, the Green Belt area is part of the 'Integrated Buri-Irrori-Hawakil Protected Area System for Conservation of Biodiversity and Mitigation of Land Degradation'. This is a project co-funded by the Government of Eritrea (GoE), UNDP and Global Environmental Facility (GEF). The Author had taken part in the preliminary study for the establishment of the National Park in the Green Belt region (1999). Out of the 129,000 ha total area of the Green Belt, some 40,000 ha has been designated for permanent enclosure (GoE, 2013, p.13).

The main objective of the project is to enable vegetation to recover through natural regeneration, protect endangered trees and wildlife species, regulate soil erosion and loss of fertility, enhance infiltration of water, create attractive and scenic landscape and conserve BD (RELMA, 2002, p. 16). Although it is yet to be demarcated and officially declared as protected area, the Green Belt area surpasses the minimum size of 1,000 ha criteria to be called a National Park.

#### **1.4 Significance of the National Park**

UNEP (2001, p. 59) defines biodiversity (BD), as referring 'to all aspects of variability evident within the living world, including diversity within and between individuals, populations, species, communities and ecosystems'. It is a diversity of life at genes, species and ecosystem levels in which all organisms interact as a 'web of life'. It refers to all species in a particular place or earth-wide. It also concerns the preservation of 'threatened species' of flora and fauna at global and national levels.

The National Park in the Green Belt region of Eritrea is found in the Great East African Rift Valley, part of the East African Highlands and Horn of Africa BD hotspots. It is home to some of the last highly diverse range of globally unique remnant tropical coniferous and broad-leaved forests. The area offers a great opportunity to conserve mammals, trees and bird species that are also significant at the regional and global levels. The *Juniperus Procera* and *Olea Africana* trees, the greater kudu, leopard, baboon, hyena, etc, mammals, and bird species like white-cheeked turaco are found only in the forest highlands of Eritrea, Ethiopia and Sudan (GoE, 2013, p. 3).

The Sahara Desert is pushing southward, and is expanding due to human activities. Climate change and habitat loss are becoming evident threats to wildlife. This alarming trend has to be reversed or at least checked through the development of protected areas which contribute towards the mitigation of climate change and enhancement of BD conservation.

Eritrea will benefit from conservation of BD. Conservation of BD will ensure the use and enjoyment by present and future generations. Ecological services that are critical to the provision of

water, forest resources, mitigation of natural disasters and climate change resilience will be secured and habitat loss deterred (GoE, 2013, p. 38). In addition, the National Park will be attractive for the development of ecotourism, creating jobs and sustainable livelihoods for the local people.

## **2. SUSTAINABILITY OF BIODIVERSITY IN THE NATIONAL PARK**

### **2.1 National Park Defined**

National parks are Protected Areas Category 11. They are defined as ‘large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational and visitor opportunities’ ([www.iucn.org/pa\\_categories](http://www.iucn.org/pa_categories) ). A national park needs to be designated, legally declared, and enclosed in which park rangers serve as its custodians. In addition, it requires adequate budget, sufficient staff, other essential facilities, etc ([http://en.wikipedia.org/wiki/national\\_park](http://en.wikipedia.org/wiki/national_park) ). It supports BD conservation, providing a safe-haven for threatened species. It is also a source of food and other economic benefits, medicine, etc. It is the preservation of ‘unspoiled beauties of nature’ (World Book, 1994, p. 16), providing a safe-home for indigenous flora and fauna; keeps the environment healthy, helps us to learn about it and gives us ideal places to enjoy (<http://www.envt.nsw.gov.au/edresources/whydowehavenationalparks.htm>).

### **2.2 Factors Required for Sustainability**

Conservation should be adopted as a basic principle for protecting land and marine resources. Conservation of forests and wildlife should continue ‘unimpaired’ for the benefit of both the present and future generations. Successful conservation efforts demand regular training and education for park management staff, local communities and park visitors. Conservation efforts can only advance with the active and conscious participation of local people.

National park management should regularly explain about the benefits of national parks, conservation and recreation. It also needs to undertake research and disseminate the findings so that people can get tangible understanding of the progress. The national park, through a learning process will enhance consciousness worthy of preserving BD that takes care for itself and the future generations. This means that ‘by caring for the parks and conveying the park ethic, we care for ourselves and act on behalf of the future’; serving as the nation’s ‘greatest university without walls’ (<http://www.nps.gov/policy/report.htm>).

Reversing loss of habitat, depletion of forests and wildlife, environmental degradation and reduction in ecosystem resilience, requires ensuring sustainable BD by identifying and preserving the indigenous and globally significant species of the habitat. Governments need to allocate adequate financial and human resources to run the National Parks effectively and efficiently. The provision of alternative means of living to the people who depend on the protected areas is imperative for successful interventions.

The Government had banned hunting wild animals and cutting trees for different purposes. But, it should be supplemented by supplying alternative energy sources for cooking and construction. To preserve the forests, introducing energy saving stoves which reduce firewood consumption by over 50% (MoA, 2015, p.4), electric power, supplying kerosene and gas at fair prices, developing wind and solar energy, encouraging people to build their houses with corrugated iron, etc are measures necessary for sustainability of the National Park. It must be noted that the area is suitable for wind and solar energy.

Nurseries are imperative for growing varieties of indigenous trees and plants. The Fagiena, Moguo, Mrara, Filfil, Mai Adkemom, Deda'e, Medhanit, and Mai-Habar nurseries already existing should continue to grow seedlings. In addition, botanical gardens in which plants and trees are grown for scientific studies should be established. Moreover, zoological gardens, in which mammals, birds, reptiles, etc are kept needs consideration in the long-term. They could be attractive for ecotourism development. Furthermore, water conservation works need to be enhanced by constructing cisterns, reservoirs and check and micro- dams. Studies need to be carried out on water resources potential on surface and underground.

### **2.3 Measures Put in Place**

The Government of Eritrea has established a National Forestry and Wildlife Authority (2006).The Authority has 155 forest and wildlife inspectors, short of park rangers, monitoring around the country (GoE, 2013, p. 10). But, this has to lead to legal framework of officially declared national park management for the designated area, having its own park management, park rangers and budget.

BD conservation has been one of the Government's priority areas since liberation (1991). To reverse the loss of forest and land degradation, summer programmes of soil and water conservation campaigns and planting of trees and plants by students and communities have been carried out. The country has 64 permanent and temporary nurseries with a potential capacity of more than 10 million seedlings of indigenous and exotic species annually (GoE, 1995, p.60).Tens of millions of plants and trees have been planted and tens of millions of kilometers of hill slopes and plateaus terraced country-wide (GoE, 2013, p.8). But, despite these, the results do not match the efforts. The main reasons are short rainy season and long dry spells in which trees desiccate and die. Lack of enclosure and follow-up are also factors.

Coffee plantations were introduced in Eritrea by the Italian colonial administration in the early 20th C. By early 1930s, 8000 quintals of coffee was produced annually. Today there are more than 500 ha suitable for coffee plantation. Local people who are growing coffee and fruit plantations should be encouraged to continue producing (MoA, 1995, pp. 5, 19). These plantations are believed to be in harmony with the national park and BD conservation and need to be provided with high quality seedlings from the nurseries (National Park Proposal, 1999, p 19) (<http://www.nps.gov/policy/report.htm>).

Local people should be encouraged to lead sustainable livelihoods through employment, production of quality livestock and fruits and wise land use practices. They should be taught to introduce

modern cattle breeding with focus on quality as directed by the Ministry of Agriculture. Modern poultry and bee keeping are already in place, but need to be further encouraged. These should be seen as essential to the development of sustainable national park and ecotourism. They are the people who will be supplying tourists with fruits, vegetables, dairy and meat products, handicrafts and other essential necessities.

Alternative way of life should be considered for those who have been growing crops with low productivity on the steep slopes. They should be relocated from the steep slopes and 'permanent enclosure'. But, without providing alternative way of life, displacement is unadvisable. To do so, a socio-economic study is imperative. Implementation requires an inclusive policy in which local people are consulted and taken as part of the solution for sustainable BD conservation and national park development. Farming productivity in the Green Belt region is low and thus local people need to be convinced through regular awareness-raising programmes. They should be taught about its benefits, and inspired to grow improved quality of crops that could lead to agricultural BD.

## **2.4 The Uses of Forests and National Park Development**

Forests are the basis for over 5,000 products: aromatic oils, herbal medicines, food, fuel, furniture and clothing, housing, etc. About 1.6 billion people of the world depend on forests for their livelihoods, and 80% of the people in developing countries use forests for traditional medicines (UNEP, 2011, p. 3, 10). The natural flora has been source of traditional medicines, firewood, house construction, fruits and other foods, etc for the local communities for centuries (MoA, 2002, p. 60). About 80% of Eritrea's household energy comes from biomass (GoE, 1995, p. 89). The forests are home to diverse flora and fauna, and essential for the survival and wellbeing of human beings. Reforestation and forestation would result in decreasing carbon emissions essential for the mitigation of climate change, guaranteeing food security and providing safe water and BD conservation. Thus, restoring forests provides 'cost-effective insurance' against impacts of climate change (UNEP, 2011, p. 19).

National park provides large-scale conservation opportunities in which natural ecological processes continue unhindered, allowing space for continuing growth and evolution. BD restores forest landscape, helps to provide adequate food, shelter, safe water, and many essential ecological benefits. About 100,000 ha, mostly in the Green Belt area have been enclosed (GoE, 1995, p. 60). By protecting the ecosystem, forests and wildlife will be restored and land degradation mitigated, ensuring the continuity of plant and animal species' and encouraging people to lead sustainable socio-economic and environmental livelihoods.

There is a strong political will expressed in the 'Project for Protected Areas'. Awareness-raising of the local people and other stakeholders about BD is also essential. Success stories of Brazil bringing deforestation under control, Kenya forestry seed centre-safeguarding the genetic diversity of forests, wildlife sanctuary for endangered bird species in northern Cambodia (UNEP, 2011, pp. 40-41) shows that BD can be successfully restored. This is a good lesson for countries like Eritrea.

Studies show that 'enclosure' provides better opportunity for young trees and shrubs to regenerate and wild animals to multiply. The existing highland forest of the Green Belt area and the remnant

Juniperus forest of Rora Habab are good examples of enclosure forest regeneration (MoA, 2002, p. 70). Complete checklist of animals and plants is unavailable and BD resources in Eritrea are neither well-studied nor documented (GoE, 2013, pp. 1-2). Despite this, Eritrea has to date recorded 126 mammals, 91 reptiles, 19 amphibians and 850 bird species out of which 20 are endemic to Eritrea ([www.shabait.com/abouteritrea/erina/15254-the-potentials-for-tourism-development-in-eritrea](http://www.shabait.com/abouteritrea/erina/15254-the-potentials-for-tourism-development-in-eritrea)).

Eye witness observations of the area confirm that stability has allowed natural habitat to gradually recover. It appears that forest BD is on the right track, and the 'naturalness' of the area is on recovery. This is encouraging in terms of forest recovery, wildlife growth and mitigation of soil erosion and land degradation. But this has to be certified in terms of statistics. Success of any development programme is measured in terms of set-out criteria. The indicators of success for BD conservation could include a wide-range of tools such as the status of wildlife species, tree species, diversity and coverage, soil and water quality and quantity, lifestyle of local people, access to health, education, safe water, etc.



*Recovery of forest around Filfil- (Photo by the Department of Environment, 2015)*

## **2.5 Issue of Invasive Species**

The issue of invasive species of exotic plants requires proper addressing. Five invasive alien plant species, namely *Opuntia Fictus-Indica*, *Opuntia Dillenii*, *Nicotiana Glauca*, *Prosopis Juliflora* and *Lantana Camara* are reported in the Green Belt area. In case of endangered species, out of the total trees and shrubs clustered under 55 families, and herbs and grasses clustered under 16 families, 36 are found to be endangered species (GoE, 2013, pp. 16-17). Appropriate measures are needed to control invasive alien species and to protect endangered species from extinction risk.

Indigenous species which are ecologically adapted to the area should be at the core of ecosystem sustainable growth and protection. Invasive species could be detrimental to sustainable growth, and thus the Government of Eritrea has issued a Plant Quarantine Proclamation (2006, NO. 156/2006) and established stations and strengthened quarantine services at air and sea ports (GoE, 2013, p.13). Similar stations should extend to other land ports such as Tesseney, Om'Hajer, Senafe, etc to effectively control the spread of pests through the import of plants and plant products.

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### 3. MITIGATION OF LAND DEGRADATION

Eritrea has an agrarian economy with about 65 % of the people living in rural areas (NSO, 2010, p.3). The livelihood of the majority depends on land for food and livestock. Cash and industrial crops are also produced. Thus land is the basic resource for all development purposes and indeed a critical resource. But land degradation is high in terms of fertility, soil erosion, vegetation and water resources (RELMA, 2002, p. 10). Land degradation is defined as the 'reduction in productivity of land by any biological, chemical or physical process' (GoE, 1995, p. 49). The absence of wise land use policies and other factors led to land degradation, depletion of natural resources, and loss of habitat and weakening of ecosystem resilience.

Life and development are dependent on natural resources. A national environmental management plan has been established to ensure that human activities are directed for long-lasting benefits (GoE, 1995, p. 5). To stride for rational and sustainable use of resources, wise land-use policy needs to be practiced, appropriate land tenure policies and forest and other natural resources protection applied. Cognizant of the fact that land and forests are renewable; the Government of Eritrea has been working to conserve forests and wildlife for more than two decades. In order to ensure improved soil and water conservation on uncultivated hill slopes, enclosing, forestation, hillside terracing, micro and check dams (RELMA, 2002, p. 27) have been extensively undertaken. This has been accompanied by the introduction of strip cropping, crop rotation, planting of leguminous crops and cultivation of grasses and legumes in farm lands. In water harvesting, construction of ponds, dams (RELMA, 2002, p. v) and cisterns is necessary. But these demand extension agents and soil and water conservation technicians are equipped with the required technical competence and know-how.

Banning of cutting trees needs to be strictly monitored. Planting of trees and plants, limiting the number of livestock and implementing wise land-use policy are imperative. Awareness-raising is critical in order to realize reduction of soil erosion, increasing forestation, and mitigation of land degradation. The local government of Northern Red Sea Region has been engaged in planting trees and conservation of soil and water in the Green Belt area. OXFAM GB was also engaged in the rehabilitation of catchment areas, provision of energy saving stoves, introduction of high quality cereal and vegetable seeds, training of local farmers, introduction of modern beehives, soil and water conservation and pasture development in the Green Belt of Debubawi Bahri (GoE, 2013, p. 91). More importantly, land tenure needs to be tailored to ensure sustainable development in which participation of local people in all decision-making processes is vital.

The impact of expansion of traditional farming and livestock breeding on deforestation and land degradation is tremendous. The Green Belt houses about 24,000 cattle, 82,000 sheep and goats and about 35,000 people (GoE, 2013, pp., 5 and 39). People in the upper part of the escarpment are sedentary farmers while those in the lower part are mainly pastoralists. To mitigate soil erosion and land degradation, concrete steps need to be taken. As noted above, those who grow traditional crops on the steep slopes need to be relocated to other places to get alternative way of life. In addition, by raising awareness of the local people and building consensus, modern livestock breeding needs to be introduced. The local people can get economic rewards from conservation of natural resources, improved animal husbandry, wise land-use and natural resources management. This will lead to increased resilience to climate change, improved quality of life and food security.

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## 4. DEVELOPMENT OF ECOTOURISM

### 4.1 Brief Introduction

The Oxford English Dictionary defines ecotourism as ‘tourism directed towards unspoilt natural environments, intended to support conservation efforts’. Since late 20<sup>th</sup> century, tourism has become a major sector in economic activity and there are indications that it will continue to grow. World-wide, as a business it produces 4.4% of the world’s GDP and employs over 200 million people (IUCN, 2002, p. V11). It can generate funds from travel, entrance and service fees, local taxes, and become a source of income for the local people, park management and the country. The Zimbabwe Devure Ranch shows that conservation reserves’ revenue may actually be higher than other land-use revenues (IUCN, 2002, p. 126).

The location of the Green Belt area is suitable for ecotourism. The spectacular land scenery is stunning beautiful with diverse fauna and flora. The area is ‘outstanding spot for bird-watching’, referred as ‘paradise on earth’ ([www.shabait.com/about-eritrea/erina/15254-the-potentials-for-tourism-development-in-eritrea](http://www.shabait.com/about-eritrea/erina/15254-the-potentials-for-tourism-development-in-eritrea)). It has impressive weather with low lying summer fogs, landscape and sceneries, hot springs, diverse cultures and traditions of ethnic groups. The beautiful scenery, wildlife, peace and security, hospitality and generosity of the people, etc. make the area suitable for ecotourism development ([www.shabait.com/about-eritrea/erina/15254-the-potentials-for-tourism-development-in-eritrea](http://www.shabait.com/about-eritrea/erina/15254-the-potentials-for-tourism-development-in-eritrea)).



*Asmara-Massawa Road passing through the National Park (Adapted from the Department of Environment, 2015)*

### 4.2 The National Park and Ecotourism Development

The aims of national parks include protection of BD, providing opportunities for a healthy and active life, economic benefit through ecotourism, natural home for threatened species, social and cultural values, and therapeutic recreation. Therapeutic recreation is believed to heal various kinds of diseases (<http://www.bridgewaterma.org/government/department/recreation/pdf>). The Hot Springs National Park in the USA has five million visitors annually. The Baden-Baden and Wiesbaden in Germany, Karlovy Vary in the Czech Republic, etc are also health and pleasure resorts, known for their therapeutic recreation and tourist attraction ([www.imperialgroup.kv.cz](http://www.imperialgroup.kv.cz)).

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The treatment is accompanied by a variety of rehabilitation services; medically supervised process administered using local, natural therapeutic resources.

The Green Belt has hot springs that ‘discharge water heated by natural processes within the earth’ (World Book, 1994, p. 375). The hot spring of Mai Wuu’y is found around Gahtelay and located 60 km west of the port city of Massawa, and about 75 km to the north of Asmara at the lower part of the escarpment. Such places attract thousands of people seasonally to bathe in and drink from the hot springs. This hot spring can be transformed into a modern health resort centre, and hence suitable for ecotourism and health development.

Tourism development is both an emerging opportunity and potential threat. In the development of roads, airports, resort facilities, hotels, restaurants, shops, clinics, etc, strong management is needed to minimize negative impacts. In road construction trees are cut, and a road with motorized transport has noise pollution and dust that disturb wildlife, vegetation and water quality (IUCN, 2002, p. 71). An asphalt road for the Semienawi Bahri Belt is already in place. People from Asmara and other parts of Eritrea resort to the Semienawi Bahri Green Belt area on weekends and enjoy its BD, ‘appreciate their culture, history and resources’ ([www.shabait.com/about-eritrea/erina/15254-the-potentials-for-tourism-development-in-eritrea](http://www.shabait.com/about-eritrea/erina/15254-the-potentials-for-tourism-development-in-eritrea)). This means that domestic tourism is to a certain extent already in place. However, to ensure sustainable ecotourism, park management should do all it can to minimize environmental and socio-economic risks.

The Monastery of Debre Bizen, found in the Debubawi Bahri Green Belt, is a historical and religious place attractive for ecotourism development. The Debre Bizen Monastery, home to monks who chose to live severe and strict life, covers 15,000 ha of the designated National Park. It was founded in 1361 by Abune Phillipos. Due to its unique geographical position, it survived various conquests for hundreds of years. Nevertheless, during the Ethiopian colonial military rule, it was used as a military outpost against the Liberation Forces, and most of its property was looted. At present, it has more than 1,000 medieval manuscripts, bound in thick leather, cloth and wooden boxes. It has also a dozen of stone monk houses, three churches, some class rooms for religious teachings and agricultural support buildings ([www.eritrea.be/old/eritrea-hamasien.htm](http://www.eritrea.be/old/eritrea-hamasien.htm)).

Nefasit is a small town at the bottom of Mount Bizen, and is located 25 kilometers north east of Asmara. To climb Mount Bizen and reach the monastery takes about one and half to three hours walk. During the annual religious festival held on August 11, thousands of men and young males from Asmara and other parts of the country pay pilgrimage to the monastery. Its spectacular view and proximity to Asmara are its real assets. But, it has a constraint that needs resolution in the long-term. There is a religious belief that lingered for quite a long time forbidding women and all female mammals from encroaching into the premises of the monastery.

### **4.3 Economic Benefits of Ecotourism**

Countries with nature-based tourism industry, like Costa Rica, experience huge economic benefits. Park tourism in Costa Rica increased 400% from 1985 to 1999 and was estimated to generate over \$600 million (<http://en.wikipedia.org/wiki/national-park>). Its national parks, wildlife refuges and biological reserves cover over 25% of the country’s area (IUCN, 2002, p. 25). In comparison, the Green Belt covers only 0.8% of the land area of Eritrea. In Nepal, despite the extensive growth of

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tourism industry local people's income is low, and with the increase of the number of tourists the living costs increased (IUCN, 2002, pp. 30-32).

The park management has to carefully balance the demands to ensure BD conservation and ecotourism development. In addition, if not properly managed, it may also disturb community life and incur risks on the ecosystem. Tourism management should plan to maximize benefits and minimize costs. It has to follow others' best practices, like that of Botswana and Bhutan 'that encourage the development of 'high end-low impact' models (GoE, 2013, p. 26). To secure such benefits ecotourism needs a strong park management that has a clear direction and followers; high quality service with balancing demand.

#### **4.4 Link Between National Park and Tourism**

The link between national parks and tourism started with the history of protected areas. For sustainability, national parks need tourism for income, and tourism needs national parks for leisure and other recreational activities. For example, nature based tourism brings \$23 billion annually to Australia (<http://www.npansw.org.au/index.php/campaign/park-protection/why-are-national-parks-important>), and between \$236 billion and \$370 billion to USA and Canada in 1996 (IUCN, 2002, p. 113). This is a good lesson to countries like Eritrea. But the risks need to be clearly understood: ecosystems disturbances, soil removal and erosion, removal of vegetation, increased demand for water, air pollution, disposal of sewerage and disturbances of wildlife (IUCN, 2002, p. 33). Some of the impacts are unavoidable. What can be done is only to minimize the impacts.

Tourism institutional capacity has to be upgraded to provide high quality service with focus on low impact tourism that does not harm the environment. Adopting 'green consumer' lifestyles goes in harmony with sustainable ecotourism as a response to environmental concerns (IUCN, 2002, p. 20). Tourism is measured and described by statistics on volume and impact, tourists increase rate and income. Parks visitors' approval rating of service provision is imperative. To increase the benefits, the management has to aim for high quality service, host special events, evaluate tourism services, monitor visitor impacts, educate the local people, provide local accommodation options, prepare products and services for tourists' expenditure and provide recreation activities.

### **5. CAPACITY DEVELOPMENT**

Capacity is 'the power/ability of something, a system, an organization or a person to perform and produce properly' (Enemark, 2003, p. 4). Capacity development is at the core of any development process. Hence, capacity building efforts need to broadly address the 'societal, organizational and individual levels', in which overall goals of the national park are achieved. The institutional capacity of the park management should be built, and awareness of the staff, local community, tourists, and of the whole population enhanced. Capacity development is not a one-time job. It requires a long-time to develop; 'continual and comprehensive learning and change processes' in which the main players and stakeholders 'identify, strengthen, adapt, create, and retain the needed capacity' (Haile et al, 2013, p. 3) for effective ecotourism policy, national park and ecotourism development.

The Green Belt region park management should seriously undertake awareness-raising, training and learning to enhance consciousness of BD and ecotourism. To ensure BD conservation learning about wildlife species, knowledge on the importance of decreasing carbon emissions, and understanding of the forest and wildlife is mandatory. Thus, management and staff and park rangers need to take a 'life-long learning' on the importance of national park, BD conservation and ecotourism. Investment in professional training and development of workforce needs to be enhanced and seen as a continuing process. It is through this process that a creative and effective workforce is created and maintained. New skills in communication and information technology, science and management are essential. Educating the whole workforce and society is crucial. Thus, national parks are key institutions that should 'never be impaired to inspire and inform future generations' (<http://www.nps.gov/policy/report.htm>) as society's heritage.

Overall, park management service depends on financing. It requires explanatory materials, interpretive facilities and guides that require adequate funding. But many national park managers experience inadequate funding. It has to be noted that world-wide protected areas' funds are inadequate. This is because governments do not fully fund protected areas. Thus, park management has to charge fees for services provided and other income generating programmes introduced. There are many fund-raising opportunities, such as entrance fee, donations, foundations, etc (IUCN, 2002, p. 120) and an increase of a small percent in sale of goods and products. Without financial sustainability, successful capacity building effort is unthinkable.

Good human resource planning and development creates competent workforce with ample candidacy for success. Thus, all national park staffs should be well-trained and recognized as 'valued ambassadors' (IUCN, 2002, p. 145). This is the prime factor that ensures successful management for BD conservation and ecotourism development. Such ambassadors can track the resolution of the challenges which faces BD conservation and ecotourism development.

## **6. CONCLUDING REMARKS**

The national park needs relevant policies, legal declaration, designated and demarcated area, park management, park rangers and adequate budget for protected areas and ecotourism management. It is only then that cadastral registration, as a basis for proper management of land and its resources implemented and sustainable development ensured. These requirements are of absolute necessities; without their application success in BD conservation, forest recovery, ecotourism development and mitigation of land degradation is unthinkable.

BD conservation and ecotourism development need harmonious co-existence. Park services should always give balanced attention to BD conservation and ecotourism development. In addition, construction activities, development of recreation centers and facilities need to go in harmony with ecotourism. Moreover, recreational activities involve risks, and dealing with risks demand seriousness. To avoid unnecessary loss of life, effective tourist risk management with essential facilities need to be in place. Innovative and effective management wins the hearts and minds of the staff, local people and of tourists. Thus to minimize the negative impacts activities need to be guided by ecotourism policy and guidelines.

In order to ensure sustainable development, local people should be encouraged to produce quality with focus on livestock. Access to veterinary services and improved dairy management are critical. In addition, local people should be encouraged to plant trees around their villages for their own purposes. Moreover, awareness-raising of the local people is essential since it is one of the critical factors of success.

National park and ecotourism should bring improved livelihood through job creation, wise land-use and modern farming practices. In addition, provision and introduction of energy saving stoves, electricity, education and health is essential. Compensation for those whose immovable properties are to be taken need to be strictly implemented. Furthermore, for those who will be relocated, a socio-economic study is imperative to find alternative ways of life. To do justice, this should be a must that has to be done.

Overall, success of national park demands continuous awareness-raising, training and learning at park management, staff, local people, society at large and visitors levels. The whole society needs to be highly aware. But, as public funds are inadequate, park management needs financing and should effectively introduce fund raising mechanism to ensure sustainable park management for BD conservation and ecotourism development.

Sustainable tourism is a long-time commitment; benefits are mainly obtained in the long-term. To ensure long-term benefits, support from the community and all stakeholders is crucially essential. Thus, park management should intelligently focus on staff, local people, and society at large to create awareness that benefits are obtained in the long-term.

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## **BIOGRAPHICAL NOTES**

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