Resource Mobilization Information Digest N° 5 January 2013

Sectoral Integration in Ethiopia

Contents

1. Introduction

Ethiopia[1] (2009) discussed biodiversity conservation and its sustainable use, based on plans, programs, policies, activities and achievements of the relevant sectoral and cross-sectoral institutions in Ethiopia. It described the processes and measures taken by stakeholders at different levels to implement biodiversity conservation and the sustainable use of biodiversity. The contribution of biodiversity in ecosystem services, products, wellbeing of the communities and national economic development was addressed. The extent to which biodiversity-inclusive Environmental Impact Assessment (EIA) is being used as a tool to monitor and minimize the negative impacts of development projects on biodiversity is shown.

2. Sectors related to biodiversity issues

In addition to the sectors that directly deal with biodiversity and environmental issues, there are many others that are supposed to do this. However these sectors have failed to integrate biodiversity considerations into their strategies and programs. These sectors include health, mining, investment, tourism, trade and industry. Although these sectors are considered to be key stakeholders and actors in mainstreaming biodiversity issues, their achievements have been inadequate.

On the other hand some of the research and educational institutions are striving to accommodate biodiversity issues in their programs. In the higher learning institutions, biodiversity related aspects are being addressed through designing full courses or incorporating the issue as chapter(s) of courses. For instance, in Bahir Dar University, courses on fisheries, wetlands and wildlife are being offered to students at postgraduate level. Mekelle University has designed courses on crop diversity conservation that incorporate the introduction of international conventions and treaties like the Convention on Biological Diversity (CBD). A course on plant ecology with a chapter dealing with biodiversity, and forestry that is being provided in Mekelle University is an expression of the importance being given to biodiversity issues by this University.

Addis Ababa University (AAU) offers graduate courses on biodiversity management, conservation, and other subjects for botany, drylands biodiversity and zoology. The courses in AAU include streams on mammology, biogeography, ichthiology, invertebrate zoology, systematics, principles of taxonomy, animal ecology, food webs, limnology, and plant propagation. There had been a prgoram on drylands biodiversity since 1997. However, the program ceased to be provided after December 2007 following the termination of support from SIDA/SAREC for the Research Program on Sustainable Use of Dryland Biodiversity (RPSUD) program coordinated from Nairobi.

[1] Ethiopia (2009). 4th Country Report, Institute of Biodiversity Conservation, Addis Ababa, Ethiopia, November 2009, 175 pp.

Hawassa University offers graduate courses on wildlife genetic resources and rangeland biodiversity. The rangeland biodiversity course has been adopted by Bale-Robe/Meda-Wolabu University. There is a plan to establish a graduate program dealing with biodiversity conservation in Wondo Genet College of Forestry and Natural Resources (WGCFNR).

In addition to the inclusion in the academic curricula, some graduate research studies are focusing on aspects of biodiversity, such as studies on invasive species, characterization of genetic resources, assessment and identification of the biodiversity and use of farmers' varieties in crop improvement. Review and use of information generated from graduate research work is important because it can serve as a source of basic knowledge on the biodiversity of the country. A shortcoming of these graduate studies is that the students do not usually give feedback to the institutions (parks, development organizations, communities) that have hosted or are the subject of their research work. To overcome this, higher learning institutions need to work towards communicating the findings from their graduate research programs to stakeholders.

Some universities are involved in research on the maintenance of farmers' varieties. The maintenance of over 3000 accessions of sorghum farmers' varieties and the establishment of a small nucleus herd of Ogaden cattle by Haramaya University are indicators of efforts being made in the higher learning educational sector to address biodiversity conservation. Research staff of Mekelle University and Hawassa University also collect and characterize farmers' varieties of various crops in their respective regions.

At primary and secondary school levels there are efforts to incorporate environment / biodiversity conservation concepts in the educational curricula and in the activities of nature and environmental clubs.

However, with the exception of Tigray Region and SNNPR, biodiversity mainstreaming in sectoral government organizations is lacking in the other regions. This has contributed to inadequate consideration of the issues in the structural set up, overall strategy and action plans of the sectors in these Regions.

The IBC has prepared several publications, workshops, seminars and trainings aimed at raising awareness about biodiversity conservation. An awareness raising workshop on biodiversity conservation and sustainable use was organized for the House of Peoples Representatives and members of the Rural Development Standing Committee of the Parliament. Specific trainings on forest genetic resources conservation and sustainable utilization were also provided to higher officials in key political decision-making positions, TVET colleges, Wondo Genet Forest Resource College students, a number of high schools, District (Woreda) Agricultural and Rural Development Office experts, technicians and development agents and rural communities living within the vicinity of in-situ and ex-situ conservation sites. Local communities residing in the surrounding rural areas of the ex-situ conservation sites of Gareno-Gorotta, Lepis, Debre Tabor and Mandura participated in such awareness raising workshop.

Representatives from the Agriculture and Rural Development Office, Regional Administration, Police and Legislative bodies of the Districts also attended the workshop.

3. Other Strategies and Programs Integrating Biodiversity

The government of Ethiopia has issued proclamations on:

- Access to Genetic Resources and Community Knowledge, and Community Rights (Proclamation No. 482/2006) and;
- Plant Breeders' Right (Proclamation No. 481/2006).

These are highly relevant to the conservation and sustainable utilization of biodiversity. The Ministry of Agriculture and Rural Development (MoARD) is one of the governmental organizations whose national strategies and programs need to integrate biodiversity. The needs assessment for the Millennium Development Goals (MDGs) (MoARD, 2005) and programs such as the Plan for Accelerated and Sustainable Development to Eradicate Poverty (PASDEP) have incorporated biodiversity within the cross-sectoral environmental focus. Through the millennium tree planting scheme, some 1.6 billion seedlings were planted within 2 years and 76 per cent of these have survived. As a result large areas of land have been rehabilitated. The rehabilitation work is very important to balance the forest clearing for plantations of tea, coffee and bio-fuel crops and other agricultural activities. In addition, MoARD plans to scale-up Participatory Forest Management (PFM) in 4 administrative regions: Afar, Somali, Benshangul-Gumuz and Gambella. Although adequate enforcing mechanisms are lacking, the environmental policy developed by EPA includes EIA for all investments.

4. Other Biodiversity Related Conventions

The majority of stakeholders are not aware of the various conventions that are related to CBD. Even when the knowledge and aware is there, strategies and plans relating biodiversity conservation with the conventions is minimal. The Environmental Protection Authority (EPA) is the focal point of the country for the United Nations Convention to Combat Desertification (UNCCD), while the National Metereological Agency (NMA) is the focal point for the United Nations Framework Convention for Climate Change (UNFCCC) (EPA, 2008).

The NMA has developed a "Climate Change National Adaptation Program of Action (NAPA) for Ethiopia" and projects and activities included in the Program have a direct bearing on biodiversity conservation and sustainable use, particularly in arid and semi-arid areas of the country.

Both EPA and NMA have made available most of the conventions related to the CBD on their respective websites with the objective of raising awareness.

The Institute of Biodiversity Conservation (IBC) works towards achieving the objectives of the various conventions and treaties by incorporating them in its Strategic Planning and Management (SPM) as well as on an ad hoc basis. The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) and the Global Diversity Trust are some of the conventions in which IBC is engaged.

The Ethiopian Wildlife Conservation Authority (EWCA), which is the focal point for CITES, has carried out some activities to control illegal items being sold in souvenir shops and on managing the captive civet cat farms.

The stakeholders believe that the various conventions related to biodiversity need to be implemented in an integrated manner.

On the other hand, there has recently been good progress made by the government towards ratification of other conventions. Among these, the ratification of the Conventions on Migratory Species (CMS) and African-Eurasian Waterbird Agreement (AEWA) are indications of commitment of the government to biodiversity conservation and sustainable utilization. In addition to governmental institutions mentioned above, there are a few local NGOs involved in biodiversity conservation. Among them are the Ethiopian Wildlife and Natural History Society (EWNHS), Forum for Environment (FfE), Ethio-wetlands and Natural Resources Association, Wildlife Conservation and Development (WildCod), Ethio-Organic Seed Action (EOSA), Institute for Sustainable Development (ISD), Movement for Ecological Learning and Community Action (MELCA-Mahiber), and Wildlife for Sustainable Development (WSD). International NGOs such Born Free and Frankfurt Zoological Society (FZS) are also actively working on the conservation of wildlife in particular and protected areas in general.

5. Organizational and structural set up for mainstreaming

For the effective conservation and sustainable utilization of biodiversity, an effective organizational and structural set up needs to be put in place. This is not the case in most sectoral and cross-sectoral institutions of the country. In governmental organizations, besides the education sector, biodiversity issues are being handled as a minor component and at times on an ad hoc basis. There are no activities that directly address biodiversity issues in a sustained manner in most of these institutions. For example, there are no formal systems to protect and conserve the Sidamo Lark, an endemic bird, which is currently critically endangered. Relevant governmental institutions such as the Ethiopian Wildlife Conservation Authority and Institute of Biodiversity Conservation, which have a national mandate to deal with biodiversity threats, had been unaware of the problem about the Sidamo Lark. They were not involved in finding solutions to preserve this unique species. Instead, an ad hoc task force was formed at zonal level to develop an action plan to take the necessary measures to save the bird with the help of local and expatriate researchers coordinated by EWNHS.

However, there are initiatives in some regions to mainstream biodiversity directly or indirectly. Tigray and SNNP Regional States could be mentioned in this regard. In Tigray Region, there is one biodiversity expert and a post for an additional expert at the regional level has been created. In SNNPR, the structure for natural resource management and environmental protection (that accommodates biodiversity) stretches from regional to district levels, and there are biodiversity experts at all levels. In SNNPR regional level experts are assigned on the basis of biodiversity components. There is a biodiversity program launched by the Organization for Relief and Development of the Amhara Region (ORDA) in five districts in the highlands and lowlands of south and north Gonder zones, respectively. Additionaly,

capacity building endeavors are underway to boost the efficiency of all districts with particular focus on North Gonder Zone.

The research strategy of Amhara Region Agricultural Research Institute (ARARI) is mainly production oriented. However, genetic selection with the objective of improving indigenous cattle and sheep breeds is also being undertaken. In addition, a project on crop improvement to study local sorghum varieties has been completed.

6. Participatory Biodiversity Management

As part of the community-based conservation of natural resources, initiatives to establish and manage protected areas are currently underway throughout the country. In Addis Ababa, 709 hectares of land has been allotted for a botanical garden where some 250 species of plants are identified through an inventory of the existing vegetation. In SNNPR around Mechisho area in Dara district, 30 hectares of land has been designated for a community park and forest rehabilitation. Similarly, in Bahr Dar, a Millennium City Park near the outlet of Abay River (Blue Nile) from Lake Tana to Tiss Abay Falls has been delineated. This Millennium City Park covers about 4000 hectares of land of which 54 per cent is found within the city boundary. Rapid assessment of the area has identified a huge diversity of fauna and flora. This is believed to have potential for socio-economic and ecotourism development with the local communities. This will also lead to the conservation, rehabilitation and recreational aspects of biodiversity being developed.

There are some attempts being made to involve the local communities in the protection of the parks in the different parks of the country. Awareness creation, livelihood diversification, and creation of employment opportunities for the surrounding communities within the parks are some of the strategies being used to involve the communities. Requirements for recruiting park scouts used to be quite high, particularly in terms of education level. However, this requirement is currently being waived to give better opportunities for the surrounding communities to compete in the recruitment process.

Support to enable local communities to produce items for sale (e.g. souvenirs) is also being implemented. Parks are assigning sociologists who are community experts in order to raise the awareness of the local communities and enable them to contribute towards the conservation of the parks. Shortage of grazing land outside park areas, particularly during dry seasons; the decline of the populations of medicinal plants outside park areas while being relatively abundant in the parks; and illegal hunting (poaching) by people who sell bush meat are serious threats to parks. Alleviating these threats requires more work to involve and engage the communities in the conservation activities. Bale Mountain National Park (BMNP) has developed a management plan through a participatory process by involving the communities.

Outreach programs provided by the Haramaya University are designed to involve Farmers Research Groups (FRG) in a participatory approach and provide full packages of technologies that are evaluated by the Group. This has created an opportunity to address natural resources conservation, use of farmers' varieties and planting of indigenous tree species. The FRGs are directly involved in selecting varieties,

which creates a platform for the farmers' varieties to be considered. There is an annual farmers' day organized by the University where farmers, breeders and other stakeholders discuss biodiversity conservation issues and seek solutions for the way-forward.

There is participatory resource management in West Arsi and Bale zones in central and south Ethiopia co-ordinated by the Bale Eco-region Sustainable Management Program (BESMP). One of the objectives of the Program is the introduction of participatory resource management including biodiversity resource conservation and providing socio-economic benefits to the rural communities. The Program is currently implementing management of natural resources in 14 districts (10 in Bale and 4 in West Arsi zone) covering an area of 22,000 km2 (Farm-Africa/SOS Sahel Ethiopia, 2007). The Program focuses on the following program outputs:

- Development of an eco-region plan;
- Functional and sustainable natural resource participatory management and conservation systems;
- Sustainable financing mechanisms;
- Improved/appropriate legal policy and regulatory frameworks in order to lobby for policy changes and develop policy briefs;
- Government and community institutional capacity built; and
- Diversification of natural resources based livelihoods.

Wondo-Genet College of Forestry and Natural Resources (WGCFNR), in collaboration with the Swedish University of Agricultural Science (SLU) and Center for International Forestry Research (CIFOR) is engaged in a new research program, known as Development Oriented Interdisciplinary Thematic Action Research (DOITAR). Within this DOITAR, the college with its partners, the communities and other stakeholders have been following a multi/interdisciplinary approach towards achieving its objectives, whereby scientific and local knowledge are combined to identify entry points for improving livelihoods, through natural resource related interventions. The DOITAR has been conducted in three pilot areas, namely: Wondo Genet catchments, Lake Langano and the Shashemene Forest Industry Enterprise. In these pilot areas, baseline surveys were initially conducted in consultation with the local communities. Researchers from various relevant disciplines were involved in the analysis of livelihood data. In this research intervention strategies were identified on the basis of the nature of the problems facing the area and communities. Twenty projects were carried out based on developing interdisciplinary thematic action plans concerned with increasing food production, income and health, and through engaging the local communities in the utilization and management of forests and woodlands. More than 50 researchers from WGCFNR and other faculties of Hawassa University with different professional backgrounds were involved in these projects. Local community members and other sectoral offices were

also involved at the various stages of the research process which extended from the identification of priority problems to evaluation of the selected technologies in the field.

Although it is difficult to assess the full impact of these interventions within the period of four years (from 2004 to 2008), several achievements at various levels have been identified (Motuma et al., 2009). Some of the achievements are that farmers gained experience and skills from training sessions, field tours, and through working with researchers. Some farmers were also able to improve their productivity and obtain more food and income. The Shashemane Forest Industry Enterprise has confirmed that its relationship with the community in the Ashoka area has improved as a result of the activities of the DOITAR. This was achieved by working towards reducing the dependence of the local community on the forest through the creation of various alternative means of getting a livelihood. These experiences are believed to have contributed positively by complimenting the teaching-learning process.

The Relief Society of Tigray (REST) has been undertaking programs on the establishment of plantations of indigenous trees: it has planted over 150,000,000 seedlings of 55 species since 1993. Environmental rehabilitation programs in the region have facilitated the regeneration of trees and shrubs through area closures that have resulted from the rich soil seed banks. Gully rehabilitation has been carried out in some parts of both Tigray and the Amhara Regions. These activities are related with gender mainstreaming and family planning in North Gondar to help minimize population pressure on biodiversity resources. In both Amhara and Tigray Regions, area closures are widely practiced for soil and water conservation and regeneration of natural vegetation.

Community participation in forest conservation in the Humbo woreda, Wolayta Zone of the SNNPR, has recently been linked to the carbon market, where the community has been awarded for their efforts that contributes to Carbon Sequestration. The livelihood diversification initiatives in these areas are currently active in managing and conserving forest resources and the production of non-timber forest products (e.g. honey and spices). Community managed forest areas such as Chilimo, Adaba-Doddola and Belete Gera in Oromiya Regional State are showing improvements in this regard.

The Productive Safety Net Program (PSNP) has been carried out in many parts of Ethiopia. It is common especially in food insecure areas of Tigray, Amhara, SNNP and Oromia Regions. The Program has focused on selected households over several years and has contributed towards the mainstreaming of biodiversity conservation to the grass-roots level. The impacts and effectiveness of the Program are important both in bringing alternative livelihoods to the food insecure families as well as in improving degraded lands and the associated biodiversity through the various soil and water conservation and related land management interventions. In Tigray, all healthy adults in food-insecure communities provide 40 days a year of free work to carry out public works. This has resulted in thousands of kilometers of terraces being built on degraded land with improved vegetation cover on a large total area. This has contributed to a reduction of soil erosion by about 60 percent. In Western Hararge, soil and water conservation activities were conducted on a watershed area that had been abandoned after people were resettled to other areas. This watershed area has brought significant rehabilitation to the ecosystem of the area.

7. Traditional Practices and Indigenous Knowledge

Conservation that capitalizes on indigenous knowledge through community participation has gained precedence in most parts of Ethiopia (MoARD, 2000; EPA, 1997). For example, the Konso people's land management practice in Southern Ethiopia is considered to be a model in traditional environmental management and rehabilitation efforts for the world (Engels and Goettsch, 1991). In recognition of the contribution of the traditional natural resource management of the Konso people, the UNFAO on its 50th Anniversary awarded this community a special prize (http://www.wiserearth.org/event/view). Such an award is a positive recognition of valuing traditional practices of the communities to manage the natural resources of the country.

Guassa area is located in the Central Highlands of Ethiopia, and has a total area of 111 km2: its altitude ranges from 3200 to 3700 masl. The area is characterized as rugged, with plateau, gorges and river valleys. The area harbors 22.6 per cent of the endemic mammals and 48.3 per cent of the endemic birds of Ethiopia. The Guassa area has been managed by the Menz community as a common property resource for centuries and it represents an interesting model of community led natural resource management regime that has operated in a very fragile ecosystem. However, as the human population of the region continues to increase, it is important to ensure that the community continues to utilize the natural resources sustainably. This will require the empowerment of the community. Currently the Afro-alpine Ecosystem Conservation Project of the Frankfurt Zoological Society is working with the Menz community to strength this age-old conservation system.

There are remarkable efforts being made by various environmental and biodiversity advocacy groups in different corners of the country. The Movement for Ecological Learning and Community Action (MELCA-Mahiber) and the Institute for Sustainable Development (ISD) focus on cultural biodiversity (combining the concepts of culture and biodiversity in the context of traditional knowledge). Activities of Kembata and Tembaro farmers in establishing area closures, the traditional forest utilization rule of the Sheka people and the Gedeo Agroforestry conservation activities are important initiatives and heritages that are exemplary in south Ethiopia. ISD applies this principle in supporting the environment clubs in 23 of the secondary/high schools, at least one from each Region of the country, to re-establish their relationships with their local communities and their traditional knowledge and practices through a program called 'back to roots'.

The Christensen Fund is organizing and coordinating the conservation of the indigenous knowledge (IK) and culture about natural resources and the environment in Sidama, Konso and Dorze areas. The Association for Research and Conservation of Culture, Indigenous Knowledge and Cultural landscape (ARCCIKCL) has established 64 community organizations in the SNNPR. These community organizations are intended to rationally conserve indigenous knowledge (IK), farmers' crop varieties, livestock and other biological resources in their respective geographical areas. In Bonga, the ARCCIKCL has conducted mapping of the area in collaboration with other NGOs. The ARCCIKCL has also prepared a map of the Konso area and submitted it to UNESCO. Based on this, the UN has assigned ICOMOS and International Union for Conservation of Nature and Natural Resources (IUCN) to verify the map on the ground and upon which, the whole Konso area is to be recognized as a world heritage site (Dr. Metasebia Bekele,

pers. comm.). Additionally, there are researchers attempting to identify traditional practices of farmers which can help to improve productivity of indigenous animals.

8. Case Studies and Success Stories

There are a number of institutions that are undertaking activities towards conserving biodiversity and are worth sharing their experiences. The Institute of Sustainable Development (ISD) is conducting a large scale study on composting to increase crop yields particularly on farmers' crop varieties (Edwards et al, 2007). This study's findings indicate that the increase in yield amounts to two to three folds when using compost rather than using unfertilized checks. The findings also shows compost is better than chemical fertilizer because the yield increase can be maintained in subsequent years and works better when used with the farmers' varieties.

A study on the seed system impact and farmers' income and crop biodiversity was conducted in the dryland of Southern Tigray with the aim of describing the effect of improved seeds on the existing seed system. This study showed the decrease in the diversity of the local crop varieties as a result of the introduction of high yielding improved/exotic varieties (Kiros et al, 2009). Five cultivars of sorghum, one cultivar of teff and four cultivars of maize have been lost and others are on the verge of being lost from the farming system of the area. This is due to the late maturity and susceptibility to moisture stresses of some of the local varieties. This was verified by studies that showed early maturing sorghum varieties from the informal seed system that out-performed and could substituted the local late maturing types. The fact that traits with higher yield, good food or culinary quality, and ability to perform best under high moisture conditions are considered to be most favored, has led to the local varieties' to be subjected to genetic erosion. In addition to taking the yielding ability and earliness traits as the only criteria for selection, emphasis needs to be given on the utility, market quality and other traits of the products.

Collection of farmers' varieties and characterization were carried out by the Tigray Agricultural Research Institute and Mekelle University. Wheat (berihu, arkbi, anji) wheat/barley mixture (hanfets), barley (abatgebs), teff (key teff, netch teff, sergegna teff), sorghum (wefey, shilkut, degalit, wedi aker, leiqua), linseed, safflower, sesame and noug farmers' varieties were included in this scheme. The aim of this collection is ensure that the resources are well managed and their characteristics identified for future uses. Mekelle University has launched an ongoing project entitled "Seed Safety through Diversity" where 2 Ph.D. and 1 M.Sc. students are carrying out their research work. In addition, research on area closures and indigenous tree species propagation are being conducted by Mekelle University. Another project entitled "Trees for Farmers" has distributed 10 seedlings of indigenous tree species to each farmer at the household level with follow-up activities to assess survival rates. Research on Jatropha's allelopathic effect, invasiveness and maximization of its oil yield has also been conducted by Mekelle University.

Based on a study conducted to determine forest carrying capacity in Adaba-Dodola Participatory Forest Management (PFM) project, the net income of forest user groups and non-forest user groups is found to be 7,360 birr/year/hh and 4,820 birr/year/hh, respectively. This shows, the current income of the forest

user group is equivalent to 1.5 times the income of the non-forest user households (Tsegaye et al 2007). Such data helps in assessing the value of the services of the biodiversity resources and in involving the communities.

9. Awareness Creation

Major biodiversity mainstreaming activities include awareness creation/raising through workshops at federal and regional levels and the use of the media. On top of that, capacity building to implement mainstreaming has been done in some areas as well. Awareness creation/raising activities primarily focusing on schools have been carried out in some parks of the different Regions. It is believed that awareness created in schools is likely to reach all the community, since students communicate what they have gained to their family. In Gewane (Afar) area, Yangudi-Rasa National Park raised awareness within the military, since it was reported that military personnel assigned close to protected wildlife areas were involved in illegal hunting for bush meat and cutting trees for fire wood. The awareness creation in the community has resulted in reduction of occurrence of wild fire. In Babille local mass media has been used in changing attitude of the population to the extent that they prevent their fellows from damaging biodiversity. In other corners of the country, awareness raising activities have been conducted on the impact of bush encroachment on the rangeland vegetation for the local communities residing within the vicinity of the Borena rangelands.

Training of personnel working at the zonal level with the intention of the knowledge being passed on to the communities and schools has been started in the SNNPR. The Ethiopian Wolf Conservation Program uses schools, social and sport events to raise awareness on the conservation problems of the species. Awareness raising has also been done in relation to fish conservation and utilization by using the mass media, field visits and training on food technology but the activity was limited in scale due to lack of capacity. In Addis Ababa awareness raising workshops have been organized on environment and biodiversity issues in all ten sub-cities. It is too early to evaluate the impact of these worskshops. Afar Pastoralist Development Association (a local NGO) has done a lot to raise awareness about pastoral development, conservation of natural resources and agro-biodiversity, as a result of which, award winning individuals have emerged at national level.

The IBC has organized a training workshop for members of the House of Representatives with the ultimate objective of influencing their decision on the environment in general and biodiversity in particular. The Annual International Biodiversity Day is also one event IBC is using to create and raise awareness among the public and stakeholders.

Farmer's field school program, organized by EOSA, has increased the exchange of information and experience among farming communities, researchers and development practitioners with regard to crop variety improvement (Genene, 2006; Regassa et al., 2009). With EOSA playing a leading role, experiences have been gained in optimizing collaboration and task division between farming communities and public institutions to scale up the Farmer Field School approach using a (TOT) training of the trainers scheme. EOSA promoted integrated conservation, use and management of agrobiodiversity, with a guiding principle of "Conservation Through Use" that involves community

groups, government institutions, researchers, other NGOs and industry. This program is aimed at promoting and increasing small-scale farmers' ability to manage their resource base, establish community-based seed networks, linking farmers with industry, creating local markets and promoting organic production (Regassa, et al., 2009).

10. The Use of Incentives

In a number of areas incentives have been used to promote biodiversity conservation. There is an attempt by local administrations to compensate the surrounding communities for loss of crops and life by elephant and other wild animals around the Babille Elephant Sanctuary. The radio-collar elephant tagging system in Babille Elephant Sanctuary has created a system by which farmers will be warned when elephants are approaching their farm and this has drastically reduced the conflict between the elephant population and the surrounding communities.

The recruitment of scouts from the surrounding community by Parks Administration (as described above) is one good incentive for the local people. As a way of raising the interest of the communities to conserve the forest biodiversity in the Bale highland, market development for the forest coffee through a specialty market and collective action has increased the income from coffee.

The Environment Protection Bureau of the Addis Ababa City Administration is involving communities of wood collectors to create alternative livelihood strategies. The aim is to protect Green Areas and biodiversity of the city. These include: 1) organizing them to produce energy saving stoves for sale which contributes to the efficiency and reduction of fuel wood use; 2) to use part of the wood harvested by the Addis Ababa fuel wood project, in return for compliance not to encroach in the forest; and 3) training of about 15,000 wood collectors in handicrafts, with support of ILO, so that they can create their own income generating activities.

Wondo Genet College of Forestry and Natural Resources (WGCFNR) engaged local communities in utilization and management of forest and woodlands through which household food security, income and the conservation of the natural resources have improved. This also led to a decrease in maternal morbidity and mortality in the area through improving the living conditions for the women.

11. Ecosystem Services

Pastoral areas have species adapted to harsh climatic conditions that are important in feed and food security.

The case of Bale Mountains National Park is a vivid indication for the importance of biodiversity, in providing ecosystem services and for overall development and human wellbeing. The Bale Mountain massive is a source for some 40 tributary rivers which flow into the main rivers of the Wabe Shebelle, Genale, Web and others. These rivers are the sources of water for about 12 million people in eastern and south eastern Ethiopia, parts of Somalia and Kenya, and for hydroelectric power and large scale irrigation in southeastern Ethiopia. A point worth mentioning here is the contribution of the giant mole rat which is found in the area. Among its other roles in the ecosystem, the mole rat facilitates rain water

percolation into the ground as a result of the large number of holes it digs in to the soil. This plays an important role in sustaining the large number of springs in the area. On top of this, the whole catchment area, being very rich in biodiversity, is the basis for ecosystem stability and home for a number of endemic flora and fauna species of the country. The carbon sequestration benefits and the high potential for ecotourism are important services with high potential for economic development through carbon-trading and tourist attraction. There is an on-going negotiation for benefits and creation of carbon neutral areas. Organic coffee and other agricultural products from this area are a source of foreign currency.

Conserving wild animals and vegetation in parks and other protected areas would encourage a thriving tourism which creates jobs. The tourism industry promotes employment opportunities by way of tourist guides, horse renting, souvenir/artifact/handicraft sale and local food industry. This, in turn, creates an incentive for the local people to protect the conservation areas.

With regard to on-farm conservation, the co-existence and co-evolution of the wild, weedy and wild-weedy relatives with the cultivated ancestors create opportunities for the continuous introgression of new traits. This contributes for enhancement of local crop varieties from the economic and agronomic points of view.

12. Biodiversity Inclusive Impact Assessment

The Environmental Protection Authority (EPA), based on the cross-sectoral Environmental Policy of the country, has developed a law on Environmental Impact Assessment (EIA) that has been passed by the parliament. In the legislation it is stipulated that without authorization from EPA or from the relevant regional environmental agency, no person shall commence implementation of any project that requires environmental impact assessment (Federal Democratic Republic of Ethiopia, 2002). Implementation of EIA in development projects is under way and its familiarization has been done. However, effective follow-up was not done because of limitations in the capacity of EPA to involve the public and other interested and affected parties. Additionally there is no monitoring activity and audit reporting to make sure that the mainstreaming is effective or not.

In the EIA legislation, though it is implied in the definition of the term impact that biodiversity needs to be considered, it is not clearly put that the assessments should be biodiversity-inclusive impact assessments.

The proclamation requires an EIA process for any planned development project or public policy which is likely to have a negative impact on the environment, and recognizes the fact that activities in other economic sectors can have significant negative impacts on natural resources in particular and the environment in general. There are sector specific laws and regulations into which EIA should be integrated.

The Rural Land Administration and Use Proclamation recognizes the right of investors to obtain and use rural land, provided that priority is given to farmers and pastoralists. Once land has been allocated, the

proclamation obliges landholders to sustainably use and manage the property. Similar proclamations are issued, accordingly, by regional states stipulating that the development plan submitted by investors seeking land must not lead to the degradation of the land or surrounding environment.

The Fishery legislation seeks to ensure sustainable use of the fish resources in the country and stipulates that federal and regional organs should ensure that development programs and projects will not have a negative impact on the fish resources of a basin. The proclamation contains important provisions that support EIA relevant to the sustainable utilization of fishery resources. However, it does not specifically require fishery developers to submit an EIA report to environmental agencies.

The Wildlife Proclamation, while asserting that wildlife based tourism should not endanger the ecological integrity of the protected areas, which is a positive measure, fails to subject the granting of permits for development of wildlife tourism infrastructures such as hotels, lodges and other facilities in protected areas to the EIA process.

The Water sector of the natural resources has a Water Resources Proclamation and a Water Resources Regulation. The proclamation states that the water resources of the country are duly conserved for the highest social and economic benefits of the country and prohibits the release of any waste into water bodies that endangers the lives of humans, animals or plants. It also prohibits the clearing of trees or vegetation and the construction of residential houses along the banks of water bodies. The regulation stipulates that a water use permit will not be issued if the plans entail the creation of pollution or harmful effects to the water resources and the environment. Like some of the other proclamations, the water resources proclamation and regulation fails to make EIA a mandatory requirement for the issuance of water use and development permits.

The law on Community Rights and Access to Genetic Resources and Traditional Knowledge (Proclamation 482/2006) states that access to genetic resources is carried out without causing harm to the environment and may be denied if the planned use may cause an undesirable impact on the environment, an ecosystem, human health or the cultural values of local communities (Mellese and Mesfin, 2008). This also fails to require applicants wishing access to the genetic resources to conduct a formal EIA process.

13. Conclusion

There is a good start with regard to mainstreaming biodiversity. As a result of some of the measures, some changes have been observed in the status and trends of some of the biodiversity resources. Based on the awareness raising activities, a relatively positive attitude is being achieved at all levels, though it is neither adequate nor exhaustive. For instance, the degree of encroachment by people and livestock in some parks (e.g. in Yangudi-Rasa and Babille National Parks) has reduced. Positive progress in some areas is observed particularly in participatory resources management. Introduction of new livelihood options (livelihood diversification), increase in production for consumption and market, conservation and sustainable utilization are some of the changes. Indigenous knowledge, cultural landscapes and some ecosystems are conserved in certain areas. The conservation of forest coffee, agro-biodiversity

and forest resources are among the positive achievements. However, it is rational to admit that what is achieved to date is far from what needs to be done given the magnitude of the problem.

Use of positive incentives has contributed to the increase of the elephant population in Babille, which in turn contributes to the tourism development in the area and income generation for the local community. This signifies the role of positive incentives in the conservation of biological resources, which should be applied in other areas. As observed in some higher learning institutions, governmental and non-governmental organizations (NGOs), incorporation of biodiversity concerns in the academic curricula, development strategies and research programs have assisted the overall efforts towards the conservation and sustainable utilization of biodiversity. However, a large number of current development projects are posing threats to the country's biological resources. It appears that EIA is often lacking and, when it exists, in most cases it does not include biodiversity impact assessment.

As compared to the vast diversity of the biological resources, the measures taken towards the implementation of the National Biodiversity Strategy and Action Plan (NBSAP) with regard to mainstreaming are far below expectations. So, urgent additional measures are required to bridge the wide gap.