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Review

Forest resource management systems in Ethiopia: Historical perspective

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The integration of economic development and environmental management has become a major concern for society, businesses and governments, especially during the past century. A desk review was carried out to examine the various forest resource management systems used in Ethiopia over the past half century. Forest resources in Ethiopia have been managed with different intentions and motivations at different times; these management systems can be broadly categorized by prominent resource management paradigms, like frontiers economics, deep ecology, environmental protection, resource management, and eco-development. Three main forest development periods are identified: pre-derge environmental protection, derge regime environmental protection and frontiers economics, and post-derge resource management and environmental protection. We suggest that for long-term sustainable forest management to succeed, a combination of resource management and eco-development paradigms should be promoted.

Key words: Ethiopia, natural resource, natural resource management paradigm, forest, forest degradation.

INTRODUCTION

Economic development takes place in the environment using resources so that the environment is the natural resource base that sustains all life including human life (Dessalegn, 2001; Barrow, 2005). Both environmental management and development before the 1960s were top-down activities, but they now seek popular participation or even empowerment: the environment and people were once to be conquered, today they are to be understood as part of the planning process. Most adopt an anthropocentric viewpoint, placing humans first and environment second; however, there are environmentalists who are more ecocentric and regard environmental care to be at least as important as human needs (Barrow, 2005).

From 1949 to the early 1970s, economic development was concerned primarily with the reduction of poverty; environmental concern was deemed irrelevant, a 'luxury' that poor people could not afford, or was even seen as part of a scheme to hold back the less-developed nations. It was not until around 1987 that it was widely accepted that development needed effective environmental management and vice versa (Barrow, 2005). The subject of environmental management and its integration with development has become a major concern for people, businesses and governments of the world especially after the United Nations (UN) conference on environment and development held in Rio de Janeiro, Brazil (1992). It was a landmark in the evolution of an international consensus on the relationships among population, development and environment, based on the concept of sustainable development (UN, 1993); and then after, the relationship between environmental management with human development was in a period of dramatic change.

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According to Colby (1991), five fundamental paradigms of environmental management systems which involve increasing integration of economic, ecological and social systems into the definition of development and the organization of human societies have been developed. These are:

Frontier economics

This was a paradigm prevailing in most countries until the 1960s and in some developing countries till now (Barrow, 2005). This paradigm treats nature as an infinite supply of physical resources to be used for human benefit, and as an infinite sink for the by-products of the consumption of these benefits, in the form of various types of pollution and ecological degradation. Managing the environment is more or less irrelevant because it is 'outside' economics (Colby, 1991; Barrow, 2005). According to Miller (1989), Cornucopians called "unrealistic technological optimists" by their opponents believe that if present trends continue, economic growth and technological advances will produce a less crowded, less polluted and more resource-rich world. For these groups, the current environmental problems are exaggerated and can be cured through technological innovations. They believe that the world will not run out of potentially renewable resources because of better management or a switch to substitutes; the earth's wild plant and animal species are here to serve our needs. Increase in economic growth and technological innovation can reduce resource depletion, pollution and environmental degradation to acceptable levels.

Deep ecology

The polar opposite of frontier economics, deep ecologists advocate merging appreciation of some of the more scientific aspects of systems ecology with a 'biocentric' (non-anthropocentric) or 'harmonious' view of the relationship between man and nature (Colby, 1991). Devall and Sessions (1985) as cited in Barrow (2005), called the paradigm a dark-green (deep-green) philosophy with an ecocentric rather than anthropocentric outlook. It advocates a harmony between humans and nature; it opposes the use of technology, and voices a wish to develop new ethics and development outlooks. Deep ecologists see technological fixes as usually leading to larger, costly, more intractable problems, rather than progresses (Colby, 1991).

Environmental protection

This is developed after the mid 1960s, this paradigm makes trade-offs between development and environmental protection. Tools like environmental impact assessment (EIA) were developed, and remedial measures were promoted to counter environmental damage. The norm was to seek 'end-of-pipe' pollution treatment or more-or-less managed dispersal (Colby, 1991; Barrow, 2005). This approach is inherently defensive or counteractive in practice and it has also been described as the 'business-as-usual plus a treatment plant approach.' The prescription of new technological solutions to mitigate pollution problems has also become part of this strategy. It focuses on setting the limits, and in some cases, cleaning up after limits are exceeded, but they are not responsible for planning development activities in ways that do not pollute or damage necessary ecological functions (Colby, 1991).

Resource management

This is developed in response to the fears that development would outstrip natural limits and cause disaster (Barrow, 2005). The basic idea is to incorporate all types of capital and resources into calculations of national accounts, productivity, and policies for development and investment planning.

Eco-development

This appeared in the early 1980s (Glaeser, 1984 as cited in Barrow, 2005) and emphasized the need to restructure society and economics to ensure that development worked with, rather than against, nature. According to Colby (1991), the relationship between society and nature in eco-development paradigm results to a *positive sum game or win-win outcome* by reorganizing human activeties so as to be synergetic with ecosystem processes and services. It advocates *pollution prevention pays* rather than *polluter pays*. It gives more emphasis for preventive measures than corrective action. Eco-development thus moves on from economizing ecology to ecologizing the economy which means designing an economic activity which is compatible to the ecology.

According to Ministry of Finance and Economic Development (MoFED) (2006), resource mismanagement coupled with their underutilization has so far reduced their contribution to Ethiopia's overall development. Over grazing and the expansion of farming into unsuitable land, caused by increasing population and livestock, without increasing economic productivity is leaving the land bare. As a result, large areas of the country, particularly on the northern and central highlands, have been exposed to loss of fertility, degradation and ecological imbalances. Dessalegn (2001) has strongly argued that the root cause of deforestation is absence of ownership security. According to EPA (2000), in order to ensure that future developments in Ethiopia are sustainable, it is essential to integrate environmental concerns into development activities so that the inclusion of the principles of sustainable development into development proposals is very essential. As a result, one of the key objectives of the EIA process is to integrate environmental considera-

tions in development planning processes in order to make use of natural resources in a responsible manner.

The objective of this paper was, therefore, to examine forest resource management systems of Ethiopia starting from the emperor period (1930-1974) till now (green economy of EPDRF) mainly based on literature review. In doing so, different documents, research findings, proceedings and regulations of the country were reviewed and analyzed from the major natural resource management paradigms point of view.

FOREST RESOURCE BASE OF ETHIOPIA

Diverse physiographic, altitudinal, climatic and edaphic resources, enables Ethiopia to have various types of vegetation ranging from alpine to desert plant communities (Sahle, 1984) which provide economical, socio-cultural and environmental benefits. Curry-Lindahl (1972), Sahle (1984), Gebremarkos (1998), Demele (2001), FAO (2003) and Tsegaye (2006) showed that forests have an important role in maintaining the productivity of the environment; trees provide food for animals, serves as a standing cover to protect the land from wind and water erosion, stabilizing the water cycle, facilitates the process of evaporation and keeps the soil porous; they are also used for construction as well as for tools, furniture, fuel, medicine, grass and herbage, for forage and provide edible fruits. They serve to absorb carbon-dioxide to reduce global warming, give off oxygen and renewing the atmosphere. Plants also serve as source of income by attracting tourists, serve as recreational facilities; prevent lakes and dams from silting; clean, regulate and distribute water resources.

Even though natural resources in Ethiopia have great contribution to development, most of natural resources are highly exposed to degradation (Demel, 2001). Gebremarkos (1998:28) stressed that “historical evidences revealed that a few hundred years ago more than 63% of the total land mass of Ethiopia was covered by dense forests but it is not greater than 3% now.” In relation to resource depletion, EPA (1998), Reusing (2000), Badege (2001), Tarekegn (2001), FAO (2003), Yitebitu et al. (2010), Alemu and Abebe (2011) and Million (2011) argued that Ethiopians are facing rapid deforestation and land degradation that has been fueled by increase of population which in turn resulted in extensive forest clearing for agricultural use, overgrazing, exploitation of existing forests for fuel wood, fodder and construction materials, setting of fire to create pasture land and expansion of settlements. As a result, there has been a rapid decreasing percentage of the forest cover of the country from 40% in 1900 to 16% in 1954, 8% in 1961, 4% in 1975, 3.2% in 1980 and now it is estimated to be less than 3%. Most scholars agreed that current rate of deforestation is estimated to be 160,000-200,000 hectares per year (Ferede, 1984; Gebremarkos, 1998; EPAE, 2002) which is extremely high. According to Ethiopian news agency (July 14, 2010) by referencing the ministry of agriculture and rural development, it was confirmed that the forest coverage of Ethiopia has increased from 3% in 2000 to 9% due to the afforestation campaign launched all over the country in the last ten years (but this data could not be validated with published government sources).

According to Dessalegn (2001), state natural resource policy was also responsible for aggravating the process of land degradation. The imperial regime laid claim to all “unutilized” land, land that had no “legal” owners, and all forests, lakes and river systems which ended up with friction between communities and the government. To deny the state rights over a given piece of land, individuals cleared it of vegetation and ploughed it up; large tracts of pastureland, land that was fragile in nature and forestland were changed into cultivable land in the 1950s and 1960s. This alarming rate of deforestation is the major cause of the disappearance of various indigenous wild animals and plants, and it has also brought about adverse effects on the country’s tourism industry, bio-diversity and economy, among others (EPAE, 2002). Table 1 illustrates how deforestation was and still a critical problem in Ethiopia.

Forest destruction results multifaceted problems. Studies by Curry-Lindahi (1972) and Demele (2001) described the effects of deforestation as a change of micro/macro climate and in hydrological cycles, causes the disappearance of wild animals, birds and reptiles, affects the natural beauty of an area, accelerates run off and soil erosion, shortage of rainfall, increase in siltation of dams and reservoir, results to increase in carbon dioxide that in turn causes an increase in temperature, causes extinction and loss of economically important indigenous plant and animal species, and land degradation greatly affects agricultural productivity and production. The current government of Ethiopia clearly articulated the seriousness of forest destruction in the Climate Resilient Green Economy (CRGE) document (FDRE, 2011) and as a solution, reduction of demand for fuel wood by disseminating fuel efficient stoves; increasing afforestation and reaforestation schemes; and promoting area closure via rehabilitation of degraded pastureland and farmland are forwarded as a viable strategy.

Tree planting activities has a long history in Ethiopia. According to historical records, afforestation started in the early 1400s by the order of King Zera- Yakob (1434-1468) but modern tree planting using introduced tree species (Australian Eucalyptus) was started when Emperor Menillik II (1889-1913) looked into solutions for alleviating shortage of firewood and construction wood in the capital, Addis Ababa. During the Derge regime (1974-1991), rapid expansion of large scale and community plantations occurred which resulted in the establishment of large scale plantations mainly for supplying the huge demand for wood products in Ethiopia (Yitebitu et al., 2010). For instance, in 1981, peri-urban fuel wood plantation projects were launched in Addis Ababa, Nazareth

Table 1. Deforestation estimates in Ethiopia by forest type (in hectare) 1994-2003 E.C.

Type	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Highforest	270 897	118 355	99 601	73 025	57 182	48 235	66 036	76 412	73 875	76 723
Wood land	83 720	77 929	75 460	79 195	83 379	85 365	86 611	91 038	95 633	96 323
Shrub land	44 678	51 432	56 752	59 377	77 242	70 164	68 051	65 548	61 854	58 685
Total*	399295	247716	231 813	211 597	217803	203764	220698	232998	231362	231 731

Source: Ministry of Agriculture and Rural Development (2004) as cited in EPA, 2004: Annex XII. *Total computed by the author.

and Debre Berhan and latter in Gondar and Dessie (EPA, 1998). This is a type of environmental protection paradigm because the plantation scheme was undertaken in response to critical shortage of fuel wood. Environmental protection by its nature (Colby, 1991) is a defensive or remedial in practice and legalizes the environment as an economic externality. Rather than showing the ecological impact of forest destruction, more emphasis was given to its economic benefit (source of fuel).

FOREST RESOURCE MANAGEMENT SYSTEMS IN THE PRE-*DERGE* PERIOD (BEFORE 1974)

In the past, large forests were managed as crown property by emperors and kings basically as sources of fuel wood and timber for the royal households. Such forests were protected and encroachment was forbidden (perhaps it may be for the peasants) (Dessalegn, 2001). According to Sisay (2008), the first elaborate and modern legislation on forest resources came during emperor Haile Selassie I (1930-1974) in 1965 which gave recognizition for three forms of forests (namely state forest, private forest and protected forest). The main objective of the forest legislation during the 1960s was not so much to promote resource conservation but rather to enlarge the sources of state revenue (Dessalegn, 2001). This shows that the forest resource management paradigm during that time was environmental protection type because the forests were preserved and protected for their economic value mainly as a source of fuelwood and construction material. In addition, little attempt was made for new plantation. The Ethiopian forestry association (EFA), which was set up in 1960, launched a farm woodland campaign to encourage peasants to plant trees on their plots as an economic and conservation measure (Dessalegn, 2001) is one indicator for this.

In the mid-1960s, an extensive deforestation took place following the promulgation of a series of forest legislation because the legislation placed all large forests under state ownership, and put severe restrictions on the use and management of private forests (Dessalegn, 2001). Another scenario during the imperial regime regarding forest resource was the expansion of large-scale, comercial agriculture, which was actively encouraged by the state, at the expense of the forests with an objective of increasing agricultural production (Dessalegn, 2001). This is rather a typical example of frontier economics type of resource management paradigm.

Dessalegn (2001) argued that there was a limited attempt by the imperial government to promote forestry in the country and to protect state forests in the early 1960s. During the second half of the 1960s, the government began to show greater concern for environmental problems and undertook several initiatives to promote afforestation and soil and water conservation. In response to pressures from different corners, several national parks and game reserves were set up in various parts of the country in the second half of the 1960s and the early 1970s with the support of UNESCO and expatriate staffs. The schemes were restrictive and had a damaging impact on the livelyhood of the people who lived in and around them (Dessalegn, 2001). This seems to be environmental protection paradigm type because the measures were taken in response to massive forest destruction due to state farm expansion. In environmental protection paradigm, remedial actions are taken after a certain intervention arises with negative externalities. They are not responseble for planning development activities in ways that do not pollute or impair necessary ecological functions. As a remedial solution, relatively small parcels of common property resources are converted to state property to be set aside for preservation or conservation as national parks and wilderness reserves (Colby, 1991).

FOREST RESOURCE MANAGEMENT SYSTEM DURING *DERGE* REGIME (1974-1991)

In 1980, *Derge* proclaimed a new law called forest and wildlife conservation and development proclamation No. 192/1980 by accusing the previous government of its improper and unplanned exploitation of the country's forest resources and stated that the forest cover was depleted because of the selfish interest of the aristocracy and the nobility (Sisay, 2008). Paradoxically, according to Yeraswork (2001), natural forests were used as spring boards for plantations that outwardly expanded at the expense of peasant holdings during the *Derge* regime in the course of time, which turned community members against the resources. Dessalegn (2001) described the situation as "many of the state forests managed by the ministry of agriculture during the *Derge* regime were enlarged by expropriating farms or grazing land. Afforestation

thus posed a threat to many peasants because it encroached on farmland, evicted households living in or near it, and took away land that was common property and had economic, social or cultural value".

Later on, *Derge* applied mass mobilization and forced labor campaigns to rehabilitate degraded lands with vegetation and area closure scheme was designed. Such areas were frequently employed for grazing by the community because alternative sources of pasture were not provided (Dessalegn, 2001). As explained by Million (2011), plantation forests during that time were mainly for commercial timber- for sawn wood and poles as well as non-industrial plantations like fuelwood and construction timber. State environmentalism during the *Derge* era, as argued by Dessalegn (2001), had placed high emphasis on government control of environmental assets on one hand, and the protection of such assets by restricting or prohibiting their utilization by the surrounding community on the other hand. From this, one can conclude that the forest management system during the *Derge* period was again the environment protection type. Forests were protected mainly for their economic value. Area closure, construction of check dams, establishment of national parks, gully control and reafforestation schemes undertaken were some instances that show how the strategies were corrective in practice rather than being preventive. The majority of these 'community forests' were destroyed during the conflict and transition after the downfall of the *Derge* (1991) because they were undertaken without the consent of the locals with the exception of the few cases where such forests were preserved by local communities often with backing of Christian or Muslim religious leaders and institutions (Pankhurst, 2001).

Tarekegn (2001) also pointed out the scenario as "after the fall of the regime there was widespread deforestation of forest areas, which were seen by the local population as state forests". Tenure insecurity and memories of coercive government for over two decades have made the local population suspicious of government controls in land and natural resource management. Afforestation schemes, national parks and areas designated for rehabilitation were closed to peasants and pastoralists who were not allowed to gain any benefits from them (Dessalegn, 2001).

According to EPA (1998:49), the most negative environmental impact during the *Derge* regime came from policy and regulatory interventions that increasingly and cumulatively eroded the rights of individuals and communities to use and manage their own resources. "Protected areas and national parks in the dry lands suffered greatly as trees were cut and vast areas were set on fire. People perceived that they had no secure land and tree tenure and the state was not able to enforce its own regulations of forest protection and environmental conservation".

Other events which led to massive degradation of forest resources during the *Derge* regime were programme of mass resettlement and villagization following the 1984/5 famine that was done with the intention of transforming rural life with radical land reform, the establishment of rural co-operatives and state farms. But much of these were done with extreme coercion (Harrison, 2001). Programs designed by the *Derg*e like collectivization, villagization and resettlement approaches were implemented with devastating effects on forest resources of the country (Tarekegn, 2001; Messay and Bekure, 2011). Dessalegn (2001:38) elaborated the situation as "…many rural policies were worked against environmental objectives. Collectivization, villagization and resettlement, which were carried out on a large scale in the 1980s, were accompanied by extensive deforestation and soil erosion". He further added that the land reform and the periodic redistribution of farm plots undermined security of holdings which discouraged peasants from investing on the land or employing conservation measures. On the contrary, illegal cutting of trees, the grazing of livestock in closed areas, the uprooting of tree seedlings planted in forest schemes and the invasion of natural parks were intensified.

In addition to resettlement programs, large scale deforestation was carried out as a result of expansion of state farms (Dessalegn, 2001). For instance, *Derge* designed resettlement as a principal strategy to ensure food security and ease the pressure on densely populated highlands. A massive emergency resettlement program were launched into sparsely populated areas as well as into underutilized peripheral lowlands after the 1984/85 droughts and famine. This is the part of the country where the remaining forests are confined (Reusing, 2000). The resettlement programs caused serious natural destruction on indigenous trees and on wildlife. The road access created by the resettlement program also facilitated over exploitation of forest and forest products (Mekonnen et al., 2011). Reusing (2000:1256) has described the situation as:

> …at the beginning of this century [20th century], the southwestern part of the Ethiopian highlands had been completely covered by montane rainforests. The situation changed with new settlers migrating from the central and northern parts of the country to this area. With the new settlers, a new farming system was introduced which did not adapted to the environmental conditions in the area.

The resettlement scenario and its consequence on forest resources during the *Derge* regime can be categorized as frontier economy paradigm type. As depicted in the above explanation, the concern was on achieving food security at the expense of forest resource. It was totally anthropocentric in its nature. According to Colby (1991), frontier economy paradigm treats nature as an infinite supply of physical resources (including forest) to be used for human benefit, and as an infinite sink for the by-products of the consumption of these benefits, in the form of various types of pollution and ecological degradation.

Case 1: Massive destruction of forest resource during the transition period (early 1990s)

State forestry under the *Derge* posed a threat to peasant livelihoods; it encroached on farm land, evicted households living in and near it, and took away land that was customarily used for grazing. Many of the forests in question were enlarged by expropriating farmland and pasture. The resources of these forests were close to the surrounding peasants, which were not allowed to graze their animals on them, nor cut grass or wood. Peasants carried on covert resistance against the schemes. They complained about area closures because these involved the loss of access to grazing land; closures were not accompanied by alternative sources of pasture. As a result of this, the attack on the environment, after the fall of the *Derge* regime, was not organized by anyone; it was rather spontaneous and anarchic. Peasants and others demolished bunds and terraces, set fire on forests and national parks, "illegally harvested" trees from government plantations, uprooted young saplings in freshly afforested or enclosed areas. Perhaps as much as 60% of the conservation assets created during the military dictatorship may have been destroyed during these two years (1991/1992). There were numerous cases of arson in national parks, and some of the big game reserves in the south of the country were badly damaged. Extracted from Dessalegn (2001; 52-80)

From the above case, one can conclude that any natural resource management system implemented without the consent and participation of the community ends up with destructive long term outcome. So long as the intervention is to enhance the productivity of nature and to improve the livelihood of local community, locals have to actively participate right from the outset to the completion of the program; and they have to be the number one beneficiaries.

FOREST RESOURCE MANAGEMENT SYSTEM (SINCE 1991)

In 1994, a new proclamation came into picture, namely, "forest conservation, development and utilization" proclamation no. 94/1994 and another great endeavor was the establishment of Ethiopian forestry action program (EFAP), which is a working document that has direct relation with forest development and conservation. EFAP set forth as objectives of forestry development, to sustainably increase production of forestry products, to increase agricultural production by reducing land degradation and increasing soil fertility, to conserve forest ecosystems and to improve the welfare of rural communities. The policy put general direction wherein, among others, expansion of forests and agro-forestry is needed to accelerate economic development of the country (Sisay, 2008). Additionally, EIA proclamation with an emphasis on the utilization of forests should be only with their regenerative capacity, which was amended in 2002 by Proclamation No. 29/2002. That means forest management that accounts for the sustainable supply without affecting environmental and social amenities derived from the forests is needed. Since free grazing affects natural regeneration of valueble indigenous trees, the policy restricts free grazing in protected forest areas (Sisay, 2008).

In 2007, the council of ministers adopted a forest policy which gives due attention to forest development and conservation considering its significance to the national economy, food security and sustainable development of the nation (Sisay, 2008). The overall objective of the policy is "to conserve and develop forest resources properly so that there could be sustainable supply of forest products to the society (hence satisfying the demand) and contribute to the development of the national economy." As stated in forest development, conservation and utilization proclamation No. 542/2007 (FDRE, 2007), in order to properly conserve, develop and utilize the forest resources of the country, major forestlands should be designated as state forests, their boundaries should be demarcated with the participation of the local community and they should be registered as protected and productive forests (article 8:1); forests shall be protected from forest fire, unauthorized settlement, deforestation, undertaking of mining activities and other similar dangers (article 9:7). It also stressed that the local community may reap grasses, collect fallen woods and utilize herbs from a state forest in conformity with the management plan developed for the forest by the appropriate regional body. The harvesting of forest products, grass and fruit as well as the keeping of beehives in state forests may be permitted based on the objective realities of the locality (Article 10:3-4) and state forests shall be used to generate income from tourism (Article 10:5).

The objectives mentioned here (both in EFAP, forest development, conservation and utilization Proclamation and EIA proclamation), have both economic as well as environmental out comes. From this, one can say the objectives have been designed based on resource management type of paradigm because most of the strategies (like agroforestry, increasing fertility of soil, increasing the productivity of the existing land, expansion of off-farm economic activity on forests like apiculture and tourism) focus on preventive rather than corrective actions. More emphasis has been given to strategies which minimize the demand of forest resources like agroforestry that reduces the pressure on the remaining forests for need of fuelwood and incrassating the fertility of soil as well as livelihood diversification so as to decrease the need for additional land for cultivation at the expense of forests.

The role of environmental conservation for sustainable development has been boldly articulated in the growth and transformation plan (GTP) of the country. The main objectives for the environment and climate change initiatives in the GTP are to formulate and effectively implement

policies, strategies, laws and standards which will foster social and green economy development so as to enhance the welfare of citizens and environment sustainability. The document further added that, during the GTP period, soil and water conservation works will be implemented using organized community participation, in those areas where such works are required as well as forestry development, protection and utilization works will be carried out in a similar way (MoFED, 2010). In addition, one of the four pillars of the green economy plan of Ethiopia (FRDE, 2011) focuses on protecting and re-establishing forests for their economic and ecosystem services, including carbon stocks.

A plan for accelerated and sustained development to end poverty (PASDEP) document of the country has also gave especial emphasis on natural resource conservation and management and stressed that integrated development and utilization of the resource bases enables the transition to improved livelihoods, and to protect these resources for future generations. It was planned to rehabilitate about 4.7 million hectares of degraded areas so as to increase the forest coverage of the country (MoFED, 2006). Even though, this plan is a kind of resource management paradigm because it focuses on protecting and reestablishing forests for their economic and ecosystem services, the current deforestation in southwestern part of the country due to foreign investment and resettlement programs (Mekonnen et al., 2011; Dessalegn, 2011) makes the strategy rather a frontiers type of paradigm and it seems a paradox.

The GTP document highly underlined that deforestation and forest degradation must be reversed to support the continued provision of economic and ecosystem services and growth in GDP. Despite their economic and environmental value, Ethiopian forest resources are under threat and unless action is taken to change the traditional development path, an area of 9 million hectare will be deforested between 2010 and 2030. Over the same period, annual fuelwood consumption will rise by 65%, leading to forest degradation of more than 22 million tones of woody biomass (FDRE, 2011). In order to overcome the problem, strategies like dissemination and usage of fuel-efficient stoves, increasing afforestation/reaforestation schemes and promoting area closure via rehabilitation of degraded land, that could help to develop sustainable forestryandreducefuelwooddemand,havebeenarticulated.

In addition to the aforementioned strategies, the document proposed agriculture intensification on existing land so as to reduce pressure from agriculture on remaining forests (FDRE, 2011). Furthermore, avoiding deforestation is also pointed out as an important development objective hoping that it will preserve the natural ecosystem endowment and also contribute to a sustainable development of agriculture. In doing so, measures like improving the efficiency and productivity of existing cultivated land and land to be cultivated to reduce pressure on forests, as well as the substitution of traditional cooking techniques with efficient appliances, thus reducing fuelwood consumption and increasing carbon sequestration by forests will be carried out (FDRE, 2011).

Since deforestation rates in Ethiopia historically correlate with the expansion of agricultural land (FDRE, 2011), reducing the need for additional farm land enables to minimize the pressure on the remaining forests of the country. In line with this, the proportion of new land for agriculture that is taken from forests will decrease from 70 to 55% in 2030 (FDRE, 2011). Two million hectares of pastureland will be afforested up to 2030 and 1 million hectares of degraded land will be reforested (FDRE, 2011).

The CRGE document acknowledges both the economical as well as ecological contributions of forests and most of the strategies designed regarding the forest resource management of the country decrease the demand of forest resources. Strategies designed to realize these objectives includes dissemination of fuel efficient stoves, agricultural intensification and diversification, area closure, irrigation on non-forest areas, agro-forestry programs and planting trees outside forests. The target is to minimize the pressure of development endeavors over the remaining forests of the country and enhancing the productivity of the existing land. The strategies are more of preventive than corrective which is peculiar characteristic of resource management paradigm. In addition, an extensive watershed management program which incorporates afforestation scheme has been designed. This is more or less environmental protection type of paradigm because the action is corrective than preventive.

Though the CRGE has planned a resource management type of paradigm and there is rehabilitation through massive watershed program (more of environmental protection paradigm), what is actually happening in northwest, southwest and southern part of the country is frontiers economic type of resource management. In these areas, forest resources have been destroyed due to extensive investment and resettlement programs designed by the government.

Case 2: Resettlement in Nanno and its impact on forest resource of the area

Nanno wereda is found in West Shewa Administrative Zone of ONRS. Resettlement programs undertaken by EPDRF exert heavy pressure on destination areas, which in turn results in swift land-use/land-cover changes. Shrub-grassland is found to be the most shrinking land use type in the area. It reduced from 41.29% in 1984 to 24.43% in 2007. It shrank at the rate of 1.06 and 7.07% per year from 1984 to 1999 and 1999 to 2007, respectively. This change involved a gradual modification of the shrub-grassland to grassland or conversion to farm land. A significant conversion (7.07%) from natural vegetation cover to cropland and settlement area was observed more profoundly between 1999 and 2007 (Messay

and Bekure, 2011: 269).

Case 3: Impact of resettlement on forest resources

Most of the resettlement programs recently have been undertaken in Bench-Maji, Kaffa, Dawuro, Sheka, South Omo zones and Basketo special district as well as in the western lowlands of Tigray and Amhara regional states throughout the year. In Southern Nations Nationalities and Peoples Regional State (SNNPRS) and Oromia National Regional State (ONRS), the resettlement sites were covered either with dense forests or wooded grass land prior to the implementation of the resettlement. Resettlement sites like *Gabiqa* in Gurafarda district and part of the *Chewaqa* resettlement site were covered with dense forests when the first settlers arrived the areas. Out of the seven resettlement sites in *Chewaqa*, two of the sites were established by clearing dense tropical rainforests due to mismatch of the number of resettlers sent to the area and the size of land designated for the resettlement. In Amhara and Tigray regions, the wood land coverage reduced by 25.76% between 2000 and 2007 due to resettlement programs. Most of the wood land has been replaced by arable land for the cultivation of cash and food crops. The situation in SNNPRS and ONRS is harsh than ANRS and Tigray (Mekonnen et al., 2011:26-35).

According to Messay and Bekure (2011), "environment-induced resettlement is the most common incident in Ethiopia." They further urged (using satellite image data) that the shrub-grassland of the country is diminished alarmingly due to the removal of plants for farmland preparation, fuel wood, construction, charcoal preparation and traditional farm equipment making. Most vegetated land use/land cover types in 1984 and 1999 were alarmingly changed to cultivated land in 2007 (p 286). Unless appropriate environmental protection and rehabilitation measures are taken, vegetated land-cover types of Ethiopia are disappearing at frightening rate.

Regarding the impact of recent resettlement schemes on the forest resources of the country, Berhanu (2007) in his MSc work pointed out that the vegetation cover of *Chewaka* resettlement site (southwestern Ethiopia) has been reduced by 42.4% due to different human activities though the government claims that the resettlement programs are environment friendly. Furthermore, there are no conservation measures initiated in the area and calls for immediate intervention. Similar study by Dejenie (2011), the case of *Guraferda* woreda, southwestern Ethiopia, came up with similar result. Poor planned resettlement programme leads to uncontrolled encroachments and farmland expansions which have posed great damage on the vegetation composition and structure of the area. In addition, like that of *Chewaka* case, no intensive efforts were made to stop further deforestation; afforestation or planting activity in the area is negligible.

Case 4: Impact of resettlement on forest resource: Amhara National Regional State

Since 2003, the ANRS has resettled 166,204 household heads in six woredas of the region, namely Metema, Quara, Tegede, West Armachiho, Tach Armachiho and Jawi. The resettlement program was undertaken in areas where the soil and the vegetation are highly susceptible to human interference. For the purpose of the government-led resettlement, the scares forest lands were used and large area of woodland is converted into cultivation. Prior to the 2003 resettlement program, the total cultivated land area in Metema and Quara woredas was estimated to be 60,650 and 236,497 hectares (ha), respectively. Besides, the woodland coverage in the respecttive woredas was 232,001 and 535,537 ha. After the resettlement program was implemented, the total area of cultivated land for Metema and Quara woredas increased to 95,105 (10.8% increment) and 264,104 hectares (3.2% increment), respectively. On the other hand, the woodland area was decreased to 201,906 ha in Metema (9.5% decrease) and 493,969 ha in Quara (4.9% decrease). The annual decrease of the woodland in Metema and Quara was 4,299 and 5,938 hectares, respectively. These dramatic land use changes occurred over a period of less than a decade (Teshome et al. 2011:297-307).

In addition to the resettlement programs undertaken by the Ethiopian government, expansion of foreign investment has also been cited as a major challenge for the remaining forest resources of the country. Guillozet and Bliss (2011), in their work stressed that "foreign investment in Ethiopia's forestry sector is currently limited, but agricultural investments that affect forests, largely through forest clearing, are common place." Getnet (2012) on this part expressed his worry of expansion of foreign investment over the remaining forest resources that, numerous investors from Asia, the Middle East, Europe and the USA have acquired land in various parts of Ethiopia [some, like the Oakland institute (2011), called it land grabbing]. Over 35 Indian firms have acquired extensive tracts of land, especially in Benishangul and Gumuz, Gambella and ONRS. He further added that "in a number of project sites, large-scale land clearance is taking place, and the removal of woods and other vegetation has exposed the land to serious erosion and damage to natural water sources. Some investment projects are undertaken even inside the national parks and inside the established wildlife habitats (p.23)". This scenario clearly depicts that the current vast investment programs are launched in the part of the country where endemism is particularly high and where the remaining forests of the country are confined (EPA, 1998:17). ONRS, SNNPRS and Gambella region account for 95% of the total high forest resource of Ethiopia (Million, 2011:11).

Case 5: Impacts of foreign investment on forest resources

Following the international food crisis of the second half

of the 2000s which was accompanied by exceptionally high commodity prices and severe supply shortages in the world market, global land grabbing has spread rapidly. The rush for land in Africa by investors has also been driven by the assumption that land is abundant in the continent, land rents and labor costs are low, and there are few regulatory roadblocks restricting production and export. The commercialization of land and the shift to large scale agriculture is taken as an essential measure for agricultural modernization and the improvement of productive efficiency. As a result, total transfers of land from the late 1990s to the end of 2008 to both domestic and foreign investors in Ethiopia reaches almost 3.5 million hectares mainly in southwestern part of the country. Gambella (the region with a unique ecology and immensely rich in biodiversity) has become the major target point for foreign investors. The investments underway is to be found in many parts of the region, and some are inside the national park and protected areas [this was also confirmed by Oakland institute, 2011]. The clearing of the land and the large-scale deforestation has caused and will bring social and economic hardship and wildlife which used to be plentiful in the area, and which they hunted occasionally for consumption, have now disappeared (Dessalegn, 2011 extracted from page 1 to 21)

From the above discussion, as far as forest resource management is concerned, the paradigm type planned in CRGE and what is actually implemented (watershed mana-gement, foreign investment and resettlement) in the current government is somewhat a mixture of frontier economy (expansion of agriculture and settlement at the expense of forests), environmental protection (a corrective action through rehabilitation of formerly degraded areas) and resource management (a preventive action-by designing strategies to minimize the pressure on the remaining forest resources).

The Ethiopia's agricultural sector policy and investment framework strategic document (MoARD, 2010) under objective 3, assured that strategies should be designed to conserve and utilize Ethiopia's natural resources in a sustainable and productive manner. In addition, one of the specific objectives of the environmental policy of the country is to ensure that essential ecological processes and life support systems are sustained; biological diversity is preserved and renewable natural resources are used in such a way that their regenerative and productive capabilities are maintained. It advocates in incorporating the full economic, social and environmental costs and benefits of natural resource development into the planning, implementation and accounting processes (resource management type of paradigm) by a comprehensive valuation of the environment and the services it provides.

Though not significant in terms of area coverage, deep-ecology types of forest management systems are also found in Ethiopia. Forests in religious compounds and some scared areas are not used by local communities and they are preserved. Regarding this issue, Dessalegn (2001) explained that forestry on *asted* [church compound] and consecrated land is also protected by the church. The forest is consecrated because of the location of *tsebel* (holy water or spring which is believed to have medicinal benefits) in it. No one is allowed to cut trees from such forests because of the fear that the holy water will dry up if deforestation takes place. In addition, tree cutting in *wujjib* (a shrine and holy burial ground in Islamic religion) is not allowed except when there is a need to construct a new mosque. In addition to the *asted* and *wujjib* forests, scared forests are also respected due to different reasons by localities. Cardelus et al. (2003) also pointed out that many rare and endemic species are found only in sacred groves of churches. Thousands of these church forests currently exist as islands in a sea of degraded land where they have become centers of forest conservation; sacred sites have demonstrated remarkable resilience in the face of change.

CONCLUDING REMARKS AND THE WAY FORWARD

Ethiopia is endowed with diverse natural resource in general and forest resource in particular. But due to unwise use of the forest resource of the country which has been taking place for centuries, the remaining forest coverage is extremely very small and is confined in southwestern part of the country. The primary causes of natural forest destruction are agricultural expansion, both through shifting cultivation, large scale investment and the spread of sedentary agriculture; the demand for increasing amounts of construction material, forest fires, fuelwood and charcoal; as well as expansion of re/settlements and livestock grazing. In addition, charcoal production is common place in the arid, semi-arid and dry subhumid parts of the country (EPA, 1998). Governments of Ethiopia, both in the past and at present, tried to implement different interventions to rehabilitate the degraded areas and to maintain the remaining forests (though most of the economic policies rather aggravated and still are aggravating the rate of forest destruction). The strategies selected can be categorized broadly as frontiers economics, environmental protection and resource management paradigms. There are some instance which resembles deep-ecology (mainly in religious institutions) and eco-development (like ecotourism, apiculture and zero grazing) but not pervasive like the others. Because of the economic, socio-cultural and ecological significances of forests, due attention should be given to their management. In doing so, priority should be give to resource management and eco-development type of paradigms. The following strategies, if implemented properly, would have a win-win outcome:

1. Provision of alternative source of energy (for cooking, baking and lightening) minimizes the demand for fuel food.

2. Livelihood diversification and agricultural intensification (expansion of non-farm economic activities like ecotourism, agro-forestry, apiculture, highland fruit productions, livestock fattening through cut and carry method) minimizes the pressure on the remaining forest resources of the country.
3. Forest tenure security encourages peoples to have their wood lots for fuel wood and construction so that it is possible to minimize the pressure on the remaining natural forests
4. Reversing the paradox- rehabilitation of the degraded area (resource management and eco-development paradigm) versus degrading the remaining forest resource (frontiers and environment protection paradigm) has to be checked. Rather than converting forest and wood lands into agricultural land (be it investment or small holder agriculture), it is better to enhance the productivity of the existing cultivated land in one hand and develope eco-friendly economic activity on the remaining forest resources (like apiculture, ecotourism, fruit and spices production)
5. Resettlement program might have a short term advantage, especially to be able to feed the food insecured portion of the population. But its long lasting effect on the forest resources of the destination area is devastating. So, rather than targeting on it, it would rather be better to enhance the productivity of land, expanding off-farm economic activities and the like. When resettlement is the only option to be applied, special attention should be given to minimize its adverse effect. In addition, priority should be given to eco friendly economic activities rather than agriculture or intensification has to be used in order to minimize additional demand of cultivable land at the expense of forests and woodlands.

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