VCS/CCB BALE MOUNTAINS ECO-REGION REDD+ PROJECT MONITORING & IMPLEMENTATION REPORT

PREPARED BY

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PROJECT SUMMARY INFORMATION

i. **Project Name :** Bale Mountains Eco-region REDD+ Project

ii. **Project Location**: Ethiopia, Oromia Regional State, Bale and West Arsi Administrative zones

iii. **Project Proponent**: Oromia Regional State of Ethiopia Federal Democratic Republic , through Oromia Forest and Wildlife Enterprise represented by Director general

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v. **Project Start Date**: January 01, 2012 and GHG accounting period and project lifetime: 20 years from project start date.

vi. **The project Implementation period covered by the PIR:** 1st January, 2012 to 31th December, 2015

vii. **History of CCBS status**: Bale Mountains Eco-region REDD+ project PDD was posted first on CCBA web page on May 27th, 2014 (http://www.climate-standards.org/2014/05/27/bale-mountains-eco-region-redd-project/). Field level validation was carried out by auditors between 24 June and 02 July 2014. Based on feedbacks obtained through auditing process, for the second time the revised PDD (version 3.4) was posted on the same CCBA website on 13th October 2015 to get public comment and to have a registration for PDD. However, the PDD registration was postponed to have a combined registration for validation and verification. The latest PDD v 3.5 includes all the three Gold level criteria such as Climate, community and biodiversity. Similarly, the PIR document was posted on CCBA website for public consultation of 30 days starting from 10th of August 2016 to 10th of September 2016.

viii. **CCBS edition**: Third edition

ix. **Project's Climate, Community and Biodiversity benefits (CCBA Gold level benefits) G1.2**

The project has addressed the three golden criteria such as community, climate and biodiversity. The achievements along these three criteria are described in the following paragraphs.

Climate benefits: Under the business as usual scenario the Bale Eco-region is expected to result deforestation of 84,150 ha of tropical forest and GHG emission of 38,321,332.28 tCO_2e. The project aimed at preventing high rate of deforestation to achieve a net anthropogenic GHG emission reduction of ex-ante estimated 25,776,421.40tCO_2e with 15% deposited emission as the buffer for risk which is equivalent to 3,866,463.21 tCO2e estimated while the net ex-ante anthropogenic GHG emission reduction under a project scenario calculated as 21,909,958.19 tCO2e. After implementation of Bale Mountains Eco-Region REDD+ project activities over the period of 2012 and 2015, the project has generated the cumulative carbon emission reduction of 5,532,367 tCO2e.

Community benefits: Bale Mountains REDD+ project has been designed with clear understanding of communities dependency's on forest-related products and the potential impact that REDD-plus activities could have on the livelihoods of local community. With this understanding, the project has engaged local communities who are living in and surrounding the forest in the project area both at a time of the project design and implementation of project activities. The project facilitated establishment of community based institutions that lay foundation to empower the local community and improve their access right and sustainable management of the forest resources. It has been agreed that communities can directly benefit from the project through benefit sharing of carbon revenue as well as other sustainably produced commercial forest products besides to the traditional uses of the forest. It is highly considered that the community should benefit from the revenue of carbon emissions reductions payments. Towards this purpose, carbon benefit sharing arrangement negotiated between the project government (OFWE) and community and reached on a consensus. Accordingly, it is agreed that community receives 60% of carbon revenue while the share of the government is agreed to be 40%. Moreover, community's exclusively rights to exercise sustainable utilization of non-timber forest products has recognized and being practiced by the community member. To improve managerial and organizational capacity building of the community based institution, different trainings on various topics, financial and materials supports were continuously provided. As a result, the average managerial and organizational capacity of 64 forest managing institutions enhanced by 64% against the baseline which was 48%. The project has been working in a way it contributes to the national poverty-reduction strategies through developing sustainable livelihoods that recognizes the potential of forest resources to support the livelihood of rural communities. Towards this, it has been carefully considered that community should benefit from REDD+ activities that have been designed to offset the on-going deforestation and forest degradation in the project area. Hence, community members who are living in the forest coffee growing areas are provided materials that were used to improve the quality of their coffee and community's livelihood incomes are increased as a result of improvement in quality of coffee. The communities are benefited through provided different training on various topics of forest management and livelihood improvements including awareness creation about impacts of climate change and role of forest to mitigate the impacts of climate change.

Furthermore, practicing of sustainable forest management through REDD+ improves better watershed management and ecological functioning that brings positive impacts on productivity of surrounding agricultural fields.

Biodiversity benefits: The Bale Mountains are unique in Africa and encompass Africa's largest alpine plateau which contains the largest populations of two of Africa's least known and yet most charismatic species like the Ethiopian wolf and the Mountain Nyala. The Bale Mountains Eco-Region also harbours an exceptionally high number of other species endemic to Ethiopia and, in some cases, endemic to the Bale Mountains themselves. They are included in Conservation International's Eastern Afromontane Biodiversity Hotspot (one of 34 such critical eco-regions for biodiversity conservation in the world) and are designated as one of BirdLife International's Important Bird Areas. Among the larger mammal species of the area, five deserve special conservation attention since they are not only endemic and/or globally threatened, but are also important flagship species for the Ethiopian highlands that includes the endangered endemic Bale monkey (*Chlorocebus djamdjamensis*), Ethiopian wolf (*Canis simensis*) and Mountain nyala (*Tragelaphus buxtoni*), as well as the endangered Wild dog (*Lycaon pictus*) and the Ethiopian lion (*Panthera leo*) which has recently been recognized as genetically different from other lion in East Africa. Around 78 species of mammals are recorded in Bale, which represent 40% of mammals known from the whole Ethiopia. Out of these, 20 species are Ethiopian endemics, representing 26% of the total species reported in the area. This is by far the highest proportion of endemics. On average, about 10% of the flora and fauna of Ethiopia are endemic. The endemic mammals of the Bale Mountains also 67% of the total endemic mammals recorded in the Ethiopian highlands. There are also seven globally threatened species of birds recorded in the Bale Mountains. These include four vulnerable species (Greater Spotted Eagle, Imperial Eagle, Lesser Kestrel and Wattled Crane), and three near-threatened species (Pallid Harrier, Rouget's Rail, and Abyssinian Longclaw). The 6 endemics out of the total 16 Ethiopian endemics are: Spot-breasted Plover, Yellow-fronted Parrot, Abyssinian Longclaw, Abyssinian Catbird and Black-headed Siskin. The Spot-breasted Plover population is the largest and most significant for the species, and hence deserves conservation on its own. In general, the Bale Mountains eco-region is not only the area that protects a significant portion of Ethiopia's and the world's biodiversity but it is also the area with immense benefits for species evolutionary processes.

However, observed trend of ecological degradation in the area has posed a severe threat to survival of most of these rare species. It has been pointed out that ''if conservation efforts are not successful and people continue to exploit the resources in an unsustainable way, more species of mammals would go extinct than any area of equivalent size on the globe". In general, isolation and rarity of the species in the eco-region put these endemic species at high risk of extinction that has necessitated a need of effective conservation strategy that supported by the national and international communities. For this reason, the Bale mountains Eco-Ecoregion REDD+ project has been initiated to contribute to sustainable conservation of all the fauna and floras existing in the project area through community participation.

Accordingly, the project has contributed to reduction of forest destruction by 62% which has a great implication to the conservation of flora and habitats of wild animals.

x. **Golden level criteria:**

The gold level criteria comprises of Climate Change adaption benefit (GL1), community benefits (GL2) and exceptional biodiversity benefits (GL3). Details of each are explained in the following subheadings.

Climate Change adaption benefit (GL1)

The Bale REDD+ is designed to make a significant contribution to the Ethiopia's Climate Resilient Green Strategy that has aimed at reducing emission reduction. In light of this , The Bale Mountains REDD+ project has contributed to reduced deforestation by 62% against scenario of business as usual. In other words, the project contributes to carbon emission by 5.5 million ton carbon dioxide. Upon the sale of the carbon credit, both the local communities and government will benefited and encouraged to realizing sustainable forest management that serves to mitigate climate change because of carbon emission.

Exceptional community benefits (GL2)

The project has played important roles in ensuring communities forest use right, improving the wellbeing of local community at individual as well as at group level. Women rights respected and actively they are participating in implementing project activities and decision making process. Similarly, the project strengthen REDD+ CBOs organization capacity of implementing project activities by 64% against the bench mark which was 48%. This implies for realized effective participation of community members in project decision making and implementation. The project also works in avoiding any risks/ trade off to not happen on local community. Besides of all these, the project has designed appropriate carbon benefit sharing mechanism through participation of local community. Accordingly, of total carbon revenue 60% is agreed to go to community while 40% is a share of government. Furthermore, the project has delivered fuel efficient stoves for community and encourages woodlot plantation by community.

Exceptional biodiversity benefits (Gl3)

Bale Mountains comprises of exceptionally high number of endemic species to Ethiopia. Ome of them are endemic to the Bale Mountains for instance around 78 species of mammals are recorded in Bale, which represent 40% of mammals known from the whole Ethiopia. Out of these, 20 species are Ethiopian endemics, representing 26% of the total species reported in the area. The endemic mammals of the Bale Mountains also 67% of the total endemic mammals recorded in the Ethiopian highlands.

Therefore, implementing the project and improving the management of the eco-region helps to save and sustain the lives of these endangered species and their ecosystem functions in accordance with exceptional biodiversity benefits indicators indicated under (Gl3) of third edition of CCBA guideline. In general, the forest which is source of biodiversity and habitat of wildlife is protected properly to not deforested. For instance during the implementation period of the project, deforestation rate was reduced by 62% against scenario of business as usual.

xi. **Date of issue**: 18-October-2016 Version 1.5

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1. GENERAL

1.1 Summary Description of the Project (G1)

In Ethiopia, major forest and agriculture sector emissions are associated with deforestation. Deforestation for farmland expansion is very high in the Oromia Regional state, where the largest remaining forest in Ethiopia exists. Bale Mountains Eco-region, which is the project area for the current REDD+, is one of the two areas in Oromia with large block of natural forests. Like most part of the country, the eco-region has experienced high level of deforestation and forest degradation. Bale Mountains Eco-region REDD+ Project (BMERP) was initiated to mitigate the prevailing deforestation in the area. The eco-region lies between 50º22'–80º08'N and 38º41'–40º44'E in Oromia Regional State in south-eastern Ethiopia. The access to the area is by road either using Addis Ababa-Nazareth-Asela-Goba road or Addis Ababa-Shashemene-Assassa–Goba road.

The BMERP area presents very interesting physiographic attributes. The central area of the eco-region is a high plateau much of which is above 3000m asl. Several peaks rise from this plateau including Tullu Dimtu (4377m), the second highest peak in Ethiopia. South of the plateau the land falls steeply into the moist tropical Harenna Forest, that distinctly shows several altitudinal vegetation stratification within short distances starting with mountain grasslands at approximately 3700m followed by Erica forest, and extending to moist tropical forests of variable species composition such as highland bamboo (*Arundinaria alpina*), *Coffea arabica* and others at the middle altitude, and dryland woodlands in the lowlands below 1500m asl. On the northern aspect the eco-region is characterized by high ridges and broad valleys covered mainly with dry Afromontane vegetation of mainly Juniper (*Juniperus procera*) and Hagenia (*Hagenia abyssinica*) species interspaced with other ecosystems such as grasslands and wetlands.

The eco-region encompasses the largest Afro-alpine habitat on the African continent. The forests together with the Afro-alpine plateau are host to a globally unique and diverse fauna and flora, including a significant number of rare and endemic species such as Nyla, Absiniayan wolves and many others. It harbours about 67% of mammals known from the Afromontane eco-region in Ethiopia. It is known as hotspot of medicinal plants of Ethiopia so far identified. It is one of the birth places and center of diversity of Arabic coffee (*Coffea arabica*) where the species still exists in a wild state. The eco-region belongs to the Afromontane biodiversity hotspot, one of the 34 global biodiversity hotspots. Therefore, the eco-region has critical biodiversity and ecological significances.

The eco-region is inhabited by about 1.6 million population (urban and rural combined). Moreover around 12 million population both in the eco-region and beyond within Ethiopia, Somalia and Kenya are estimated to directly and indirectly depend on several ecosystem services generated from the eco-region. Particularly, those rural people in the eco-region are directly dependent on the forest and other natural resources of the area. Major livelihoods strategy of the population is cultivation, livestock production and

forest based income. The local community depends on the natural vegetation of the eco-region for their livelihoods. Annual direct consumptive use value of the vegetation is valued at US$ 407 per household from the forests, 228US$ per household from livestock, and part of the later value also attributable to the forest system as forest grazing is the dominant form of livestock production in the area. Moreover, crop cultivation that provides the highest annual income directly comes from ecosystem services from the forest ecosystem services within eco-region. There is significant potential to improved management of the eco-region to sustain and enhance conservation and the livelihoods of the local community and beyond.

However, the eco-region has been facing pressure that has grown over time that also challenge the long term sustainable conservation of this globally unique ecosystem and its biodiversity resources. Between 2000 and 2011, BMERP area experienced annual deforestation in the range of 1.1% to 6.6%, depending on the forest type and agricultural frontier expansion, with an average rate of 3.7% for the entire eco-region. This rate is almost four times the 1% country-wide deforestation rate (FAO, 2010). This REDD+ project in the eco-region is designed to support the improved management of the forests in the eco-region and its biodiversity for multiple benefits that includes climate, community and biodiversity outcomes.

The BMERP has been working to improve government and community partnerships on one hand and facilitate the development of community based local institution on the other to result in an improved forest ecosystem and landscape management in the Bale Eco-Region (BER). About 64 local PFM cooperatives have been established and their capacities strengthened. The BMERP also identified and planed a number of interventions. The BMERP has aimed at avoiding unplanned deforestation of considerable area of unique Afromontane forests to reduce emission of a large quantity of GHG that contribute to improved conservation of rich and globally significant biodiversity and enhance local livelihoods through the sustainable use and development of local resources including products and services from the forests.

The BMERP is a reducing emission from unplanned deforestation and forest degradation (REDD+) in the Bale massif, Ethiopia. The GHG emission considered is only CO2 from above ground and below ground biomass pools only. The project period is 20 years, extending from 2012 to 2031.The historical deforestation rate was established through a multi-temporal image analysis of 10 years before the start date of the project in the Reference Region that covers 2.08 million ha. The historical deforestation rate estimated revealed the average annual deforestation rates of 1.1% for the Moist Evergreen forest stratum and 6.67% for the Dry Evergreen forest stratum for the period from 2000 to 2011. The primary agents of deforestation in the area have identified as smallholder farmers, while the major drivers of deforestation comprised of (i) expansion of agricultural activities (small-holder farming, market driven crops and livestock rearing) into forest lands, (ii) unmanaged fuel wood and construction wood collection from the forest and, (iii) intermittent incidence of forest fires. Those drivers are reflection of several underlying factors principally legal and institutional weakness, demography, market system and poverty.

The Project Boundary of BMERP is 333,924 ha. This project boundary constitutes the Project Area (PA) equal to 261,053 ha of moist and dry forests (238,200 ha of moist and 22,853 ha of dry forests), and 72,924 ha of non-forested land that constitutes the Project's Leakage Management Area (LMA). The PA purposely excluded forests within the Bale Mountains National Park (BMNP). The Project Boundary (PB), PA, Leakage Belt (LB) and Reference Region (RR) are shown in Figure 1. The LB covers all forest and non-forest areas within 6 km buffer around the PA, which are suitable for non-forest use and that, could be deforested by the surrounding community. This has a total area of 398,532 hectares, consisting of 220,010 ha of non-forest, 30,418 ha of dry forest and 148,102 ha of moist forest. Projection of the deforestation to the crediting period (2012-2031) under the baseline scenario (i.e. business as usual) reveals the likely deforestation of some 84,150 ha of forests (moist and dry forests combined). The deforestation of this much forests in the eco-region will result in the baseline emission of 38,321,332.28 tCO_2e.

The objective of the BMERP is to prevent this high rate of deforestation and achieve a net anthropogenic GHG emission reduction, which is estimated (ex-ante) 25,776,421.40tCO_2e. With the buffer for risk of 15%, equivalent of buffer credit of 3,866,463.21 tCO2e estimated for the project, the net ex-ante anthropogenic GHG emission reduction under the project scenario will be 21,909,958.19 tCO2e.The project offers significant ecological/biodiversity benefit. It contributes to sustainable conservation of the Bale Mountains area as a global hotspot of endemism and high conservation values while improving the livelihoods of the local communities.

Expansion of agricultural activities by small-holder farmers, unmanaged fuel wood and construction wood collection from the forest; intermittent incidence of forest fires, growing population, and in-migration to the project area from other areas of the country were identified as causes of deforestation in the areas. To tackle these causes of deforestation the following project activities have been identified and implemented. The project activities accordingly have designed to incorporate; agricultural intensification and provision of economic alternatives to ensure the well-being of local communities, provision of alternative fuel wood and construction poles supply from newly established plantations on non-forest lands, Forest Protection and Environmental Measures, Strengthening enforcement of existing policies and law, and strengthening the young and weak local institutions and structures for managing forest lands, institutional strengthening of the PFM Cooperatives and OFWE.

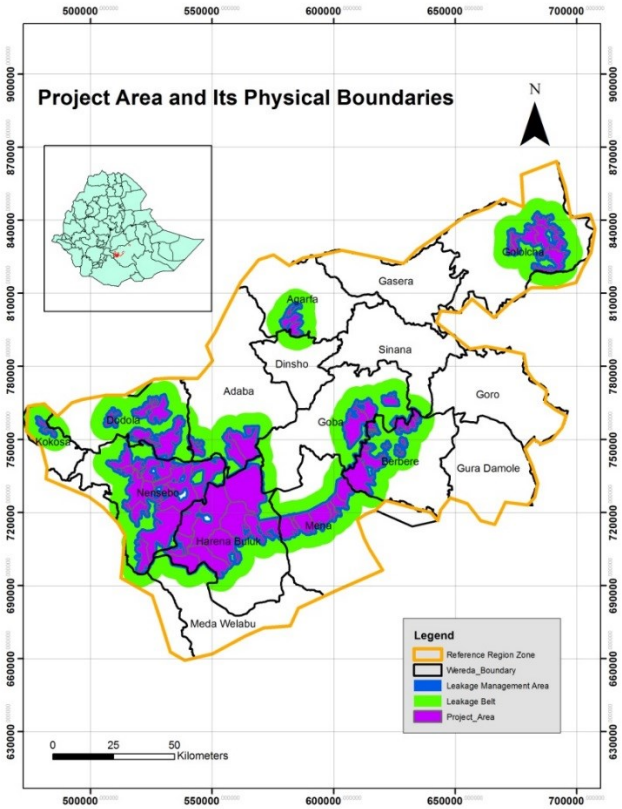

Figure 1: Map of project and surrounding areas of BMERP.

The project has implemented project activities indicated in the Project Design Document such as institutional set up, community managerial and organization capacity building and livelihood improvement activities. Through the implementation of project activities, positive climate, community and biodiversity impacts have been achieved. Regarding, climate impact, a net greenhouse gas emission reduction of 5,532,713.849 tCO_2e was achieved during the current monitoring period, 2012-2015. Communities' managerial and organizational capacity has been enhanced, and household income also improved.

1.2 Project Location (G1.3,G1.4,G1.7)

The Bale Mountains Eco-region lies between 5º22'–8º08'N and 38º41'–40º44'E within the Oromia Regional State in the Southeast Ethiopia (Figure 2). The Bale Mountains Eco-region is one of the two highland divisions in Ethiopia, separated from the larger called western plateau of the Ethiopian highlands by the Great African Rift Valley, one of the longest and most profound chasms in Africa and the world. The main central area of the Bale Eco-region is a high plateau, much of which is over 3000 m asl with several peaks rising from it. The highest peak in the eco-region is Tullu Dimtu (4377m), the second highest point in Ethiopia. South of the plateau the land falls steeply to the Harenna Escarpment and

further into the Somali and Borana lowland plains, and further into the Indian Ocean. The northern area is composed of high ridges and broad valleys that gradually descend to the extensive Arsi-Bale plateaus and further into the Central Rift Valley lowlands (Figure 2). The mountains chain and topography with its broad flat plateau has given the Bale eco-region spectacular scenery. The diversity of the landform has also resulted in a diverse soil formation and local climate (influenced by slope and aspect); hence diverse ecosystems and rich flora and fauna diversity. Moreover, the mountains massive of the eco-region play a vital role in climate control of the region by attracting large amount of orographic rainfalls.

The project location is bounded to the north and north-east by the Wabi Shebelle river, to the east by the agricultural plateau on which the towns of Robe and Goba are found, to the south by the lower limits of the forest zone (thus, above the Combretum-Terminalia woodland zone), and to the west by the agricultural plains that are the continuum of the Arsi-Bale plains. Administratively, the area comprises sixteen Woredas namely Agarfa, Dinsho, Adaba, Dodola, Goba, Sinana, Gololcha, Gasera, Delo Mena, Kokosa, Berber, Harenna Buluk, Nensebo, Mada Walabu, Goro and Guradhamole. In these woredas there are six priority forest areas (PFAs): Aloshe Batu, Goro Bale, Harana Kokosa, Menna Angetu, Kubayu, and Adaba Dodola, which in total are 566,258 ha including the forests in the Bale Mountains National Park or 480,910 ha without the park forests. The total population of the woredas is about 1.6 million, 85% of which is rural and the rest urban.

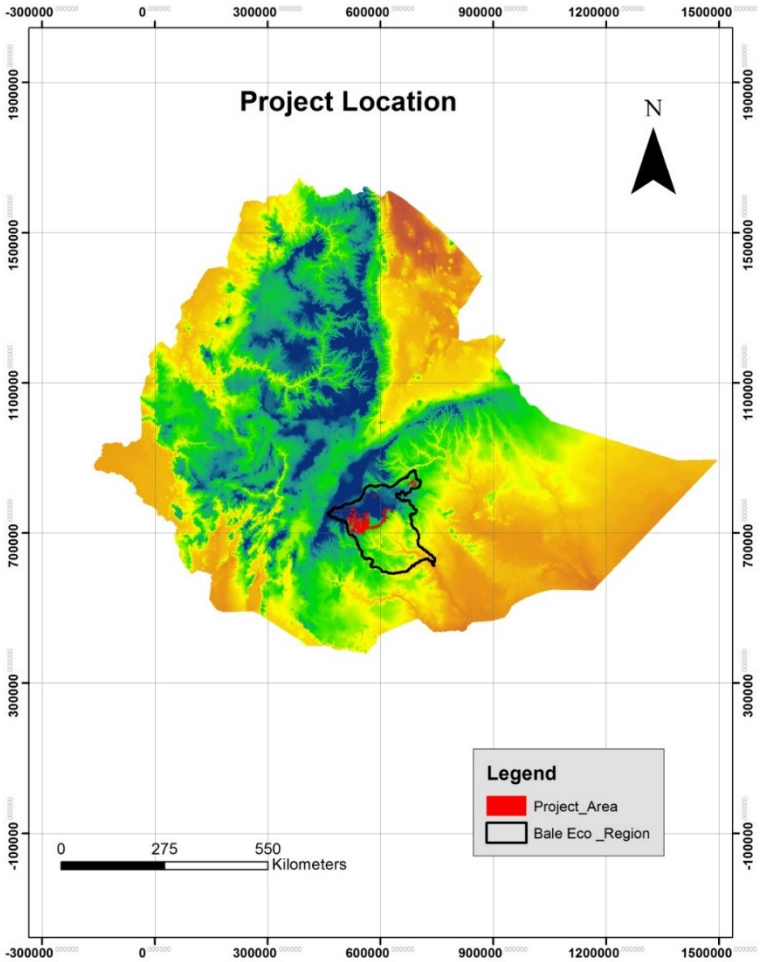

Figure 2: Location of BMERP area within Ethiopia

1.2.1. Other Basic Physical Parameters

Climate: Ethiopia's climate in general is extremely varied and despite its location within the tropical region and being close to the equator the country doesn't follow the typical tropical climate pattern. Its local climates are modified by its landforms, i.e. altitude-induced climatic conditions prevail over the country, which is typical also for the Bale eco-region. The vast highland plateau and associated mountains of the 1plateau and Tullu Dimtu could experience snowfalls in winter. Further south of the mountains and down in the lowlands a tropical warm and dry climate prevails.

A bimodal local climate with two wet seasons that have heavy and small rains is characteristic in the eastern part of the project area, while the western part is characterized by a monomodal rainfall pattern. In the part with a bimodal rainfall pattern, heavy rain occurs from July to October, with the highest peak in August and the small rains from March to June, with a peak in April. There are typically eight rainy months (March-October) and four dry months (November-February) in a given year in the part with monomodal

patter. The far south and lower altitudinal areas experience a shorter, four-month rainy season usually from February to June. This lower altitude area receives between 600-1000mm of rainfall annually, whereas the higher altitudinal areas receive between 1000-1400mm. The rainfall is received from two directions -the equatorial westerlies and the Indian Ocean air streams.

Temperature falls with increasing altitude. At the higher altitudes, the lowest temperatures occur at night in the clear skies of the dry season and the highest temperature during the day time during the same season. The daily temperatures during the dry season show high fluctuation. The lowest temperature that has been recorded in the mountains is -15 ^{O}C at night, with the highest recorded temperature the next day of +26 ^{O}C; thus a range of 40°C within a 24-hour period. In contrast, the rainy season is mild and the temperature shows much less daily fluctuation. It rarely freezes during the rainy season but also the temperature rarely climbs over 20°C.The mean annual maximum temperature is 18.4 ^{O}C, while the mean annual minimum is1.4 ^{O}C.

Hydrology: The BMERP area holds vast hydrological resources of local and regional significance. More than 40 springs and streams rise in the Bale Mountains that feed five major rivers in the eco-region namely the Web, Wabi Shebelle, Welmel, Dumal and Ganale (Figure 3 & Table 1). Note on the figure that the source of most of the springs is the plateau where the national park is located. Additionally, the Bale massif is the source for many springs in the lowlands. These rivers and streams are vitally important for the pastoral and agro-pastoral communities inhabiting the semi-arid and arid ecosystems in the lowlands of south-eastern Ethiopia, Somalia and northern Kenya. In effect the Bale Mountains provide many ecosystem services, one of which is hydrological flow regulation that supports large human, livestock and wildlife population in the region. Approximately 12 million people downstream in the Ogaden, Somalia, lowlands of Ethiopia and northern Kenya are dependent on these ecosystem services for their livelihoods. If the flow of the rivers is altered in any way – through deforestation, overgrazing of pastures and/or over abstraction for irrigation (all of which are occurring at present) – a highland/lowland imbalance results with loss of perennial water in the lowlands. If such a situation arises, the dry season range of the people and their livestock reduces dramatically and they concentrate about whatever water source remains. It is widely recognized that such uneven distribution of people and livestock leads to rapid and lasting degradation. The people are, therefore, likely to become increasingly food-aid dependent if the water catchment areas of the Bale Mountains are insufficiently protected. There is already evidence that over abstraction of water in the Bale Mountains is occurring. Furthermore, two rivers emanating from Bale, the Wabi Shebelle and Yadot, (tributary of the Ganale) have hydroelectric schemes.

The Bale Mountains serve as a fallback site for surrounding pastoral communities in search of animal feed and water during drought seasons and years. It is estimated that, theoretically, the value of all direct and indirect ecosystem services of the Bale Mountains together (hydrology, recreation and tourism, crop production, livestock, timber, firewood and non-timber forest products, wild food, medicinal resources,

genetic stocks, carbon absorption, electricity production, soil stabilization, flood prevention, etc.) is at least 812 million US dollar per year, and can add up to almost 1.8 billion US dollar per year.

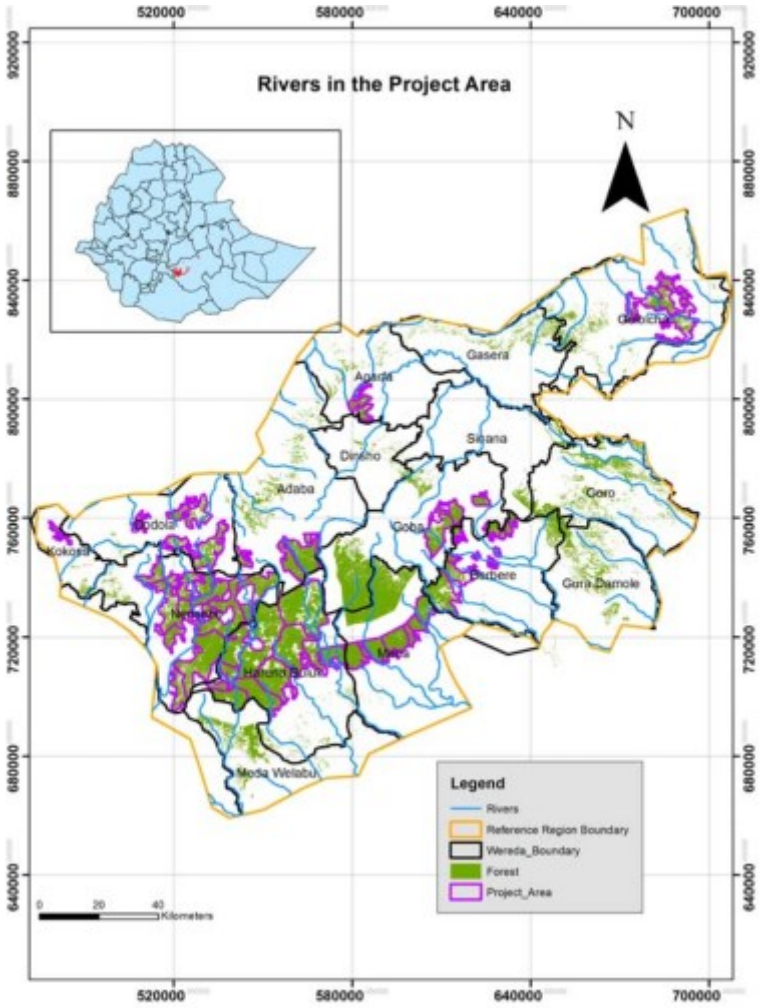

Figure 3: Hydrological Network of the Bale Eco-region

Table 1: Major rivers and their tributaries originating from the Bale eco-region

Major rivers	Tributaries
Wabe Shebele	Abasa, Arba, Baaranda, Boko, Furunna, Gondadoh, Layleeso, and Solay
Web	Albabo, Dalacha, Danka, Dimbeeba, Garano, Gaysay, Kabasha, Kaficho, Keyrensa, Lolla, Micha, Shaiya, Shaiya-Gugesa, Tayanta, Togona, Toroshama, Walla, Wasama, Web and Zetegne Melka
Dumal	Deyu and 5 un-named tributaries
Welmel	Garemba, Rira, Shawe, Shisha and Yadot
Ganale	Welmel and 2 other large tributaries

Oligocene and Miocene geological periods, between 38 - 7 million years ago (Miehe and Miehe, 1994). The rocks of the volcanic outpourings are pre-dominantly trachytes but also include rhyolites, basalts and associated agglomerates, and tuffs. The area consists of a vast lava plateau with at least six volcanic cones, each more than 4,200 meters high, which have been considerably flattened by repeated glaciations (see figure 4).

There have been at least two glacial periods in the history of the mountains and they were glaciated as little as 2,000 years ago. During the last ice age, the Bale Mountains were one of the most extensively glaciated areas in Ethiopia with a total area of ice in Bale of approximately 180 km^2. There was a 30km^2 ice cap around the peak of Tulu Dimtu (the second highest mountain in Ethiopia) on the Sanetti Plateau and individual glaciers of considerable thickness reached down to 3,200 meters. As a consequence, the landscape as we see it today is the lava outpourings much modified by over 20 million years of erosion by water, wind and ice.

There are certain geological features that remain an enigma to geologists and glaciologists such as the striations that appear on shallow hillsides on the Sanetti Plateau. Boulder grooves (large stone sorted stripes two to four meters wide and eighty meters long), till ridges and numerous glacial valleys, such as the Togona Valley on the northeast facing slopes of the Sanetti Plateau, provide evidence of the ice-age effects on the landscape. Until the beginning of de-glaciation (13,000 to 14,000 years ago) the snowline was at 3,700 meters and the upper tree limit in the Bale Mountains was well below 3,000 meters. Fluctuations in climate over the last historical period, including the last 3,000 years, have dramatically affected the vegetation and other biodiversity in the highlands.

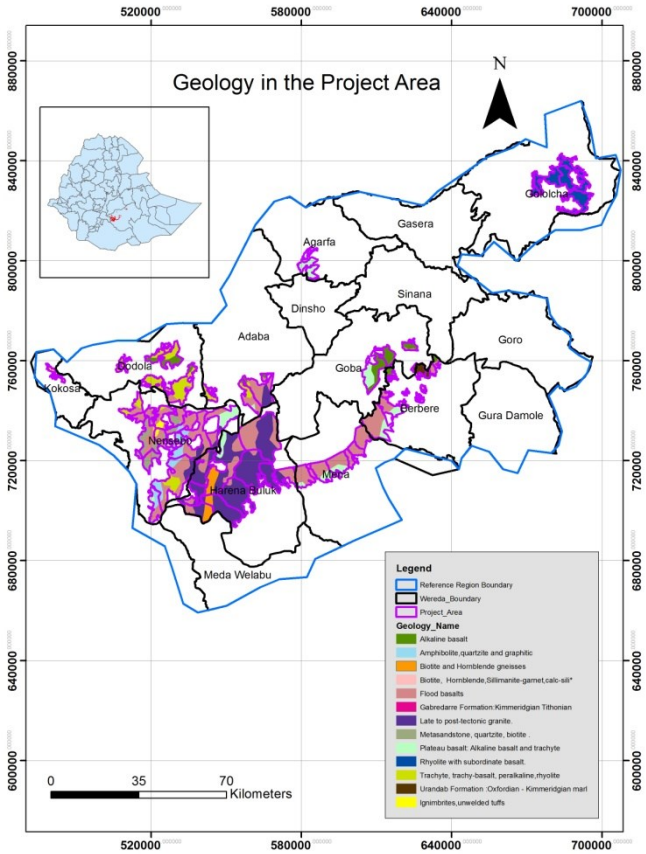

Figure 4: Geology of the Bale Eco-region

Soils: The wide ranges of topographic and parent materials existing in Bale Eco-Region have resulted in wide range of soil formations (Figure 5.). More than 30 soil types are recognized in the eco-region although most of them are found in pocket areas only. The main soil types common in the area are: Cambisols, Vertisols, Luvisols, Lithosols and Nitosols. There is limited information on the conditions of the soils of the co-region due to limited study on soils of the area. However, the Vertisols, Cambisols and Luvisols in the wide plateau of the eco-region are very fertile supporting subsistent and commercial agriculture with high productivity to the standard of the country. There is high potential to boost the productivity of these soils by improving land and crop management. Due to poor management, the soils of these highlands are characterized by low organic matter contents (Yimer, 2007), and also loss organic matter quickly following conversion from grazing and forest land to cropland. Research has indicated that Ethiopian soils including the ones in Bale eco-region are generally low in available nitrogen and phosphorous, and these are priority nutrients recommended for improving productivity. Another constraint is the high rate of top soil erosion by water particularly from the undulating parts of the area. The forests of the eco-region plays significant role in this regarding due to erosion control and regulation of surface run-off.

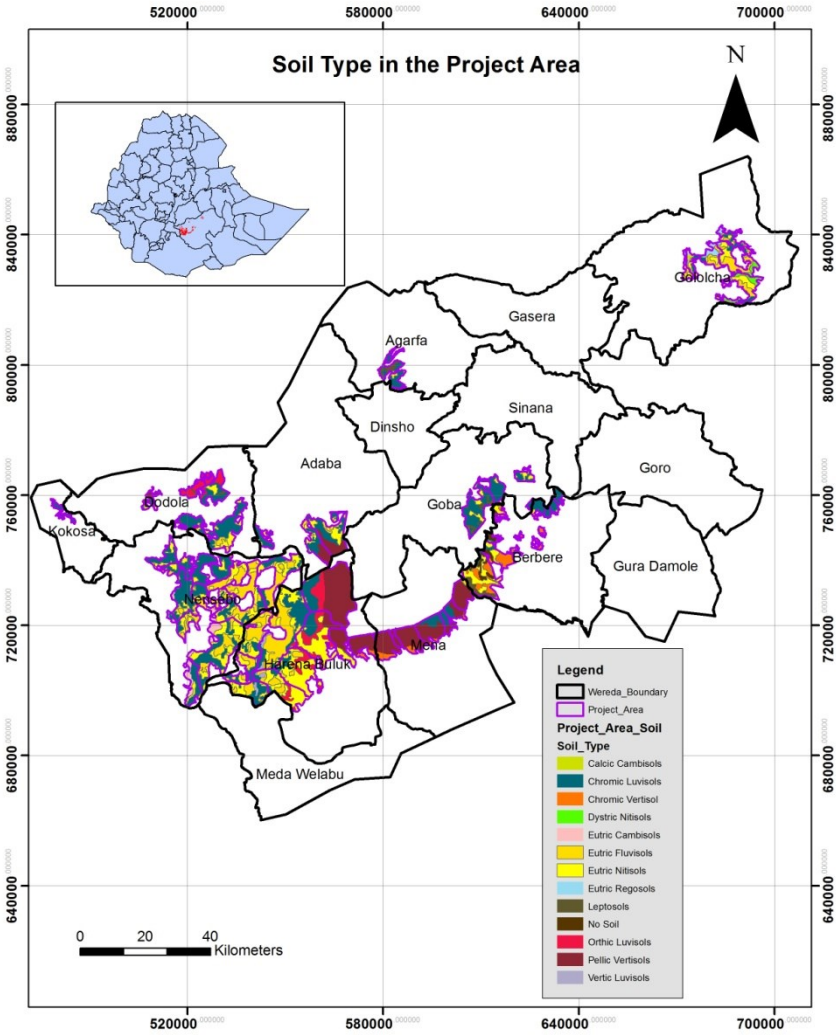

Figure 5: Soil Map of Bale Mountains

Land use: Cultivated lands in the eco-region covers about 15-20% of the land and majorly dominated by small holder subsistent farming system. There is also small large scale commercial farming in the Arsi plateau. The small holder subsistent farming system in the eco-region is typical of the farming system common to most highland areas in Ethiopia. The system is a mixed farming system that combines crop and livestock enterprises. The exact combination of crop and livestock may vary depending on altitude. In the lower altitude areas, bordering the project area, typically below 1500m asl in the southern fringe of the eco-region pastoralism and agro-pastoralism is the typical land use system. The highland farming system may comprise at least three sub-types depending on crop-livestock combinations that are further influenced by altitude. These are: i) livestock-barley subsystem; ii) livestock – wheat/pulse mixed system; iii) livestock- maize/teff subsystem. The livestock- barley sub-system is typical of the cool and humid high altitude areas above 3000m asl with a mean temperature of about 14 ^{o}C. Barley, horse, sheep and cattle were the major component of the farming system. In recent years potato is also emerging as important

crop in this part. Wheat can also be grown mixed with barley in this farming system. Diversity of crop is very restricted in this farming system due to low temperature. The livestock- maize/teff sub-system is typical of the warm and humid lower altitude area near transition to the hot arid and semiarid lowlands. It is typically practiced in the altitude range between 2000-1500m asl. The livestock-wheat/pulse occupies intermediate altitude range (2000-3000m asl) between the above two sub-systems.

There is a strong interaction between the crop and livestock components of these farming systems. The livestock component provides draught power for ploughing and transport, manure for soil fertilizing, as well as additional income to purchase chemical fertilizers and other inputs. Cultivation is done with oxen that pull locally made plough called 'maresha (Figure 6). The crop system in turn provides the major supply of feed. Owing to declining grazing land, in most part of the northern section of the eco-region crop residues supply at least 50 % of the annual feed requirements. The farming system in general is characterized by traditional Ethiopian highland practices that involves oxen ploughing, hand weeding, broadcasting and manual harvesting and threshing. Livestock grazing system is also a free roaming. Community focuses on number rather than productivity as having large herd offers culturally a social pride.

The farming system is characterized by low input and low output system. Use of chemical fertilizer is restricted mainly due to timely supply and economic constraints. Market access and agro-industries are yet to be developed.

The natural forests are widely used as forest grazing areas to supplement annual feed requirement for the livestock enterprise supplementing the feed from crop residue and forage from the small grazing land reserves. In addition, the forest system supplies products that generate considerable household income. In fact livelihood activities in the eco-region can better be described as crop-livestock-forest mixed production system. Forestry provides up to 1/3 of annual household income (Tesfaye, 2010; Ameha 2013).

Figure 6: Typical farming system in Bale eco-region

In the southern parts of the eco-region coffee production is one of the major land use system with increasing importance in terms of contributing to household livelihoods. Coffee is produced in the form of

small scale garden production system as well as production from natural stands – forest coffee. In this part of the eco-region enset (Mussa ventricossa) or false banana cultivation is also observed.

For the pastoral and agro-pastoral communities in the lower altitude areas in the southern part of the eco-region, the high forests (dry and moist) serve as a dry season grazing fallbacks. There is a traditional grazing system called Godantu meaning seasonal migration with livestock, which is a system of moving with livestock particularly during dry season to areas with sufficient feed and water.

1.3 Project Proponent (G1.1)

Organization name	Oromia Forest and Wildlife Enterprise
Contact person	Didha Diriba Ararsa Regessa Deputy General manager Gedefa Negera REDD+Focal Person
Title	General Manger
Address	OFWE P. O. Box: 6182, Arada Sub-city, Queen Elisabeth II Road, Kebena, Addis Ababa, Ethiopia;
Telephone	Ararsa Regessa/Didha Diriba/Gedefa Negera OFWE P. O. Box: 6182, Arada Sub-city, Queen Elisabeth II Road, Kebena,Addis Ababa, Ethiopia; Phone: +251-111-24-64-54/+251111240687; Fax: +251-111-24-64-55; E-mail: ofweredd@gmail.com; Website: www.oromiaforest.gov.et
Email	E-mail: ofweredd@gmail.com

1.4 Other Entities Involved in the Project (G4)

Organization name	Farm Africa and SOS Sahel Ethiopia
Role in the project	Project implementation partner
Contact person	Mulugeta(Dr.) and/ or Girma
Title	1st contact Regional Head of forestry, the 2nd is Bale REDD+ Project Coordinator
Address	Addis Ababa
Telephone	+251 115 573331
Email	MulugetaL@farmafrica.org ; GirmaA@farmafrica.org

1.5 Project Start Date (G1.9)

The project started on January 01, 2012

1.6 Project Crediting Period (G1.9)

The project started on January 01, 2012 and GHG accounting period and project lifetime: 20 years from project start date.

2. IMPLEMENTATION OF DESIGN

2.1 Sectoral Scope and Project Type

The project falls within the scope of the AFOLU sector (Agriculture, Forestry and Other Land Use), and in the category of Reducing Emissions from Deforestation and Degradation (REDD) in particular. The proposed type of activity is Avoided Unplanned Deforestation and/or Degradation. The project is not a grouped project .

2.2 Description of the Project Activity (G1.8)

2.2.1 Integration of REDD+ Concept and Practices into the Project area

2.2.1.1. Community Institutional set up

In the BMER REDD+ project area about 25,000 households have been organized into 64 Forest Managing Cooperatives and legally registered by the Oromia Cooperative Promotion Agency. Then each cooperative has entered into a formal agreement with Oromia Forest and Wildlife Enterprise that provides them a legal responsibility of forest management and rights to utilize the forest sustainably including the benefit sharing from carbon revenue. Therefore, executive organ of each cooperative mobilized their respective members to involve in forest patrolling activities that demonstrated in reduction of deforestation by 62%.

2.2.1.2. REDD+ and Climate change awareness creation

Awareness creation on diverse topics like climate change REDD+ and MRV were provided to government staff and community members through organizing workshops, experience exchange visits, forums and seminars (Figure 7). Accordingly, about 1,122 people (954 male and 168 female) that representing district level officials, technical staff in different government organizations at Region, Zone and Woreda were addressed. Similarly, a total of 4,992 community members (3170 male and 1822 female) were sufficiently provided awareness creation on climate change and MRV.

Figure 7: Participants of various capacity building activities

Furthermore, 4000 copies of brochure that conveyed message about concept and impact of climate change and roles of forest in mitigation of climate change were published and distributed to beneficiaries just to raise public awareness about REDD+ and alarming condition of global climate change (Figure 8).

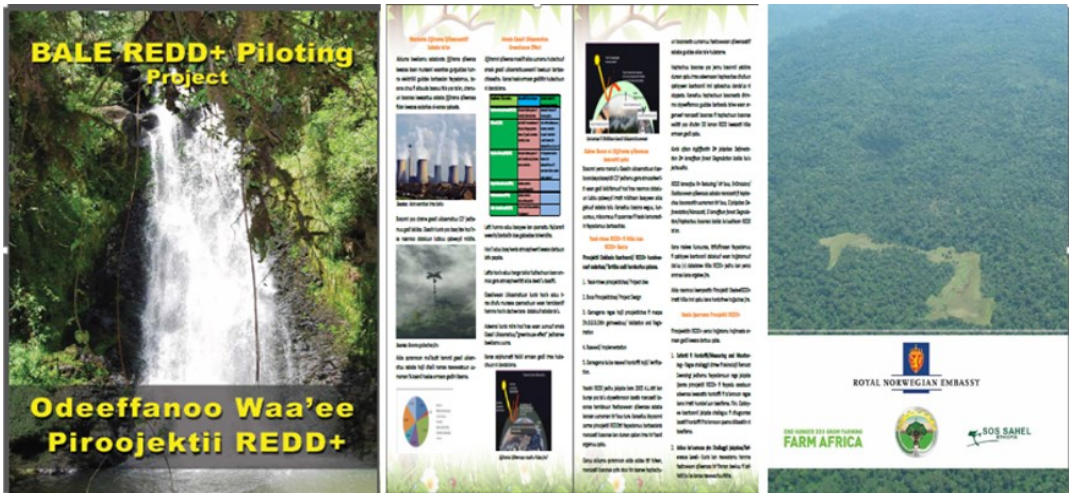

Figure **8**: Published broacher

In general the awareness creation activities have contributed lot in different ways. Primarily, communities' awareness about climate change and role of forest in mitigation of climate change well understood and the community actively and voluntarily involved in forest protection activities. Secondly, the government official and technical staff particularly at local level committed to support the project activities.

2.2.1.3. Strengthening of law enforcement

People from other regions and zones came and attempted to settle inside the boundary of the project which was illegal. Clarifying the issues, Oromia Forest and Wildlife Enterprise, Arsi branch office discussed with REDD+ cooperatives and took appropriate measures. Besides to this, forest managing communities decided and participated in dismantling of illegally constructed houses and fences within the boundary of the forest (Figure 9). This measurement was very important in discouraging any other illegal settlers we attempted to come from other regions.

Figure **9**: While communities were removing illegally constructed fences Bale

2.2.1.1 Supply of Fuel Efficient Stoves

Fuelwoods consumption was identified as cause of deforestation in the Bale Mountain Eco-Region REDD+ project. To minimize deforestation due to consumption of fuel wood, the project subsidized 30% of the cost of fuel efficient stoves and 28,445 stoves were distributed to communities who are living within all REDD+ project area.

2.2.1.2. Community Plantation in the leakage belt area of Bale REDD+ project

At the beginning of designing the Bale REDD+ Project, fuelwoods and construction woods consumptions were identified as the direct causes of deforestation and forest degradation. Therefore, it was strategized to create alternative sources of woods supply. In line to this, The project provided trainings and necessary nursery equipment to members of different forest CBOs. As result of that within the six woredas like the Haran buluk, Delo mena, Goba, Nensebo, Dodola and Gololcha about 125.45 hectors of lands were covered by 277,428 seedlings (Table 2 and Appendix 26.

Table2: The status of forest plantations within different Woredas

Woreda	Hector	Seedlings	Species
Haran buluk	19.3	57000	Grevillea and eucalyptus
Delo mena	39.8	98250	Grevillea and eucalyptus, wurburgia ugandesis
Goba	4	10000	Junipers, Hygenia, eucalyptus, Olea
Nensebo	8.35	19050	Bamboo, Junipers, Eucalyptus, Erithrina brusi, hygenia,
Dodola	49	78128	Eucalyptus, cupress
Gololcha	5	15000	Grevillea
Total	125.45	277,428	

2.2.2 Community Organizational Capacity Building

2.2.2.1. Organizational Capacity Assessment system developed and applied

A Memorandum of Understanding (MoU) was signed with Oromia Cooperative Promotion Agency in order to provide continuous and effective services for forest managing cooperatives. Therefore, excel based organizational capacity assessment and analysis tool was developed in partnership with this Agency to track five areas of CBOs capacity indicators in relation to their forest management performance. These five components cover organizational leadership, bookkeeping, assets management, forest development, forest protection and sustainable forest utilization (Figure 10).

Following the development of OCAT software, a familiarization workshop was provided for 200 technical staff (183 male and 17 female) and those trainees conducted the organizational capacity assessment of 64 REDD+ CBOs to develop baseline data. The result revealed that the average capacity of CBO was 48% which indicates CBOs were managing the forest with capacity of below 50%. Implementing the project, the average capacity of CBOs' enhanced to 64%.

Organizational Capacity Assessment tool (OCAT) comprises of five important parameters like leadership, financial and assets management, Forest development, forest protection and sustainable forest utilization. A leadership parameter consists of indicators on the dimensions of human and social capital. Financial and assets management parameter contains indicators that use to reflect whether the common resources are properly managed or not. The forest development and protection parameters comprise key indicators that help to reflect the evidence for developed forest area and protection measures taken. Sustainable forest utilization business development parameter designed to address two aspects. Firstly, it

contains indicators that measure whether the forest resource is sustainable utilized or over exploited. Secondly, it helps to measure a capacity of forest CBO in running business of NTFPs to improve livelihood of the members.

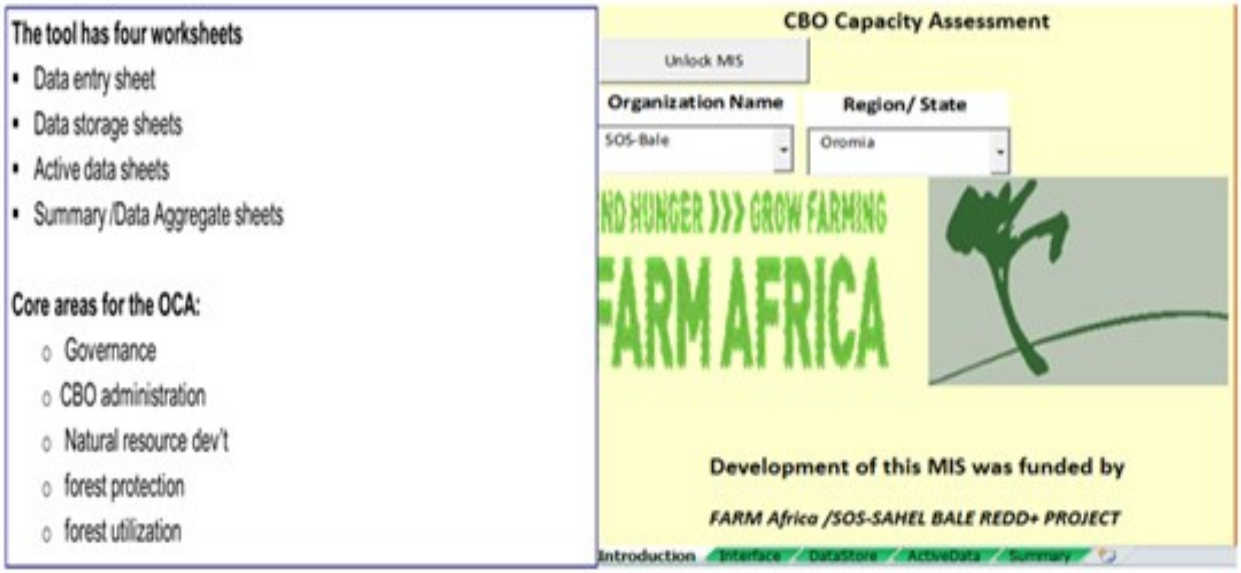

Figure 10: Interface of Organizational Capacity Assessment Tool

2.2.2.2. Managerial and Organizational Capacity Building

Identifying the capacity level of CBOs, the project has vigorously provided managerial and organizational capacity building services through various means of capacity building indicated as below.

- **Training**

In response to the identified gaps, important capacity building training topics like leadership, bookkeeping,

Asset management, forest management were provided in two phases. First ToT training for 206 technical staff (171 male and 35 female) were provided. Secondly, ToT attendants provided same training for 8,254 community members (5869 male, 2385 female) Figure 11.

Figure 10: While organizational capacity

- **Community's Guideline Development**

Two community's guidelines prepared and 2000 copies of each published and distributed for organized 64 forest managing REDD+ cooperatives (Figure 12). The first guideline was prepared in collaboration with the cooperative promotion agency of the Bale and West Arsi zones. This guideline is produced mainly focusing on organization management and contains two sections. The first section explains about CBO's governance while the second section elaborates about the financial and assets management like rules, regulation, procedures, steps and formats needs to be followed.

The second guideline produced to provide general and specific guide about implementation of participatory forest management. Therefore, important issues like the forest protection, forest development, sustainable forest utilization including forest monitoring and evaluation approaches included. Moreover, the planning and reporting format have developed and contained in the guideline.

Figure 11: Forest management and co-operative management guidelines

- **Assets and Finance supports**

Financial support equal to Birr 780,000.00 provided to 30 forest cooperatives in order to enable them to construct their respective offices. Moreover, nursery materials and forest firefighting equipment, GPS and other necessary equipment were provided to all 64 CBOs (Figure 13).

Figure 12: Provided equipment material support

- **Experience exchange visits**

To facilitate the adoption and diffusion of knowledge and experience among different CBOs, community to community experience exchange visit was strategized and implemented. Accordingly, about 926 CBOs

members (458male, 468 female) involved in the experience exchange visits and were able to learn about the leadership, financial and property management including forest management practices (Figure 14).

Figure 13: Participants of CBOs to CBO experience exchange visit

- **Constitution of Bale Mountains Eco-region Trust fund**

Initially, the project was supposed to establish a trust fund that works for the Bale Eco-region REDD+ only. However, as the result of new development in the region associated with the Oromia Forested Landscape REDD+ Program (OFLP), OFWE is interested to establish one such REDD+ Trust fund to work across the Oromia Regional State. This has caused changes in the modality of the trust fund constitution; hence the cause for the delay. The OFLP institutional structure is established to include relevant institutions at national, state and sub-state levels with discrete accountabilities and decision making roles based on existing mandates. Oromia REDD Coordination Unit (ORCU) is established and administratively housed within OFWE, which is accountable to the Executive Oromia Regional State Level (President and Vice President Offices), and supported by National REDD+ Secretariat, which is housed within the Ministry of Environment, Forest and Climate Change.

The regional state's multi-sector REDD+ Steering committee and Technical Working Group provide strategic guidance and technical supports, respectively to OFLP implementation. OFWE and sector bureaus would implement and coordinate activities on-the-ground through their woreda offices/experts and kebele development agents (extension officers) who cover forest, agriculture, water, and household energy.

Oromia Regional State, OFWE, all relevant bureaus, with ORCU serving as OFLP implementation unit to coordinate this work. At sub-state levels, the woreda administrators and a combination of woreda sector experts and development agents under them already implement a range of initiatives, sector programs and operations that would need to be coordinated and leveraged to deliver on OFLP objectives. The

ORCU has clarified roles and responsibility of different actors and started the process hiring three OFLP facilitators that would supervise the OFLP Woreda Coordinators and the OFLP Safeguards Coordinators and the other six OFLP Safeguards Coordinators who will provide support in concert with the OFLP Woreda Coordinators throughout the state to manage risks and promote sustainability of forest-related interventions and REDD+ activities (Appendix 23). Despite this, the emission reduction has been achieved by the Bale REDD+ project before initiation of the OFLP is discussed to be treated separately. Additionally, it is also under discussion to keep the Bale REDD+ as a separate project in the future because it is a pioneer project from which important lessons have been learnt and will be expected to learn.

Oromia Forested Landscape Program has been planned to start in 2017 and responsible for carbon to be generated after starting date of implementing the OFLP program. In line to this, a carbon credit that has already generated by Bale Mountains REDD+ Project is agreed to be treated separately. Afterwards, the Bale Mountains REDD+ Project is going to nested into the OFLP jurisdictional approach to avoid effect of double counting effect.

2.2.3 Livelihoods improvement Activities

2.2.3.1 Introduction of FAO's Market Analysis and Development approach

Market Analysis and Development (MA&D) approach was introduced to enhance business development skills of the community who engaged in the sustainable forest Management and REDD+ activities. Towards this, about 40 technical staff (30 male and 10 female) from OFWE and cooperative promotion offices were provided TOT training on MA&D approach. Then the TOT team delivered same training for about 1897 people (1093 male and 804 female). After training, many trainees able to identify the potential Non Timber Forest Products like forest coffee, Honey and Bamboo and they have actively engaged in business.

2.2.3.2. Supported communities' business plans

- **Coffee Quality improvement**

Before project intervention the quality of forest coffee was very poor due to lack of skills and less access to technologies that used to improve quality of forest coffee. Later as a result of knowledge acquired through MA&D training, seven REDD+ CBOs developed their respective business plans to procure materials that used to improve quality of Non-Timber Forest Products (NTFPs) such as mesh wire to construct coffee drying beds, hessian sacks which is proper container and plastic sheets to protect coffee from moisture. Prior to support, feasibility of the business plans was assessed by the project and then a

subsidy of 30% to each business plan was provided. Accordingly, a total subsidy of Birr 319,100.00 provided for all seven CBOs. Subsequently, all CBOs procured the planed materials and distributed for 506 coffee producers (397 male and 109 female).

Regarding, mode of payment to the materials cost, each CBO collected 30% of material price at a time of materials delivery as in advance payment while remaining 70% of the cost and 5% marginal profit collected after farmers harvested and sold their products when price of products was good on the market. This was very important for two reasons. Firstly, the CBOs were engaged themselves in procurement process of items with minimum support by the project. In doing this, they have developed confidence and feeling of confidence to manage things which is strong foundation for sustainability of project's outcomes. Secondly, almost all beneficiaries who could not afford to pay total costs of materials by that time provided opportunity of getting the materials with in advance payment of 30%.

Apart the materials support about 889 farmers (697 male and 192female) provided training on coffee quality improvement and post harvesting handling. Furthermore, 2072 farmers (1700 male and 372 female) trained on requirements for Organic Certification of Forest coffee. As a result, coffee plots of 1552 farmers (1450 male and 102 female) were inspected and audited that qualified for organic certification. After auditing, coffee organic certification document was obtained. Quality of forest coffee was very poor before project intervention because farmers collected red and green cherries and put on bare land and inside inappropriate containers. After intervention, those farmers who provided trainings and material supports could able to improve quality of their coffee and sell for better price than what was before.

- **Honey production**

Traditionally, people produce log hives and put on the top of the tree which is very difficult to keep the quality of honey and also there was risks of forest fire because farmer use fire during the collection of honey. Realizing, these limitations, trainings and technical support provided for those farmers who interested to engage in beekeeping activities. As a result, farmers have started adopting of transitional and modern hives (Figure 15). Moreover, they have harvested quality honey, packed, labeled and sold on the market for better price. The activity is very important because farmers started practicing of apiary management around homestead which contributes to avoid the risks of forest fire.

Figure 14: Traditional way of honey production and processing

- **Village Saving and Lending Association**

In the project area fuel woods and charcoal selling was practiced by local communities particularly by poor women as means of income generating scheme to support their livelihood. Therefore, Bale REDD+ project has facilitated establishment of Village Saving and Lending Associations (VSLA) to start saving and credit services that helps them to engage in different alternative livelihood options. Accordingly, about 20 VSLAs were organized in different woredas and involved in small business like trading of forest coffee, honey, fruit and vegetables including other agricultural products. As a result, their practices of income generating from sell of fuel wood and charcoal has shifted to identify alternative means of income generating options.

- **Equal opportunity for women and men**

To keep an equal opportunity for women and men during training, workshops and experience exchange visits, the project has been working to keep a ratio of 50 to 50 between men and women to make sure the equal opportunity for women as described in below.

- ✓ Women engagement during training

For instance while three days training was organized on participatory carbon stock assessment and MRV about 341 men and 323 females were drawn from 11 woredas and attended the training (Table 3) and Appendix 25.

Table 3: Participants from community training on PFCA and MRV

Woreda	No of Kebele	Participants		
		Male	Female	Total
Bale Zone				
Agarfa	3	19	17	36
Barbare	10	58	56	114
Dello Mena	7	37	37	74
Gololcha	6	36	32	68
Goba	3	16	14	30
Harena Buluk	8	52	59	111
Meda Walabu	1	5	5	10
West Arsi Zone				
Nensebo	12	48	56	104
Dodola	8	38	26	64
Adaba	3	20	13	33
Kokkosa	2	12	8	20
Grand total	63	341	323	664

- ✓ Women engagement during experience exchange visit

During CBO to CBO experience exchange visits **a**bout 297 women and 362 men participated as indicated in Table 4 and Appendix 25. The experience sharing visit was organized to facilitate learning among community on the following topics:

- Forest conservation, development and utilisation
- Community based institution leadership, administration and governance
- Planning, documentation and reporting system
- Financial management
- Assets management
- Monitoring & evaluation systems
- Natural resources based businesses by Women's saving and credit

Table 4: Number of participants during the experience exchange visits

Woreda	Female	Male	Total

Mada walabu	6	6	12
Delo Mena	42	42	84
H/buluk	58	58	116
Berbere	57	59	116
Agarfa	9	23	32
Gololcha	30	30	60
Adaba	5	23	28
Dodola	45	47	92
Kokosa	9	11	20
Nensebo	36	54	90
Technical staff	0	5	5
Technical staff	0	4	4
Total	297	362	659

2.3. Management of Risks to Project Benefits (G1.10 ,G1.11)

The project identified the potential risks such as fire, weak law enforcement, weak institutional capacity to implement REDD+ project. As part of mitigation measures fire brigades have established and firefighting equipment distributed to the communities. Moreover, in the Bale REDD+ project area comprehensive and wide awareness creations and trainings were provided to all relevant government stakeholders and wider community on climate change, role of forest in mitigating climate change, concepts and principles of REDD+ and the benefit and risks of the proposed BMERP to the local stakeholders. Human induced risks such as weak institutional capacity and weak law enforcement were also identified that would affect the climate, community and biodiversity benefits. To mitigate such risks measures like provision of series of awareness-raising meetings and community engagement in Participatory Forest Management (PFM) have been strategized and successfully implemented by different stakeholders (Table 5).

Table 5: Potential project risks and mitigation measures taken

Potential risks	Mitigation strategies	Responsibility

Fire	• Firefighting equipment /tools made available for each JFM CBOs; • Capacity building of forest CBOs' to better manage the risks of forest fire ;	OFWE, JFM CBO, Farm Africa, SOS Sahel Ethiopia,, Woreda/Zonal/Regional Administration, Bureau of Agriculture
Weak law enforcement	• Oromia regional government has given attention to forest protection law enforcement, to stop illegal activities inside the forest; • The Climate Resilient Green Strategy (CRGE) and the Growth & Transformation plan of Ethiopia has given due attention to forestry sector (REDD+ is one of the four fast track implementation activities of the Ethiopian CRGE Strategy); • JFM CBOs (local community organization) are given mandate to locally enforce their internal bylaw to protect forest; • The project established close working relationships with judiciary to enforce law.	OFWE, Oromia Regional government, Federal government, local/ woreda government, Forest management cooperatives
Weak institutional capacity to implement REDD+ project	• Frequent training in areas of REDD+ project implementation provided to OFWE staffs and the local communities; • REDD+ unit established in OFWE HQ and in the Bale and Arsi branches; • Federal level REDD+ secretariat established to provide support to regions for the implementation of REDD+ pilot projects • Farm Africa and SOS sahel Ethiopia with comprehensive experience in the forest carbon backstopped implementation of the project.	Farm Africa, SOS sahel Ethiopia, OFWE, Ministry of Environmental Protection and Forestry (MoEPF),

2.4. Measures to Maintain High Conservation Values (CM2.2)

The Eastern Afromontane forest in which the Bale mountain ecoregion lies has designated as one of the 34 biodiversity hotspots worldwide due to its exceptionally high levels of biodiversity and threats (Figure 16). However, over 90% of the original habitat of Eastern Afromontane has lost or significantly degraded. The Bale eco-region is one of the few places that represents and significantly contributes to the

conservation of biodiversity of such local, national, regional and global significance. Moreover, a forest that comprises natural growing *Coffee arabica* in the Bale Mountains Natural forest contributes a lot to the household economy in the area. Therefore, special attention has given to these HCV areas through implementing of Participatory forest management because by its nature participatory forest management is in favor of biodiversity conservation that contributes to maintain all the HCV of the eco-region. Similarly, the project has supported the local community owning the wild coffee in the BMERP area to sustainably use the coffee for their livelihood improvement without harming the forest and biodiversity. Furthermore, to maintain the conservation HCVs, the project activity has given special attention to address drivers that can severely affect biodiversity of the forest such as forest fire control through providing training and material supports to local communities such as (Firefighting devices). Additionally, measure such as establishment of woodlots for construction and fuelwood supply were promoted as agro-forestry outside of the forest areas and also fuel efficient stoves were distribute to beneficiaries to reduce the impacts of fuelwoods consumptions .

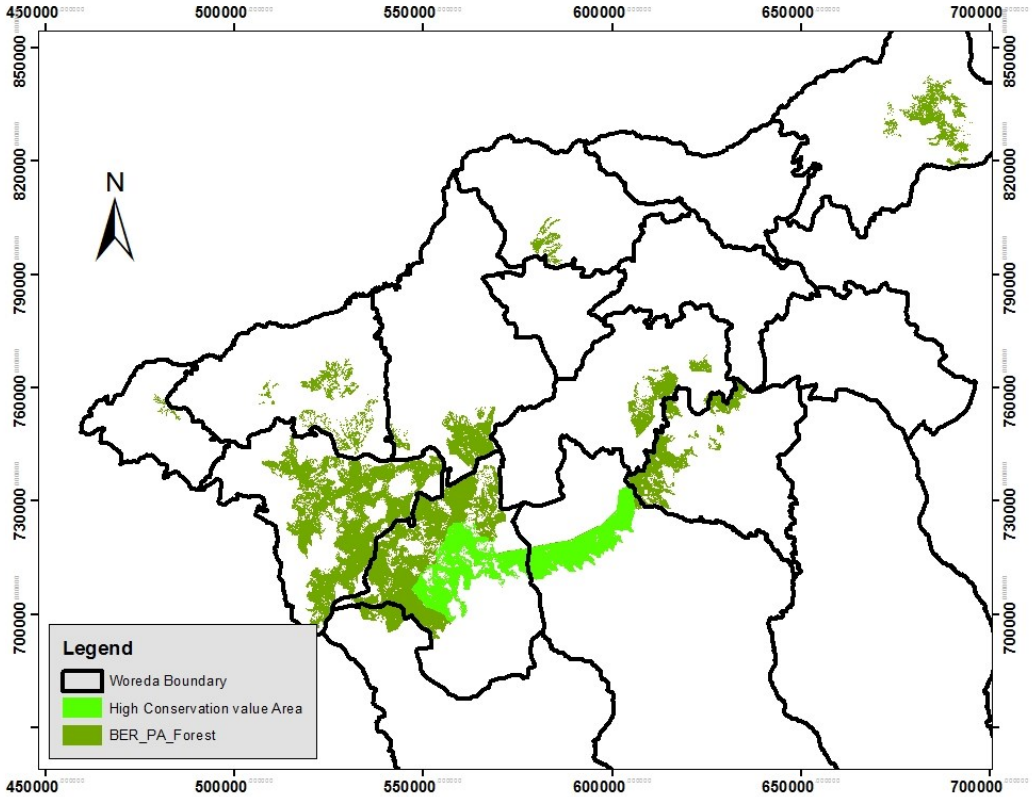

Figure 15: Map of Project area with High Conservation Value area

2.5. Project Financing (G1.12)

The project finance incomes mainly derived from three sources: The first is the financial source to be generated from the trading on voluntary market of ER of 37 million tons of CO_2e GHG by the end of the project in 2031. The second source is from the revenue generated form sustainable forest management and forest based business development mainly NTFPs in which some share reserved as forest fund. The Third is from OFWE's annual budget allocation to the management of Bale Mountains Forest. These sources can ensure financial sustainability for the project. The part of money generated from the carbon credit which required to execute project activities needs to channel to the project site OFWE's branches though the existing fund transfer system that is in placed in OFWE system. Furthermore, the BMERP has developed and implemented with the financial support of grants secured by Farm Africa/SOS Sahel, and the on-going support of OFWE. This has already covered considerable part of the early investments before carbon credits are verified and sold.

The Oromia Forest and Wildlife (OFWE) is the proponent of the project and a public enterprise with the average annual revenue of 180,795,518 Eth Birr (10 million US$). During the past six years a capital of 1.5 Billion Eth Birr equivalent to US$ (83 Million). Over the period, its income has grown by more than 65% mainly from sustainable harvest of plantation forests within its concession. The annual expenditure during the same time period for the enterprise was 39 Million Eth Birr or (US$ 2.1 Million). The OFWE owns the concession of all forest plantations and natural forests within Oromia Regional State and its income is growing over the years.

The OFWE is governed by a board chaired by the regional Vice President. The organization has strong finance and administration wing fully capacitated. Furthermore, it conducts external audit each and every year to make sure its financial system is healthy and free of any corruption. OFWE has the policy of zero tolerance to corruption and has an anti-corruption unit that independently check and control the way it manages its operation and financial resources.

2.6. Employment Opportunities and Worker Safety (G3.9-12)

Workers' safety capacity-building plan prepared for the government agencies and community institutions who directly involved in the implementation of the Bale REDD+ project activities. The capacity building activities included awareness creation about the general climate change & its impact on local community, role of forest in mitigating climate change, what the BMERP is doing, how the implementation of the project is carried out, any risk associated with the project implementation and safety requirements. Particularly, during the FPIC process, the OFWE has conducted comprehensive trainings and discussions with different community groups. At the time of discussion with the local forest dwellers, it was explained that all community members would be given equal job opportunity.

The employment opportunity and worker safety is also backed by the Ethiopian laws. For instance, the Ethiopian Labor Proclamation No. 377/2003 entitled "Labor Proclamation" is the main legislative standard for the Ethiopian labor law and ensures worker-employer relations (Appendix 21). This proclamation

governs relationship between worker-employer based the basic principles of rights and obligations with a view to enabling workers and employers to maintain industrial peace and work in the spirit of harmony and cooperation towards the all-round development of their country. The OFWE which is the proponent of this project is strictly governed by the Labor Laws of Ethiopia. Therefore, as per the law and workers' safety requirement, a number of equipment were purchased by OFWE and being used by concerned workers. The OFWE has developed its own worker safety guideline (Appendix17).

In the case of BMERP, the hiring of the local people and OFWE personnel is prioritized to carry out the functions envisaged by the project. At initial stages, hiring was carried out by contracting directly between the project management and those hired labor in accordance with Ethiopian law. Additionally, wherever it is appropriate, the hiring process is supposed to be done by the PFM cooperatives or other implementing partners.

The project is co-implemented by local community living with the forest and the public enterprise which is very aware and capable of implementing the labor law of the country. The enterprise supports local communities to fully understand and comply with their rights and obligations. The Ethiopian labor law under its section three subtitle 12 clearly indicates the safety issues of the worker. Accordingly, it is the obligation of the employer to take all the necessary occupational safety and health measures and to abide by the standards and directives to be given by the appropriate authorities in respect of these measures (Ethiopian Labor law: proclamation No. 377/2003).

2.3 Stakeholders (G 3.1, G3.2, G3.5, G5.2)

The Bale Mountains Eco-region REDD+ project comprises multiple stakeholders from the Federal to local grassroots level. Bale REDD+ project which is a pioneering REDD+ initiative in Ethiopia and was discussed widely at national scale that attracted the interests of all stakeholders. At the federal level the Ministry of Environment and Forests (MEF) and the national REDD secretariat housed in the (MEF) are among the most pertinent stakeholders. Consultation process for the Bale REDD+ project was conducted between different stakeholders at different levels: Federal, Regional, Zone and woreda government levels and at local levels with the community. The government level consultation was conducted in Addis Ababa with the presence of federal and regional government's stakeholders while the zone level consultation was conducted in the Bale Zone. The grassroots level consultation and participations were conducted in each village in which it was accessible to communities. At the Oromia regional state, the project was approved by the Regional State of Oromia because the project site belongs to this regional state. Communities who are living in and around the project are the major stakeholders of the project. For this reason, participation and commitment of the local communities in the project areas was carried out in 64 REDD+ kebeles and agreed through the process of FPIC that was led by Farm Africa/SOS Sahel Ethiopia. In some of the kebeles, high number of community members attended the meeting that made event was very special in its kind where such high number of community members attended the meeting (Figure 17).

Figure 16: Communities' consultation and participation in Bale REDD+ project design process

The term FPIC is an abbreviation that stands for Free, Prior and Informed Consent. The FPIC was carried out to secure the local community consent for the proposed REDD+ project. During the FPIC planning phase, facilitators were selected from the locality, and trained on core principles of FPIC, what FPIC does mean and their roles as facilitators. After the training the facilitators sent back to their respective kebeles/community where they were assigned to conduct the FPIC process. Then the facilitators conducted awareness raising work on BMERP project for the wider community through kebele level meetings on the following topics.

- Nature, size, pace, reversibility and scope of any proposed project or activity;
- Reason/s or purpose of the project and/or activity;
- Duration of the project;
- Locality of areas that will be affected;
- Preliminary assessment of the likely economic, social, cultural and environmental impact, including potential risks and fair and equitable benefit sharing in a context that respects the precautionary principle;
- Personnel likely to be involved in the execution of the proposed project (including indigenous peoples, private sector staff, research institutions, government employees, and others); and
- Procedures that the project may entail.

After extensive discussion on the project's contents and ideas, in many places communities satisfied to the consultation which was carried out and expressed their interest of accepting the project and willing to work with the project . As a witness for their willingness they nominated five community representatives per kebele to sign the consent document on behalf of wider community (Figure 18).

Figure 17: Sample signature of community's representative during FPIC consultation

- Public comments:

- The development of Bale REDD+ project and the progress of implementing the REDD+ project were actively communicated to national stakeholders through various communication such as email, national media (TV and radio) programs before posting the documents on CCBA website.
- The posting of project documents on CCBA was done using English and Afan Oromo versions.
- Communities in and around the project zone were also informed by the project proponent about the documents posted on CCBA website through organized public meetings, gatherings.

- **Conflict/grievances redress mechanism**

The success of the REDD+ project depends on ability of stakeholders to effectively and amicably resolve any problems and issues that arise during implementation of the project. For this reason, the project has facilitated the development of grievance handling procedures (Appendix 14). Towards this, the structure for the grievance addressing mechanism is deliberately integrated into the structure of the JFM/PFM cooperatives by having a traditional conflict resolving elders committee in dealing with first level conflicts at each cooperative level.

It has been discussed and agreed that as much as possible conflicts should be transparently, and quickly be managed and/or resolved through this traditionally well accepted procedure. It has emphasized that the committee should be available to hearing of complaints and providing a platform for discussion and resolving of the conflict within a month time period. Project stakeholders can raise complaints and

grievances to the elderly committee or its member either verbally or in writing. However, resolution reached, whether resolved or note, should be communicated to the parties involved in writing. The elderly committee is made aware the requirement for keeping records of every complaint and keep track of the status. In case conflicts could not be resolved at the level of the elderly committee, subsequent procedure for grievance resolution will follow the formal judiciary procedure of the country moving from district level courts to subsequent higher level as long as the grievance remains unsolved.

3. LEGAL STATUS

3.1. Compliance with Laws, Statues, Property Rights and Other Regulatory Frameworks (G5.6)

Ethiopia is the Federal State that comprises of three organs of government such as legislative, executive and judiciary. The parliament in the country is responsible of making legislation while the power of executive is vested upon the prime minister and the judiciary organ is mandated of interpreting the law of the country. The federal government oversees 9 National Regional states and 2 chartered cities' administrations. The regions are further divided into administrative zones which are in turn divided into districts (woredas). The districts are made up of neighborhood peasants associations (kebeles).

The 1995 Constitution of the Federal Democratic Republic of Ethiopia empowers community through stressing the right of people of the country to participate in any development activities in their vicinity and assigns extensive power to the regions that can establish their own government and carry out functions of government through an executive committee and regional sectoral bureaus. This structure of council, executive, and sectoral public institutions is replicated to the next administrative level of district/woreda. In Ethiopia the ownership of land and other natural resources is vested in the people and the State that is stated in the 1995 Constitution of the Federal Democratic Republic of Ethiopia (Appendix 15). Article 40(3) of the Constitution provides that "The right to ownership of rural and urban land, as well as of all natural resources, is exclusively vested in the State and in the peoples of Ethiopia. Land is a common property of the Nations, Nationalities and Peoples of Ethiopia and shall not be subject to sale or to other means of exchange." There are different ways to interpret this ownership by the State and the peoples of Ethiopia. The best interpretation is that the Constitution has considered State and people as two distinct entities. Land is the joint property of these two entities, but the State administers land on behalf of the people. This is supported by Article 40(6) of the Constitution that indicates the State administers the land on behalf of the people. "Without prejudice to the right of Ethiopian Nations, Nationalities, and Peoples to the ownership of land, government shall ensure the right of private investors to the use of land on the basis of payment arrangements established by law. Particulars shall be determined by law."

A number of laws have been enacted that further confirm the State's ownership of all lands in Ethiopia. The most relevant is the Federal Rural Land Administration and Land Use Proclamations Proclamation № 456/2005 which indicates that the Ethiopian government is the owner of all rural lands. Rural lands also

include forests (Appendix 16). The right to use land can be transferred by the State to individual users, communities, and others. The right to use land and other natural resources can also be separated. Forests (trees) are considered natural resources which can be sold independently from the land. All natural forests are considered to be government owned, but they can also be owned by communities when the government transfers a forest to them. Plantations are government owned when planted by the government and community owned when planted by the community on land transferred to them by the government.

Land use rights can be transferred to communities by government agencies pursuant to legislation. This could be via issuance of land holding certificates, concessions, or other agreements made pursuant to the relevant law. Once the land use right is transferred to the respective users, they can receive a landholding certificate. This landholding certificate may award the lifelong tenure for individual users, though the certificate does not offer complete protection against the government taking back the land use rights in the future. An exception to the lifelong tenure rule applies to communal landholders, for which no time limit is indicated in the landholding certificate. The time limit may be determined by the contractual agreement between the government and the community. Land use rights are wide, but fall short of a right to sell the land. For instance, users can sell or bequeath property they have produced from the land by their labor or capital. These rights can be exercised by all rural land users including communal land users.

According to the Constitution, not only the State but also Nations, Nationalities and Peoples of the country (which include the local/traditional people of the country) have rights over land and forests. Local communities, especially pastoralists and forest dwellers usually own land/forests communally when assigned to them by the State and these rights are recognized by the Ethiopian Constitution. This constitutional right is confirmed by subordinated laws. In addition to land rights at individual level, communities will have group rights over land/forests when this has been granted by the government by a special agreement. Other laws and policies relevant for the project include the federal forest proclamation (Appendix 18) and the Oromia Forest proclamation (Appendix19), and that of cooperative commission establishment proclamation (Appendix 20). These laws and policies re-enforce government's ownership of land and other natural resources, while ensuring the right of legally organized communities to jointly manage and use natural resources by entering into formal agreement, as is the case with PFM, with federal or regional government.

3.2. Evidence of Right of Use (G5.7,G5.8)

All land is state owned in Ethiopia and all natural forests are state property. However, rural households can obtain usufruct right over land for farming. Similarly, communities that live in and nearby the forests are entitled to use the forest for household purposes while additional uses particularly commercial uses of forests is arranged under special management agreement between Joint Forest Management Agreement

signed between communities and the government's forest agencies. This arrangement has granted for the Bale eco-region communities. Through this arrangement the management responsibility as well as use rights of the forests under OFWE's concession has been formally transferred to organized community groups under the JFMAs.

Joint Forest Management Agreements (JFMAs) set out the rights, benefits, and responsibilities of the cooperatives and the relevant forest enterprise. Under the JFMAs the cooperatives enjoy the following benefits:

- Recognition of the right to live in the forest (if they are currently doing so).
- Sustainable utilization of forest resources based on the forest management plan.
- A share of the benefits from ecosystem services (including carbon sequestration).
- Benefit sharing from plantation and natural forests.

In the meantime, the cooperatives have also responsibilities to carry out:

- Fully implement the joint Forest Management Plan
- Produce and implement a Forest Management Action Plan annually.
- Ensure that destructive activities such as forest fires, clearance and settlement do not occur within the forest.
- Seek prosecution for individuals who destroy the forest.
- Prevent new house construction, coffee planting and agricultural expansion inside the forest.
- Ensure that the forest is able to naturally regenerate and that seedlings are planted when necessary.
- Protect the forest and seek legal redress from individuals, who without customary use rights, have utilized the resource without having entered into an agreement with the Cooperative.
- Ensure that beehive construction is not destructive and does not use endangered trees.
- Ensure that all fires are controlled and managed when used in the forest for cooking, burning crop residues, smoking beehives etc.

The OFWE who sign the agreement on behalf of the government has the following responsibilities:

- Build the capacity or provide technical assistance to the cooperative in order to realize sustainable forest development, protection and utilization.
- Assist and monitor the implementation of the joint Forest Management Plan.
- Ensure that the rights of the cooperative are not violated by any individual, group or organization by supporting the cooperative in any way possible.
- Ensure that benefits from ecosystem services (including carbon sequestration, payments for environmental services, trophy hunting) is shared with cooperative based on a supplementary agreement being made between the two parties.

Regarding to the carbon credit, Ethiopia does not contain any specific legislation that defines what a carbon credit is, who owns it, or how is transferred. Despite that, the carbon credits is associated to land and forests that carbon credit derived from and it may be considered as a "forest product". Then by the implication of Forests and things derived from them are a natural resource which under the constitution is owned by the people and Government. This implies that the administrator of the carbon credits is to be the state while the state can also transfer the rights to natural resources managing individuals, communities or other groups of the society.

The federal government has granted the power to administer state forests to the regional states under the Federal Proclamation 542/2007. This proclamation dictates how CBOs obtain rights to forests: "Private individuals, associations, governmental and non-governmental organizations and business organizations who want to develop forest shall have the right to obtain rural land in areas designated for forest development in accordance with regional land administration and utilization laws.

The Oromia Forest and wildlife Enterprise (OFWE) is established by the Regional Government of Oromia to administer the forest under its concession. This includes all the forest within the project except for the Bale Mountains National Park. Given the inextricable link between forests and REDD carbon credits, OFWE is also responsible for administering any carbon credits associated with the forests it responsible for. This extends to the sale of carbon credits and management of the proceeds of such sales. This is clearly supported by the regulation number 122/2009 provided for its establishment that indicates:

- OFWE was established with the recognition that "it is necessary to establish an independent structure that takes up the implementation of carbon trading
- One of OFWE's objectives is to contribute to mitigation of climate change by applying conservation, extensive development and sustainable utilization of existing forest resources.
- OFWE is responsible for managing the Forest Fund, including revenues from sales of carbon credits.
- OFWE has the power to "issue and implement directives relevant for the attainment of its objectives" and "perform all other duties necessary for the attainment of its objectives".

Confirmation of OFWE's rights to the carbon credits is also being sought from the federal Environmental Protection Authority via a letter of no objection. As the CBOs are responsible for managing the forest to generate the carbon credits, a benefits sharing issue was discussed through extensive consultation and participation processes that was carried out with between community and Oromia Forest and Wildlife Enterprise (OFWE). As the result of JFM agreement both parties have agreed on benefit sharing arrangement for products extracted and traded from the forests in Bale Eco-Region. In addition to that, both parties conducted additional negotiation on benefit related to the carbon credit from BMERP as the earlier agreement doesn't include such dimension. The outcome of the negotiation has confirmed the lion share of the carbon credit to be channeled to the community for the purpose of community level social development works such as school, clinic and road infrastructure building to benefit the entire community

as well as partly to incentivize communities that are directly engaged in the management of the forests. Accordingly, it is negotiated that 60% of the carbon benefit goes to community and 40% to government. The share of government is supposed to be used to address directly the drivers of deforestation through introduction, adoption and distribution of improved technologies by appropriate agents.

3.3. Emissions Trading Programs and Other Binding Limits (CL2)

The emissions reductions and removals generated by the project will not be used for compliance with any emissions trading program or to meet any binding GHG emissions limit. To avoid double counting, emissions reductions will only be issued as Verified Carbon Units (VCUs).

3.4. Participation under Other GHG Programs (CL2)

The Bale Mountain Eco-Region REDD+ project has not been and will not be seeking registration under any other GHG programs other than VCS and CCB. CCB verification is demonstrated positive climate, community and biodiversity impacts, but does not produce any registered emissions reductions or credits.

3.5. Other Forms of Environmental Credit (CL2)

Not applicable

3.6. Projects Rejected by Other GHG Programs (CL2)

Not applicable

3.7. Respect for Rights and No Involuntary Relocation (G5)

The Oromia Regional State through OFWE has already entered into legal contract (agreement) with the local community for indefinite period of time to jointly manage and benefit from the forests through the new form of management arrangement called Joint Forest Management (JFM). This agreement clearly stipulated rights and obligations of each part. As part of the rights granted to the community they obtained a legal respect of continue living in and around the forest in harmony with the forest while managing sustainability and continue benefit from it including the carbon credit to generate. Through this agreement community has gained a confirmation that they will not be subject to any involuntary relocations. This was based on the very principle of JFM to ensure the co-existence between the community and the forest by fully engaging local communities in decision making over their forests, participate in forest management in partnership with government and share benefit from any commercial use of forest while enjoying traditional use rights.

By gaining rights over the forest through the signed forest management agreement, the community are also granted share of carbon credit related benefits. This has confirmed during the extensive FPIC

consultation and participation activities conducted throughout the project sites. During the process of FPIC, issue of the Bale REDD+ like potential risks, impacts, benefits and activities related to the REDD+ project were sufficiently discussed. The FPIC consultation was conducted in 64 kebeles of the Bale eco-region where local communities living around the project. The FPIC process was conducted as a process of establishing conditions under which people exercise their fundamental rights to negotiate the terms of externally imposed policies, programs, and activities that directly affect their livelihoods or well-being, and to give or withhold their consent to them. Therefore, the key elements of the FPIC process that was used in the case of BMER were understood as described below:

- **Free:** implies no coercion, intimidation or manipulation;
- **Prior:** implies consent has been sought sufficiently in advance of any authorization or commencement of activities and respect of time requirements of indigenous consultation/ consensus processes;
- **Informed:** implies that information is provided that covers (at least) the following aspects:
    - Nature, size, pace, reversibility and scope of any proposed project or activity;
    - Reason/s or purpose of the project and/or activity;
    - Duration of the above;
    - Locality of areas that would be affected;
    - Preliminary assessment of the likely economic, social, cultural and environmental impact, including potential risks and fair and equitable benefit sharing in a context that respects the precautionary principle;
    - Personnel likely to involve in the execution of the proposed project (including indigenous peoples, private sector staff, research institutions, government employees, and others); and
    - Procedures that the project may entail.
- **Consent: -**Consultation and participation are crucial components of a consent process. Consultation should be undertaken in good faith. The parties should establish a dialogue allowing them to find appropriate solutions in atmosphere of mutual respect in good faith, and full and equitable participation. Consultation requires time and an effective system for communicating among interest holders. Indigenous/local peoples should be able to participate through their own freely chosen representatives and customary or other institutions. The inclusion of a gender perspective and the participation of indigenous women are essential, as well as participation of children and youth as appropriate. This process includes the option of withholding consent. Consent to any agreement should be interpreted as indigenous peoples having reasonably understood it.

3.8. Illegal Activities and Project Benefits (G5.4)

The forests in the eco-region were exposed to a near open access situation due to lack of dedicated local institutions, weak forestry government's sector, poor law enforcement and lack of empowering and engaging local community in management as well as benefit sharing generated form forest products. As a result the forests have suffered from illegal timber harvest and sale as well as farmland encroachment. Following establishment of the OFWE as the public enterprise with clear mandate and approach to engage, empower and work in partnership with local communities. The PFM has introduced and allowed the legal transfer of forest management responsibility and use right to community living in and around the forests. This model has proven effective in reducing deforestation significantly while making forestry play considerable role in rural development and boosting household income.

The same has envisaged for the Bale eco-region where this REDD+ project has been implementing to generate incentive to strengthen sustainable forest management by avoiding illegal activities. Moreover, as outlined in the project activities the capacity of the organized local communities and that of OFWE need to further strengthen to sustain the control of illegal practices. In addition there are federal and regional level anti-corruption and bribery laws that can re-enforce any illegal activities by any agents, while law enforcement agencies have been well oriented to avoid any further illegal activities within the project boundaries.

Ethiopian Federal Constitution (1994) declared that all land; including forests belongs to the government and the people of Ethiopia while the regional states are mandated to manage land/forest within their administrative boundaries. Accordingly, in Oromia Regional state, the forest areas are given to OFWE on concession basis in order to enhance the forest development, conservation and sustainable utilization. Therefore, many forests areas in the region including the Bale Eco-region are co-managed by OFWE and the local community through Participatory Forest Management (PFM) regimes. In Bale Mountains Eco-region, the PFM started as pilot in Adaba Dodola in 1999, and further expanded to the rest of the Eco-region since 2007.Threfore through PFM approach, appropriate monitoring and evaluation protocol is designed for the project to track any problems encountered and to ensure timely avoidance of illegal activities.

Moreover, the efforts of avoiding illegal activities is backed by legal provision. For instance, the Federal Forest Proclamation (542/2007) states that forests shall be protected from fire, unauthorized settlement, deforestation, undertaking of mining and other similar activities. It also highlights the need for community participation and benefit sharing mechanism from sustainable forest management. The proclamation states that" Conditions shall be facilitated whereby inhabitants within a state forest shall continue living in the forest, while participating in the development and conservation of the forest, in a manner that shall not obstruct forest development; or, based on a study and in consultation with the appropriate body, they shall evacuate the forest area and settle in other areas suitable for living". The proclamation stated that forests be managed and utilized only in accordance with approved management plans. This

proclamation clearly prohibits harmful practices and activities such as: cutting trees, settling temporarily or permanently, grazing domestic animals, carrying out hunting activity, carrying cutting saws and any other tools used for cutting trees; and keeping beehives or extracting honey inside forests without seeking permissions from appropriate government authority.

Similarly, Oromia Forest Proclamation (72/2003) also prohibits the following activities without appropriate permission: cut any trees, make charcoal, settle in the forests, keep domestic animals in the forest, hunt, keep beehives or harvest honey, and take natural resources. Specifically, this Proclamation prohibits cutting and utilizing of some endangered forest tree species such as *Hagenia abyssinica, Cordia africana, Podocarpus falcatus, Prunus africanus,* and *Juniperus procera*.

4. APPLICATION OF METHODOLOGY

4.1. Title and Reference of Methodology

The VCS VM0015 v 1.1 methodology has been adopted after assessing options using eight criteria points as shown in (Table 6).

Table 6: Selection criteria for VCS methodology

	VM0006	VM0007	VM0009	VM0015
Scope	✓	✓	✓	✓
Baseline	✓**	✓	✓**	✓
Project boundaries	✓**	✓	✓	✓
Agents and drivers of deforestation	✓	✓	✓	✓
Activities in the project scenario	✓**	✓	X	✓
Leakage	✓	✓**	✓**	✓
Monitoring	✓	✓	✓	✓
Carbon stocks	✓	✓	✓	✓

(Note: "√" mark represents that such item has no application constraints. When the "√" mark is followed by asterisks (**) it means that the item has some constraints to be applicable to the Bale REDD Project, which are described below. The "**X**" mark means that the item is not applicable).

The BMERP meets the five applicability conditions of the VM0015, v1.1 methodology as follows:

a. Baseline activities include unplanned agricultural and grazing activities, fuel wood collection, considered unplanned deforestation according to the most recent VCS AFOLU guidelines
b. BMERP activity is classified as " Protection with controlled logging, fuel wood collection" one of the eligible categories defined in the description of the scope of the methodology (see table 1 and figure 2 – scope of methodology);
c. The project area includes mainly old-growth and degrading forests of moist and dry evergreen montane forests meeting the definition of "forest according to Ethiopia's definition of forest – see footnote 1".
d. At project commencement, the project area includes only land qualifying as "forest" for a minimum of 10 years prior to the project start date. The project has confirmed this through satellite images based analysis starting from the year 2000.
e. The project area does not included forested wetlands.

Thus, the project complies with the specifications of the chosen methodology and uses the four specified spatial domains: the reference region, the project area, leakage belt, and leakage management area, the latter three sub-regions of the reference region.

4.2. Deviations from the Monitoring Plan

Minor deviation in deforestation monitoring period is occurred though it does not have any serious impacts. Deforestation monitoring has planned to be carried out annually, however, it is pushed to the fourth year because of two reasons. Primarily, a validation process of the project took a longer time. As a result, Bale REDD+ project proponent has been waiting for validity of methodology before conducting annual monitoring of deforestation. Secondly, the Bale REDD+ project proponent has learnt that it is difficult to detect those small and scattered deforestation on annual basis. This is a case where the deforested areas are found below the spatial resolution of remote sensing. Therefore, deforestation monitoring has been done at the fourth year and divided by four to estimate the annual rate of deforestation in the project area. Apart this minor deviation, the procedure that has been employed in the PDD is also strictly followed in the monitoring process. This minor deviation does not bring any impact on applicability of the methodology, additionality or appropriateness of the baseline scenario. Therefore, the project is remain in compliance with the applied methodology of VCS.

4.3. Project Boundary (G1.4)

4.3.1. Boundaries of the Project Area and Project Zone

The Bale Mountains Eco-region adopted the VCS vm0015 methodology, based on critical assessment of the various methodological options according to the eight methodological requirements namely scope of activities, baseline, project boundaries, agents and drivers of deforestation, project activities, leakage, monitoring and carbon stocks. Accordingly, the BMERP has the following physical boundaries defined according to the guidelines of this methodology:

Reference Region (RR): This represents the analytic domain from which information about rates, agents, drivers, and patterns of land-use and land-cover change (LU/LC-change) is obtained, projected into the future and monitored. In Ethiopia there has been no nationally or regionally defined sub-divisions that can be used for generating baselines for projects like the BMERP, Therefore, project reference region was defined by the project by selecting areas that exhibit similar ecological characteristics as well as agents and drivers of deforestation with that of the delineated project area (PA). This region included the project area (PA), leakage belt (LK) and leakage management area (LMA) plus some areas around these (Figure 7). The total area of the reference region therefore is 2.08 million ha. This reference region includes extensive dry and moist forests, shrub land (high elevation Erica shrub and afro-alpine grassland land-cover), and extensive woodland and agricultural land. It is approximately 8 times the size of the project area and has a perimeter of 3,386 km. The reference region also includes the Bale Mountain National Park, which has exhibited some deforestation over the historical reference period. The southern limit of the reference region was defined by an elevation cut-off of 1,400 m.

Project Area (PA): This represents forest area that remained forest at least for the past 10 years and represent extension that would be deforested in the baseline scenario of the project based on the spatial model of deforestation. Considering the methodology VM0015 v 1.1 this can include other areas that are not projected to be cleared but are or may be threatened. This is where the project proponents intend to prevent deforestation that would occur in the baseline and account GHG emission reduction benefits. This area totals 261,053 hectares and includes moist (238,200 ha) and dry forest (22,853 ha) strata as identified and mapped from imagery analysis. PA purposely excluded the Bale Mountains National Park area (Figure 19). The PA has remained forested at least for the past 12 years as detected from satellite image analysis.

The project area comprises 261,053 hectares of forest land located within the Oromia Forest & wildlife Enterprise, the project proponent, the project area including the surrounding project zone forest was given the OFWE as a concession by the government through a regulation № 122/2009. It excludes non-forest land within the boundary.

Project Boundary (PB): The PB has an area of 481,010 ha and contains forest and non-forest lands. Given that the PA, which is forested area, is 261053 ha this leaves about 220,010 ha non-forested land as the Project's Leakage Management Area (LMA).

Leakage Belt (LB): This represents areas that are at risk of deforestation, surrounding the project area and within the Bale Mountains eco-region. This leakage belt for the project included areas which could be deforested by the local communities living in or surrounding the forest. A mobility analysis, based on experts opinion, was applied (option II, step 1.1.3 VM0015) to define the leakage belt for the project, which resulted in the Leakage Belt with a total area of 398,538 hectares. This area comprised 220,010 ha of non-forest, 30,418 ha of dry forest and 148,102 ha of humid forest.

Leakage Management Area (LMA): These are clearly demarcated non-forest areas within the Reference Region where activities that could reduce deforestation and degradation will take place including agroforestry, agriculture intensification and improve efficiency of cook stoves where those activities are part of the REDD+ investment activities. No emission reductions will be claimed from this area. The LMA of the project constitute a total of 220,010 ha.

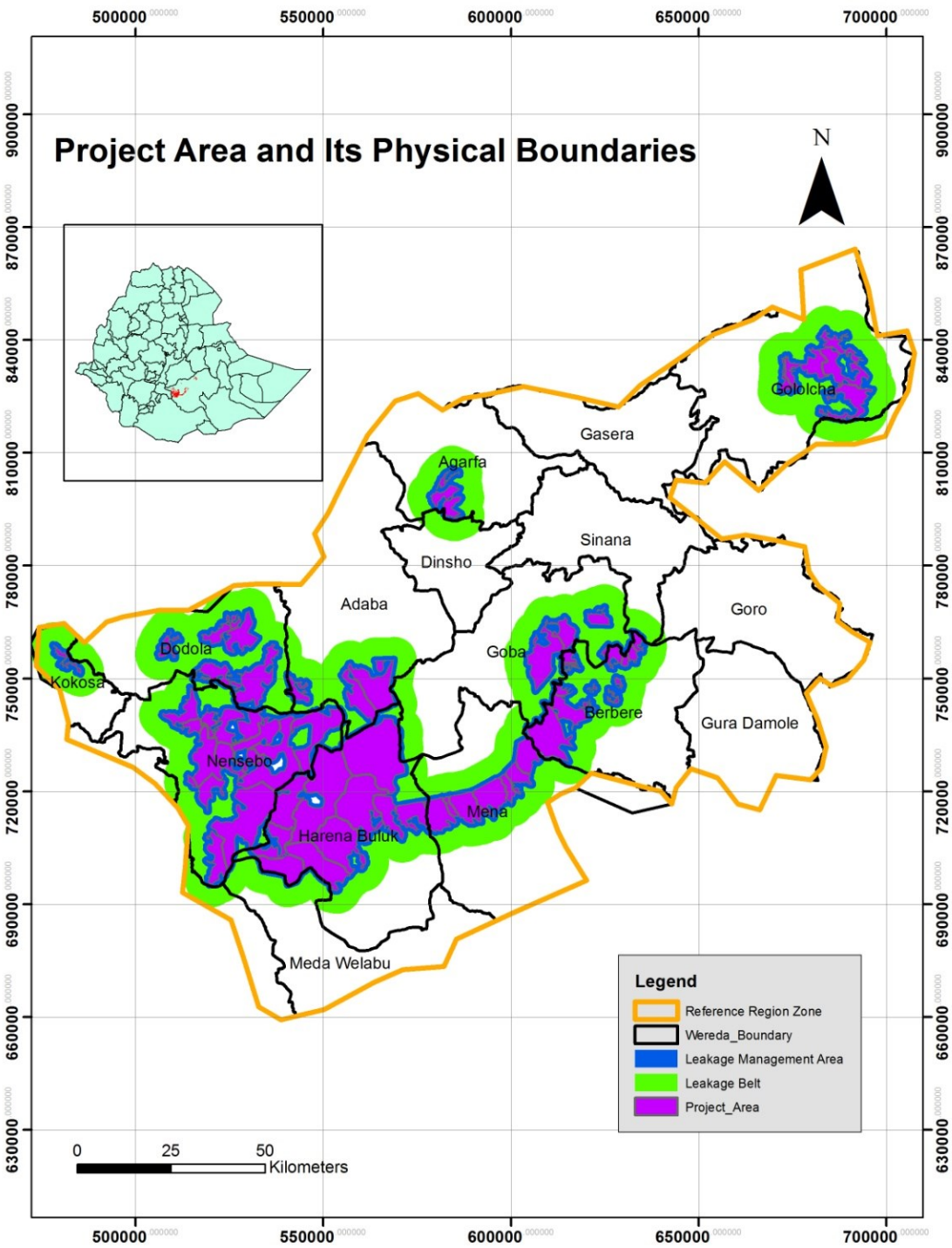

Figure **18**: Map of project and surrounding areas of BMERP

4.3.2. Source of Carbon pools in the Case of Bale Mountains REDD+ Project

This project considered above ground and below ground biomass pools only (Table 7). Instead of using defaults from the literature a forest carbon stock assessment was conducted in the Bale Mountains Eco-

region to obtain a relatively better estimate. Based on the estimated above ground carbon stock a below ground carbon stock was estimated using the root-shoot ratio as proposed by IPCC GPG 2003 with regards to its significance:

Above ground biomass: Represents the pool where the greatest carbon stock change will occur.

Below ground biomass: Recommended by the methodology as it usually represents between 15% and 30% of the above-ground biomass

Dead wood: Conservatively excluded because since deadwood (standing and lying) are mostly collected by farmers as fuelwood under both baseline and project case, they were considered as insignificant proportions of carbon stocks in the project area and also envisaged to be largely stable.

Harvested wood products: Under the baseline scenario selective logging occurs in very small scale and, therefore, harvested wood products have been considered insignificant and conservatively excluded.

Soil organic carbon: Conservatively, it decided to exclude. This was due to most of the deforestation for conversion is into perennial crops like coffee, enset (false banana), and chat.

Table 7: Carbon pools included or excluded within the boundary of the proposed AUD project activity (Table 3, VM0015 v 1.1).

Carbon pools	**Included / TBD / Excluded**	**Justification / Explanation of choice**
Above-ground	Tree: Included	Represents the pool where the greatest carbon stock change will occur.
	Non-Tree: excluded	Baseline land cover is annual crop or pasture grass
Below Ground	Included	Recommended by the methodology as it usually represents between 15% and 30% of the above-ground biomass.
Dead wood	Excluded	: Conservatively excluded because Since deadwood (standing and lying) are mostly collected by farmers as fuelwood under both baseline and project case, they were considered as insignificant proportions of carbon stocks in the project area and also envisaged to be largely stable
Harvested wood products	Excluded	Under the baseline scenario selective logging occurs in very small scale and, therefore, harvested wood products have been considered insignificant and conservatively excluded.
Litter	Excluded	Not to be measured according to the latest VCS AFOLU Requirements (version 3.4).
Soil organic carbon	Excluded	Conservatively, it was decided to exclude Most of the deforestation for conversion is into perennial crops like coffee, esnet (false banana), and chat. Although there are conversion to annual crops like Barley and wheat in the dry forest area.

4.3.3. Sources of GHG emissions:

The sources of GHG emissions included within the boundaries of the BMERP are listed in the (Table 8).

Table 8: **Sources and GHG included or excluded within the boundary of the proposed AUD project activity (Table 4, VM0015, v 1.1)**

Source		Gas	Included?	Justification/Explanation
Baseline	Biomass burning	CO_2	yes	Counted as carbon stock change
		CH_4	No	
		N_2O	No	
		Other		
	Livestock emissions	CO_2		Not a significant source
		CH_4		The major baseline activity is conversion of forestland to agriculture land by small holder farmers, not to grazing land
		N_2O		
		Other		
Project	Biomass burning	CO_2	No	Counted for as changes in carbon stocks
		CH_4	No	The BMERP is implementing activities that avoid conversion of forests to cropland and grazing / pasture land which can reduce emissions of N_2O and CH_4 that are associated with biomass burning used to clear the land, fertilizer use and other agricultural practices that would have occurred if the forests had been converted.
		N_2O	No	Considered insignificant according to VCS Requirements Document 8 October 2013, v3.4
	Livestock emissions	CO_2	No	Not a significant source
		CH_4	No	Raising livestock is not a widespread baseline activity and the BMERP will not promote the raising of livestock or result in an increase of this activity compared to the baseline. Therefore, livestock emissions are conservatively excluded.
		N_2O	No	Not significant

4.4. Baseline Scenario (G2.1)

Comprehensive steps and processes required by VM0015, v 1.1 methodology (Appendix) was employed to establish the baseline scenario. The general steps followed involved the following main activities:

I. Satellite image acquisition, analysis and determination of historical deforestation rate and establishment of bench mark maps;

II. Identification of agents of deforestation, modeling and projection of deforestation from the bench mark forest map and year to end of the project period,

III. Forest inventory and collection of forest biomass data, and

IV. Computing carbon stocks and changes from combination of step II and III.

4.4.1. Analysis of historical land-use and land-cover change

Analysis of the land-use and land-cover change of the reference region was conducted for the reference period (2000-2005-2009 and 2011) using medium resolution multi-temporal satellite imagery (Appendix 1b). Ethiopia's definition of forest is 0.05 ha, which is too fine-scale to be achieved through the analysis of 30-meter medium resolution imagery. In order to be as conservative as possible, areas identified as forest but less than 0.09 ha were filtered out and assigned a non-forest category. After the completion of the classification, deforestation rate were calculated using the following equation:

$$r = \frac{1}{t_2 - t_1} * \ln\left(\frac{A_2}{A_1}\right)$$

Where: r is the estimated rate of deforestation,

t_2 is the final year of analysis,

t1 is the initial year of analysis,

A2 is the forest area at t2 and

A1 is the forest area at t1.

Accordingly, the average historical rates for the reference period between 2000 and 2011 were 6.6% for dry forest and 1.1% for humid forest while the weighted average was 2.5% for both forest strata combined (Table 9). The first two values were used to project the baseline for each forest strata. Accordingly, projection of the deforestation to the crediting period (2012-2031) under the baseline scenario (i.e. business as usual) reveals the likely deforestation of some 84,150 ha of forests (moist and dry forests combined). The deforestation of this much forests in the eco-region will result in the baseline emission of 38321332.28 tCO_2e (Annex 2).This leads to loss of diverse genes, several species, ecosystems and associated goods and services that benefit the society. Therefore, The Bale Mountains eco-Region REDD+ project is designed to prevent this high rate of deforestation and achieve a net anthropogenic GHG emission reduction which is estimated (ex-ante) 25776421.40tCO_2e. With the buffer for risk of 15%, equivalent of buffer credit of 3,866,463.21 tCO2e estimated for the project, the net ex-ante anthropogenic GHG emission reduction under the project scenario estimated to be 21,909,958.19 tCO2e. The project intervention maintains and enhances the capacity of the forest to provide essential goods and services that come the forest for the local community and the society at large, and conserve biodiversity that helps to be resilient to climate change. The project can also generate additional revenue through carbon finance that is highly needed for local development, sustainable forest management and transformation of the local economy.

Table 9: **Forest cover and loss in the reference region during the reference period 2000-2005-2009-2011**

Forest Classes	Observed forest area in Ha				Observed forest change in Ha/year			Change in %			Average in %
	2000	2005	2009	2011	2000-2005	2005-2009	2009-2011	2000-2005	2005-2009	2009-2011	2000-2011
Dry forest	228020	174571	136065	109892	10689.8	9282	13539.5	5.3	6.2	10.7	6.6
Humid forest	508105	476332	468297	448379	6354.6	7758.25	10699.5	1.3	0.4	2.2	1.1
Reference Region	736125	650903	604362	558271	17044.4	17040.25	24239	2.5	1.9	4	2.6

4.5. Additionality (G2.2)

Project additionality is demonstrated following the methodology, which requires use of the most recent approved VCS "*Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other land use (AFOLU) Project Activities"*, namely VCS Tool VT0001.

Step 0: Preliminary screening based on the starting date of the AUD project activity

The project passes this screening as the project start date is after 1 January 2012.

Step 1: Identification of alternative land use scenarios to the proposed REDD project activity

Sub-step 1a. Identify credible alternative land use scenarios to the proposed REDD+ project activity

The identified credible land use scenarios under the baseline activities are summarized in the (Tables 9 and 10). In the baseline scenario the forests are mostly cleared for those alternative land uses indicated in the. However, the forests while still as forest (i.e. being before cleared) is also used for small forest based product extraction mainly honey production, and some wood production. These forest based productions are in general focused on non-timber forest products and limited and sustainable timber exploitation.

Table 10. Identified alternative land uses likely to replace the two forest strata in case of baseline scenario

	Forest stratum type	
	Moist forest	Dry forest
Alternative land use	Enset production	Enset production
	Coffee production	Wheat/barley
	Maize production	

The additionality effect of the project is described in the following scenario based assessment: without project scenarios.

Scenario 1: Conversion of forest land to other land uses (Coffee, maize, enset, wheat/barely) As described above without the project, deforestation and forest encroachments are expected to continue resulting in a considerable area of dry and moist forest being cleared and converted into subsistent small holders agricultural system mainly wheat/barely, Enset, Coffee and Maize production. The projected deforestation shows a total of 84150 ha of forest clearance in the project area during the coming 20 years. Hence this scenario entails an increase in deforestation within the project area as the most economically viable activities would continue to be the same for the surrounding communities. There are two options (scenarios) to reverse this baseline scenario, each of which is described below:

Scenario 2: OFWE to increase its scope of forest management

This scenario is the only likely alternative scenario to the baseline scenario without the project scenario framework. This scenario assumes OFWE strengthens itself and engages in active forest management and conservation to reduce deforestation rate. This requires dramatic shift in enforcement of legal requirements and/or government support for protection of the forest need to be put in pace. This requires a significant improvement in the performance of government institutions, both policy formulating and law enforcing institutions such as OFWE, MoA, MEF, police departments and judiciary systems in implementation of a number of policies to ensure the protection and conservation of the environment in the forest areas, linked to social improvement, economic and cultural rights of local communities. Furthermore capacity limitations both in terms human resources and logistics constrains the OFWE from making good conservation progress since this requires financial resource that is beyond the capacity of the OFWE and the government. Therefore, this scenario is less likely to result in a positive biodiversity, community and climate outcomes.

OFWE as a business model virtually has limited community livelihoods development commitment other than sharing any revenue generated from forest management and utilization. Other sectors essential for rural development and climate effect are outside its institutional mandates, hence without the REDD+

project there is no and will be no significant additionality in terms of GHG emission reduction and also enhancing rural livelihoods.

A scenario that could lead to the same results as the project scenario (REDD+) without using Carbon resources is could be a government plan to resettle inhabitants outside the regions, contraceptive campaigns for reducing population growth and agricultural intensification to reduce the need of open forest areas. This however, entails huge investment which is unavailable.

Investment analysis made in the project area comparing various options of land use clearly reflects that pending and rural development additionalities are clearly unlikely.

Furthermore, given its business model OFWE's focus is more on economic management of forests and wildlife, hence focus on those resources that assist the enterprise to remain financial viable. These are mostly planted forests and controlled hunting areas. However, with assistances from development partners OFWE is fully committed to support and work together in the improved management of natural forests as well, particularly by engaging local communities in the form of Joint Forest Management (JFM).

Sub-step 1b. Consistency of credible land use scenarios with enforced mandatory applicable laws and regulations

Despite these regulations, prevailing institutional weakness and lack of law enforcement is making the forests to be threatened by illegal and spontaneous expansion of farmlands and grazing lands.

Table 11: Credible land use scenarios with enforced mandatory applicable laws

	Forest management by OFWE	Unplanned Conversion
Alternative land use	Forest under the OFWE's 9 branch enterprises	Wheat/barley
		Enset production
		Coffee production
		Maize production

The majority of unplanned forest conversion in all scenarios is technically illegal but those legal requirements are weakly enforced for a variety of reasons and non-compliance is the norm across the majority of the reference area and the broader regions of Ethiopia in general and Bale Eco-region in particular. This is evident from inspection of deforestation data for the historical baseline period in the case of BMERP. Strengthening law enforcement, providing incentives for legal compliance and access to legal alternatives to deforestation as a livelihood strategy are among the key elements of the proposed project.

Step 2. Investment Analysis

Sub-step 2a. Determine appropriate analysis method

Since the REDD project generates no financial or economic benefits to the project proponents other than carbon market-related income, *Option II. Apply investment comparison analysis*

Sub-step 2b. – Option II. Apply investment comparison analysis

NPV is selected as the most suitable financial indicator to compare alternatives to implementing the project.

Data collection on costs and revenues, and financial analysis of the above mentioned alternative land-uses was conducted (Appendix 14).

Sub-step 2c. Calculation and comparison of financial indicators

Forest conservation is not financially viable without carbon benefit

The investment analysis clearly shows that for both forests (Dry and Moist Evergreen forests) returns from forest conversion into agriculture is greater than the financial benefits obtained from forest based uses or forest conservation (Table 12). For instance, at 15% discount rate the NPV of financial return obtained from Moist Evergreen forest conversion into Coffee provides about six fold greater than the NPV obtained from honey production and timber harvesting combined. For the dry forest as well the NPV of Enset production is by far greater than the forest based use.

Therefore, under current level of forest use and market *forest conservation is not financially viable without carbon benefit,* and if the project fails to realize conversion of the forests into the alternative land-uses is inevitable. The financial model underpinning this analysis is available for review by an auditor.

Table 12: Comparative financial analysis (NPV) on per year and hectare basis from credible land use alternatives and forest land use in the Bale Mountains Eco-region under various discount rates.

Land use alternative	Products	Dry forest case			Moist forest case		
Forest use		NPV@5%	NPV@10%	NPV@15%	NPV@5%	NPV@10%	NPV@15%
	Honey	881	881	881	881	881	881
	Timber	881	881	881	881	881	881
	Total forest	47987	32921	21341	84326	69281	57298
Alterative	Enset				16659	13112	10454

land use (agriculture)	Coffee				3520	3520	3520
	Maize	11315	11315	11315			
	Wheat	11690	11690	11690			
	Barely	881	881	881	881	881	881

Sub-step 2d. Sensitivity analysis

If deforestation projected in the baseline scenario were to take place, the total loss from forest based return would be approximately US$ 17.5 million for the moist evergreen forest and US$ 1.9 million for the dry evergreen forest over the 20 years period. If the moist forest projected to be deforested under the baseline scenario were used for crop production, the benefits of clearing would be:

- ✓ US$ 496,388,053.25 over 20 years when discounted at 15 %, if the land is used for Enset production
- ✓ US$ 90,011,727.44 over 20 years when discounted at 15%, if the land is used for coffee production
- ✓ US$ 30,309,557.86 over 20 years when discounted at 15%, if the land is used for maize production

Similarly, if the dry forest projected to be deforested under the baseline scenario were used for crop production, the benefits of clearing would be:

- ✓ US$ 46,569,420.91over 20 years, if the land is used for Enset production
- ✓ US$ 24,690,597..56 over 20 years, if the land is used for wheat production
- ✓ US $ 25,508,889.57 over 20 years, if the land is used for Barley production

Conclusion of Step 2: The investment analysis clearly indicates that the project activities, without additional revenues from sale of carbon credits (scenario 1), are less attractive than the baseline scenario.

Step 3. Barrier analysis

Not applied due to the application of investment comparison analysis (step 1 and 2)

Step 4. Common practice analysis

Many forest areas in Ethiopia, including large parts of the BMERP area, receive little active protection. The forest management is often associated with the presence of some NGO working in partnership with government

However, there are essential differences between such activities and the proposed BMERP project in scope on spatial, temporal and financial scales. No existing projects achieve full spatial coverage and address all key threats with sustainable funding over a period of decades. The norm for conservation projects in the country is to achieve partial coverage with limited capacity to address only some key threats. Funding for these projects is dependent on short-term (1-3 year) donor funding cycles.

The REDD project is clearly distinct from these similar, 'common practice' conservation activities based on the following components:

1. Greatly increased, sustained financing, commensurate with the scale and duration of the threats facing the site, in particular for law enforcement activities.
2. Direct linkage of project success to further revenue, ensuring a sustained long term focus on achieving measurable emissions reductions.
3. Creation of a new conservation-based revenue stream for the Bale Ecoregion increasing the level of long-term political support for protection of the forests.
4. **The** scale and nature of project activities to reduce deforestation are not common practice in the region, and what limited activity is taking place is essentially different as much as it is not linked formally to measurable commitments to reduce deforestation.

Summary:

In the absence of the REDD+ project activities and associated revenues, the Bale Mountains Eco-region potentially have two alternative land-use scenarios: 1) Forest conservation with costs assumed by the OFWE and Forest Cooperatives or by dramatic upsurge in public support or 2) Deforestation for conversion to agriculture (baseline).

- These alternative scenarios are characterized by weak or nonexistent application of relevant laws and regulations.
- Without carbon revenues, forest conservation and implementation of proposed project activities is not economically attractive as compared to the baseline scenario.
- Improved governance and public funding, on the scale required to execute project activities, is constrained by institutional barriers as well as social conditions. The baseline scenario is unconstrained by these barriers and is in fact driven by this lack of governance and social pressures.

5. MONITORING DATA AND PARAMETERS

5.1. Description of the Monitoring Plan (CI4, CM4, B4)

5.1.1. Organization Structure

In the monitoring plan of the Bale Mountains Eco-region REDD+ project it is stated that during the first five years of the project implementation, Oromia Forest and Wildlife Enterprise responsible to collect monitoring data, analyze, process and report. Parameters to be monitored were identified as biomass inventory, social, biodiversity impact assessments, recording activity implementation, and any other data required to be monitored under the methodology VM0015, V1.1. The monitoring period for different parameters were clearly identified in the monitoring plan part of the Project Design Document (PDD). The communities JFM CBOs have also assumed to be responsible to carry out project actions where appropriate. In the context of implementing and monitoring of Bale REDD+, Oromia Forest and Wildlife Enterprise (OFWE) comprised sub divisions known as branches and districts that have been responsible to implement REDD+ project activities and monitoring of the progress (Figure 20).

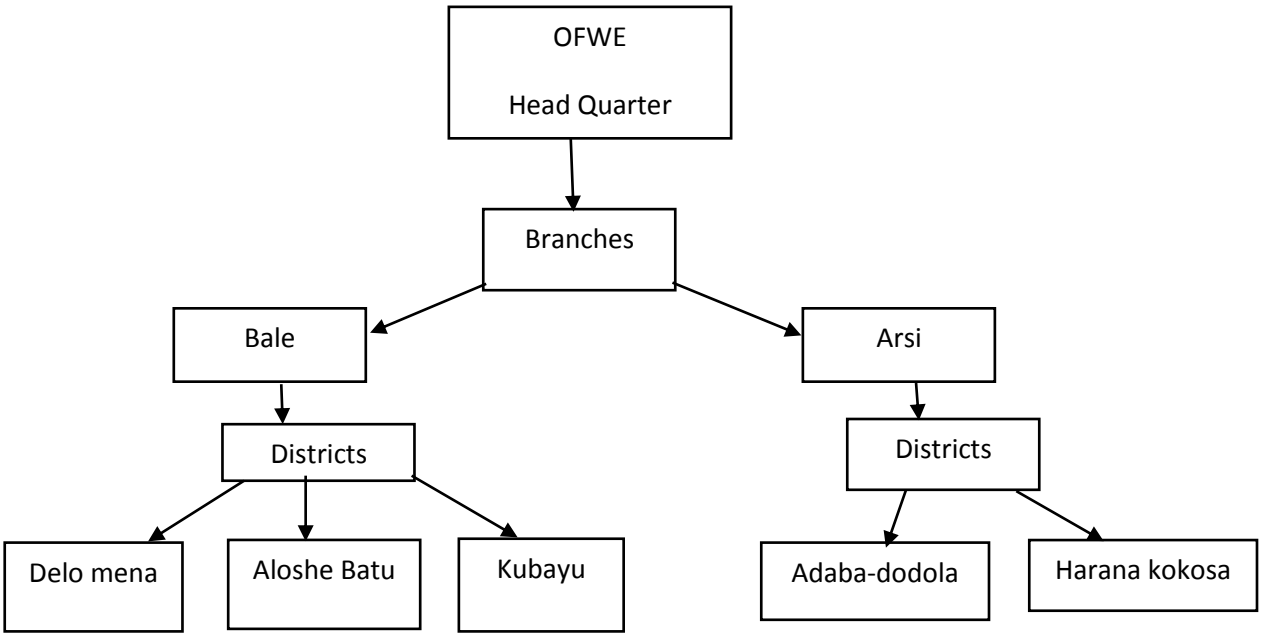

Figure 19: Organization structure of OFWE

5.1.2. Sources of data and procedures of data collection

The Bale REDD+ project has carried out monitoring activities on deforestation, Organizational capacity assessment and communities' perception and the overview of these monitoring processes are described under the following headings.

- **Deforestation monitoring**

Based on methodological procedure used to deforestation analysis during project design (Appendix 1b), the year 2015 image from Landsat was freely downloaded and underwent image pre-processing steps. Flowingly, the image classification process was carried out and a map that shows forest and non-forest area was produced. The accuracy of classification was calculated as 91.67% base on ground control points which were collected using GPS equipment, See (Appendix 1a). The calculate forest area was in year 2015 was deducted from the forest area that was existed in year 2010 to determine the amount of avoided deforestation or occurred deforestation.

- **Communities' Organizational Capacity Assessment**

Towards sustainable forest management it has been clearly understood that developing communities' organizational and managerial capacity was provided due attention in the case of bale REDD+ project. With this attention, the Project has developed a tool known as Organizational Capacity Assessment Tool (OCAT). This tool comprises of five main components of Capacity building such as Leadership, Asset and finance management, Forest development, Forest protection and Business development. Each of this component are measured with 10 questions while each question has the maximum of 2 scores. This implies that a single component contains a maximum of 20 scores that indicates all the five components altogether are 100 scores. Therefore, the organizational capacity of each forest CBO is expressed out of 100 in terms of percentage. Regarding data collection, the base line data was collected from each CBO and analysed using the OCAT spreadsheet (Appendix 4). Following same procedure, data collection were carried out every 2 years and the analysis compared with the baseline date to monitor changes whether it is positive or not.

- **Participatory forest Resources Assessment**

The Participatory Forest Assessment has been carried out during establishment of forest CBOs in each forest areas in the Bale Eco-region. The purpose of assessment was to know the status of forest in terms of many parameters such as basal area, felling intensity, regeneration status, canopy cover and others. The assessment technique to measure these parameters is based on acceptable methodology indicate (Appendix 27). According to this methodology, the forest map of each kebele is produced and the map is divided into grids of 1km by 1km. The coordinate where the grid line intersects entered to GPS and is use a plot where forest parameters are collected by community and technical staff using forestry equipment.

This PRRA is decided by community and government to carry out every three year to monitor the observed changes. In this monitoring, the assessment was carried out in the place of high conservation value where forest coffee is available cognizant to the importance of this place.

- **Participatory Rural Appraisal (PRA) technique**

The monitoring approach in the case of Bale REDD+ was based on the theory of change that anticipated larger impacts would be visible in the long term through converting inputs to outputs and outputs are changed to outcomes. This kind of data can be collected using the techniques of Participatory Rural Appraisal. The PRA techniques comprise of various tools such as problem tree analysis, participatory mapping, transect walk, matrices and seasonal calendar techniques (Appendix 28). In this monitoring, the matrix technique was employed to measure people's perception about project activities, biodiversity and socio-economic impacts. Before data collection from the field, criteria and reasonable sample size was determined by the stakeholders of the project. Finally, ten PRA groups across the project area was decided while each group consisted of 5 males and 5 female participants (Appendix 6).

5.1.3. Responsibilities and competencies of monitoring Team

Different individuals with various educational background who are working as staff of OFWE, Farm Africa and SOS Sahel Ethiopia were involved in the process of Bale REDD+ project verification. Senior staff have facilitated method of data collection, quality control and quality check responsibilities. The junior technical staff have been facilitating data collection and analysis responsibilities (Table 13).

Table 13: Participants of monitoring Team

Name	Profession & Status	Organizational responsibility	Roles and responsibility in monitoring
Ararsa Ragasa	MSc in Forestry	OFWE Deputy/General Director	Data quality assurance
Merga Diyesa	MSc in GIS & RS	GIS specialist	GIS data collection and analysis
Seyoum G/kidan	BSC in forestry	REDD/PFM advisor	Coordinating data collection
Getacho Umer	BSC in NRM	REDD/PFM advisor	Biodiversity data collection
Sahlemariam Mezimur	BSC in forestry	Carbon finance advisor	Socio-economic and biodiversity data analysis
Zerihun Dheko	BSc in GIS & RS	GIS specialist	GIS data collection
Girma Ayele	MSc in RD	REDD+ project coordinator	Data Quality control
Mulugeta Lemenih	PhD in Forestry	Head of Forestry	Data Quality control and Quality assurance

- **Data Quality control and Quality Assurance**

Based on monitoring parameters identified from VM0015 v 1.1. Methodology, the technical team of OFWE Bale and Arsi branches have carry out the monitoring and reporting with close support of Farm Africa and SoS sahel Ethiopia. The monitored field data were analyzed and submitted to OFWE REDD+ Focal person and the Bale REDD+ Project coordinator in Addis Ababa to carry out quality Control. Then OFWE deputy General Manager and Head of forestry to Farm Africa have been responsible carry out further quality assurance.

- **Data Management**

Oromia Forest and wildlife Enterprise is responsible to kept all records of field data and other evidence demonstrating the correct execution of project implementation. Therefore, all the data of monitoring such as Landsat image, validation report, PDD document, field data report, emission calculation sheets and other evidence are kept in OFWE and Farm Africa both in soft and hard copies which are available to auditors.

5.2. Data and Parameters Available at Validation (CL4)

Data Unit / Parameter:	**Deforestation Dry evergreen Forest**
Data unit:	Hectares
Description:	The annual area of Dry evergreen forest converted to non-forest vegetation.
Source of data:	Analysis of Landsat images of 2000, 2005, 2009 and 2011 available in GIS data files and Methodological LUC (Appendix 9)
Value applied:	10,738.9 Ha/year Average annual deforested area on the historical reference period (2000-2011).
Justification of choice of data or description of measurement methods and procedures applied:	Deforestation will be measured using the same steps of the Methodological steps used and presented in the LUC (Appendix 9) (and Forest Cover Benchmark Map (2011) to obtain annual increments in classes of non-forest land in the period 2001-2011. Using the same land use matrix with Remote Sensing and GIS Techniques, the analysis for land cover change will be performed using medium resolution imagery with some high resolution imagery for and ground truthing data for verification
Any comment:	See Methodological LUC Annex9

Data Unit / Parameter:	**Deforestation moist Forest**
Data unit:	Hectares
Description:	The annual area of moist forest converted to non-forest vegetation.
Source of data:	Analysis of landsat images of 2000, 2005, 2009 and 2011 available in GIS data files and Methodological LUC (Appendix 9)
Value applied:	5,429.6 Ha/year Average annual deforested area on the historical reference period (2000-2011).
Justification of choice of data or description of measurement methods and procedures applied:	Deforestation was measured using the steps described on the Methodological LUC Annex9, including the Forest Cover Benchmark Map (2011) to obtain annual increments in classes of non-forest land

	in the period 2000-2011 (time-steps 2000-2005-2009-2011). Using the land use matrix with Remote Sensing and GIS Techniques. The analysis for land cover change was performed using medium resolution imagery with some high resolution imagery for and ground thruthing data for verification.
Any comment:	See Methodological LUC Annex

Data Unit / Parameter:	**Carbon stock in Dry Forest aboveground biomass**
Data unit:	tons C/ha or tons CO2e/ha
Description:	Dry Afromontane forest is one of the forest strata identified in the Bale Eco-region. The above ground biomass refers to the carbon stock in the woody live vegetation in this forest stratum.
Source of data:	Forest inventory for DBH in combination with global allometric equation and national Wood Density data.
Value applied:	99.71 tC/ha
Justification of choice of data or description of measurement methods and procedures applied:	Forest inventory was conducted to determine the biomass carbon stocks. A nested 1 ha plot size was laid and dendrometric parameter of trees within the plots (DBH) was measured including tree species identification. Then Chaves et al., 2005 allometric equation was applied with national/Regional WD value to estimate biomass, with carbon stocks per tree estimated to be approximately 0.5 of the biomass based on IPCC good practice guide.
Any comment:	See Bale Forest Inventory Report and Bale carbon stocks assessment manual (Appendix 10)

Data Unit / Parameter:	**Carbon stock in Moist Forest aboveground biomass**
Data unit:	tons C/ha or tons CO2e/ha
Description:	tons of carbon per hectare in aboveground biomass within the Moist Forest class (stratum) in the BALE Eco-Region
Source of data:	Forest inventory conducted as above
Value applied:	176.54 tC/ha

Justification of choice of data or description of measurement methods and procedures applied:	Forest inventory was conducted to determine the biomass carbon stock in the moist forest stratum of the eco-region. A nested 1 ha plot size was laid and dendrometric parameter of trees within the plots (DBH) was measured including tree species identification. Then Chaves et al., 2005 allometric equation was applied with national/Regional WD value to estimate biomass, with carbon stocks per tree estimated to be approximately 0.5 of the biomass based on IPCC good practice guide..
Any comment:	See Bale Forest Inventory Report and Bale carbon stocks assessment manual. (Appendix 10)

Data Unit / Parameter:	**Mean Wood density of species**
Data unit:	gram/cubic centimetre (g/cm^3)
Description:	Average basic wood density for major species in Bale eco-region
Source of data:	Data on basic wood density of tree species in Bale eco-region was obtained from secondary sources, mainly national research report as described in. (Appendix 13)
Description of measurement methods and procedures to be applied:	Data on basic wood density of major tree species in Bale eco-region was obtained, and averaged to develop an average basic wood density to be used in the allometric equation. Although the average wood density value obtained was 0.669 (ca. 0.67 g/cm3), we applied a conservative value of 0.6 gm/cm3 in the allometric equation. (Appendix 13)
Frequency of monitoring/recording:	
Value applied:	0.6gm/cm^3
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	Density of tree specious found in the Bale forest was identified from literature and their average was computed to use it for tree carbon calculation.
Any comment:	

Data Unit / Parameter:	An allometric equation for forest type j, linking above ground biomass (in kg $tree^{-1}$) to diameter at breast height (DBH) and possible tree height (H)
Data unit:	None
Description:	Global allometric equation developed by Chave et al., 2005 for dry and moist tropical forest (forest type) was used to calculate AGB (kg/tree) using wood density and DBH parameters only. Height was not considered
Source of data:	Chave et al., 2005 (scientific article) (Appendix 10)
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	Only once at project start
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	Select appropriate allometric equation for the forest, measure the dendrometric parameters of all of the trees in the sample plot and estimate the CO_2 .see (Appendix 10)
Any comment:	

Data Unit / Parameter:	**DBH**
Data unit:	Centimeter
Description:	Diameter at breast height of individual trees within sample plots
Source of data:	Field direct measurement
Description of measurement methods and procedures to be applied:	Measure the diameter of trees at breast height (DBH) or 1.3 meters of all trees with DBH ≥2 cm using caliper and diameter tape. Detail of the measurement procedure is provided in forest carbon measurement manual (Appendix 10)
Frequency of monitoring/recording:	At project start and every five years
Value applied:	
Monitoring equipment:	Diameter tap and caliper

QA/QC procedures to be applied:	See QA QC protocols in Annex6 of Bale forest carbon assessment manual
Calculation method:	Diameter measured in two opposite direction per tree was averaged and taken as DBH per tree
Any comment:	

Data Unit / Parameter:	Number of sample unit to be measured in LU/LC class cl that is allocated proportional to the size of the class. If estimated ncl<3,set ncl=3
Data unit:	No
Description:	The total number of sampling units taken from the forest to estimate CO_2 per hectare of the forest. The decision on the number of plots depends on vegetation type, logistics, accuracy level, manpower and cost. The number of samples for each stratum is selected proportional to its size. See (Appendix 10)
Source of data:	(Appendix 10)
Description of measurement methods and procedures to be applied:	The total number of plots to be measured was determined using a tool developed by Winrock International for generating number of plots (http://www.winrock.org/Ecosystems/tools.asp).
Frequency of monitoring/recording:	
Value applied:	17 sample plot from dry forest 62 plots from moist forest
Monitoring equipment:	Conduct forest inventory, GPS,GIS
QA/QC procedures to be applied:	See QA QC protocols in Annex6 of Bale forest carbon assessment manual see (Appendix 10)
Calculation method:	See (Appendix 9)http://www.winrock.org/Ecosystems/tools.asp).
Any comment:	

Data Unit / Parameter:	**Total area of projected baseline deforestation during the fixed baseline period of Bale REDD+ project**
Data unit:	Hectares
Description:	The annual area of forest area expected to be converted into other non-forest land uses within the 20 years project period (from 2012-2031) in project area (PA), Leakage Belt (LK) and Reference Region (RR)
Source of data:	Projection based on average historical deforestation based on the analysis of land sat image of 2000, 2005, 2009 and 2011 as described in the Methodological LUC Annex 9 (SM.04)
Description of measurement methods and procedures to be applied:	Historic deforestation (2000-2011) was assessed using the steps described in the Methodological framework presented in the LUC Annex 9 (and Forest Cover Benchmark Map (2011) to obtain average deforestation rate. The established average deforestation rate for each stratum was then applied to the base map to estimate future deforestation for the years 2012-2031.
Frequency of monitoring/recording:	Each renewal of fixed baseline period
Value applied	A total 289082.8 ha of forest predicted to be deforested within 20 years
Monitoring equipment:	ARCGIS, Medium resolution LNDSAT image
QA/QC procedures to be applied:	QA / QC protocols document used in PDD followed
Calculation method:	See Methodological LUC Annex
Any comment:	

Data Unit / Parameter:	**Average carbon stock per hectare in the above-ground biomass carbon pool of initial forest class icl (Moist forest stratum)**
Data unit:	tons C/ha
Description:	tone of carbon stock per hectare in above ground biomass
Source of data:	Original forest inventory was conducted and data collected by OFWE, Farm Africa, SOS Sahel Ethiopia and NCRC

Description of measurement methods and procedures to be applied:	Stratified sampling technique was applied, in which moist forest formed one of the strata. Nested 1 ha size plot was used and a total of 62 sample plots inventoried. Dendrometric parameter, principally DBH (cm), of trees falling in the sample plots were measured. Biomass per tree was estimated using Chaves et al., 2005 allometric equation (for moist tropical forest in this case), summed to per plot and hectare basis. Then, plot biomass was averaged to a per hectare biomass by strata. For estimating carbon stock, the carbon fraction of 50% based on IPCC good practice guide was applied.
Frequency of monitoring/recording:	Every five years
Value applied:	Average above ground biomass 176.54 tC/ha
Monitoring equipment:	Conducting forest inventory
QA/QC procedures to be applied:	QA QC protocols in Annex6 of Bale forest carbon assessment manual (Appendix 9)
Calculation method:	Individual tree biomass was calculated using Chave et al., 2005 allometric equation, for moist tropical forest. For wood density average value for species in the eco-region was applied (Appendix 13). Individual tree biomass is summed up to plot biomass. Then, plot biomass measurements were averaged to stand biomass per hectare.
Any comment:	

Data Unit / Parameter:	**Average carbon stock per hectare in the above-ground biomass carbon pool of initial forest class icl (Dry forest stratum)**
Data unit:	tons C/ha
Description:	tone of carbon stock per hectare in above ground biomass
Source of data:	Original forest inventory was conducted and data collected by OFWE, Farm Africa, SOS Sahel Ethiopia and NCRC
Description of measurement methods and procedures to be applied:	Stratified sampling technique was applied, in which dry forest stratum was one. A nested 1 ha plot size was used for the inventory. A total of 17 plots were inventoried. Dendrometric parameter, principally DBH (cm), of all trees falling within the plots were measured. Biomass per tree

	was estimated using Chaves et al., 2005 allometric equation (for dry tropical forest), summed to per plot and hectare basis. Then, plot biomass was averaged to a per hectare biomass. For estimating carbon stock, the carbon fraction of 50% based on IPCC good practice guide was applied.
Frequency of monitoring/recording:	Every five years
Value applied:	Average above ground biomass 99.71 t C/ha
Monitoring equipment:	Conducting forest inventory
QA/QC procedures to be applied:	See QA QC protocols in Annex6 of Bale forest carbon assessment manual (Appendix 10)
Calculation method:	Individual tree biomass was calculated using Chave et al., 2005 allometric equation for dry tropical forest. For wood density average value for species in the eco-region was applied (SM 32). Individual tree biomass is summed up to plot biomass. Then, plot biomass measurements were averaged to stand biomass per hectare.
Any comment:	

Data Unit / Parameter:	**Average carbon stock per hectare in the below -ground biomass carbon pool of initial forest class icl (Dry and moist strata)**
Data unit:	Tons C/ha
Description:	Tone of carbon stock per hectare in above ground biomass
Source of data:	Forest inventory conducted NCRC, OFWE, Farm Africa and SOS Sahel Ethiopia
Description of measurement methods and procedures to be applied:	Below ground biomass and carbon stock were derived from Above ground biomass and carbon stock, were measured as described above. The Below ground biomass and carbon were calculated applying the IPCC good practice guide: which indicates root: shoot of 24% for moist forest and 27% for dry forest.
Frequency of monitoring/recording:	Every five years
Value applied:	For moist forest 42.37 t/ha, and for Dry forest

	26.92 t/ha.
Monitoring equipment:	See QA QC protocols in Annex6 of Bale forest carbon assessment manual (Appendix 10)
QA/QC procedures to be applied:	See QA QC protocols in Annex6 of Bale forest carbon assessment manual (Appendix 9)
Calculation method:	After calculating the above ground biomass, it is assumed that below ground biomass of a tree consisted 27% and 24% of the total above ground biomass for the dry and moist forests, respectively.
Any comment:	

Data Unit / Parameter:	**Cumulative actual carbon stock change due to un avoided unplanned deforestation at year *t* in the project area**
Data unit:	tCO_2-e
Description:	Total amount of CO_2 e GHG emitted from the project during the project life time
Source of data:	Predicted deforestation (activity data) multiplied by the emission factor obtained from forest inventory
Description of measurement methods and procedures to be applied:	The average carbon stock per hectare by forest stratum (emission factor in CO_2e) was obtained from forest inventory and was multiplied by predicted deforestation by forest strata and cumulated over the project life time to provide ex-ante cumulative carbon stock change from un-avoided unplanned deforestation.
Frequency of monitoring/recording:	Annually
Value applied:	627245.54 tCO_2-e (average of 20 years)
Monitoring equipment:	Conducting forest inventory, remote sensing GIS and land sat
QA/QC procedures to be applied:	See QA QC protocols in Annex6 of Bale forest carbon assessment manual (Appendix 9)
Calculation method:	Multiple emission factor by activity data per year, and cumulate the result over the project period, and divide the total by the project life time (yr)
Any comment:	

Data Unit / Parameter:	Total actual carbon stock change due to un avoided unplanned deforestation at year *t* in the project area
Data unit:	tCO_2-e
Description:	Total CO_2-e emitted during the project life time
Source of data:	Emission factor (obtained from forest inventory) & activity data per year and per forest stratum as obtained from projected deforestation 8
Description of measurement methods and procedures to be applied:	The emission factor established for each forest stratum based on forest inventory was multiplied by the activity data per year and forest stratum and the resulting value summed up to the project life time.
Frequency of monitoring/recording:	Annually
Value applied:	12544910.88
Monitoring equipment:	Conduct forest inventory, remote sensing image analysis
QA/QC procedures to be applied:	See QA QC protocols in Annex6 of Bale forest carbon assessment manual (Appendix 10)
Calculation method:	Multiplication of emission factor by forest stratum with projected annual activity data per stratum, then adding the annual value to the total project life time.
Any comment:	

Data Unit / Parameter:	Cumulative net anthropogenic greenhouse gas emission reduction attributable to the AUD project activity
Data unit:	tCO_2-e
Description:	The total amount of anthropogenic gas emission reduced due to project intervention for the given period of time.
Source of data:	Forest inventory for emission factor, and projected deforestation and project claimed performance factor
Description of measurement methods and procedures to be applied:	The emission factor was multiplied by activity data and the result was reduced by the factor of performance factor to estimate net emission reduction due to the project.
Frequency of monitoring/recording:	Annually
Value applied:	25776421.4 (cumulative over the project period)

Monitoring equipment:	Conduct forest inventory, remote sensing image analysis
QA/QC procedures to be applied:	See QA QC protocols in Annex6 of Bale forest carbon assessment manual (Appendix 10)
Calculation method:	Emission factor is multiplied by activity data and the resulting product was multiplied by the performance factor claimed by the project
Any comment:	

Data Unit / Parameter:	Net anthropogenic greenhouse gas emission reduction attributable to the AUD project activity at year t
Data unit:	tCO_2-e
Description:	Mean anthropogenic gas emission reduced due to project intervention per year (average of 20 years).
Source of data:	Emission factor from forest inventory, projected activity data from historic deforestation and performance factor by the project
Description of measurement methods and procedures to be applied:	Emission factor was established for the different forest stratum based on forest inventory, this was multiplied by activity data projected based on historic deforestation and finally the product of the two multiplied by the project claimed performance factor.
Frequency of monitoring/recording:	Annually
Value applied:	1288821.07 (average of 20 years)
Monitoring equipment:	Forest inventory, and remote sensing image analysis
QA/QC procedures to be applied:	See QA QC protocols in Annex6 of Bale forest carbon assessment manual (Appendix 10)
Calculation method:	Emission factor multiplied by activity data multiplied by the performance factor per year.
Any comment:	

Data Unit / Parameter:	Risk factor used to calculate VCS buffer credits
Data unit:	%
Description:	This refers to risk elements that may affect forest carbon stock and is used to estimate buffer credits based on VCS non-permanence risk tool.
Source of data:	Project social, political, economic and environmental situation assessment or analysis (elements required in the VCS non-permanence risk tool)
Description of measurement methods and procedures to be applied:	Risk factors derived based on the guideline in the VCS-approved AFOLU Non-Permanence Tool
Frequency of monitoring/recording:	Each renewal of fixed baseline period
Value applied:	15%
Monitoring equipment:	VCS-approved AFOLU Non-Permanence Tool
QA/QC procedures to be applied:	
Calculation method:	Select the likely risks that assumed to appear in the eco-region from the list of VCS-approved Non-Permanence tool and give the score then add the total.
Any comment:	

Data Unit / Parameter:	Root-shoot ratio appropriate for species, group of species or forest type
Data unit:	%
Description:	The ratio of the amount of belowground biomass (root) divided by above ground tree biomass.
Source of data:	IPCC good practice guide
Description of measurement methods and procedures to be applied:	The root-shoot ratio for calculating below ground biomass of the forest strata was obtained from IPCC good practice guide. Different value was used for the different stratum available in the project forest
Frequency of monitoring/recording:	Only once at project start
Value applied:	24% for moist forest and 27% for dry forest

Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	

5.3. Data and Parameters Monitored (CL4, CM4 & B4)

Data Unit / Parameter:	**Area of dry ever green and moist forest deforested in 20 years within the leakage belt in the baseline case**
Data unit:	Hectares/year
Description:	The annual area leakage belt forest converted to non- forest land use
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	**Area dry evergreen and moist forest deforested in 20 years within the project area in the baseline case**
Data unit:	Hectares/year
Description:	The annual area of dry ever green and moist forest converted to non-forest land use
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	

QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	**Area of dry evergreen and moist forest deforested in 20 years within the reference region in the baseline case**
Data unit:	Hectares /year
Description:	The annual area leakage belt forest converted to non- forest land use
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	**Plot area**
Data unit:	Meter square (m^2)
Description:	This is a sample of forest from which forest biomass data was collected. A size of 10,000 m2 or equivalent to 1 ha size was applied.
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	

Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	**Total forest area in dry evergreen forest within the reference region at the project start date**
Data unit:	Hectares
Description:	
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	**Total forest area in moist forest within the reference region at the project start date**
Data unit:	Hectares
Description:	

Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	**Total area of projected baseline deforestation during the fixed baseline period of Bale REDD+ project**
Data unit:	Hectares
Description:	The annual area of forest area expected to be converted into other non-forest land uses within the 20 years project period (from 2012-2031) in project area (PA), Leakage Belt (LK) and Reference Region (RR)
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	**Average carbon stock per hectare in the above-ground biomass carbon pool of initial forest class icl (Moist**

	forest stratum)
Data unit:	tons C/ha
Description:	tone of carbon stock per hectare in above ground biomass
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	**Average carbon stock per hectare in the above-ground biomass carbon pool of initial forest class icl (Dry forest stratum)**
Data unit:	tons C/ha
Description:	tone of carbon stock per hectare in above ground biomass
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	**Average carbon stock per hectare in the below - ground biomass carbon pool of initial forest class icl (Dry and moist strata)**
Data unit:	Tons C/ha
Description:	Tone of carbon stock per hectare in above ground biomass
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	Total baseline carbon stock changes for the above-ground biomass pool in the project area
Data unit:	
Description:	.
Source of data:	
Description of measurement methods and procedures to be applied:	Not applicable
Frequency of monitoring/recording:	
Value applied:	

Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	

Data Unit / Parameter:	**Cumulative actual carbon stock change due to un avoided unplanned deforestation at year *t* in the project area**
Data unit:	tCO_2-e
Description:	Total amount of CO_2 e GHG emitted from the project during the project monitoring period (2012-2015)
Source of data:	Actual deforestation (activity data) and emission factor obtained from forest inventory
Description of measurement methods and procedures to be applied:	Deforestation of 4 years was analyzed using Landsat image, the Emission factor was taken from initial forest inventory (Appendix1a and 2,3)
Frequency of monitoring/recording:	3 years
Value applied:	3,852,574
Monitoring equipment:	Landsat image, GPS, ENVI5.0
QA/QC procedures to be applied:	QA QC protocols of PDD was followed
Calculation method:	Emission factor per forest strata multiplied by actual deforestation of each forest strata
Any comment:	The monitoring was initial supposed to be carry out every 3 year but due to delay of PDD finalization the monitoring was carried out at year 4 which did not bring any change

Data Unit / Parameter:	**Total actual carbon stock change due to un avoided unplanned deforestation at year t in the project area**
Data unit:	tCO_2-e
Description:	Total CO_2-e emitted after deducting performance factor

Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	**Cumulative net anthropogenic greenhouse gas emission reduction attributable to the AUD project activity**
Data unit:	tCO_2-e
Description:	The total amount of anthropogenic gas emission reduced due to project intervention from 2012-2015.
Source of data:	Image analysis of year 2015 and emission factor from initial forest inventory
Description of measurement methods and procedures to be applied:	The emission factor was multiplied by the actual deforestation occurred in the monitoring period and subtracted the result from the estimated baseline deforestation of the monitoring period (Appendixnnex 1a and 2,3)
Frequency of monitoring/recording:	Annually
Value applied:	5,532,367
Monitoring equipment:	Remote sensing image analysis, GPS
QA/QC procedures to be applied:	See QA QC protocols indicated in PDD
Calculation method:	Emission factor is multiplied by actual deforestation and the resulting product was subtracted from the baseline emission estimate.
Any comment:	

Data Unit / Parameter:	**Net anthropogenic greenhouse gas emission reduction attributable to the AUD project activity at year t**
Data unit:	tCO_2-e
Description:	Mean anthropogenic gas emission reduced due to project intervention per year
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	**Mean Wood density of species**
Data unit:	Gram/cubic centimetre (g/cm^3)
Description:	Average basic wood density for major species in Bale eco-region
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	

Any comment:	No change to the baseline data

Data Unit / Parameter:	**Ex ante estimated effectiveness index**
Data unit:	%
Description:	The effectiveness of project activities in addressing deforestation.
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	**Sum of ex-ante estimated leakage emission at year t**
Data unit:	tCO_2-e
Description:	Ex-ant estimation of CO2e emission from deforestation in the leakage belt
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	

QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	An allometric equation for species, or forest type j, linking above ground biomass (in kg tree^{-1}) to diameter at breast height (DBH) and possible tree height (H)
Data unit:	None
Description:	
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	Total number of sample units to be measured (in all LU/LC classes)
Data unit:	No
Description:	
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	

Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	Number of sample unit to be measured in LU/LC class cl that is allocated proportional to the size of the class. If estimated ncl<3,set ncl=3
Data unit:	
Description:	
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	**Risk factor used to calculate VCS buffer credits**
Data unit:	%
Description:	This refers to risk elements that may affect forest carbon stock and is used to estimate buffer credits based on VCS non-permanence risk tool.
Source of data:	Project social, political, economic and environmental situation assessment or analysis (elements required in the VCS non-permanence

	risk tool (Appendix 12)
Description of measurement methods and procedures to be applied:	Risk factors derived based on the guideline in the VCS-approved AFOLU Non-Permanence Tool
Frequency of monitoring/recording:	Each renewal of fixed baseline period
Value applied:	15%
Monitoring equipment:	VCS-approved AFOLU Non-Permanence Tool
QA/QC procedures to be applied:	
Calculation method:	Select the likely risks that assumed to appear in the eco-region from the list of VCS-approved Non-Permanence tool and give the score then add the total.
Any comment:	It is updated and published on CCB's website on October 2015 so that still valid for this monitoring period

Data Unit / Parameter:	Root-shoot ratio appropriate for species, group of species or forest type
Data unit:	%
Description:	The ratio of the amount of belowground biomass (root) divided by above ground tree biomass.
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	Start date of the historical reference period[GA1]
Data unit:	Year
Description:	The year 2000 is the start year of historical reference period which is 2000-2011
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	Duration of the historical reference period[GA2]
Data unit:	Yrs
Description:	
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	

Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	t-student value for 95% confidence level
Data unit:	
Description:	
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	Variable included in the deforestation model
Data unit:	
Description:	
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	

Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	**Number of Buffer credits deposited in the VCS Buffer at year 4**
Data unit:	tCO_2e
Description:	The amount of tCO_2e GHG set aside as buffer to make up the risk identified for the project
Source of data:	Risk assessment for the project
Description of measurement methods and procedures to be applied:	The calculated non-permanence value 15%, net anthropogenic greenhouse gas emission value
Frequency of monitoring/recording:	Four years
Value applied:	829,855 tCO2e[ms3][GA4]
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	The net emission reduction calculated for the project was multiplied by the buffer risk (15%) and divided by 4 to obtain buffer credit of each year. (Appendix 11)
Any comment:	

Data Unit / Parameter:	**Number of Verified Carbon Units(VCUs) to be made available for trade at 2015**[GA5]
Data unit:	tCO2e
Description:	The net tCO_2e GHG available after reduction of buffer for risk
Source of data:	Calculated of avoided emission
Description of measurement methods and procedures to be applied:	The net VCU available for trade is obtained after reducing the buffer for risk value from the ex-post net emission reduction by the project
Frequency of monitoring/recording:	Annually

Value applied:	4,702,512 [ms6][GA7]
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	The deposited buffer credit was subtracted from the ex-post net emission reduction by the project
Any comment:	

Data Unit / Parameter:	**Average carbon stock per hectare in the dead wood biomass carbon pool of final post-deforestation class fcl**
Data unit:	
Description:	.
Source of data:	
Description of measurement methods and procedures to be applied:	Not applicable
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	

Data Unit / Parameter:	**Average carbon stock per hectare in the dead wood biomass carbon pool of LU/LC class cl**
Data unit:	

Description:	.
Source of data:	
Description of measurement methods and procedures to be applied:	Not applicable
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	

Data Unit / Parameter:	**Average carbon stock per hectare in the dead wood biomass carbon pool initial forest class icl**
Data unit:	
Description:	.
Source of data:	
Description of measurement methods and procedures to be applied:	Not applicable
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	

Data Unit / Parameter:	**Average carbon stock per hectare in the dead wood biomass carbon pool per zone z**
Data unit:	
Description:	.
Source of data:	
Description of measurement methods and procedures to be applied:	Not applicable
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	

Data Unit / Parameter:	**Average combustion efficiency of the carbon pool p in the forest class**
Data unit:	
Description:	.
Source of data:	
Description of measurement methods and procedures to be applied:	Not applicable
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	

Data Unit / Parameter:	**Carbon fraction for tree tr, of species, group of species or forest type j**
Data unit:	%
Description:	
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data

Data Unit / Parameter:	**DBH**
Data unit:	Centimetre
Description:	Diameter at breast height of individual trees within sample plots
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	

Any comment:	No change to the baseline data

Data Unit / Parameter:	**Height of the tree**
Data unit:	
Description:	.
Source of data:	
Description of measurement methods and procedures to be applied:	Not applicable
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	

Data Unit / Parameter:	**Community forest income change**
Data unit:	US$/hh/yr
Description:	Household economic data collection using randomly selected sample households and compare with baseline income level
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	Every five years
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	

Calculation method:	
Any comment:	No change to the baseline data because it is planned to be conduct the monitoring every five years

Data Unit / Parameter:	**Community forest management institution capacity assessment 2015**
Data unit:	%
Description:	Capacity is assessed regularly using a method developed by the project called Organizational Capacity Assessment Tool (OCAT). The assessment comprises the following parameters: forest protection, forest development, forest utilization, cooperative financial management and leadership. The tool applies scale based assessment and overall average indicates status of the CBO. Based on the identified gaps, capacity building activities were provided.
Source of data:	Assessment of capacity of Forest management cooperatives
Description of measurement methods and procedures to be applied:	Using established survey questions included in the OCAT tool, all necessary data were assessed from each forest managing institution and analysed using the developed Organizational Capacity Assessment Tool (OCAT) software
Frequency of monitoring/recording:	Annually
Value applied:	64.4 %, at monitoring period
Monitoring equipment:	Questioners and computer, excel base OCAT
QA/QC procedures to be applied:	
Calculation method:	A total of 50 questions, each question has a value of 0, 1, 2 value as per their capacity, these values added to give the overall result from 100.
Any comment:	

Data Unit / Parameter:	**Biodiversity condition of the area**
Data unit:	Species richness; stem/ha

Description:	Biodiversity potential of the forest assessed
Source of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No change to the baseline data because it is planned to be conduct the monitoring every five years

Data Unit / Parameter:	**Monitor community attitude and perception on the project**
Data unit:	
Description:	Using established participatory rural appraisal (PRA) techniques Communities' attitude toward the project assessed
Source of data:	Community living in and around the forest
Description of measurement methods and procedures to be applied:	Different PRA tools deployed to assess communities' perception and attitude on parameters such as activity implementation, socio- economic impact and biodiversity impact.
Frequency of monitoring/recording:	Every five years
Value applied:	Not applied
Monitoring equipment:	Flip chart, computer, cards and markers
QA/QC procedures to be applied:	
Calculation method:	The score given to each perception parameter by participants were added and expressed in terms of percentage (Appendix 6)

Any comment:	This preliminary monitoring was carried out while exclusive household survey and qualitative data collection supposed to carry out every five years.

6. QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS (CLIMATE)

6.1. Baseline Emissions (CL1)

The initial Forest Carbon stock inventory was conducted and the average biomass per hector for each forest stratum was calculated in PDD. The average biomass per/ha used to calculate the emission factor in tCO_2e/ha. On other hand, using Landsat images, historical deforestation between 2000 and2011 was assessed to determine the annual rate of deforestation that used to calculate expected deforestation to happen in each year of the 20years period of carbon credit (Appendix 1b). The predicated area of deforestation of each year was multiplied by the calculated emission factor to quantify ex ante emission of 20 years under the scenario of business as usual (Appendix 2).

6.2. Project Emissions (CL2)

According to VM0015 v 1.1 methodology, deforestation of 2015 was analyzed using Landsat images for both in the project and leakage belt areas. Based on the knowledge of experts about the Bale Mountains Eco-Region REDD+ project areas 176 training points for forest and non-forest land were digitized from Landsat image of 2015 on the computer screen using ENVI5.0 version and those points used to run the image classification using the supervised image classifier with maximum likelihood algorithm in ENVI 5.0. Furthermore, to make sure the classification was in the limit of acceptable range about 152 testing points were collected from the ground using Garmin72 GPS both for the forest and non-forest land areas and used to check the accuracy of the classification. The overall accuracy of image classification was calculated as 91.67% which indicates the high level of precision in the range of acceptable limit indicated during baseline establishment (Appendix 1a).

The Ethiopia's definition of forest is 0.05 hectors which is too small-scale to be achieved by the analysis of medium resolution imagery. Therefore, during the preparation of baseline line data, area of less than 0.09 hectors were filtered out and assigned a non-forest category. Similarly, in this analysis the minimum mapping unit (MMU) of 0.09 ha was employed. According, the classified image of 2015 was converted to vector file and exported to Arc Map GIS then the area of forest which were less than 0.09 hectors was filtered out. Subsequently, to calculate the forest size in the project and leakage areas, respective shape files of project and leakage belt areas were used to clip out using Arc Map GIS 10.

Finally, the size of deforestation was deducted from predicted deforestation to determine the net avoided deforestation. Net avoided deforestation multiplied by emission factor to quantify the amount of carbon emission avoided that indicated in (Table 14 & Appendix 3) by following methodology used in the PDD.

Table 14: Deforestation and Emission analysis over the period of 2012 and 2015 in the Project area

Forest types (A)	Baseline Deforestation in ha 2012-2014 (B	Occurred Deforestation in ha (C)	Avoided deforestation in Ha D=B-C	Emission factor ton Co_2/ha (E)	Total avoided emission in tCo_2 F= D*E
Moist	15,796	7256	8540	510.91	4,363,171
Dry	4,448	492	3956	295.55	1,169,196
Sum	20,244	7748	12,496		5,532,[ms8]367[GA9]

6.3. Leakage (CL3.1& CL3.2)

Using Table 21d of VM0015 version 1.1, the ex-ante and Ex-post leakage was calculated. The total ex post leakage was subtracted from the ex-ante baseline carbon stock change in the leakage belt (Table 15). The size of occurred deforestation deducted from the predicted deforestation baseline to determine the avoided deforestation over the project period. Finally, avoided deforestation was multiplied by the emission factor to quantify the amount of carbon emission avoided (Appendix 3). The result indicates total emission in the leakage belt was less than what was estimated as baseline data.

Table 15: Total net baseline carbon stock change in the leakage belt

Project year t	Total ex ante net baseline carbon stock change		Total ex post net actual carbon stock change		Total ex post leakage[GA10]	
	Annual CBSLLKt tCO2-e	cumulative CBSLLKt tCO2-e	Annual CBSLLKt tCO2-e	cumulative CBSLLKt tCO2-e	Annual CBSLLKt tCO2-e	cumulative CBSLLKt tCO2-e
2012	826,562	826,562	259,769	259,769	566,794	566,794
2013	801892	1,628,454	235,099	494,868	566,794	1,133,587
2014	778,566	2,407,020	211,773	706,641	566,794	1,700,381
2015	756,333	3,163,353	189,540	896,181	566,794	2,267,174

Deforestation in the leakage belt of the moist forest was reduced by 61% as compared to the predicted deforestation. However, deforestation was high in the leakage belts of dryland forest which was happened by the illegal settlers who came from distance places. To tackle this challenge the project has organized consultation workshops how to tackle those challenges see (Appendix 26). Despite this, the overall project leakage was lower than what was expected so it does not affect the overall achievement of the project.

6.4. Summary of GHG Emission Reductions and Removals (CL2 and CL3)

To calculate the net emission reduction, project emission in the project area and emission in leakage belt were added and the sum of the two was deducted from the predicted baseline emission. In this calculation emission in the leakage belt was considered as zero because the project designed in a way not to claim the credit generated from the leakage belt area (Table 16 & Appendix 2). Of the total net greenhouse gas emission that is indicated in the Table 16 a buffer credit of 15% which is about 829,855 tCo2 was deducted and the tradable avoided carbon emission was calculated which is 4,702,512 tCo2. The Non-Permanent Risk Assessment was calculated as 15% during the project design and still valid see (Appendix 12).

Table 16: Net Greenhouse Gas Emission calculated

Year	Baseline emissions in (tCO_2e) A	Project emissions (tCO_2e) B	Leakage emissions (tCO_2e) C	Net GHG emission reductions or removals (tCO_2e) D=A-(B+C)
2012-2015	9,384,941	3,852,574	0	5,532,[ms11]367[GA12]
Total		[ms13]		5,532,367[GA14]

6.5. Climate Change Adaptation Benefits (GL1)

While the economic and social impacts of climate change at the national level are difficult to estimate, the World Bank's study of the Economics of Adaptation to Climate Change indicates that climate change has the potential to reduce Ethiopia's GDP growth by 2-6% by 2015, with losses in the worst-case scenario rising to 10% by 2045. Some predictions and climate modelling at national level reported the following for Ethiopia ((Ethiopia Climate Resilient Green Economy, 2010).

- A rise in temperature of about 1.2^{O}C by 2020s from 1961-2000 average
- A rise in temperature of 1.5-5.1 OC by 2090s from 1970-1999 average
- A decrease in the frequency of cold nights (linked to frost in dry season) significantly in all seasons
- A declining trend in the February to April short rains
- A slight increases in the June to August long rains, as well as in October and November
- An increase in flood events
- Losses of ecosystems/habitats and biodiversity, and the environmental services of forest areas;
- Lower river flows during dry season, which affects downstream community and hydropower generation;

- Increased drought and incidences of forest fires;
- Risk of the expansion of desertification in the highlands;
- Impacts on human health, due to increase in pollution, vectors and disease causing agent.

Generally, there is less confidence in rainfall projections and less convergence between models. But, most models projected a slight increase in average annual rainfall nationally, but with seasonal and regional differences, which may mean some regions might experience decreasing rainfall in certain seasons. The models broadly agree that more rain will fall in 'heavy events' – in increased volumes over shorter periods of time.

Given the dependence on rain-fed agriculture, these trends could have a negative impact on food security. The World Bank's study of the Economics of Adaptation to Climate Change (World Bank, 2010) indicates that climate change has the potential to reduce Ethiopia's GDP growth by 2-6% by 2015, with losses in the worst-case scenario rising to 10% by 2045.

The rising temperatures, changes in intensity and pattern of rainfall, increased incidences of flooding and landslide are factors stimulate the loss of ecosystems and the decline of local species in addition to making subsistence farming and/or family farming unattractive. Longer dry seasons and decrease in water supply to the pastoralist communities downstream may also lead to increase in duration of stay, and the number of human and livestock population that seasonally migrate to the highland forest. This in turn threatens plant and wild animal species, degrade forest quality that eventually lead to loss of the forest habitat, and livelihoods of the local forest dependent communities.

For instance, some preliminary studies indicated that the wild population of coffee might be lost from the Bale Mountains over the coming 4-5 decades. This may also significantly hamper the quality and quantity of coffee produced locally.

All Bale Eco-region carbon project activities are geared towards sustainable forest and land management that reduces deforestation, while improving livelihoods through increasing revenue for the community. Forests influence local microclimates, moderating extremes of temperature, which also has impacts on moisture regime. Vegetation cover also reduces runoff and flooding, and increase percolation of rainwater, which instead contribute to ground water recharge. These roles of forest are beneficial for the community and biodiversity.

The Bale Eco-region carbon project encourages and supports the local community to develop different organizational skills to improve forest and agricultural land management that optimizes conservation and sustainable use to adapt to climate change. These activities, aimed at mitigation and adaptation of local climate changes, included:

- Strengthening and empowering forest management cooperatives and their members;

- Strengthen and enhance the value chains of non-timber forest products and agricultural products through strengthening associations, cooperatives and unions;
- Develop plans for land reclamation and reforestation;
- Promoting multi-story agroforestry practices;
- Disseminate more sustainable silvo-pastoral practices (e.g. zero-grazing, cut-and carry, land zoning);
- Support developments of other PES like watershed protection services to generate additional revenue to support local climate-resilient developments initiatives;
- Promote the use of new alternative income sources that are consistent with changes in local climate, primarily increased temperature and decreased rainfall.

7. COMMUNITY

7.1. Net Positive Community Impacts (CM2.2)

Without project scenario: In the current scenario the poor livelihoods situation of the Bale Mountains communities is a significant root cause of deforestation. The communities residing in and around the Bale Mountains forests are totally dependent on small-scale agriculture and livestock rearing. Therefore, they are forced to clear forestland to feed themselves and their families. As populations continue increasing this need for land also increases at alarming rates. Further they also cut forest trees for timber and fuel wood. Without the project activities, expansion of agriculture and overgrazing by cattle is expected to continue since unsustainable use of natural resources including non-timber forest products (NTFPs) such as coffee and honey could not meet the demands of the community due to low market prices. Other external influences such as population increase, and drought, also continues to contribute to increasing deforestation and forest degradation. Fire is another incident that occurs regularly in the Bale eco-region. This requires much work in building capacity and awareness to create a system that will mitigate / reduce the incidence of fire. In addition, the weak law enforcement and exclusion of local communities from managing and using the forest resources opens the way for illegal settlement in the forest and conversion to other land uses which also allowed the unsustainable exploitation of natural forest resources to continue. As a consequence there was increasing conflict between the original inhabitants of local communities and new settlers arriving from different parts of the country, as the new settlers try to convert the forestland to agricultural land at the `expense of local peoples' forest based livelihoods. These new settlers also break the longer standing natural and less destructive relation between the environment and local community which weakens them as a group and compromises their traditional ways of life. Another line of action of the project is based on strengthening the JFM CBOs representative institutions. The goal is to improve the performance of the Bale Mountains forest management cooperatives before implementing many of the planned actions. Among the activities planned are those that will lead to stop

drivers of deforestation as well as the acquisition of office equipment to support the CBOs in their implementation.

The community impacts that have been achieved by implementing of the Bale Mountains Eco-Region REDD+ project have monitored based on the theory of change that describes the logical relationships between project's activities, outputs, outcomes and impacts. The monitoring data collected using different methods of data collection like Participatory Rural Assessment (PRA) and Focus Group Discussions and the findings are summarized in the following subheadings.

- **Institutional and Social benefits**

Towards improving the institutional and social development, trainings on various topics were identified and provided to forest managing CBOs. Additionally, manuals, guidelines, finance and materials assets were provided to all 64 REDD+ CBOs. In light of this capital and social development efforts, people perception about the impact was monitored using PRA technique. Accordingly, the majority of participants which was (73%) perceived that the supports were found high and (27%) perceived that the provided supports were medium. To capacitate community's institutions towards conflict management that a rise in relation to forest resources management, the managerial and organizational capacity building services were provided to all CBOs. In relation to this, PRA participants was requested and (63%) of them perceived that community's capacity of conflict management enhanced highly while (34%) indicated it was moderate and the remaining (3%) mentioned that the capacity was low (Tables 17 & Appendix 6).

Apart from the PRA technique, the OCAT used to monitor and analysis institutional capacity of each CBO's. Basically, the OCAT designed to comprises five indicators of organizational capacity such as leadership, finance and assets management and the other three forest management elements such as protection, development and utilization. Therefore, the OCAT data analysis indicates that the average organizational capacity of each CBO was improved from 48.64 to 64.36. In this analysis the sustainable utilization was found 3.24 out of 20 scores in 2013 and it was improved to 9.24 in 2015. Likewise, forest development increased from 9.5 to 13.94 (Figure 21).

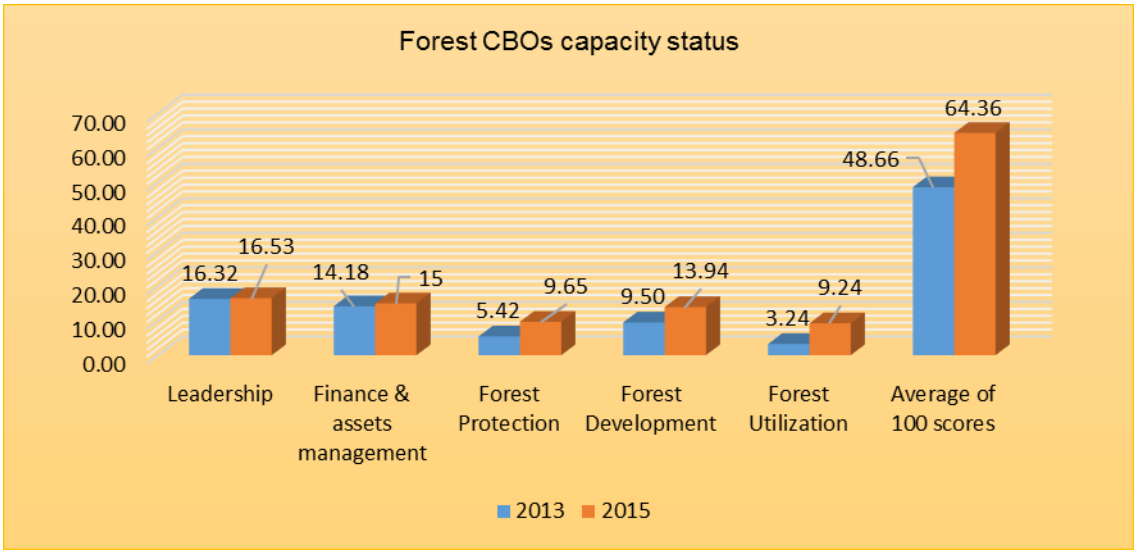

Figure 20: Organization capacity status before and after intervention

Overall institutional and social impacts improvement is described in terms of aspects like accumulation of various assets such as constructed offices and forestry equipment. Besides to this, a gender equity was properly addressed by having proper provisions in the community's bylaw. Accordingly, it is sated that out of seven executive committee members at least three members would be represented by females' representative. Furthermore, it is explicitly indicated that if the chairperson of CBO is male the deputy should be a female and vice-versal. Moreover, communities' forest uses rights and carbon benefit sharing modality recognized through having agreement with government. Additionally, to enhance bargain power of primary forest managing CBOs, a forest managers' union that comprises all primary comparatives was established as a strong institution that represents CBOs and discuss with government and any other parts on any issues that matters to its members.

Table 17: People's perception about delivery of project activities

Parameters	Total Participants	High		Medium		Low	
		No.	%	No.	%	No.	%
Supply of coffee quality materials	94	38	40%	36	38%	20	21%
Awareness creation on Climate and REDD+	105	79	75%	25	24%	1	1%
Fuel efficient stoves distribution	114	5	4%	63	55%	46	40%
REDD+ CBOs capacity building supports	114	83	73%	31	27%	0	0%
Forest development related support	113	26	23%	68	60%	19	17%
Establishing of saving and credit institutions	114	28	25%	71	62%	15	13%
MA&D business development support	114	40	35%	60	53%	14	12%
Overall perception	768	299	39%	354	46%	115	15%

- **Income increase from Non Timber forest products**

Prior to the intervention of REDD+ project in the Bale Mountains Eco-region, people used to collect both ripen and unripen coffee cherries and dried on bare ground. This was resulted in low quality and lower price that affected the income of households. To compensate lower income, many farmers obliged expanding of size of coffee areas by converting forest lands to coffee plantation which was a driver of deforestation. To combat this driver of deforestation, the Bale REDD+ project has strategized to improve quality of forest coffee with assumption of generating better income instead of coffee expansion through removing the forest. On top of this, the project has delivered mesh wires, hessian sacks and plastic covers that used to improve the quality of forest coffee. Additionally, 889 farmers (697 male and 192 female) provided training how to improve the quality of their coffee products. Towards this efforts, people's perception was monitored and 40% of the PRA participants perceived that supply of coffee quality improving materials was found high while (38%) perceived it was medium and (21%) mentioned that the supply of materials was low (Table 17 and Appendix 6). Following scoring process, through focus group discussions it was indicated that the materials were properly provided to the right beneficiaries at the right time. Despite that, the quantity of materials was too small as compared to the forest coffee they collected.

As a result of materials supports and trainings provided, many farmers and could able to improve the quality of coffee. Concerning this improvement, the PRA participants were asked to judgment the extent how coffee quality was improved. Then the coffee quality improvement was perceived as high by (20%) of the PRA participants while (78%) indicated it was medium and the remaining (2%) perceived the improvement trend was found low. The majority of PRA participants perceived that trend of coffee quality improvement was found medium. It was confirmed through focus discussion that many farmers felt that amount of provided materials was not sufficient as compared to quantity of coffee produced by each farmers. It was indicated that usually on average each coffee farmer was provided 10m^2 mesh wire and in case a farmer possess more than one hector of forest coffee and all coffee cherries ripen in same period, the 10m^2 drying beds cannot accommodate all collected cherries so that farmers obliged drying on a ground. Therefore, it implied that Bale REDD+ project contributed a lot in improving quality of coffee through introducing the new technologies while further works would be carried out (Figure 22).

Figure 21: Coffee production system before (left) after intervention (right)

Regarding honey production, like in the case of coffee before the intervention of the Bale REDD+ project the local community used to sell unpurified crude honey on the market for lower price. However, the Bale REDD+ project facilitated skill and knowledge development on value addition aspects such as packaging, labeling and marketing. Inline to this, the PRA participants requested to judge honey quality improvement and (6%) of the participants responded quality of honey was highly improved while the majority of the participants about (83%) perceived that honey quality improvement was moderate justifying that modern and transitional hives that used to produce quality honey were not sufficiently adopted to the extent of their expectation. Mentioning same reason (11%) of the participants concluded that honey quality improvement was slow (Table 17).

Materials supports and quality improvement were not an end to project. Rather the end goal was to enable farmers to access good market and generate better incomes that positively impacts their livelihoods. Towards this coffee producers, like in Delo Mena district could able to export 11 tons of clean coffee and sold for better price that had implication for increase of households' incomes. In light of this, the trend of income increase from NTFPs was asked to rate by the each PRA team and (8%) of the PRA participants indicated that income increase from both coffee and honey was found high while almost the majority (75%) of the participants mentioned that income increase was moderate while (18%) mentioned that the income increase was found low. Through conducted FGD, it was understood that the income level was remained moderate because the market price particularly coffee international market price was found very low.

- **Small business development**

The Bale REDD+ project has introduced FAO Market Development and Analysis (MA&D technique and provided trainings to community in order to capacitate community's members to identify and engage in the potential forest related products. The ultimate goal of this service was to produce and supply the product to market so as to earn better incomes. On top of this objectives many smallholder particular women were provided training and produced their own business plans and engaged in small business.

The progress of this development service was perceived as high by (35%) of PRA participants while majority of participants (53%) replied that it was delivered moderately and about (12%) of the participants claimed that delivery of this activity was slow (Table 17).

On other hand, in the Bale REDD+ project area, it found that in many places there was no opportunity for rural people to get financial access such as saving and credit accesses. For this reason, the Bale REDD+ project has facilitated for establishment of women's saving and credit cooperatives, saving and lending association (Figure 23) and provided financial supports to different REDD+ CBOs. The setup of institutions required to create access of saving and credit to the rural poor people that gives them opportunity of getting in small business like petty trading. In light of this, the PRA participants were asked to put their own judgments about the progress of this activity and then (25%) of the participants perceived that this activity was delivered at highly and (62%) of the participants mentioned it was done moderately while (13%) perceived it was low (Table 17). The majority of PRA participants perceived that it was moderate because they felt that it was easily accessible financial institutions in their locality particular to the women, despite that financial limitations remained constraint to address the interest of the borrowers at the sometime. Therefore, in many cases it was mentioned that credit service was provided for 6 months to 1 years on basis of turn by turn. This means that when the people who borrowed for first round paid pack what they borrowed the remaining members given opportunity of credit access.

Figure 22: While VSLA practice and business practiced

In addition to the above initiatives, communities were provided nursery equipment and training services to raise seedlings and establish their own forest planation. This activity was supported to meet two objectives. The first was to reduce wood consumption of the natural forest by developing alternative sources of wood supply through establishment of private woodlots. The second objective was aimed at generating income from sale of established forest woodlots. For these purposes, nursery equipment and trainings provided to enable each CBOs to let establish their own forest woodlots. In line to this, participants were requested to judge the extent of supports and (23%) of the participants perceived that the support was high while the majority of participants which was (60%) perceived the extent of support was moderate and others (17%) claimed that the support was found low (Table 8).In the meantime, the impacts of this activity was assessed through PRA technique and about (11%) of PFR participants responded that the woodlot was developed highly while (60%) indicated that it was moderate and the remaining (29%) perceived that woodlot development was low. In general during discussion, it was explained that many farmers have started planting the woodlots, despite that income generating from sale wood lot was not yet achieved because the established woodlots did not reach the maturity stage (Table 17).

- **Overall institutional, social and economic benefits**

Increase of the households' incomes from NTFPs and small business activities have contributed towards better livelihood of the project's beneficiaries. As a result, the community members could manage to send their children to school. This progress was perceived as high by (74%) of the PRA participants while (26%) responded that children's access to school was improved moderately. During focus group discussion, it was explained that many farmers send their children to school because of their income improvement and better awareness created as a result of the project. Despite these reasons, the construction of schools by a government at relatively shorter distance has its own effect. Moreover, (36%) of the PRA participants mentioned that housing conditions of the beneficiaries found highly improved while (61%) indicated that improvement of housing condition was moderate. The remaining (3%) perceived that the improvement was low (Table 18). Further explanation was made through focus group discussion mentioning that many community members have changed the roofing style of their houses from thatched covers to the corrugated iron sheets.

Table 18: People's perception about socio-economic impacts of the REDD+ project

S/No.	Parameters	Total Participants	High		Medium		Low	
			No.	%	No.	%	No.	%
1	Coffee quality improvement	94	19	20%	73	78%	2	2%

2	Honey quality improvement	114	7	6%	94	83%	13	11%
3	Income increase from coffee& honey	114	9	8%	85	75%	20	18%
4	Community awareness about climate change and REDD+	114	99	87%	15	13%		
5	Community engagement in forest protection	114	69	61%	38	33%	7	6%
6	Women's participation in PFM& REDD+ activities	114	68	60%	40	35%	6	5%
7	Forest related conflict management capacity	114	72	63%	39	34%	3	3%
8	Improved housing conditions	94	34	36%	57	61%	3	3%
9	Children access to school	104	77	74%	27	26%	0	0%
10	Adoption of fuel efficient stoves	114	26	23%	56	49%	32	28%
11	Forest woodlots development	114	12	11%	69	60%	33	29%
	Overall perception	1204	492	41%	592	49%	120	10%

Regarding forest planation 11% of the respondents responded that forest plantation was highly carried out and 60% of the responded indicated that it was moderate while 29% responded that the planation was found very low. It was reported that in six woreda such as Haran buluk, Delo Mena, Goba Nensebo, Dodola and Gololcha about 125.45ha was covered by 277,428 seedlings (Appendix 24 section 4.2.3).

7.2. Negative Offsite Stakeholder impacts (CM3)

Adjacent to the BMERP, there are pastoral community who depends on livestock as a means of livelihoods. Traditional during dry season the community brings their livestock to the edge of forest for grazing. Under the project scenario the pastoral community continues using the area on the sustainable basis in the way that they still do not affect the resources negatively. This was stated in the participatory forest management (PFM) plan where the offsite stakeholders who had the traditional use right on the forest will be considered as secondary members.

The Bale Mountains Eco-region REDD+ Project was not expected to have negative social & economic impacts on the stakeholders. The implementation strategy of the project is Participatory Forest Management (PFM) which make ensure participation of all identified stakeholders that supposed to be affected by the project activities. The activities have been carefully designed so that elite capture, one of the frequently identified potential threats, is properly addressed. Hence, PFM is implemented in the reference area and is based on a participatory mapping exercise carried out with the different community members to identify and understand the various relationships that exist in the Bale Mountains Eco-Region – both within and outside the project area. This has ensured that all communities have a net benefit as a result of the REDD+ activities.

The project has promoted economic development based on sustainable use of natural resources which includes value addition on local products such as forest coffee, honey, bamboo products) and market identification. There was monitoring system to ensure that the REDD+ project generates positive impacts

and has system to manage any potential negative impacts to offsite communities, such as illegal logging, deforestation etc. If any unexpected negative impact is identified, the issue is discussed between OFWE and the affected community representatives to address and solve the issue immediately.

7.3. Exceptional Community Benefits (GL2)

The project demonstrably qualifies for Gold Level for its exceptional community benefits, because the comprehensive set of community approaches are effectively bringing benefits to the poorer sections of the local community. The following issues are addressed in turn below.

- *Project zone is in a low human development area*

Ethiopia's HDI value for 2013 is 0.435 which is in the low human development category positioning the country at 173 out of 187 countries and territories, according to the UNDP Human Development Report. The BMERP area does qualify as the group of rural areas that includes Bale, the project zone.

- *Benefits for people in the lowest category of well-being*

The experiences drawn from an earlier and on-going participatory forest management (PFM) practices reveal that deforestation can only be better counteracted if the needs and the rights of the local people are taken into account. PFM as part of the REDD+ activities ensures the poorest households and marginalized groups such as women headed households are included within the CBOs that implement the project activities along with OFWE.

The project has engaged the local communities living in and in surrounding area during design and implementation of REDD+ strategies. It is based on clear understanding of forest-related dependencies on vulnerable groups and the potential impact that REDD-plus activities could have on the livelihoods of vulnerable groups, including local community at large. It has empowered women in governance and improved their access to resources. The contributions to marginalized groups through the planned activities of conservation, sustainable management and restoration of forest resources strengthened through REDD-plus interventions. The environmental and social co-benefits from the REDD+ project and their impacts on vulnerable communities and also their potential contributions was taken into account.

- *Removal of barriers that prevent benefits of the poorer or vulnerable group*

The barrier to poorer and vulnerable groups, which were identified in the Bale REDD+ project case was, rural women, their low participation initially. To address this issue the project identified the cause for low participation and arranged FPIC consultation called women only FPIC to reach out to women in the best place and time convenient for them. Accordingly as many as 8279 women participated, informed about the project, expressed their expectation and given their consent of the acceptance of the project.

Moreover, as a result of the women only FPIC consultation approach 457 women in three woredas have joined membership of the forest CBOs and contributed towards the revision of CBO bylaws. Accordingly, in a revised bylaw there are articles which state that out of the 7 members of Executive committee at least 2 members must be women. Moreover, it is stated that if a chairperson of the CBO is a man, the deputy should be woman while the reverse still holds true (Appendix 25).

8. BIODIVERSITY

8.1. Net Positive Biodiversity Impacts (B2)

The Bale Mountains is the most important component of the Ethiopian Highlands Conservation International (CI) Hotspot, within the Eastern Afromontane Hotspot (PASP, 2005).The Bale Mountains have one of the highest incidences of animal endemicity of any terrestrial habitat in the world, with 160 endemic species of flowering plants and is the most important area of high conservation values in the Ethiopian highland. It constitutes part of Conservation International's Eastern Afromontane Biodiversity Hotspot Area, and is one of the 69 Important Bird Areas (IBAs) designated in the country, harboring about 280 bird species, of which six are endemic, seven are globally threatened and 42 out of 48 Afro-tropical highland biome bird species (88% of the total in the country). Compilations of previous studies show at least 78 mammal species, belonging to nine orders and 23 families of mammalian groups, are known to occur in the Bale Mountains Eco-region. Twenty (26%) of the total species are reported to be endemic to Ethiopia representing 40% and 67% of the total mammal species and endemics, respectively, occurring in the Ethiopian highlands. Furthermore, at least five species are presumed to be confined to the Bale Mountains area while another five species are locally endemic.

Under the "without project" scenario, 32.2 %of the Bale mountains forest estimated to lose by 2031. The loss of forest cover implies a loss of biodiversity and habitat for local flora and fauna, as well as the environmental services that the forest provides. This loss of forest also directly affects the conservation of the soils and disturbs the ecological processes on a larger scale. However, the REDD+ project scenario assumes that the resources required to guarantee forest conservation and sustainable development are available from emissions reductions payments. Under this scenario, it is assumed that the forests in the project area can be conserved and promote great benefits in terms of biodiversity conservation when compared to the "baseline" scenario. This has achieved through the establishment of a robust system for biodiversity conservation and monitoring in the Bale Mountains Eco-region in which community actively engaged. The importance of involving local communities and their role in maintaining the integrity of the ecosystem is highly encouraged through Participatory Forest Management (PFM).

The Bale mountains REDD+ project contributed to decrease rate of deforestation by 62% which implies for high conservation of biodiversity. The project is set in Afromontane humid and dry forest ecosystems housing diverse wild Arabica coffee, and other endemic flora and fauna populations. No invasive species have not been e introduced in the natural forest area. It envisages enhancing wild coffee production from the existing natural forest while promoting marketing of coffee beans at premium price. The project also encourages sustainable production and harvesting of Non Timber Products (NTFPs) to compliment the livelihood of the local community. In the Bale Mountains Eco-region, the communities grow exotic species at the vicinity of their villages/farms as boundary plantings or woodlots while the Oromia Forest and Wildlife Enterprise grows industrial exotic plantations of *Cupressus lusitanica* and Eucalyptus species in the concession area outside of the forest areas. The plantations are meant to meet the ever increasing demand of the local community for wood and thereby reduce pressure on the natural forest. The genetically modified organisms has never been introduced and will not be used in anyway in the project area. Moreover, people's perception about the biodiversity impact were monitored by using Participatory Rural appraisal (PRA) and Participatory forest assessment and the results are described as below:

Awareness creation on climate change and REDD+ project was aggressively provided to the community members and these activities were judged as high by (75%) of PRA participants while (24%) perceived it was medium and (1%) responded low. Similarly, in relation to the delivery of these activities, the level of peoples' awareness were monitored with same procedure. Hence, almost all the PRA participants which was about (87%) perceived that community's understanding about climate change and REDD+ was highly improved while (13%) perceived community's awareness was medium mentioning that there were some individuals who would be further addressed (Table 17 and appendix 6).

Following these awareness creation efforts, the community in the project area started to actively engage in the sustainable forest management and this extent of community's engagement in forest management was judged as high by (61%) of PRA participants while (33%) perceived that the participation was medium and the remaining (6%) perceived it was low participation. In general, during focus group discussion it explained that many people involved in forest patrolling and controlling of illegal activities such as illegal tree felling, conversion of forest to farmland. Emphasis to gender issue, women's participation separately monitored and (60%) of PFR confirmed that women's participation in forest activities was high than what was before the project and about (35%) of the PRA participants perceived it was medium mentioning that women had several responsibilities and did not have sufficient time to participate with men equally. The remaining (5%) of participants felt that women's participation was low (Table 18).

On the other hand, the Bale REDD+ project distributed 28,445 fuel efficient stoves to project beneficiaries in 2012 and 2013 (Appendix 5). Referring to this distribution, about (4%) of the PFR participants indicated that the distribution was done highly while the majority of participants (55%) perceived the distribution

was moderate and the other (40%) mentioned that the distribution extent found low mentioning that the distribution was sufficient because there were many individuals who were waiting for get the fuel efficient stoves (Table 18). The fuel efficient stoves were basically distributed to beneficiaries of the project to address the two important purposes. Primarily, it aimed at reducing high consumption of fuel woods which has implication to the forest resource and carbon emission. Secondly, it supposed that the stoves would improve health condition of women by avoiding excess heating and smokes that affect the health conditions of the women particularly their eyes. Towards these objects, the assessment was conducted to get insight how the technology was efficiently adopted and then (23%) of the participants perceived that fuel efficient stoves were efficiently adopted at high rate while (49%) perceived the adoption trend found moderate and the remaining (28%) of the participants perceived it was found low (Table 18).

Besides to this, MSc study entitled fuelwoods consumption and environment implications was sponsored by the Bale REDD+ project and this study revealed that fuel efficient stove used to decrease fuelwoods consumption by 28.6% as compared to tradition stove which implies for saving 0.875 ton of fuel wood/stove/year/. This value was used to calculate a total amount of fuel woods saved. Accordingly, the total stoves 28,445 stoves that were distributed has a contribution to avoid the destruction of forest biomass equivalent to 24,884 ton/year.

Concerning the overall benefits of the biodiversity, the deforestation analysis made using Landsat image indicated that deforestation in the eco-region 12500 ha of forest was saved from deforestation which was 62% achievement of reducing deforestation against what was estimated under scenario of business as usual in the absence of REDD+ project. This indicates biodiversity in the project areas is well conserved in a better conditions at larger landscape level which implies that many plants biodiversity and wild animals protected from destruction.

To supplement biodiversity benefits assessed through PRA technique, a case study was carried out in the selected (HVC) area using Participatory Forest Resources Assessment tool adopted and used to assess forest resources in the Bale eco-region. Therefore, the case study conducted in Chiri forest compartments indicated that the average forest basal area in 2012 was 29.3m^2 /ha and it was increased to 30.05m^2 in 2015. This implies the average basal area was increased by 0.75 m^2/ha with average increment of 0.75 m^2/ha over the indicated three years (Table 19). The largest increment of the basal area 1.49 m^2/ha was recorded in Dikocho compartment while decrease in basal areas was identified in Hiliye compartment. Despite these, the overall result indicates the total basal area increment implies for sustainable forest management.

Table 19: Basal area statistics

No	Compartment name	Basal area in 2012	Basal area in 2015	Increment over 2012 to 2015

1	Hiliye	30.4	29	-1.4
2	Melka fugnani	28	30	2
3	Dikicho	31.71	33.2	1.49
4	Bahicho	27.1	28	0.9
	Total	117.21	120.2	2.99
	Average /ha	29.3	30.05	0.75

During assessment of 2012, the forest regeneration was recorded as plenty in 11 plots and in 2015 reduced to 8 plots because those seedlings were below 2 meters in 2012 grew and shifted from the regeneration to other forest class. Unlike this, regeneration in medium category was increased from 14 to 22 plots which was the indication to the increase of regeneration as compared to the baseline data. Similarly, in 2012 the regeneration was recorded as scarce in 11 plots but in 2015 it was decreased to 6 plots which is an indicator for the improvement of regeneration (Appendix 7).

Regrading, wild animals the PRA participants indicated that before intervention of the Bale REDD+ project in some places wild animals were killed illegally by individuals for various reasons. After intervention this incidence decreased and the trend of decreased was perceived as high by (96%) of the PRA participants while (4%) perceived trend of incidence was decreased slowly. Having discussion with participants, it was clearly explained that an incidence of killing wild animals was decreased by far in relation to provided awareness creation activities and capacity building supports provided to REDD+ CBOs. Following decrease of this illegal activities and better conservation of forest resources, it assumed that the visibility or presence of wild animals in the area expected to increase. With this assumption, PRA participants were requested and about (46%) of participants indicated that the wild animals' frequency to appear around forest was increased highly while (50%) perceived it was moderate and the remaining (4%) perceived as it was low or rare (Table 20).

Table 20 People's perception about biodiversity benefits

S/N0.	Parameters	Total Participants	High		Medium		Low	
			No.	%	No.	%	No.	%
1	Reduced deforestation trend in the project area	112	79	71%	33	29%	0	0%
2	Reduced rate of deforestation surrounding to the project boundary	114	73	64%	36	32%	5	4%

	(leakage belt)							
3	Forest regeneration improvement	114	89	78%	24	21%	1	1%
4	Reduced illegal tree feeling	114	73	64%	40	35%	1	1%
5	Decreased incidence of forest fire	114	108	95%	6	5%	0	
6	Decreased trend of slashing of undergrowth in the forest coffee area	94	25	27%	56	60%	13	13%
7	Reduced incidence of Killing of wild animals	114	110	96%	4	4%	0	0%
8	Frequency of appearing of wild animals in and around the forest	114	53	46%	56	49%	5	4%
	Overall perception	890	610	69%	254	29%	26	3%

8.2. Negative Offsite Biodiversity Impacts (B3)

The Bale Mountains Eco-region REDD+ Project is designed in a way to not bring any negative offsite biodiversity impacts. It rather expected to result in increased conservation value to an area that is globally significant. Therefore, the project does not bring any negative offsite of biodiversity impacts.

8.3. Exceptional Biodiversity Benefits (GL3)

Ethiopia has a large number of species listed as critically endangered and vulnerable to global extinction. The threatened species in Ethiopia can be broken down into three categories (based on IUCN ratings): Critically Endangered, Endangered and Vulnerable (Massicot, Paul 2005). In the table below (Table 21) Mountain Nyala, Ethiopian Wolf, African Wild dog, Harena shrew and others which are found in the project area falls in one of these three categories. This implies implementing the project and improving the management of the eco-region helps to save and sustain the lives of these endangered species and their ecosystem functions.

Table 21: **List of fauna species in Bale eco-region at various level of threat**
http://www.animalinfo.org/country/ethiopia.htm

Critically endangered mammals	**Endangered mammals**	**Vulnerable mammals**		
Bilen gerbil	Grevy's zebra	African	Large-eared free-	Red-fronted gazelle

		elephant	tailed bat	
Black rhinoceros	Mountain nyala	Ammodile	Lesser horseshoe bat	Rupp's mouse
Ethiopian wolf	Nubian ibex	Bailey's shrew	Lion	Scott's mouse-eared bat
Guramba shrew	African wild dog	Bale shrew	Moorland shrew	Soemmerring's gazelle
Harenna shrew		Beira antelope	Morris's bat	Speke's gazelle
MacMillan's shrew		Cheetah	Mouse-tailed bat species	Spotted-necked otter
Walia ibex		Dibatag	Natal free-tailed bat	Stripe-backed mouse
		Dorcas gazelle	Nikolaus's mouse	
		Glass's shrew	Patrizi's trident leaf-nosed bat	

The Bale Mountains are unique in Africa and encompass Africa's largest alpine plateau which contains the largest populations of two of Africa's least known and yet most charismatic species – the Ethiopian wolf and the Mountain Nyala (Figure 24). Bale Mountains also harbour an exceptionally high number of other species endemic to Ethiopia and, in some cases, endemic to the Bale Mountains themselves. They are included in Conservation International's Eastern Afromontane Biodiversity Hotspot (one of 34 such critical eco-regions for biodiversity conservation in the world) and are designated as one of BirdLife International's Important Bird Areas.

Figure 23: ***Endemic Mountain Nyla - male***

Among the larger mammal species of the area, five deserve special conservation attention since they are not only endemic and/or globally threatened, but are also important flagship species for the Ethiopian highlands. These include the endangered endemic Bale monkey (*Chlorocebus djamdjamensis*), Ethiopian wolf (*Canis simensis*) and Mountain nyala (*Tragelaphus buxtoni*), as well as the endangered Wild dog (*Lycaon pictus*) and the Ethiopian lion (*Panthera leo*) (Figure 25) which has recently been recognized as genetically different from other lion in East Africa.

Figure 24: ***Ethiopian lion with unique black mane – Harenna forest area***

Around 78 species of mammals are recorded in Bale, which represent 40% of mammals known from the whole Ethiopia. Out of these, 20 species are Ethiopian endemics, representing 26% of the total species reported in the area. This is by far the highest proportion of endemics. On average, about 10% of the flora and fauna of Ethiopia are endemic. The endemic mammals of the Bale Mountains also 67% of the total endemic mammals recorded in the Ethiopian highlands. Isolation and rarity put these endemic species at high risk of extinction and, thus, in need of effective conservation strategies that are supported nationally and internationally. Not only does this area protect a significant portion of Ethiopia's and the world's biodiversity, it is also an area with immense benefits for species evolutionary processes.

However, the current trend of ecological degradation in the area poses a severe threat to the survival of most of these rare species. It has even been said that ''if conservation efforts are not successful and people continue to exploit the resources in an unsustainable way, more species of mammals would go extinct than any area of equivalent size on the globe.''

Hence the work that is envisaged to be carried out by the REDD+ project over the whole Bale Mountains area will no doubt have an exceptional biodiversity benefits while placing a sustainable natural resources management system in an area with such global significance.

There are seven globally threatened species of birds recorded in the Bale Mountains. These include four vulnerable species (Greater Spotted Eagle, Imperial Eagle, Lesser Kestrel and Wattled Crane), and three near-threatened species (Pallid Harrier, Rouget's Rail, and Abyssinian Longclaw). The 6 endemics out of the total 16 Ethiopian endemics are: Spot-breasted Plover, Yellow-fronted Parrot, Abyssinian Longclaw, Abyssinian Catbird and Black-headed Siskin. The Spot-breasted Plover population is the largest and most significant for the species, and hence deserves conservation on its own. All these endowments make the Bale mountains eco-region to be unique and providing exceptional biodiversity benefits.

9. ADDITIONAL INFORMATION

9.1. LIST OF APPENDICES

1a: Remote Sense based Land Cover Change Analysis report of 2015

1b. Bale REDD+ deforestation modeling report

2. Deforestation and Green House Gas emission calculation for project period (2012-2015)

3. Deforestation and Green House Gas emission calculation project life time

4. Organizational capacity Building Assessment report of 2015

5. Distribution of fuel efficient stoves

6. Assessment of people's perception on biodiversity and socio-economic impacts of Bale REDD+ project

7. Participatory Forest resources assessment report of Chiri kebele in 2015

8. MSc study on efficiency of fuel stoves

9. Bale REDD+ Modelling Report

10. Bale REDD+ Forest Carbon Stock Assessment Training Manual Version II

11. Bale-REDD+ VCS non permanence risk assessment

12. Bale-REDD+ VCS non-permanence risk report calculation tool v3 plus governance score

13. Wood density data for species in Ethiopia and Bale

14. Grievance handling mechanism

15. The constitution of Ethiopia Federal Republic

16. Ethiopian Federal Rural Land administration Proclamation

17. Oromia Forest and wildlife enterprise Labor law

18. Proclamation of Federal forest Development, Conservation and utilization

19. Oromia Regional state Forest proclamation

20. Federal proclamation to establish cooperatives' commission

21. Ethiopian Federal labor proclamation

22. VM 0015 methodology for Avoided Un planed Deforestation V1.1

23. Oromia Forest Landscape Program Process framework

24. Bale REDD+ project 2015 Annual Report

25. Bale REDD+ Donor's Annual report in 2014

26. Bale REDD+ Donor's Annual report in 2016

27. PFRA guideline

28. Participatory Rural Appraisal guideline