

Forest and Community Analysis

As part of the NABU project:

"Climate Protection and Preservation of Primary Forests – A Management Model using the Wild Coffee Forests in Ethiopia as an Example"

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By the

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Acronyms and Abbreviations

BHD	Breast Height Diameter	
BR	Biosphere Reserve	
CIA	Coffee Investment Area	
DoAD	Department of Agricultural Development	
DTM	Digital Terrain Model	
EMA	Ethiopian Mapping Authority	
EWNHS	Ethiopian Wildlife and Natural History Society	
GIS	Geographic Information System	
нн	Households	
IBC	Institute of Biodiversity Conservation	
Kafa BR	Kafa Biosphere Reserve	
KFCU	Kaffa Forest Coffee Farmers Cooperative Union	
LU	Land Use	
LUC	Land-use change	
LULC	Land use / Land cover	
LULUCF	Land-use, land-use change and forestry	
MAB	"Man and Biosphere"	
MTS	Multiple Tree Species	
NABU	The Nature and Biodiversity Conservation Union	
RFPA	Regional Forest Priority Area	
NTFP	Non-Timber Forest Product	
PRA	Participatory Rural Appraisal	
RS	Remote Sensing	
SUPAK	Sustainable Poverty Alleviation in Kaffa	
ТМ	Topographic Map	

Table of Contents

1.		Ex	ecutive Summary	7		
2.		Introduction7				
3.		Ва	ckground	9		
	a.		Description of the project in general and description of the specific task	.10		
	b.		Kafa Biosphere Reserve	.11		
	c.		Existing Protected Areas and Management Models	.18		
4.		Ob	ojectives	.21		
	a.		Drivers for forest loss	.22		
		i.	Population Pressure	.22		
		ii.	Agriculture Expansion	.22		
		iii.	Resettlement	.23		
		iv.	Concessions (coffee)	.24		
		v	Property Rights	24		
		vi vi	Unsustainable use of forest resource	24		
	h	v	Identification of suitable areas of project components	25		
	.	i	Reforestation	25		
		1. 11	Community plantation	25		
				. 27 20		
F		нн. вл.	Agroiorestry	.20 30		
э.	_	IVI	eunoas	.20		
	а.			.29		
	b.		Remote Sensing,	.30		
		I. 	Classification of Remote sensing data	.30		
		п.	DEM production and assessment of erosion	.33		
	c.		GIS	.35		
		i.	Model production	.35		
			1. Agroforestry	.36		
			2. Reforestation	.36		
			3. Community Plantation	.39		
	d.		PRA	.41		
	e.		Capacity Building	.42		
	f.		Wood measurement	.42		
6.		Re	sults	43		
	a)		Current status of the forest and its fragmentation	.43		
		i.	General Causes for Fragmentation	.44		
		ii.	Concepts	.44		
			1. Landscape Fragmentation Tool	.44		
			2. Land-cover patterns	.45		
			3. Thematic Sources	.45		
		iii.	Relevance of Fragmentation for Kafa Biosphere Reserve and Planning of Reforestation .	.46		
			1. Outlook and Recommendations	.47		
	b)		People and Forest	48		
	~,	iv	PRA	48		
	c)		Tree selection	50		
	4) ~)		Site selection	65		
	uj	i	Woreda Adivo	67		
		ı. ;;	Woreda Rita	70		
		 	Worda Chana	.19		
		ш.	WUICUA UIEIIA	. 73		

iv	. Woreda Decha	106
v.	Woreda Gawata	127
vi	. Woreda Gesha	151
vi	i. Woreda Gimbo	170
vi	ii. Woreda Saylem	182
ix	. Summary of all selected sites	195
7. Le	essons learned	200
a.	Project planning	200
b.	Spatial Data	201
с.	Project components	201
i.	In general	201
ii.	Reforestation	202
iii	. Agroforestry	202
iv	community Plantations	203
d.	Forest loss	203
e.	Stakeholder	204
i.	Governmental representatives	204
ii.	Local Communities	204
8. N	lap production	205
9. R	ecommendations on the future status of forest and socioeconomic issues / project	
planni	ng adaptation	207
a.	Geodata – Kafa Biosphere reserve	207
b.	Specific recommendations	209
10.	References	
11.	Annex	
a)	Annex 1: In depth description of sites (distributed to Rangers)	213
b)	Annex 2: Table: Share of PEM sites on different Kebele	240
	Annex 3: Questionnaire for Group discussion	
d)	Annex 4: Ouestionnaire In-depth interviews	244
e)	Annex 5: Relevé Sheets	247
c, f)	Annex 6: Share of core zone area on administrative boundary (Kebele level)	
•,		

List of Tables

Table 1: Summary of Population Density in Kafa BR	11
Table 2: Distribution of habitats in Kafa BR	13
Table 3: share of core zone area on administrative boundary (Woreda level)	17
Table 4: Contribution of core zones on Woreda extent (%) compared with inhabitants (km ²)	18
Table 5: Considered PFM sites	20
Table 6: Basic data for LULC classification	31
Table 7: Cofusion matrix for remote sensing classification	32
Table 8: Slope classes concerning forested areas and other land cover	34
Table 9: Slope classification	35
Table 10: Wood measurement	43
Table 11: Reforestation of degraded natural forest with native pioneer-tree species - Albizia spe	ec.52
Table 12: Reforestation of degraded forest with native pioneer-tree species - Cordia africana	53
Table 13: Reforestation of degraded forest with native pioneer-tree species - Celtis africana	54
Table 14: Reforestation of degraded forest with native pioneer-tree species - Hagenia abyssinica	a.55
Table 15: Reforestation of degraded forest with native pioneer-tree species - Macaranga spp	56
Table 16: Species for Community plantation for wood supply - Eucalyptus spec.	57
Table 17: Species for Community plantation for wood supply - Arundinaria alpine	58
Table 18: Species for Community plantation for wood supply - Casuarina cunninghamiana	59
Table 19: Species for Community plantation for wood supply - Casuarina equisetifolia	60
Table 20: Species for Community plantation for wood supply - Pinus radiata	61
Table 21: Agroforestry with native multi use tree species - Erythrina brucei	62
Table 22: Agroforestry with native multi use tree species - Millettia ferunginia	63
Table 23: Agroforestry with native multi use tree species - Prunus africana	64
Table 24: Adopted main criteria for site selection	65
Table 25: Selected Sites on Woreda level	. 199
Table 26: Data Source in general	.206
Table 27: How to read the maps?	.206
Table 28: Additional Information on Maps and their data source	.207

List of Figures

Figure 1: Errors in Biosphere Reserve Geodata	14
Figure 2: Site selection Workflow	29
Figure 3: Spatial Model (ArcGIS) for component "reforestation	
Figure 4: Patchy BR Zonation	207
Figure 5: BR Core Zone unprotected	208
Figure 6: BR Core zone very close to BR boundary	208
Figure 7: Inconsistent handling of roadnetwork	

List of Maps

Map 1: Overview of Kafa Zone and Biosphere Reserve / Ethiopia	8
Map 2: Woreda boundary discrepancies	9
Map 3: Habitat Types in Kafa Biosphere Reserve	.13
Map 4: Population density in Kafa BR	.16

Map 5: Spatial distribution of core zones (blue) on Woreda level	17
Map 6: National Forest Priority Areas in Kafa BR	19
Map 7: Participatory Forest Management in Kafa BR	21
Map 8: Spatial distribution of basic data	31
Map 9: 3D view on Kafa Biosphere Reserve	34

1. Executive Summary

The component "Forest and Community Analysis" was conducted within the framework of the International Climate Initiative project ""Climate Protection and Preservation of Primary Forests – A Management Model using the Wild Coffee Forests in Ethiopia as an Example "implemented by NABU – The Nature and Biodiversity Conservation Union, Germany's biggest Nature Conservation Organisation. During a timeframe of six month, the task was concerned to select sites for reforestation, community plantation and agroforestry introduction within the Kafa Biosphere Reserve. Hence, this project component contributes to climate change mitigation and tries to bridge the gap between wood demand of rural communities and forest loss.

Calibrated GIS models could help to perform a rapid assessment of the study area to select potential sites for project components implementation (reforestation, community plantation and agroforestry). Different strategies combining satellite image interpretation and geoprosessing to understand the biophysical processes and discussions with forest stakeholders were developed. The participation of rural communities is considered to be crucial for a sustainable project implementation. Participatory Rural Appraisal was implemented to integrate the know-how and motivation of the people whose future is strongly related to the forest. In total 128 sites for the above mentioned different project components could be selected, while 49 sites are reforestation sites, 65 sites are assigned for community plantation, and at 13 sites agroforestry strategies will be introduced.

2. Introduction

The cloud forests in the Kafa Zone in southwest Ethiopia (division Southern Nations, Nationalities and People's Region) have international importance due to their ecology, biodiversity and economic value (due to significant contribution on the world market of coffee). Furthermore, they contribute to climate protection as significant carbon storage. The preservation of these forests is a major policy concern. International recognition to the unique forest cover with different varieties of wild Coffea Arabica has been given by the acceptance as UNESCO MAB Biosphere Reserve in June 2010.



Map 1: Overview of Kafa Zone and Biosphere Reserve / Ethiopia

The future of the forests in the Kafa zone is strongly related to the future of people living in and from the forest resource. Successive resettlements and spontaneous migration have caused tremendous land use and land cover (LULC) changes. Agriculture expansion, wood collection for construction and cooking and forest grazing threaten the existence of the remaining primary forests.

This project component "Forest and Community Analysis" is directly related to the international initiative REDD+ (Reducing Emissions from Deforestation and Forest Degradation) which aims are directed towards forest conservation, sustainable forest management and the enhancement of carbon stocks. In Kafa region there are different approaches concerning forest conservation such as protected areas (Regional Forest Priority Areas, UNESCO Biosphere Reserve) and concepts to implement sustainable forest management (Participatory Forest Management).

This project component is directed to the enhancement of carbon stocks within the Kafa Region. It takes the biophysical processes (forest conversion, LULC dynamics, erosion and soil degradation) and perceptions of forest stakeholders into concern, to propose land for sustainable land use conversion. Three active land use conversion strategies (reforestation, community plantation, implementation of agroforestry) are proposed and site selection criteria were elaborated on the analysis of spectrally classified satellite images (ASTER 2010 / SPOT5 2011), 'round-tables' with relevant forest stakeholders and introduced Participatory Rural Appraisal (PRA). The study area for the implementation and selection of sites for project action is the UNESCO Kafa Biosphere Reserve (Kafa BR). According to the analysis of recent satellite imagery, 47 percent or 351,641.22 ha of the Kafa BR are covered by forest in 2011.

The BR has an area of 744,919.18 ha of land and according to the census of 2002 (SUPAK data) a population of 718,526 (including whole Decha). Administratively, the BR is divided into ten woredas (Tello, Chetta, and Decha only partly) and 250 rural kebele administrations and 25 urban

towns (according to Bureau of Finance and Economic Development Southern Nations, Nationalities and People's Region, Ethiopia). Due to the minor contribution of Tello and Chetta on study area extent, they are not considered in the analysis. The highest population density can be found in Chena Woreda (1007 p/km2) and the lowest in Saylem woreda (6 p/km2). The average population density of the BR is 130,14 p/km².

According to the importance to consider all relevant stakeholders, the official woreda boundaries of the 'Bureau of Finance and Economic' are used for the analysis. According to the administrative infrastructure of official bodies, each Woreda has its' own DoAD and woreda representative.



Map 2: Woreda boundary discrepancies

There are 20 ethnic groups living in the zone and the ethnic composition shows that Keffecho, Amhara, Bench and Oromo accounts for 81.04%, 5.72%, 5.5% and 2.35% respectively (Central Statistical Agency, 2007 as cited from EWNHS, 2008).

According to a GIZ survey (2000) the minority group 'Menja' are categorized under the Keffecho ethnic group and constitute about 5% to 10% of the total population in the Biosphere Reserve (Kafa Biosphere Reserve Application, 2009).

The heterogeneity of driving factors for forest loss and socioeconomic differences, unsecure land tenure and the absence of an accessible land-register forced an individual selection of sites but a general model could be used to determine a pre-selection for stakeholder discussion and community selection.

3. Background

a. Description of the project in general and description of the specific task

The overall goal is the implementation of the project "Climate Protection and Preservation of Primary Forests – A Management Model using the Wild Coffee Forests in Ethiopia as an Example" funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). The aim of the project is the protection and sustainable use of the remaining primary forest in south-west Ethiopia. Reasons and incentives to protect these forests are various and it highlights the unique character of this project. The ecological value is one of them due to the genetic origin of *Coffea Arabica* in the mountainous cloud forests. Closely related are economical values for whole Ethiopia, which is the seventh largest coffee producer in the world. Coffee is Ethiopia's most important export crop.

Besides the invaluable biodiversity of Ethiopia's forests, the protection will make a contribution to mitigate climate change by avoiding greenhouse-gas emissions and it will secure carbon storage capacities. Carbon stabilization and sequestration will be increased through activities reducing deforestation/ degradation or active enhancement of storing capacity by reforestation and rehabilitation of fragmented forests and degraded areas. Due to the fact that the gap between wood demand and supply is continuously growing, community plantations with fast-growing species will be introduced and safeguard both, the needs of the local population and positive effects on biophysical processes.

The project component "Forest and Community Analysis" (contract number 11/2010_2) is timephased at the beginning of the 4 years overall project activity and responsible for locating appropriate sites for different project components namely

- 500 ha Reforestation of degraded or fragmented forests,
- 1,500 ha Community plantations to create an additional wood supply for rural communities and the
- 200 ha Introduction of Agroforestry systems on pilot sites.

In general it includes an analysis of the status of the forest, which is based on the forest fragmentation and its' underlying causes, addressing the main habitats and the detection of species composition around and on selected sites.

Due to the different intentions of project components (reforestation, community plantation, Agroforestry), decisive biophysical and socioeconomic criteria for the allocation of sites were selected to guarantee a sustainable project result. While the allocation of 500 ha for reforestation depends on forest fragmentation and the support of the Biosphere Reserves' zone functions; the establishment of 1,500 ha Community plantations is a participatory process with rural communities to bridge the gap between wood demand and supply. The character of introducing Agroforestry systems to the Kafa BR should serve as a 'model of good practice' to evoke imitation by local people to combat farm land degradation. As different as the intentions of these three components are, as diverse the methods to solve them. Especially in developing countries, where detailed land information is often rare, Geographical Information Systems (GIS) in combination with Remote Sensing is a powerful tool. GIS models were developed to rapidly assess the potential sites for implementation of the project components. This pre-selection of sites was discussed with all relevant stakeholders and it was helpful to select rural communities to implement a Participatory Rural Appraisal (PRA). After harmonization of spatial and non-spatial information final sites could be selected.

Due to the time-phase at the beginning of the project "Climate Protection and

Forest Preservation - A Management Model using the Wild Coffee Forests in Ethiopia as an Example," the lossons learned during the activity can contribute to the other sub components

Example", the lessons learned during the activity can contribute to the other sub-components and examined areas of conflict can help to adopt the project planning.

b. Kafa Biosphere Reserve

i. General information on Kafa Biosphere Reserve

The Kafa Biosphere Reserve was accepted by the UNSECO "Man and Biosphere" Program in June 2010. It is based on a comprehensive management plan and has celebrated the inauguration in March 2011 with a lot of medial interest and prominent guests. Due to good marketing, the Kafa Biosphere Reserve is well known among the urban population in Kafa. Anyhow, it is recommended to enlarge the PR campaign with different tools to rural places. The implemented PRA revealed an information gap at rural communities even when living in or adjacent to sensitive BR zones (such as Core or Candidate Core area). During in-depth-interviews, the awareness level of different forest protection measures was assessed (Participatory Forest Management, Regional Forest Priority Areas, and Kafa Biosphere Reserve). Due to the long tradition of PFM sites, this strategy was known by dwellers close to PFM sites as well as far from them. In the case of Kafa BR, especially the forest dwellers did not have sufficient information about the function, duties, and rights of a Biosphere Reserve.

As mitigating climate change is on the top of agendas of many initiatives it fits also very well to the concept for MAB Biosphere Reserves. Protected areas in general can contribute to reduce climate change impacts. In many cases protection is the only way of keeping carbon locked in an ecosystem. Consequently, the Kafa Biosphere Reserve is the project area for the project "Climate Protection and Forest Preservation - A Management Model using the Wild Coffee Forests in Ethiopia as an Example" funded by the International Climate Initiative. The analysis component "Forest and Community Analysis" takes a major part in improving the capability to store carbon and enhancing the incentives to contribute on the voluntary carbon market.

As the statistical data are dissolved to Kebele level, it is not possible to give precise numbers for population density. According to the census 2002 (SUPAK data) the mean population density within the Kafa BR is 130 p/km².

Woreda	Population density (p/km ²)		
Adiyo	121.7		
Bita	63.6		
Chena	236.7		
Decha	96.2		
Gewata	102.1		
Gesha	117		
Gimbo	156.4		
Saylem	59.7		
* can only show the tendency of population density due to data source publication date 2001 (SUPAK data)			

Population density according to the Woreda level looks as follows:

Table 1: Summary of Population Density in Kafa BR

The table indicates a very heterogeneous population distribution on Woreda level. This is one of the reasons for the necessity to adopt the criteria of the project activity toward the different Woredas, e.g. in Chena it was very challenging to detect sites for any project activity (except sites for Agroforestry) due to Woreda-wide LU for private farming activity.

ii. Habitat types within the Biosphere Reserve

Different habitat types can be found in the Biosphere Reserve, according to the Institute of Biodiversity Conservation (Kafa Biosphere Reserve application, 2009), namely:

- Sub-Afroalpine Habitat Type (altitudinal range > 3,200 m.a.s.l.)
- Evergreen Montane Forest and Grassland Complex (altitudinal range 1900 3.300 m.a.s.l.)
- Moist Evergreen Montane Forest Habitat Type (altitudinal range 1500 1900 m.a.s.l.)
- Combretum-Terminalia Woodland Habitat Type (altitudinal range 900 1900 m.a.s.l.)
- Wetland Habitat Type (altitudinal range 900 2600 m.a.s.l.)

They are characterized by different plant societies and geographic criteria. There was an attempt to delineate the Kafa Biosphere Reserve according to the latter named vegetation types. This was done by intersecting the satellite image classification towards altitudinal range and a stepwise classification on spatial neighborhood. For intersection with altitudinal range, following LU classes were not considered: "Coffee investment area", "Pine plantation", "Tea plantation", "Agriculture". Following data sources were used to delineate the habitats from each other:

- Digital Terrain Model (resolution 30 m)
- Satellite image classification (ASTER / SPOT5)
- SUPAK database

According to IBC the Moist Evergreen Montane Forest Habitat Type occurs between an altitudinal range of 1,500 – 2,600 m. In the classification, the focus was on the occurrence of *Coffea Arabica* due to its economic and ecologic importance. According to the Kafa Zone Agriculture and Rural Development Department, the upper altitudinal limit for coffee growth is 1,900 m.a.s.l., while Schmitt (2006) describes the most suitable range for coffee growth as being 1,500 – 1,800 m.a.s.l.. Hence, this habitat type is limited for classification purposes to an altitude of 1,900 m.a.s.l.. According to the 'National Biodiversity Strategy and Action Plan' (IBC, 2005) the habitat type "Combretum-Terminalia Woodland Habitat Type" includes Oxytenanthera abyssinica, which can mainly be found in the Woreda Adiyo.

It has to be pointed out, that the data have to be validated in field and criteria have to be improved.

The distribution of habitats in the Kafa BR looks as follows:



Map 3: Habitat Types in Kafa Biosphere Reserve

The spatial distribution of habitats show that the Sub-Afroalpine Habitat Type only occurs to a minor extent in the south-east (Woreda Tello / Kebeles Shosha, Migera; Woreda Adiyo / Kebele Mecha) while wetlands are more present in Woreda Bita, Gawata, and Gimbo.

The share of different habitat types in the Kafa Biosphere Reserve looks as follows:

Habitat Type	Area (ha)	Area (%)
Sub-Afroalpine Habitat Type	826.67	0.2
Sub-Afroalpine Habitat Type / Arundinaria alpina	492.67	0.1
Evergreen Montane Forest and Grassland Complex	214986.55	52.1
Moist Evergreen Montane Forest Habitat Type	107393.28	26.1
Combretum-Terminalia Woodland Habitat Type	61307.48	14.9
Wetland Habitat Type	26832.69	6.6

Table 2: Distribution of habitats in Kafa BR

iii. Zonation of Kafa Biosphere Reserve

The Zonation concept is a centerpiece for any planning and management tasks concerning land use. According to the management plan (Dennis Moss Partnership), the key functions are:

- Core Zones, which should serve as refugee for various endemic and /or endangered

species, provide opportunities for long and short-term research and monitoring programs, as well as non-consumptive use.

- Candidate Core Zones, which constitute of highly endangered habitats. They are supposed to be included into the Core Zones are far as the feasibility is explored.
- Buffer Zones, which have a very important function as vitally important linkages between the statutory conservation areas, the rehabilitation of degraded river systems to create ecological corridors as part of the buffer. This Zone can therefore play an important role in connecting conservation areas that have been isolated by human activities. In general, the buffer zone should encourage the function of a symbiotic relationship between conservation and nature related economic activities; the aim is to invest a portion of benefits derived from the use of natural resources back into conservation.
- Transition Zones, which have the function of enhancement of the environmental integrity or rehabilitation of unutilized farmland and plantations, aim at restoration and preservation of sites and /or features of historical and cultural significance.

Accordingly, the Kafa Biosphere Reserve consists of 28,172.12 ha core area (4%), 219,320.39 ha candidate core (28 %), 161,351.85 buffer area (22 %), and 336,069.01 ha transition area (46 %). In total the BR area has a size of 744,919.35 ha.

Area size of the Kafa BR is varying between 745 518 ha - 760 000 ha in different publications. For this analysis, the boundary and zones of the geo-data were revised to clean overlapping areas and gaps but the general database "refers to the current boundaries of Kafa BR as shown in the map from June 2010" (TOR "Forest and Community Analysis").



Figure 1: Errors in Biosphere Reserve Geodata

The inconsistency of BR geodata was discussed with NABU – HQ (Jena meeting, January 2011). The final elimination and correction of the data was proposed to be discussed also with local coordinators. Due to communication problems, there was no final approval of this issue. Anyhow, the data are corrected concerning gaps and overlaps and will be handed over in a final set of geodata on DVD.

Further irregularities in BR Zonation data could not be corrected without supervision. More details are given in the Chapter 9 (Recommendations).

iv. Share of forest and population density

According to very recent (2010/2011) satellite data, it was possible to update forest cover information within the Kafa BR. The forest cover (all non-managed and managed forests) has a spatial distribution of 351641.22 ha. It has to be stated, that forest cover has to be revised while incorporating the complete SPOT5 coverage for the Kafa BR. Due to late distribution of images (PlanetAction initiative) in the central of Kafa BR, the satellite imagery of SPOT5 could not be incorporated. This leads to a heterogeneous resolution of forest cover information. Though SPOT5 imagery were resampled to the spatial resolution of ASTER (15 m), a lot of mixels (pixels with mixed spectral information) led to a overestimated forest cover classification due to the incorporation of trees forming traditional live fencing. To overcome this problem, a mixture of spectral and object-oriented classification is recommended. The forest cover is distributed on different BR zones in the following:

- core zone with 28110,62 ha of forest
- candidate zone with 174482,02 ha of forest
- buffer zone with 87487,57 ha of forest
- transition zone with 61560,99 ha of forest

As core zones are assigned only for low impact uses, it seems to be very important to support populated areas close to core zones, with e.g. additional wood resource, or more efficient management practices such as agroforestry.

The map below should give an impression on population density (Kebele level) (Inhabitants / km²) and Biosphere Reserve zonation. The population density according to Kebele level can be found in the Appendix (f).



Map 4: Population density in Kafa BR

According to the objective, the distribution of selected sites is evenly spread. But priority is given to the site characteristics and the importance concerning the fulfilment of selected criteria (e.g. buffering the core zone has more weight than enhancing forest connectivity). The site selection is harmonized with the spatial distribution of the BR zonation. Especially for core zones the use rights are restricted except for research. Accordingly, it was calculated which Woreda has the most area share percentage of core zones to find out which Woreda has priority to compensate the 'locked' wood resource from primary forest. The distribution looks as follows:

Woreda Name	Woreda Size (ha)	Core Area (ha)	Percentage (%)
Adijo	102723.32	5947.07	5.78
Bita	109090.27	7270.35	6.65
Chena	90218.09	982.32	1.20
Chetta	77774.2	364.17	0.47
Decha	297542.55	6624.48	2.23
Gawata	93089.25	4161.13	4.46
Gimbo	87182.33	2518.62	2.89

Tello	42971.01	303.92	0.71

Table 3: Share of core zone area on administrative boundary (Woreda level)

According to the statistic, Bita, Adiyo and Gawata are prioritized Woredas for Community Plantations, which create an additional wood resource. The spatial distribution of core zones looks as follows:



Map 5: Spatial distribution of core zones (blue) on Woreda level

According to the statistics, Woreda Bita has the biggest share of core zones. MAB core zones are strictly protected and should serve as example of natural ecosystems. This can raise a conflict, if population density is very high and the inhabitancy of the area depend on the forest to sustain their livelihood. According to the SUPAK data, Chena is the most populated Woreda which is sharing a core zone. The core zone area contributes with 1.09 % of the total Woreda size. Furthermore the forest cover in Chena (28.87%) is comparatively low (compared with the other woredas, Adijo 36%, Bita 57%, Chetta 46%, Decha 56%, Gawata 49%, Gimbo 43%, and Tello 62%). Accordingly, Chena was most focused to receive additional wood resources (community plantations).

WEREDA	Share of Core Zone (%)	EW / SQKM
Chena	1,09	150,33
Tello	0,71	141,79
Gimbo	2,89	125,41
Gesha	0	96,38
Adijo	5,79	89,13
Gawata	4,47	62,62
Bita	6,66	48,86
Saylem	0	43,02
Chetta	0,47	39,04
Decha	2,23	35,16

Table 4: Contribution of core zones on Woreda extent (%) compared with inhabitants (km²)

c. Existing Protected Areas and Management Models

A brief description of existing protected areas (RFPA) and existing management strategies within Kafa BR is given in this chapter. Spatial characteristics and coherences are evaluated to detect possible synergetic effects in the matter of BR management and implementation of reforestation sites. Reforestation sites should primarily take place on sites, which have high protection value. Furthermore, it is important to respect all forest protection initiatives. Hence the component "community plantation" should not be implemented within areas of protection status (personal communication Alexandros K. Makarigakis/ UNESCO Addis Ababa Office, Science Programme Specialist).

i. <u>Regional Forest Priority Areas</u>

It is relevant for the project components to consider if a selected site is currently under protection and if the proposed land conversion can support the function as protected area or is disqualified due to active silviculture.

In 1980 the vast majority of the forest in the Kafa region was classified as National Forest Priority Area (NFPA) by the government to cope with the rapid forest decline. After the fall of the socialist regime all NFPAs were handed over to the regional states and became Regional Forest Priority Areas (RFPAs).

The RFPA include protected forests (according to Million and Leykun of 58 RFPAs in total, 37 had been listed as protected areas), but missing boundary demarcation led to a disregard of regulations. According to the National Geodatabase (2000), the RFPA 'Bonga' is the only demarked one in the Kafa region. PRA in the region and field visits could not prove solid demarcation.

Furthermore, the areas were only listed because of its specific significance in biodiversity aspects without clarifying how to integrate or compensate local communities that depend on the forest resources.

It was found that the extent of RFPA in Kafa region still rely on the forest extent of the 1980s and the existing spatial geodata for RFPA are produced for scales of > 1 : 200,000. Nevertheless, they cover an area of 400,783.64 ha within the Kafa BR and are covered with 250,442.83 ha forest (62.5 % forest cover).

According to group discussions with local communities and interviews with forest dwellers, the awareness level concerning RFPA is insignificant. Most of the key informants did not know about the classification and protection status, neither about where to find the boundary. Due to this reason, RFPA are not a preliminary concern for the selection of project action sites.



Map 6: Regional Forest Priority Areas in Kafa BR

ii. Participatory Forest Management

Participatory Forest Management (PFM) is a wide spread initiative in Africa and Asia for partnerships in forest management involving both the state forest departments and local communities. This concept gives credit to local communities and their role in improving forest management.

Different sources (PRA, key informants and remote sensing analysis) indicate that PFM initiatives are the most promising approaches to combat forest degradation and forest loss at that time. One factor for the success of implemented sites might be the clarification and strengthening of user rights. PFM membership avoids the 'open access' to the forest resource. Furthermore, the shift of responsibility towards the community for sustainable use of forest resources and well defined procedures to hand over the forest to the community seem to be the key to success.

There are four organizations, which are related or actively involved in PFM implementation in Kafa BR:

1. Kaffa Forest Coffee Farmers Cooperative Union (KFCU): The establishment of the union and the need for PFM emerged simultaneously with the establishment of long-term coffee

marketing relation with international buyers (Original Food GmbH / Kraft food GmbH). The request of the buyer to ensure both sustainable supply and forest management (within GIZ support, in the frame of Public-Private-Partnership) has supported the union to look for PFM as an alternative for the member cooperatives. The Union has sufficient infrastructure and well trained staff. An analysis of geoSYS for GEO Rainforest Conservation in 2009 could show the positive impact of PFM sites implemented by the KFCU. During the analysis, the General Manager (namely Frehiwet Getahun) participated actively in two open GIS workshops to improve work routines in GPS reading and map production.

- FARM Africa / SOS Sahel Ethiopia: In 2002 the international NGO commenced the implementation of PFM sites in the Kafa Region. They achieved the establishment of 14 PFM sites and compiled valuable guidelines for the successful implementation of PFM sites (<u>http://www.farmafrica.org.uk/resources/Key%20Steps%20in%20Establishing%20Participat</u> <u>ory%20Forest%20Management.pdf</u>).
- 3. The DoAD initiated PFM sites since 2005 with funds from the World Bank. They implemented 15 PFM sites in Bita, Gesha, and Gewata. These sites are neither well documented nor recorded by GPS. Hence, the PFM sites shown in the maps produced for this project component (Fragmentation Maps; 1:50,000) do not contain information about the PFM initiated by DoAD.
- 4. The EU funded PFM implementation of PFM in the Woredas Gesha and Gewata. Only imprecise information could be collected concerning their spatial location. They are not included in map production.

It is recommended to keep up and follow the collection of missing information from the Woreda Administrative. This task could be realized best by persons, who are close to the woreda offices, e.g. the ranger team of Gesha and Gewata.

On behalf of the Kaffa Forest Coffee Farmers Cooperative Union, established and GPS recorded PFM sites could be used for the forest and community analysis. Additionally, a collaborative work of this analysis and KFCU incorporated very recent PFM sites to the geodatabase. Following PFM sites are recorded and integrated to the geodatabase:

PFM Name	Area (ha)	Woreda	Kebele	TOTAL PFM Members	Male	Female	Date	PPP-Project Phase
Gawa Mecha	584,03	Gawata	Gawa Mecha	251	179	72	April 2006	1
Gomma	1998,21	Gawata	Wediyo	206	150	56	June 2006	1
Kahin	260,83	Decha	Gedam	104	73	31	July 2005	1
Kejakata	735,09	Gawata	Kasha	299	198	101	April 2007	1
Nada	1103,29	Gawata	Wediyo	192	145	47	June 2006	1
Orora	997,07	Gawata	Kasha	252	155	97	June 2006	1
Budi	844,15	Decha	Budi	332	167	165	December 2008	2
Keja-Araba	1474,20	Decha	Qeja Araba	629	490	139	June 2008	2
Mankira	900,53	Decha	Mankira	502	294	208	January 2008	2
Tagera	945,93	Gawata	Tagera	377	175	202	November 2008	2
Tula	1036,99	Gimbo	Tula	147	74	73	December 2009	2
Ufa	1208,03	Decha	Ufa	602	417	185	November 2007	2
Yanga	1533,06	Decha	Yanga	286	146	140	October 2008	2
Baqa	211,07	Gimbo	Baqa	323	158	165	September 2010	3
Meshamello	472,67	Gawata	Mesha Mello	2133	998	1135	Februar 2011	3
Qeshi	1548,40	Decha	Qeshi	5251	2520	2731	Februar 2011	3

Table 5: Considered PFM sites

It was decisive for the project component (Community Plantation) to estimate the wood demand of the communities for estimating bottleneck effects. It was assumed that, communities under PFM initiative have relatively good supply of wood for livelihood. Hence, communities without PFM vicinity were prioritized for implementing PRA.

Anyhow, the community in Awurada is part of PFM (FAO implementation) and raised the question for a follow up of the initiative. In that case, the 'guided' implementation phase and the financial support were expired and structures such as a community hall and office were missing. Due to the intention of the superior project to implement PFM sites in Kafa region, it is recommended to ensure a vital PFM environment even after project completion.

(In Annex f you can find the percentage share of existent PFM sites on Kebeles)

The following map shows the distribution of all established PFM sites in the Kafa region implemented by KFCU and FARM Africa / SOS Sahel Ethiopia.



Map 7: Participatory Forest Management in Kafa BR

4. Objectives

The main object is to analyze the status of the forest and the interrelation of communities in the frame of climate protection. The approach to support climate protection was to select and recommend sites for the project components: Reforestation, Community Plantations and Agroforestry and produce maps for the implementation of these project components. The selection planning is based on a detailed assessment of the land use, drivers and processes for

forest loss and socioeconomic features. These aspects create a sound set of criteria for implementing the project components.

a. Drivers for forest loss

This chapter will give a comprehensive overview of all drivers and processes influencing the forest cover in the study region. In general, five main aspects are in focus, namely agriculture expansion, population pressure, resettlement, concessions (for coffee), and land property rights. Drivers of forest loss within the Kafa BR were addressed through various means, such as:

- Satellite Imagery interpretation and collected / existing geodata
- Personal communication with NABU Project Coordinators, who are practitioners with years
 of experience in the region
- Group discussions with rural communities, who are also stakeholders due to their dependence on wood resource, NTFP and forest services
- In-depth interviews with forest dwellers and non-forest dwellers adjacent to forest borders
- Literature review

i. <u>Population Pressure</u>

In general, population growth is an underlying reason for forest loss in many developing countries. According to the above mentioned information sources, it seems to be one of the main underlying causes for forest loss and fragmentation in the Kafa Region. While population pressure in Kafa Region is not directly affecting the forest area, many drivers as informal migration and resettlement, agricultural expansion and the unsustainable use of forest resources are interrelated with population pressure. Demographic change on the one hand creates the demand for more resources but might also foster the initiatives to combat the problem of natural resource degradation. This should be seen as a chance to motivate the introduction of efficient resource management practices as promoted by this analysis.

During in-depth interviews 'population pressure' was always named as reason for severe forest destruction. Actually it is one of the underlying reasons for agriculture expansion and migration which foster forest destruction and land conversion. One way to relieve the pressure on the forest is adopted (e.g. plant species which are more suitable for the site) and sustainable agriculture. This is a good reason to introduce Agroforestry systems.

ii. Agriculture Expansion

The conversion of forest land to agriculture is at first a way to increase the productivity. This can be mainly observed at forest borders, were farmers systematically clear the understorey (mostly initiated by forest grazing) and thereafter slash and burn the area. This could be observed in Woreda Gimbo (Michity, Tula, Kuti), Gewata (Saja, Kasha), Adiyo (Boqa, Medwutta), and Bita (Sheda, Gaweti). The harvested wood is used as an additional income (fire wood, or charcoal) or for the own consumption. This procedure is also described in literature (e.g. Denboba 2005). But field visits show as well, that more often trees with huge diameter (BHD > 60 cm) are only burned due to a lack of appropriate harvesting tools. The non-use of this wood destructs the area in multiple ways. After clearing the understorey and opening the canopy layer cultivation will start at the next farming period. The current agricultural practices are considered as not sustainable and efficient. Fallow periods are only ensured when soil is already heavily degraded and even land with

very steep slopes >35° is cultivated. For whole Kafa BR approximately 1,112.22 ha of agriculture is on very steep slopes. Associated with unfavorable site selection for agriculture, a high annual productivity loss can be estimated. These sites are of high importance for initiating project activity and are included in the model for pre-selection.

Farmers in Kafa Region practice subsistence farming on an average of 1 - 2.5 ha land per household (6 - 10 members). This is regarded as an absolute minimum to provide sufficient food for one HH (Berhanu et al. 2002).

The problem of agricultural expansion is well known as driver for forest loss in Kafa Region. The government started to tackle this problem in 1991, by development programs. One of those development programs is the 1990s extension package program that forced farmers to access credit to purchase fertilizer for more efficient cereal crop production. Until today, this program is running. In-depth interviews revealed that the application of purchased fertilizer is often omitted due to a lack of technical assistance and inexperience. Furthermore, in many cases the costs to by the fertilizer are exceeding the financial capacity of farmers. This seems to be the fact, when fertilizer is not used properly and the costs cannot be compensated by additional yield.

iii. Resettlement

According to a survey of EWNHS (2008), people from the northern part of Ethiopia were resettled during the previous Derg regime (1974 until 1991, according to Schmitt 2006) to the Decha and Gimbo woredas.

While the recent policy encourages resettlement within the SNNPRS "5000 households from Kembata, Timbaro, Sidama and Gurage Zones were resettled to Decha woreda" (EWNHS Survey 2008), all planning and management activities in forested areas should be worked out with governmental cooperation. This dynamic condition seems to be closely related to land cover change. During the PRA it was stressed out, that resettlements motivated by the government are seen as severe threat to the protection of forest area and undermine the communities' initiative to share resources in a sustainable way. It seems that resettlers are not well affiliated in the social structure of the 'territorial' communities. They are marginalized to the outer boundary of the community or situated within the forest. This leads to user right conflicts of all environmental resources supporting livelihood.

Furthermore, so called villagization processes are responsible for a dynamic land use change. This program was set up during the 1980 and forced forest dwellers to leaving the forest area. The abandoned land was recovering with secondary forest growth. Quite recently, it could be observed by satellite image interpretation, that the process is one main reason for perforation of forests. According to the study taken in 2008 (M.Sc. thesis, Elisabeth Dresen), the forest perforation with up to 40 ha can regenerate within 20 years.

An often stressed out problem for communities with continuity are the 'landless youth'. They receive land from the government to settle by informal migration, but do not hold their own area of cultivable land. They are cultivating land of their relatives by share the cropping or on a rental basis. Industry such as large scale investment areas (as Wushwush tea plantation) offer possibility for labor. This leads to a livelihood with strong dependence on natural wood resources due to the lack of own woodlots in home gardening.

The 'landless youth' often settle on the holding or close to their parents' home. If labor cannot support livelihood sufficiently, it results in a widespread illegal/uncontrolled use and conversion of forest land. It was observed, that dynamic forest perforation patches with unstable shape and size were settled by people without permission. This was encountered as most challenging factor to select sites for project activities. Furthermore it is seen as an important point for further research

to create incentives or develop mechanisms to avoid settlement within forested land. According to the local coordinator of this project (Bonga) taxation measures are on the way, to discourage people from forest settlement.

iv. Concessions (coffee)

Large scale coffee investment (coffee investment area) is supported by the government. In Kafa Region there are various different coffee investment areas which are a concern of all environmental initiatives and adjacent communities due to their impact on biodiversity and exclusive use right. Sites in governmental forest land are given to investors. Due to the site requirements of Coffee plants, the upper storey of forest is thinned while the understorey is systematically removed. This practice decreases the biodiversity of the forest tremendously. Furthermore, the capability to store carbon is minimized. Local communities are banned for all purposes of forest use. If there was previously a mutual management among community members to manage 'their' forest in a sustainable way, this is not credited. Consequently, incentives for forest dwellers and rural communities to manage the forest resource in a sustainable way are low. The governmental support of profitable coffee (additional benefit from selling removed timber) investment undermines established structures of self-organization and sustainable resource management of rural communities. Until now, they do not have sufficient opportunity to influence decision making, nor articulate illegal spreading of investor sites. If sites are assigned for coffee investment, there is no compensation for forest dependent communities up to the opportunity of short-term labor at coffee nurseries and on a coffee plantation.

It is very challenging to find reliable information on location, spatial extent and future sites. The collection in the geodatabase is probably inconsistent. There was no systematic detection of CIA. The recorded nine large scale CIAs have a size of 2,563.85 ha.

The insecure information policy concerning CIAs is threatening any environmental initiative (e.g. in Woreda Gewata / Medabo, a concession was given to an investor to be able to expand his CIA of 500 ha – 2 km from the BR core zone! Concerning the information of Mesfin Tekle, the conversion of land could be stopped. Anyhow, young coffee plants replacing the understorey could be detected along the forest border.).

v. Property Rights

According to the country's constitution, the ownership of land vests with the State and the people of Ethiopia. Private ownership and land markets are not allowed under the Ethiopian constitution. Instead, farmers are given use rights for land with paying yearly. The frequent redistribution of land as explained under point 3, have led to a high degree of insecurity among farmers concerning the tenure rights of their holdings and use rights over the forest. This advocated an 'open access' mentality and prevent forest dwellers from the support of sustainable forest management. Accordingly, agriculture is more attractive to invest to than forestry in terms of ease of securing land user rights.

vi. Unsustainable use of forest resource

Legal and illegal forest use is increasing since customary user rights have been replaced by state sanctioned rights (Worldbank, 2011). Missing technical assistance in sustainable silviculture and

missing resource use (of plantations) from governmental side lead to illegal and unmanaged use of wood resource. It was observed, that communities adjacent to governmental natural forests or plantations followed poor forest management practices. To elude fees raised by the government for using wood resource, logging is uncoordinated and selectively practiced on young trees. As a result, the forests regeneration is hampered and in combination without any investment in natural forest to replenish the stock this leads to severe degradation of the forest. This was observed two times during analysis field visits (Gimbo/Hamani and Michity) and need to be verified by more examples.

An increasing livestock and the practice of forest grazing (especially in Gesha & Saylem Woreda) is the major driving force of forest degradation. The practice is described under point 2 (agriculture). In that case, the underlying cause seems to be the insufficient and unclear user rights for forests. The initiative of "participatory forest management" is a good example how the problem can be successfully managed.

b. Identification of suitable areas of project components

Different project components are proposed to address forest loss and forest degradation. These components namely reforestation, community plantation and Agroforestry will be implemented during a timeframe of four years.

In the frame of this project, a successful establishment and sustainable use of trees require a multicriteria analysis. It should consider the biological tree species site requirement (or preferences), a sound understanding of land use structures, and willingness of communities to participate. This has to be brought in line with the overall intention of the project to preserve the forest cover in Kafa Region and enhance the carbon storage capacity.

The identification of suitable areas to implement the project components is based on different criteria which were calibrated upon the input of PRA, single informants and the incorporation of recommendations of the local coordinators (some sites were already assigned to be suitable for a component).

Another objective of this task is to recommend species for the different components, more detail about the selection can be found under Chapter 6c (Results/ Tree Selection).

Each criterion is adapted for the planned component (reforestation, community plantation, Agroforestry) to provide reliable predictions for potential sites.

In this section, the selected criteria are briefly discussed; it will give an overview on which spatial data are integrated and how to implement the suggested strategy on the sites.

i. <u>Reforestation</u>

Reforestation is a sensitive topic without combating the underlying cause of forest loss in a country with high deforestation rates. Currently, only 2.7% (Reusing, 1998) of the total land of Ethiopia is under forest cover though it was estimated to have been about 40% in the past (IUCN, 1990). The severe forest loss has main underlying causes as population pressure or poor land use right allocation and various drivers which directly foster the decline of forest cover (discussed in Chapter 5b). To challenge this development one needs to address the main causes for forest loss; it is even more difficult to counteract by reforestation.

Every land use change caused by humans is motivated by a reason. In Kafa region it can be observed, that natural forest is converted into agriculture land at severe rates. The new land use will be present until the land is not favorable anymore for the present land use (e.g. shifting

cultivation). The abandoned site might be of concern for reforestation activity, but without parallel education in sustainable resource management, reforestation might be ineffective.

It is important that local communities adjacent to proposed reforestation sites see their benefit in the project activity. Otherwise, regulations will be undergone as in previous time and the established resource will be rapidly depleted. This implicates to avoid reforestation on sites where the motivation is "simply" restoration of degraded forests.

There are various projects in Ethiopia which are engaged in reforestation, following different intentions for reforestation. The 'Humbo/Soddo Community based forest management project' (H/SCBFMP) focuses on carbon accounting (Humbo Woreda in the Wolayita zone in SNNPRS). The project is in restoration of indigenous tree species and uses an approved CDM methodology. In contrast, the foundation 'Green Ethiopia' is more focusing on reforestation to counteract erosion on bare hills.

The component of this analysis achieves different intentions such as protection, improvement or support issues. Protection of the BR core zone is one of the priorities to assign sites for reforestation. Recent migration or agriculture expansion entered BR core zones or they are assumed to enter in the very near future. Response to stop the encroachment of human activity will be a buffer of approx. 20 meter along the BR core zone with reforestation and enrichment planting of the degraded forest with a mixture of on-site occurring tree species.

A sound mechanism has to be worked out to sustain the reforested areas. Local communities always raised the importance of strong boundary demarcations by exotic tree species.

Further priority is given to areas which can contribute to prevent forest fragmentation or increase connectivity between forest patches. Main negative effects of fragmentation are perforations within intact natural forest. Perforations caused by illegal migration will be reforested with local tree species found at the forest border (indicated in the matrix sheets). To increase connectivity between forest patches, disturbed riparian forests or 'unprotected' rivers will be reforested with a 40 - 50 meter buffer of local trees. This strategy is very promising due to the minor use for agriculture (raising/ dropping water level, steep slopes). This strategy is also applied for the project component 'community plantation' but with different focus towards population density (wood demand) and recent forest loss.

Lastly, degraded forest areas which were seriously affected by unfavorable environmental conditions are considered for reforestation. In Gesha, Saylem and Gewata Woreda huge parts of bamboo forest dried out in 2010.

For reforestation a stepwise reforestation (2011 / 2012) is planned. Underlying cause is of administration reason (nurseries so far do not have the capacity for complete seedling supply) and furthermore this strategy creates more natural like stands with distributed age classes.

Tree species selection depends very much on the site for implementing the component, but some general suggestions can be given with the selected trees which can be found in Chapter 6c (Results/ Tree species).

The criteria integrated into the site selection for reforestation are mainly derived from satellite imagery interpretation, and geoprocessing functions of existent spatial:

- Population density (derived from number of households / Kebele level)
- Small Perforation / huge perforation (derived from ASTER/SPOT LULC \rightarrow fragmentation)
- Erosion vulnerability (derived from DEM and LULC)
- Core protection (derived from BR zonation intersected by LULC)
- Forest patches (derived from ASTER/SPOT LULC \rightarrow fragmentation)
- Capital vicinity (derived from digitized settlements \rightarrow SPOT data; DEM for spatial distance)
- Lack of riparian forest (digitized rivers \rightarrow SPOT data and others)
- Road distance (GPS data of road network, TM of EMA)
- Forest loss (Change detection of 2008 2010/2011)

ii. <u>Community plantation</u>

Decisions about land use and the potential of land for specific purposes seem to be rather important in areas, where growing populations require more land for food production and where urban areas are spreading. Plantations are in competition to food securing systems which also have clear land use policy. So far, incentives for community based plantations are missing. Except for an example in Chena Woreda (Kebele Shayicha Meka, < 2 ha of community organized woodlot on private land) no structures of community leveled plantation could be found. This is different for community based forest management of natural forests (PFM).

The initial phase for this project component could be realized by food for work or other payment schemes from project funds to establish the plantation. It seems to be important that communities intended to manage the plantation in future are involved into the establishment as well to strengthen the individual responsibility. However, the use rights of planted trees and management concepts should be discussed before the component will be implemented. This will ensure that the community always keeps up their protection activities. If the resource belongs to the community, they feel responsible for it.

The most common species for plantations in Ethiopia are Eucalyptus, Cupressus lustanica and Pine spec. largely managed by the government. As exotic species, these tree species are often criticized by environmental organizations due to their possible impact on water regime, self-spreading and competition with native species. Due to the low site requirements of Eucalyptus and rapid economic return, Eucalyptus spread over whole Ethiopia. Farmers integrate eucalyptus on site along boundaries and in small woodlots. Eucalyptus plantations are well studied and the growth yield is known for different sites.

A study from Jagger and Pender from 2003 estimated the economic value of Eucalyptus as follows "With an average planting density of 4,500 trees/ha and a survival rate of 64%, a woodlot of average-sized eucalyptus trees would be worth more than 80,000 Ethiopian Birr/ha, or \$ 10,000, and much more in places where trees are scarce. With more than 70 ha of woodlots per tabia, this represents a substantial contribution to the wealth of communities in Tigray".

Other researchers claim that more and more exotic species are introduced to Ethiopia, while indigenous species like bamboo are being destroyed. Research of bamboo is done by the Swedish University of Agricultural Science (Uppsala). They highlight the underutilized multipurpose characteristics of bamboo in Ethiopia. In Woredas with high natural occurrence of bamboo (e.g. Adiyo) it is utilized in many different ways, such as fencing, house construction and other services (such as bee hive construction). Traditional knowledge, using bamboo for soil conservation was addressed by an in-depth interview of the minority group the "Menjas". Literature review could not verify a systematic use of bamboo from the minority group to combat erosion. Due to the pragmatic approach of this study there was no further research done.

'Lessons learned' from international reforestation projects indicate the importance to use traditional knowledge or systems which were successfully introduced. Hence, an ideological motivated ban of Eucalyptus should be avoided. Furthermore, there should be done research concerning the real impact of Eucalyptus plantations in Kafa Region.

The selected species are proposed for plantations with a mean size of 40 ha. The criteria integrated into the site selection for 'Community Plantations' are mainly derived from satellite imagery interpretation, geoprocessing functions of existent spatial data and the introduced Participatory Rural Appraisal at selected sites.

- Population density (derived from number of households / Kebele level)
- Small Perforation (derived from ASTER/SPOT classification)

- Erosion vulnerability (derived from DEM and LULC)
- Town vicinity (digitized settlements from SPOT; DEM for considering distance)
- Road distance (GPS data of road network, TM50)
- Forest loss (Change detection of 2008 2010/2011)

iii. Agroforestry

The potential of agroforestry systems to combine environmental objectives, combat erosion problems and taking the pressure off the natural forest is remarkably. Apart, the benefit of Agroforestry is well recognized and the system is already practiced in Kafa Region. Practices of intercropping (only with cereal crops), the use of trees for coffee shade in home garden and hanging bee hives are widespread. The acceptance among local communities seems to be a very promising factor for successful promotion and implementation of pilot sites. Willingness to participate as pilot site is very high across all Woredas. The expected benefits by farmers are the increase of crop productivity, a diversification of products for subsistence and income, and positive effects to combat erosion and soil degradation. The latter named factor outlines one major problem on farm sites in the Kafa Region.

Considering different international Agroforestry projects (e.g. <u>http://www.eco-index.org/search/results.cfm?ProjectID=384</u>) it is always recommended to establish agroforestry systems based on one commercial main tree species, such as coffee. The local Project Coordinator (Bonga) favors the use of fruit tree species such as mango and avocado due to traditional knowledge concerning these species. They are used as shade tree of rural communities.

It is advised to improve existing Agroforestry systems by promoting good proveniences of tree seedlings. They should be robust, have good yields and likely to adopt under unfavorable soil conditions. Experiments should be carried out to identify good seed proveniences.

To give a positive impact to many farmers, plant material able to be propagated vegetative should be favored. In this matter Erythrina brucei seems to be very promising.

The criteria integrated into the site selection are mainly derived from satellite imagery interpretation, geoprocessing functions of existent spatial data and the willingness of pilot farmers to participate in the study.

First step was a pre-selection of potential sites of criteria, which are deeply discussed in the section "6.c.1 – Methods". To give a short overview of integrated material, please refer to the following:

- Population density (Kebele level)
- Capital vicinity (Thiessen Polygons please refer to the first interim progress report, where this method is explained)
- Road distance (incorporated GPS tracks to digitized road network of TM50, EMA)
- LULC (derived from ASTER / SPOT)
- DEM (derived from Huchinsons Topo to Raster interpolation method, base material for interpolation digitized height points of the TM50, corrected GDEM were http://asterweb.jpl.nasa.gov/gdem.asp, GPS recording with barometric altitude measurements) to estimate erosion

5. Methods

The whole analysis was divided into information technology analysis and 'in-situ' data and information collection. The IT related work was realized by a team from Germany. Work related to pre-processing, analysis and classification of satellite images was the duty of Mrs. Hannemann (attached to GeoSYS), who is a geographer (Diploma) with several years of work

experience in the matter of Remote Sensing. Mr. Gemeinholzer was assigned to evaluate all PRA data and to assist during the field work. He has a B.Sc. in landscape planning and is currently working for geoSYS. All work related to GIS and geoprocessing was collaboratively done by Mr. Weiss and Mrs. Dresen who hold a degree in forestry (Diploma) and a M.Sc. in Information Technology. Due to insecure power and internet supply in Ethiopia (Bonga) most of the IT tasks were realized in Germany (Berlin).

The baseline data and data for gap filling could be collected during two field trips in February/March and April/May. The team in Ethiopia consisted of Mr. Mekuria and daily paid field guides. Mr. Mekuria had good recommendations of the NABU Project Coordinator (Bonga) and is based in Bonga. Due to its' origin, the analysis could profit of his very good communication skills and local knowledge. Mr. Mekuria was under contract for the whole time period of the analysis to assist in the field and as back stopper in Bonga, when the German team returned to Berlin.

a. Work Flow

The final result of site selection is a whole procedure of spatial/spectral analysis, 'round tables' with stakeholders and Participatory Rural Appraisal methods. To gain an overview of the integration and importance of all aspects, a graphic is representing the whole workflow.

Site Selections Workflow



Figure 2: Site selection Workflow

The task was focused on the site selection of different project components. At the beginning of the task the focus was to collect, sort and process all relevant data as literature and geodata. To be able to perform the analysis of spectral (satellite imagery) and spatial (geodata, DEM) data,

preprocessing was the most time consuming part. Relevant criteria were selected according to literature review, personal communication with NABU coordinators and own experience. The finally incorporated criteria for the site selection are forest change, altitude and its derivative slope, population density, visually detected "vacant areas"¹, road network accessibility, forest fragmentation, and current land use. These criteria were assigned to a GIS model, produced in GIS software (ArcGIS 9.3.1). The advantage of a model is the possibility to easily update or incorporate additional information. The models were calibrated during the field visits and outputs were printed on maps to discuss with forest stakeholders of the Kafa Biosphere Reserve. The discussions were held with the Department of Agriculture Development (except of Woreda Saylem), Woreda representatives and foresters, the Kaffa Forest Coffee Farmers cooperative Union and sometimes community representatives were present as well. After acceptance of proposed sites, the site was visited. In some cases the participation of community was not necessary due to absence of in direct vicinity of the selected site (mainly for reforestation). In that case, the site was automatically qualified for final site selection (e.g. Gesha, Saylem woreda, assigned reforestation sites at dried bamboo areas). Normal procedure after conducting "round tables" the site and adjacent communities (also stakeholders) were visited and a Participatory Rural Appraisal was implemented. Due to the number of selected sites, it was not possible to fully implement PRA on every proposed site for "Community Plantation". Instead unsystematic in-depth interviews were conducted. The advantage of in-depth interviews is the possibility that introduced persons can lead an interview. Visiting the selected site (Plot), site characteristics (slope class, altitude, ownership, land form, accessibility, erosion, grazing impact, forest disturbance, and wood collection) and species composition (crown cover, dominant tree species, description of natural vegetation) had been recorded. Remote areas were visited and invested by rangers. Information was gathered by Mr. Muluken Mekuria, the local expert contracted for this task, and send for analysis. The gathered information was incorporated to the geodatabase and released into a standardized matrix sheet, which describes all important characteristics of the site and its function. Finally, the selected sites were displayed on thematic maps in 1 : 50,000.

b. Remote Sensing,

Different remote sensing, geoprocessing and geostatistic methods were used to create an up-todate baseline of geodata for the study area. The following description should show how existing data were integrated and which accuracy can be expected from derived geodata.

i. Classification of Remote sensing data

Satellite images can be used for LULC classification and monitoring. The basic principle contains the reflection characteristics of the electro-magnetic spectrum for different surfaces.

5 scenes of the ASTER satellite are available for the BR. Although the images were not taken in the rainy season, edge parts of the ASTER images have a thick cloud cover. For these areas SPOT images have been used.

Topographic maps were only used for referencing or comparing issues because of the age of the maps. Details of the used data are given in the following table and map 3.

¹ "Vacant areas" refer to areas without agriculture, forest, wetland or visually detectable anthropogenic use. Visual detected was done on SPOT5 images. Characteristic of "vacant areas" is a LULC with scattered trees and grass or shrub layer.

Data	Acquisition date	Resolution / Scale	
Satellite imagery			
ASTER	16.01.2010 (3 Scenes)	15 m	
	10.01.2009 (2 Scenes)	15 m	
SPOT	05.02.2011 (3 Scenes)	2.5 m	
	06.02.2011 (2 Scenes)	2.5 m	
Topographic Maps	1985 (14 Maps)	1:50,000	
	1977 (1 Map)	1:200,000	

Table 6: Basic data for LULC classification



Map 8: Spatial distribution of basic data

All satellite images were georeferenced and transformed into the UTM37N coordinate system. The ASTER satellite images partly show positional deviations from topographic maps and existing GPS tracks. Therefore, a correction was done by using well-identifiable objects like streets. Channels of the visible and near-infrared were used for LULC classification.

The following classes could be separated:

- Forest
- Bamboo Forest
- Coffee plantation
- Tea plantation
- Bare soil
- Shrub / Bush

- Wetland
- Agriculture / Grazing area
- Pine plantation

The unsupervised and supervised classifications were used for the identification of the LULC classes. The unsupervised classification was done with a cluster analysis by combining pixels of similar spectral properties. The supervised classification required the definition of training areas for assigning pixels to classes.

Because of very similar spectral signatures (especially Wetland, Forest, Agriculture / Grazing area) different misclassifications occurred, that had to be adjusted during post-processing. Single outlier pixels have been eliminated and misclassifications were rearranged and newly digitized.

The forest class mostly could be identified. However, there was no difference between vital thick and degraded forest, as transitions were not clear enough to be identified.

Bare soil could be classified very easily because of its clear signature. This is also true for huge parts of Agriculture / Grazing area. Many problems were caused by single trees or smaller groups of trees.

Wetlands could be identified because of its characteristic structure, but the signature is very similar to that of forest or agriculture / grazing area.

Tea and Pine plantations could be identified visually and have been digitized. They cover only very small areas.

The towns were digitized on the basis of the satellite images.

	Reference data							
Classified	۸	D	Б	c	S W/ Tot	Total	Producers	Users
data	A	Б	1	5	vv		accuracy	accuracy
A	70	2	6	6	9	93	0,82	0,75
В	6	52	0	0	0	58	0,96	0,90
F	5	0	64	0	24	93	0,70	0,69
S	4	0	1	54	0	59	0,90	0,92
W	0	0	20	0	34	54	0,51	0,63
Total	85	54	91	60	67	357		

Confusion matrix

Table 7: Cofusion matrix for remote sensing classification

Overall accuracy = 0,77 Kappa coefficient = 0,71

- A = Agriculture / Grazing area
- B = Bare soil
- F = Forest
- S = Savannah
- W = Wetland

The classification was accomplished for the 5 LULC-Classes Agriculture / Grazing area, Bare soil, Forest, Savannah and Wetland. The classification accuracy for the individual classes show significant differences. The mean classification accuracy is 72.55%. According to the favourable recording time of the satellite images, agriculture was not that leafy and could be easily separated from the forest class.

Bare soil contains all sights without vegetation as well as all build-over sights like buildings or paved roads. As these sights have a special spectral characteristic they could simply be separated.

The wetland class with its vital vegetation has a forest-like spectral signature; therefore a lot of incorrect classifications occurred between the 2 classes. As a follow-up, wetland could be manually separated from forest due to its special structure.

The pixel values of savannah were sometimes merged with agriculture, but – like all other classes - they could be validated and corrected after the classification.

On the basis of SPOT satellite images, topographic maps, SUPAK-data and GPS ground control points (GCP) and the classification results additional classes could identified and digitized, including Bamboo Forest, Coffee investment area, Pine plantation, Shrub / Bush and Tea plantation.

ii. DEM production and assessment of erosion

Most relevant factors for landslides and soil degradation are dependent on spatial criteria which were analyzed in this study. The project region Kafa is vulnerable towards landslides and soil degradation due to the distinct topography and human intervention such as road construction or land use. Different studies conducted in the Ethiopian highlands, highlighted especially deforestation, overgrazing, and cultivation on steep slopes are main drivers of soil degradation. Climatic factors and seasonal rainfall variability should be considered as well as important, but due to data shortage they could not be integrated in the analysis.

To estimate areas with high susceptibility towards erosion, a Digital Terrain Model (DTM) was interpolated. Information of different sources were homogenized and contributed to the final DTM product.

Incorporated sources:

- Height points of all Topographical Maps (EMA)
- In situ measurements of field survey in 2008 (MSc. Elisabeth Dresen)
- In situ measures of field survey in 2009 (Diploma thesis Jan Schormann)
- GDEM of NASA (http://asterweb.jpl.nasa.gov/gdem.asp)
- Rivers and perennial streams (different sources)
- In situ measurements of both field visits (February / May)

A weighted suitability was derived by testing reference height points (accuracy ~ 15m) with data sources. After calibration, a continuous DTM was interpolated by using standard GIS methods (Topo to raster, by Hutchinson 1988).

DTM characteristics:

- 30 m resolution
- hydrological corrected
- derived of Satellite Imagery (ASTER) and ground measurement
- Extent as BR

Problems that occurred:

The height values of northern region (Woreda Saylem) are biased due to a permanent cloud cover in ASTER data and missing TM.

Close to rivers, the incline is overestimated. This is caused by the interpolation method chosen. This was calibrated by using a variability map and masking areas with outliers.

Small, local artifacts might occur (espec. in flat terrain)



Map 9: 3D view on Kafa Biosphere Reserve

The visualization in 3D is helpful to comprehend the complex terrain, to be able to classify satellite images in different land cover classes. It becomes clear that Land Cover is highly correlated to slope classes. Steep slopes and mountain ridges are predominantly covered by forest while flat areas are either converted to agriculture or influenced by water, thus classified as wetland.

Slope Classes for Forest (h	าล)	Slope Classes for other la	Slope Classes for other land cover/Matrix (ha)			
CLASSES	SUM AREA HA	CLASSES	SUM AREA HA			
Undulating	85807,87	Undulating	117096,81			
Easy Rolling	81409,54	Easy Rolling	104590,66			
Rolling	53108,07	Rolling	60032,15			
Flat	46034,31	Flat	50976,06			
Strongly Rolling	37405,95	Strongly Rolling	34965,34			
Moderately Steep	19968,31	Moderately Steep	15242,02			
Steep	16974,35	Steep	10356,43			
Very Steep	6594,23	Very Steep	4175,19			

Table 8: Slope classes concerning forested areas and other land cover

Furthermore, derivatives of the DTM serve as indicator for potential reforestation sites. While the intact forest cover is not relevant for the analysis, the matrix (such as agriculture or wetland) is of major concern for tree planting.

Slope Class	Inclination
0 - 3°	Flat to gently undulating
4 - 7°	undulating
8 - 11°	Easy rolling
12 - 15°	rolling
16 - 20°	Strongly rolling
21 - 25°	Moderately steep
26 - 35°	steep
> 35°	Very steep

Table 9: Slope classification

The BR is distributed as follows, on the different slope classes:

Slope Classes	Area ha		
Flat	99123,21		
Undulating	201050,82		
Easy Rolling	185170,5		
Rolling	113562,81		
Strongly Rolling	72349,11		
Moderately Steep	35521,74		
Steep	27343,35		
Very Steep	10791,36		
	744912,9		

The selection of sites concerning erosion susceptibility for tree planting is based on different spatial factors.

- slope > 20° (moderately steep very steep)
- land cover (absence of forest cover)
- distance to road network (road construction is often a risk aggravating factor)

c. GIS

i. Model production

Efficiency reasons (time, resource) required a rapid assessment of potential areas for the project activity. Due to a sound geodatabase, GIS-models could be developed.

A big advantage of models is the possibility of calibration towards new findings. The incorporation of new information is easy and different scenarios can be tested. But the selection of sites is only representing criteria which are recorded in the geodatabank and can only serve as a pre-selection of potential sites for project action. This was the intention of the model design.

To consider the various requirements of different project action, it was necessary to provide

models which are adopted towards the project component.

Each component (Agroforestry, Community plantation, Reforestation) of the analysis is based on different criteria, thus three different models were developed to select appropriate sites. This is a necessary step to adapt the model to the real condition.

The spatial models are created by using ESRI software (ArcGIS 9.3.1) and they are one of the deliverables at the end of the contract. If used in ESRI environment, they can be adapted easily and weights of the different parameter can be changed. If maintained on occasion, the models could serve for site selection even in the future.

1. Agroforestry

The criteria of project component "Agroforestry" were recommended by the National Project Coordinator of NABU in Addis Ababa.

One important criterion is the accessibility (distance to road network) of the site. First, it will facilitate the monitoring and success/failure control, second the plant material transport is easier and third, the pilot farmers should be located in exposed sites in such a way to raise the awareness level concerning good farming practices.

Furthermore, it is important to be able to show the potential of Agroforestry systems. As Agroforestry is an integrated approach of using the interactive benefits from combining trees and shrubs with crops and/or livestock, it is suitable for degraded farm land. Hence, the second criterion is the degradation of farm land. Degradation of agricultural sites can be roughly estimated by combining derivatives of the DEM with LULC.

Additionally, factors concerning population density were integrated. Farm sites in populated areas are more likely to be visited and seen by other farmers then remote places.

Final integrated criteria and its underlying data, to determine proposal sites for agroforestry are namely:

- Population density (derived from number of households / Kebele level)
- Capital vicinity (derived from digitized settlements \rightarrow SPOT data; DEM for spatial distance)
- Road distance (GPS data of road network, TM of EMA)
- LULC around institution (derived from ASTER/SPOT)
- Degradation on-site (DEM and LULC)

2. Reforestation

Reforestation preliminary depends on spatial criteria, e.g. the distance to BR core zones, or the forest fragmentation.

The decision to select sites for reforestation purposes is mainly based on the aim to improve forest structure through defragmentation. The model could be calibrated towards the forest connectivity, between forest patches. From the ecological point of view, it is important to assure gene flow between all forest patches. Due to a high pressure on the land resource for agriculture, grazing areas or new settlements, it seems to be a promising strategy to create corridors (to improve forest connectivity) along perennial rivers. This strategy combines the positive effects of riparian forests (improve the water quality, avoid sedimentation and shade the rivers) and apart, the reforestation will not cause any conflict in land use rights, due to less intense use for agriculture practices close to rivers.

Another objective is to combat the fragmentation of core forests which is congruent to core zones of the BR in most cases, into small forested areas (forest patches). According to the in-depth
interviews this thread can only be alleviated by an obvious forest boundary demarcation with nonnative species (e.g. Eucalyptus spec.).

Perforation of the forest is an increasing thread in Kafa region. Multitemporal satellite image interpretation revealed that cultivated patches in core forest have the tendency to increase rapidly. Accordingly, the perforations are a concern for reforestation and patches in core forests have high suitability to be assigned as potential reforestation site.

Another focus lies in increasing the area of medium and large core forests. Due to steady agricultural expansion and pressure on forest borders the protection of BR core zones is very important.

For the reforestation component mainly sites with degraded forest (e.g. along rivers) or the protection of BR core zones, which are close to other land-use (e.g. agriculture, grazing areas) were given priority.

The integrated final criteria and its underlying data, to determine proposal sites for reforestation are namely:

- Population density (derived from number of households / Kebele level)
- Small Perforation / huge perforation (derived from ASTER/SPOT LULC \rightarrow fragmentation)
- Erosion vulnerability (derived from DEM and LULC)
- Core protection (derived from BR zonation intersected by LULC)
- Forest patches (derived from ASTER/SPOT LULC \rightarrow fragmentation)
- Capital vicinity (derived from digitized settlements \rightarrow SPOT data; DEM for spatial distance)
- Lack of riparian forest (digitized rivers \rightarrow SPOT data and others)
- Road distance (GPS data of road network, TM of EMA)
- Forest loss (Change detection of 2008 2010/2011)

The spatial model below shows all integrated spatial tools, input data, interim products and additional integrated parameters.

This model can be adjusted and modified at every time. The component "reforestation" depends more than the other components on spatial criteria. Thus the model could be developed easily.



Figure 3: Spatial Model (ArcGIS) for component "reforestation

3. Community Plantation

The main criteria for establishing community plantations are land use rights. This criterion is the most challenging to capture due to the absence of a consistent land register with spatial information and the unsecure land rights in general.

The whole community should benefit from community plantations, either in forest products or by selling timber. Churches often harbour small wood lots in their surrounding and benefit from the NTFP or the profit by selling the timber. Thus, benefit sharing of community goods has already some tradition and can also be observed in the PFM initiative.

To guarantee a fair benefit sharing among the community members, the optimal site should be assigned as communal land. Unfortunately, there is no comprehensive register of real estate, where the communal land is accounted.

Some areas are resettled illegally (e.g. in Saja / Boginda forest). If information flow with the governmental body, concerning legal "land right" relocation could be established, it would be possible to detect "illegal" settlements by remote sensing techniques (change detection). The illegal settlements are a big threat within intact forests. The change detection of a previous work (Master thesis Elisabeth Dresen) show the tendency of once established "holes" in the forest cover grow year by year. This perforation of an intact forest will encourage more settlers to clear the forest. To hamper the illegal settlement within the forest, a specific taxation is in progress (communication with Mesfin Tekle). This will detract more settlements and on a long term, settlers might search for other opportunities. If adjacent to legal settlements, the abandoned areas could serve for "community plantations" (e.g. Boginda forest, refer to the detailed site description). The wood demand (fire wood, construction wood) of communities are considered as important source for being able to estimate the acuteness and prioritise areas with a high wood demand. A correlation of number of people and wood demand is assumed, while the facilities to process the wood could not be taken into account. It can be assumed, that if energy saving stoves are used, the wood demand will decrease. In all visited sites, the farmers were cooking on open fire.

Apart of land rights, some spatial criteria foster a successful implementation of community plantations.

Final integrated criteria and its underlying data, to determine proposal sites for community plantations are namely:

- Population density (derived from number of households / Kebele level)
- Small Perforation (derived from ASTER/SPOT LULC \rightarrow fragmentation)
- Erosion vulnerability (derived from DEM and LULC)
- Capital vicinity (derived from digitized settlements \rightarrow SPOT data; DEM for spatial distance)
- Road distance (GPS data of road network, TM of EMA)
- Forest loss (Change detection of 2008 2010/2011)



Figure 4: Spatial Model (ArcGIS) for component "community plantation"

d. PRA

During two field visits, participatory rural appraisal facilitated the sharing of knowledge and information on land resources, wood demand and land owner or land use rights between the project staff and the communities in order to select appropriate sites for the "Community Plantations" with regard to sustainable resource management. Due to the number of sites, it was not realistic to incorporate a full PRA at every potential "community plantation" site but feasible to conduct unsystematic in-depth interviews on site. The analysis design was calibrated and remote areas could be assessed by the rangers. The used PRA methodologies were namely,

• focus group discussions, (on community level)

This method was selected to determine the different levels of access and control of resources in the community to sustain their livelihood. It was a helpful tool to identify the main problems concerning land management within the community and a good entrance point for further information gathering.

In total 14 group-discussions were conducted, in which representatives of the local communities participated. Elders, females, young landless farmers and children were present of different share and contribution. Male community members were dominant in presence and discussion participation. The group-discussions took place in Adiyo, Gawata, Decha, Gimbo, Gesha, and Saylem and were partly conducted by the NABU rangers or DoAD staff.

• in-depth interviews, (on household level)

In-depth-interviews were held to be able to estimate the wood demand, to figure out past experiences with development projects and to gather additional information about problems occurring on community land. The interviews revealed opinions that would not have been discussed in public among the community members. Interviews were conducted in privacy, most of the time in the main tukul of the household. The aim of the interviews was also, to balance the gender of informants for gathered information. For all selected sites in-depth interviews were conducted, except for 17 sites namely

- Bita (Meligawi, amesha Mecheta, Shota, Tuga, Oda, Gaweti) \rightarrow the rangers were not participating in conducting interviews
- Chena (Chomecha, Kuta Shoraye, Shishinda, Boba Bala, Wote Wora) → the rangers were not participating in conducting interviews
- Gimbo (Shocha)

It is recommended to draw socioeconomic data from these sites as well.

• producing sketch maps (community level)

Sketch map techniques were applied to get a detailed insight of the spatial distribution of resources and land use rights. These are geographical and environmental models of the community done by the community members themselves. The maps identify community boundaries, local resources and environmental resources. Furthermore, the aspect of soil degradation and field productivity or hazards (like landslides) could be included. It was possible to delineate areas which were left due to different reasons.

• transect walks (Kebele level)

Generally, the PRA team was guided by 2 - 4 community members to verify the information that was gathered with map drawings. In this regard the project team was able to get familiar with the diversity of land use patterns, erosion and slope processes, drainage patterns and the spatial extent of the community.

The production of multitemporal print out scenarios with and without project implementation turned out to be a coherent instrument for awareness creation. Different printouts were produced of the LULC within the community at present state, the planned procedure, two years later (with/ and without component) and four-five years later (with/and without component). The scenarios are based on change detection of multitemporal Landsat imagery. The forest loss of the last ten years with a mean of 8% was extrapolated until year 2015. This procedure was recommended by the local Project coordinator (Bonga) and turned out to be a very important communication tool for the woreda administrative as well as for community group discussions. The different scenarios can be found in the appendix.

e. Capacity Building

"Without more and better higher education, developing countries will find it increasingly difficult to benefit from the global knowledge-based economy" (World Bank & UNESCO 2000) The project could contribute to a small part in Capacity Building. Due to the importance of GPS and GIS it is important to support and increase the decision-making and responsibility. In this matter three workshops could be realized namely:

- GPS & GIS workshop I (two full days)
- GPS & GIS workshop II (two full days)
- GPS & map reading Rangers' workshop (one day)

The workshops were accomplished with Open Source software, which has the advantage that it can be copied, distributed and remain with the participants.

The workshops were a win-win situation for the participants and for the task which benefited of smooth data transfer from the project site to the international consultant after leaving the project region. Especially the ranger workshop resulted to be very important for the task. Only with the multiplicator of NABU rangers, almost all selected sites could be visited, without the help of the rangers this would not have been feasible.

Furthermore, communication with KFCU was facilitated which was important for data exchange concerning recently established PFM sites and harmonization of existent geodata.

Mr. Muluken Mekuria was employed during the whole timeframe (until 16.06) of the analysis as local backup based in the project region. During the timeframe of the analysis he could gain sufficient knowledge in operating GPS devices, so that he was able to support the rangers' work. In general, it seems to be important to bind resources to the project. This will bring additional benefit for the project and the staff.

f. Wood measurement

According to in-depth interviews and group discussions with rural communities it was found out that the major source of energy in Kafa region is based on wood. In the Woreda capitals

unsystematic interviews were conducted with restaurant and hotel owners or staff. Only two of seven were using kerosene (namely Coffee land hotel/Bonga and Mankira hotel/Bonga). Rural communities are very depending on the wood resource. "Forest means life to us! No wood, no food", was once stated of an informant. Using charcoal is widespread in towns. To a very small amount crop residues are used instead of fuel wood, but only in the absence of dry wood.

It is reported from the northern part of Ethiopia that cattle dung is also commonly used instead of firewood, this could not be found in the Kafa region.

In-depth interviews in combination with wood measurement could reveal a systematic underestimation of the own wood consumption of the community members. The participants were asked to estimate the daily wood consumption in kg. The most frequent answer (whatever size of household!) was around 20 kg.

The wood measurements recorded (with balance) can be found below. Unfortunately, the numbers do not allow any statistical sound conclusion. Measuring wood frightened the people. They assumed to get punished because most of the firewood is gathered in governmentally owned forests.

Wood amount (kg) per day	people in HH	Kebele
11	2	Ufudo
28	3	Wushwush
30	4	Wushwush
32	4	Wushwush
32	3	Bonga
35	5	Michity
37	5	Kutti
38	4	Wushwush

Table 10: Wood measurement

It could be interesting to follow this approach to gain more reliable data. Perhaps, a correlation between fuel wood consumption and forest habitat can be found or reveal the differences of wood consumption and catchment area (urban, rural).

It is assumed that kebeles with higher population density have higher demand on fire wood. But probably, due to a bottleneck effect the inhabitants are forced to spend this resource more efficiently.

The in-depth interviews show, that preliminary women and children are responsible for the fire wood supply. This should not imply that only dry wood is collected. Many times even women could be seen, working with the ax. Other common practice is to slash the tree and leave it in the forest for drying. Step by step the tree is utilized as fire wood.

6. <u>Results</u>

a) Current status of the forest and its fragmentation

Fragmentation is one of the main criteria with different significance for the three components reforestation, community plantation and the introduction of agroforestry. This chapter addresses the landscape change and the forest habitat fragmentation in the Kafa Biosphere

Reserve while causes, concepts and recommendations should highlight the importance of action.

i. General Causes for Fragmentation

Forest fragmentation is defined as the "breaking apart" of continuous forest into distinct pieces. When it occurs three interrelated processes take place: habitat loss, subdivision into remnants or fragments, and introduction to other forms of land-use that replaced forest. There are various reasons for fragmentation. Conversion of agricultural land leads to fragmentation and isolation of forest habitats. Legal and illegal logging and extensive collection of woody material for firewood lead to forest degradation. In addition, natural habitat disturbance, increasing rates of fire, overgrazing of sensitive habitats are threats that may cause habitat loss. Overlaying reasons such as increasing population, and uncertain property and use rights of forested areas may be the triggering factors for increasing fragmentation and forest habitat loss.

ii. Concepts

1. Landscape Fragmentation Tool

In the fragmentation analysis morphological image processing for classifying spatial patterns at the pixel level on binary land-cover maps of the Kafa Biosphere Reserve was used. In morphological image processing an algorithm to classify forest patterns is defined by a sequence of logical operations such as union, intersection, complementation and translation using geometric objects called 'structuring elements' (SE) of pre-defined shape and size.

The "Landscape Fragmentation Tool"(LFT), presented by Vogt (2006) was used to perform the analysis. The LFT was jointly developed through a partnership between the Centre for Land Use Education and Research (CLEAR) at the University of Conneticut and Placeways LLC. The tool provides a morphological image processing method to quantify landscape fragmentation. It was designed to be used in ESRI's ArcGIS 9.2 geographic information system (GIS) software and allows users to analyse fragmentation using their own raster land cover information.

Preliminary reasons for using the LFT-approach in the analysis of forest fragmentation of the Kafa BR are

- (i) to avoid drawbacks of alternative methods and
- (ii) to exploit the advantages of morphological image processing.

The objectives can be summarized as follows:

1. Higher spatial precision and thematic accuracy of LFT compared to previous approaches based on image convolution (moving window) or patch-based approaches. Patch-based approaches are difficult to implement in large-area assessments due to the large number of patches and the large extent of the map.

2. Fragmentation indicators or indices at landscape level provide only a single value and are difficult to interpret independently of composition (Neel et al. 2004). In addition, landscapes

with substantially different arrangements of forest can have the same landscape-level index value.

3. Pixel-level classification such as LFT permits mapping and monitoring of spatial patterns at the pixel level. This provides a greater sensitivity to pattern changes over time.

4. Possibility to retain the capability to label fragmentation related features at the pixel level for any scale of observation.

5. Because of the higher accuracy of pixel-level mapping, summary statistics and trend analyses at landscape level is also more accurate.

6. Straightforwardness: clear distinction between different land-cover patterns based on pre-defined structuring elements.

2. Land-cover patterns

The LFT analyses the types of fragmentation present in the forest land cover type. Using LFT forest cover is classified as "perforated" "edge" "patch" and "core". **Core** forest is relatively far from the forest—no forest boundary. The entire area of the core is forested. The core category is further subdivided into large, medium, and small cores based on scientific literature suggesting thresholds for minimum viable forest patch sizes. Small Core = smaller than 250 acres (101.17 ha)

Medium Core = between 250 and 500 acres (101.17 Ha) Large Core = larger than 500 acres (202.34 ha)

Patch forest comprises coherent forest regions that are too small to contain core forest. The forest is surrounded by non-forest land cover such as would occur with a small woodlot in an urbanized or agricultural area.

Perforated forest defines the boundaries between core forest and relatively small perforations such as would occur around a small clearing.

Edge forest includes interior boundaries with relatively large perforations as well as the exterior boundaries of core forest regions such as would occur along a large agricultural field or settlement area.

The width of edge and perforated forest was set to 100 meters. The edge width parameter determines the width of the edge and perforated forest zones as well as the thickness of patches. Edge widths reported in the ecology literature range from 50 meters to several hundred meters - depending on the issue of interest. An edge width of 100 meters is often used for general purposes analysis.

3. Thematic Sources

The fragmentation analysis is based on the classification of ASTER satellite imagery recorded in 2010. Furthermore, the fragmentation was estimated on Landsat imagery of year 2002. It is therefore possible to detect forest cover and fragmentation class changes for the investigated

period. To compare the different sensors with each other, the ASTER data were resampled to a spatial resolution of 30m. Forest represents only unmanaged, but not further stratified forest.

iii. <u>Relevance of Fragmentation for Kafa Biosphere Reserve and Planning of Reforestation</u>

In 2002 forested land covered approximately 80 Percent of the total land cover in the Kafa Biosphere Reserve (BR). Within the observed time period the BR experienced a total net loss of 9,178 ha of forested land resulting in 75 Percent of total land cover in 2010.

The fragmentation analysis classified 57 Percent of the forest as forest edge for the year 2002. Core forest (small, medium and large) at that time was about 30 Percent of the total forest area of which 22 Percent was covered by large core forest. 73 Percent of core forest was larger than 200 ha. The proportion of forest patches (isolated forests surrounded by non-forest land cover) in the total forest in 2002 was 3 Percent.

Overall, it can be stated that in consideration of the general forest loss for the period between 2002 and 2010, the relative proportions of the different fragmentation classes have only moderately changed. Still one can interpret the area shift as an indication for changing fragmentation processes. The most pronounced changes were found for the forest patch category with an increase of 56 Percent. Perforated forest recorded a loss of 36 Percent.

Overall, core forests in 2010 account for 29 Percent of the total forest land. This corresponds to a net loss of approximately 4,000 ha since 2002. While its share on total core forest was 73 Percent in 2002 it decreased to 66 Percent in 2010. The largest share of the loss of core forests comes from large core forest. It declined by 18 Percent or 5,500 ha, while small and medium core forest gained approximately 1,500 ha or about 14 Percent over the same period.

In addition to the pure loss of forest area the BR experiences a growing fragmentation of the forest which is illustrated most clearly by the growth of isolated forest areas (patches) and the decline of large core which is fragmented into small and medium-sized core zones.

Below are the tabular results of applying the forest fragmentation model to land cover in the Kafa BR in 2002 and 2010.

Forest Fragmentation				
Class	Ca	over (ha)		
	2002	2010	Change	Change (%)
Patch	4.489	6.993	2503,53	55,77
Edge	77.819	75.335	-2483,82	-3,19
Perforated	14.427	9.204	-5223,22	-36,2
Small core	7.455	8.497	1042,09	13,98
Medium core	3.597	4.093	495,47	13,77
Large Core	29.831	24.320	-5511,58	-18,48
Total Core	40.883	36.909	-3974,02	-9,72
Total Forest Area	137.619	128.442		-6,67
Net change	-9.178			



Planning of reforestation has to consider the structural situation of the forested land in the BR and take into account the on-going process of deforestation and fragmentation. The decision upon reforestation areas is based on the aim to improve forest structure through defragmentation. The main objective concerning analysis of fragmentation is to combat the fragmentation of core forests into small forested areas (forest patches). This aspect is well represented by connecting forest patches through intact riparian forest, which serves as corridor. Another focus should lie in increasing the area of medium and large core forests.

The fragmentation analysis is a helpful tool to find areas that are especially suitable for re- and afforestation from a structural point of view. In areas that are dominated by forest patches, afforestation and reforestation would reduce the negative effects of fragmentation. Both strategies would, in addition to the plain effect of forest area increase, create forest corridors which have a positive effect on the landscape structure by turning forest patches into forest cores.

1. Outlook and Recommendations

Destruction and fragmentation of habitats are major factors in the global decline of populations

and species, the modification of native plant animal communities and the alteration of ecosystem processes. In view of the commitment of the biosphere reserve to protect and use wild coffee as a special ecological and economic resource in a sustainable way, the protection of forests contributes to the conservation of biological diversity. The forest management within the biosphere reserve should prevent further fragmentation of the forest primarily by avoiding further deforestation. Loss of forest inevitably leads to an increase in forest fragmentation. Regardless of the particular management zone, especially those forests should be preserved and enlarged that today are classified as forest patches because of their small size. Possible core forests should be protected at their edges through cutting bans and strong boundary demarcation. The positive influence of core forests on the biodiversity could be enhanced by reducing the proportion of perforated forests within core forests.

b) People and Forest

In general forest management and protection has its focus on efficient and sustainable management of trees. The project component incorporates land use planning which implies the relevance of human activity. The negative impact of people living in and adjacent to forests is outlined in many studies regardless of their strong relation on this resource and their tradition to live with the forest. Demographic changes are forcing the people to deplete the resource they depend on. In the Kafa region this contradictory development can be observed very well. Anyhow, people living in and adjacent to forests have their experience to use forest resources and their future is strongly related to the future of the forest. Different actors such as private investors, unsecure land use rights and the enforcement of changing settlement policy are negative synergies which intensify the situation.

The challenge of today is to incorporate the traditional knowledge of rural people into management concepts and give these people a voice whose livelihood is depending on that resource we want to protect.

iv. <u>PRA</u>

Different PRA techniques were applied to get an overview of problems, needs and expectations of rural communities.

The project component "Community Plantation" can give the rural community the possibility to shape their future and contribute with traditional know-how in the field of silviculture.

Group discussion and in-depth interviews are summarized to Woreda level to be able to give a broad overview on aspects which influence the analysis activity. Direct site related information is incorporated into the geodata and influenced the site selection.

PRA summary on Woreda level:

Adiyo:

- Family size is smaller than in other Woredas (mainly 1 5)
- Many re-settler and migrants
- Diversified livelihood income due to spices and MPT (mainly mango) on farm
- Lack of land for agricultural activities but enough for grazing
- Production of charcoal
- Wood demand is covered by woodlots from homegarden
- Forest grazing is practiced
- Awareness concerning forest loss (decrease in size and density)

- Erosion is not a severe problem or is sufficiently tackled (FAO initiative)
- PFM is well known and participated

Chena:

- Lack of land for agriculture
- Lack of land for grazing
- Agroforestry is known and practiced
- Awareness concerning forest loss (decrease in size and density) \rightarrow recommendation to combat by strong boundary demarcation
- Erosion is a severe problem (Wara Bamba, Agaro, Dosha, donga)
 - High demand for technical assistance
- No effective erosion measures
- Population pressure is highlighted
- Fire wood mainly from woodlots (Eucalyptus)

Decha

- Relatively big HH (11 15)
- Agroforestry is well known and practiced
- Forest loss is not recognised by all informants
- Erosion is a severe problem but frequent training is offered but not efficient
 - Lack of seedlings → high demand from different interviews and group discussions
 - \circ Lack of technical assistance
- PFM is well known and practiced
 - PFM could stabilize deforestation
 - Forest is increasing in density

Gawata

- small land holdings (0.25 1 ha)
- Diversified livelihood due to different species on site (intercropping is practiced)
- Lack of land for agricultural activities
- Communal grazing is widespread
- Agroforestry is known and practiced
- Charcoal production
- Additional income is honey
- Erosion is not a severe problem, training was offered
- Wood supply of forest and PFM
- Good suggestions to replace artificial fertilizer DAP and URIA by biological measures
- Awareness concerning forest loss (minor decrease in size and minor decrease in density)
 → recommendation to combat by strong boundary demarcation

Gesha

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- No coffee for livelihood support
- Main livelihood support is livestock
 - mainly single grazing
 - Agroforestry is well known and practiced
 - Honey is important NTFP
- Lack of fire wood
- Erosion is a very severe problem
 - o Demand for technical assistance
 - Demand for training
 - Very good options for agroforestry

- Awareness concerning forest loss (decrease in size and density)
 - Underlying reason: illegal settlement and population pressure
- PFM is known, partially fears to participate
- Problems with fresh water supply

Gimbo

- Main livelihood support crop (less livestock) and labour
- Many re-settlers and Migrants
- Agroforestry not known
- Diversified livelihood income due
- Erosion is a problem, training offered
 - Demand for follow-up
- Biosphere Reserve Concept by the majority not known
- Severe problems in sharing forest resource (landless youth are mainly named as reason)
 - Area for resettlement in 2005
- Lack of land for grazing activities
- PFM is well known and participated
- Awareness concerning forest loss (decrease in size and density)

Saylem

- Small land holdings (0.25 1 ha)
- Main livelihood support is livestock
 - o mainly single grazing
- Minor important crop maize
- Agroforestry only partly known
- Very high estimated wood demand
- Lack of fire wood
- Erosion is a severe problem
 - Lack of manpower
 - Lack of training

c) Tree selection

The recommendation of particular species for the implementation of the different components is not adapted to the specific site conditions of every selected site (plot). The selection is based on own observation, discussions with local communities and a literature review and can only support the final species selection which has to be based on first-hand experience of species' performance under any given set of site conditions. Whiles the duration and sophistication on such experiments might vary, its importance cannot be overemphasized. Trials in tropical reforestation programs show that even the good performance of a specific species in a tree nursery is not a guarantee for an optimal result. Due to various growth rates, the ability to adapt and fertile top soil from the nursery (if not planted bare rooted) direct decisions about the capacity of a species growth performance under existing site conditions is hampered. The choice of proposed species is influenced by the objective of the component. The capacity of a given species to meet the objectives depends on a series of different characteristics, such as growth rate, tolerance to withstand heavy sun or degraded soils, the availability of seeds and ease of propagation, and the acceptance of the local people. According to respect the different objectives of the components, the species selection is divided into "species for reforestation purposes", "species for community plantation", and the introduction of "Agroforestry". Species

characteristics are presented in the form of data sheets for each selected species. These include brief information on the species" natural occurrence (Habitat/Ecology) within Ethiopia, species characteristics (habitus), climatic and edaphic preferences (growing area), silvicultural characteristics (management), and additional remarks (such as production potential or traditional usage).

Albizia spec. (probably A. gummifera: engl. peacock flower or A. schimperiana) / possible also for agroforestry

Habitat / Ecology	Habitus	Problems / Concerns	Growing area	Mixt.	Plant ass.	Management	Remarks	Information / Sources
common	large	Albizia schimperiana is	Altitude:		Moist evergreen	Propagation methods	Apiculture:	http://www.w
in lowland	deciduous	widespread and locally	600 -		forest: this	Use of seedlings, direct sowing at site and wildings are	Bees visit the	orldagroforest
and	tree 4.5-30	common, and not	2300m		vegetation-type is	popular modes of propagation.	nectariferous	ry.org/sea/Pr
upland	m <i>,</i>	threatened by genetic			characterized by	Tree Management	flowers.	oducts/AFDba
rain-	branches	erosion.			tall and medium-	Lopping and coppicing while young to improve form		ses/af/asp/Sp
forest,	ascending				sized emergents,		Fuel: The tree	eciesInfo.asp?
riverine	to a flat	However, locally			and understorey	-erosion control: The root system of A. gummifera holds	provides good	SpID=1757
forest and	top.	populations are under			shrubs.	soil and prevents gulley erosion.	fuelwood.	
in open		great pressure because				Shade or shelter: Is a useful shade provider in homes and		http://databa
habitats	Crown flat;	of deforestation and			Emergents include	pastureland. Nitrogen fixing: Known to fix Nitrogen. Soil	Timber: Bears	<u>se.prota.org/</u>
near	bark	poor regeneration, e.g.			Aningeria adolfi-	improver: Known as a good mulch tree	pale brown	<u>dbtw-</u>
forests.	smooth	in Ethiopia			friedericii, Albizia		heartwood of	wpd/exec/dbt
	and grey.				gummifera, A.	Planting in pure stands is not recommended because of	medium	<u>wpub.dll</u>
lt	Leaves	A. gummifera. Young			grandeabracteata,	the greater risk of pest problems. Planted trees can be	strength.	
occasional	bipinnate	trees are often			Macaranga	managed by coppicing.	Used as	
ly appears	in 5-7	damaged by strong			capensis and		timber but	
as a	pairs,	wind, from which they			Ocotea	The addition of NPK fertilizer is recommended for	not very	
pioneer	leaflets	should be protected.			kenyensis.	seedlings. In planting experiments in Ethiopia, Albizia	durable.	
species in	dark green					gummifera showed a survival rate of 94%. Young planted	_	
forests	roughly	Further tests are			Typical understorey	trees can be managed by coppicing and lopping.	timber is	
and in	similar in	needed to confirm its			shrubs include	······································	highly	
thickets.	size but	promise as an auxiliary			Chionanthus	Handling after harvest	susceptible to	
	top pinnae	tree in agroforestry			mildbraedii and	Freshly harvested logs float in water and can be	wood borer	
	in 9-16	systems. Once			Psychotria	transported by river. Treatment of the logs with	attack.	
	pairs,	adequate vegetative			orophila.	preservatives is necessary if they are to be left in the		
		propagation				forest for some time, to avoid damage by fungi or insects.		
		techniques have been						
		developed, A. gumm.				Prospects: A. gummifera is a multipurpose species. It		
		deserves to be				seems to have good prospects as a commercial timber		
		promoted for planting.				tree in sustainably managed forests and in afforestation		
						projects.		

 Table 11: Reforestation of degraded natural forest with native pioneer-tree species - Albizia spec.

Reforestation of degraded natural forest with native pioneer-tree species (also agroforestry)

Cordia africana (East African cordia, large-leafed cordia, Sudan teak); Amharic: wanza

Habitat / Ecology	Habitus	Problems / Concerns	Growing area	Management	Remarks	Information / Sources
Altitude: 550-2 600 m, Mean annual rainfall: 700-2 000 mm Soil : Large leafed cordia thrives in forest soil. occurs at medium to low alt., in woodland, savannah and bush, in warm and moist areas, often along riverbanks- frost tender. grows in drier conditions but thrives in good rainfall areas riverine forest and secondary bushland, transgressing into humid types of woodland. clearings in montane forest, and wooded grassland at 500–2200(– 2700) m altitude. The annual rainfall in its area of distribution is 900–2000 mm, with a dry period of 3–4 months and an estimated mean annual temperature of 16–22°C. prefers deep, moist but well-drained soils, but can also be found on rocky slopes.	Up to 25m heavily branched with a spreading , umbrella- shaped or rounded crown. Bole typically curved or crooked. Bark greyish- brown to dark brown, smooth in young trees, but soon becoming rough and longitudi nally fissured with age	 Young trees can be attacked by nematodes Locally, especially in Ethiopia and Kenya, the exploitation of <i>Cordia africana</i> has been severe and led to depletion of natural stands. However, it seems unlikely that this species is under serious threat because it is widespread in different types of habitat, appears to have fair rates of regeneration and is commonly planted. As a result of heavy exploitation of selected trees such as <i>Cordia</i> <i>africana</i>, <i>Pouteria adolfi- friederici</i> and <i>Prunus africana</i>, these species are reported as endangered by some studies (Ensermu Kelbessa and Teshome Soromessa 2004, Girma Balcha et al, 2002, Schmitt C. B., 2006) Deforestation coupled with the extensive exploitation of the species for timber production has led to its depletion, and the Ethiopian government has banned its cutting from natural forests though the problem remains unabated 	afro-montane rainforest and undifferentiated afro-montane forest (mixed Podocarpus forest), usually along margins and in clearings. In southern Ethiopia it is considered one of the most important indigenous tree species, and the demand for seed is still increasing. Research in selectively logged rainforest in south- western Ethiopia demonstrated that <i>Cordia africana</i> has adequate regeneration and seems to have good prospects for sustainable management of timber production forest.	can be managed by coppicing, pollarding and pruning, Regular pollarding is recommended when <i>Cordia a.</i> is used as shade tree for crops to reduce shading. As a timber tree, <i>Cordia a.</i> can be grown in rotations of 40–50 years. Close spacing and regular pruning are recommended because the boles have a tendency to develop a poor form and numerous branches. Natural regeneration of <i>Cordia a.</i> in more closed forest is restricted to gaps early colonizer in forest regrowth. It is often left when forests are cleared for cultivation, as the tree is an excellent shade tree for crops <i>Tree Management</i> The species grows fairly fast, reaching 7-8 m in 7 years; management practices include pollarding, lopping and coppicing. <i>Germplasm Management</i> After extraction, seeds are dried in the sun to 6-8% mc; can be stored for at least 1 year in hermetic storage at 3 deg. C with no loss in viability. There are about 18 000 seeds/kg. <i>Services</i> Shade or shelter: C. africana is planted as a shade tree in coffee plantations; it is usually left in the fields, as it provides excellent shade for crops. Soil improver: Leaf fall in the dry season is heavy, and the leaves make good mulch. Ornamental: Trees are planted in amenity areas.	 Products Food: Mature fruits have a sweet, mucilaginous, edible pulp Fodder: Leaves provide fodder for the dry season. Apiculture: C. africana provides good bee forage, as the flowers yield plenty of nectar. Beehives are often placed in the trees. Fuel: Trees are a good source of firewood. Timber: The heartwood is pinkish-brown, reasonably durable, relatively termite resistant; it works easily and polishes well but is often twisted and difficult to saw. It is used for high-quality furniture, doors, windows, cabinet making, drums, beehives, joinery, interior construction, mortars, paneling and veneering. Medicine: The fresh, juicy bark is used to tie a broken bone; this splint is changed occasionally with a fresh one until the bone is healed. 	http://www.wo rldagroforestryc entre.org/sea/P roducts/AFDbas es/af/asp/Speci esInfo.asp?SpID =588

Table 12: Reforestation of degraded forest with native pioneer-tree species - Cordia africana

<u>Celtis africana</u> (White stinkwood, Camdeboo stinkwood)

Habitat / Ecology	Habitus	Problems / Concerns	Growing area	Mixt.	Plant ass.	Management	Remarks	Information / Sources
It is f airly	Up to 25 m in		in a wide range	by. O. europaea	- Aningeria adolfi-friedericii,	grows fast, 1–2 m per	The timber has	http://www.plant
drought	forests; short	In Uganda it has	of habitats	africana,	upland rainforest	year. First fruits may	no commercial	zafrica.com/plant
resistant	with spreading	been recorded	from the coast	Allophylus		appear when trees are 4	value. But it is a	cd/celtisafrican.h
and can	crown in the	that <i>Celtis</i>	up to 2 100 m,	abyssinica,	- Podocarpus forersts	years old.	good general	<u>tm</u>
withstand	open	africana does not	from the Cape	Celtis africana,	(coniferous), 2000 -2500m		timber suitable	
frost. It does		regenerate under	Peninsula	Croton	with Celtis in the	In Uganda it has been	for making	
best in	easy to	the canopy. In	northwards	machrostachys,	lower(second stratum) layer	recorded that Celtis	planks,	http://books.goo
good, rich,	distinguish by	gaps	through South	Dombeya spp.,		africana does not	shelving, yokes,	gle.de/books?id=
deep soil	its smooth, pale	regeneration was	Africa to	Ekebergia	- Mixed Juniper-Podocarpus	regenerate under the	tent-bows and	WKj YqTU4AC&
with plenty	grey to white	prolific.	Ethiopia, where	capensis, Olea	Upland Evergreen Forest	canopy. In gaps	furniture.	pg=PA86&lpg=PA
of water in	bark. It may be		it grows in	hochstetteri	These forests are found as	regeneration was		86&dq=celtis+afri
summer.	loosely peeling	Seeds collected	dense forest, on	and Prunus	dispersed patches of forest in	prolific. Celtis africana is		cana+ethiopia&s
	in old trees and	from the ground	rocky outcrops,	africana	Oromiya, SPNN and Amhara	propagated by seed and		ource=bl&ots=tT
1200-	sometimes has	are mostly	in bushveld, in		Regional States. They are	wildlings.		ORE TvpU&sig=7
2200m	horizontal	infested by	open grassland,		found between 1,500 to	(iii)		<u>S_mdPAmKZjofpC</u>
	ridges	insects, and it is	on mountain		2,700 where annual rainfall is	 It is a major co- 		kWFbjZLDxlkY&hl
over 1400		recommended to	slopes, on		between 700 and 1,100 mm.	dominant tree species		<u>=de&ei=wNI5Te3</u>
mm rainfall		harvest fruits	coastal dunes,		Mean annual temperature	 clustered seedling 		LA8OYOvHBpJ0L
		directly from the	and along river		ranges between 14° and 20°	distribution at the base		<u>&sa=X&oi=book</u>
		trees when they	banks and in		C. The main canopy species	of		result&ct=result&
		turn from	kloofs.		are J.procera and P. gracilor	overstorey trees.		resnum=4&ved=0
		yellowish to			between 20 and 30 meters	Vegetative regeneration		CDYQ6AEwAzgK#
		brownish, and to			high, with a well-developed	by coppicing or		v=onepage&q=ce
		dry them in the			strata of small to medium	sprouting also seems to		ltis%20africana%
		sun before			trees, chiefly O. europaea	be an		20ethiopia&f=fals
		extracting stones.			africana, Allophylus	important mode of		<u>e</u>
		These should be			abyssinica, Celtis africana,	regeneration		
		cleaned from			Croton machrostachys,			
		fruit flesh before			Dombeya spp., Ekebergia			
		sowing.			capensis, Olea hochstetteri			
					and Prunus africana			

Table 13: Reforestation of degraded forest with native pioneer-tree species - Celtis africana

Habitat / Ecology	Habitus	Problems / Concerns	Growing area	mixture	Plant ass.	Management	Remarks	Information / Sources
from 2000- 3000 m elevation, in areas receiving 1000- 1500 mm of rainfall - in the Bale mountain s: In the upper zone between 3,000- 3,400 m	20-30m short trunk, thick branches, and thick, peeling bark. The leaves are up to 40 cm long, compound with 7-13 leaflets, each leaflet about 10cm long with a finely serrated margin, green above, silvery- haired below. The flowers are white to orange-buff or pinkish- red, produced in panicles 30- 60cm long.	The dry Afromontane forests in Ethiopia are composed of a number of indigenous tree species that are declining at an alarming rate in this ecosystem. The few reforestation programs, which have so far been undertaken, employ exotic tree species. This is mainly due to lack of knowledge on the environmental requirements of indigenous trees. soil fertility loss in the highlands: using dung and crop residues as household fuels and animal feeds, declining fallow periods, soil and organic matter burning (guie), low use of chemical fertilizers. Though the farming system in most part is mixed crop-livestock, nutrient flows between the two are predominantly one sided, with feeding of crop residues to livestock but little or no dung being returned to the soil. - unable to regenerate in areas suffering from a high level of grazing. Young trees have poor competitive ability	 Formerly one of the commonest high-altitude rain forest trees in Ethiopia. Now only scattered trees remain in Moist and Wet Weyna Dega and Dega agroclimatic zones upper limit of 3,000 to 3,400 the forest first changes to <i>Hagenia abyssinica</i> forest with scattered clumps of <i>Arundinaria alpina</i> (bamboo), then with increasing altitude to <i>Erica arborea</i>. high-elevation Afromontane regions of central and eastern Africa. It also has a disjunct distribution in the high mountains of East Africa from Sudan and Ethiopia in the north. often dominant in the woodland zone just above the mountain bamboo. <i>H. abyssinica</i>, <i>Hypericum lanceolatum</i> and <i>Erica arborea</i> dominate the forest formation, mostly mixed with <i>Juniperus excelsa</i>. <i>Erica arborea</i> occurs as a shrub at its uppermost distribution range. <i>Hagenia</i> can descent to an altitude of 2600 malong deep valleys and topographic depressions. 	in mixed afromontane forest with Podocarpus, Afrocarpus, and other trees, and in drier afromontane forests and woodlands where <i>Hagenia</i> is dominant, or in mixed stands of <i>Hagenia</i> and Juniperus procera	 often associated with Schefflera abyssinica, S. volkensii, Galiniera saxifraga, Rapanea melanophloës and with the mountain bamboo, Arundinaria alpina; at lower altitudes often at forest margins. clear example of an afro-montane endemic In Ethiopia, <i>H. ab.</i> is a dominant tree in subhumid montane woodland (rainfall up to 1250 mm per year). In humid montane woodland (rainfall up to 1600 mm per year), it occurs with the dominant tree bamboo <i>Sinarundinaria alpina</i>, together with <i>Schefflera volkensii</i>, <i>Hypericum</i> spp., <i>Ilex mitis</i> and <i>Nuxia congesta</i> 	 Agroforestry In Tanzania, planted or wildings are allowed to grow, interspersed throughout a field at a density of about 10 trees/ha. To reduce light competition with crop and foster marketable bole development, the trees are pruned once each year in November, about two months before planting crops at the onset of the rainy season. Typically, annual prunings of mature trees remove 40-50% of the canopy height. Pollarding is suitable . great amount of litter production -fast decomposition rates which makes it an effective nutrient pump. beneficial role in enhancing soil fertility status which in turn results in higher productivity. -regeneration cycle associated with heavy forest fires. Crucial by clearing the area of competitive plants and heating the prospective seedbed. tolerant of fire, and heavy fires create ideal germination conditions for the small wind- dispersed seeds. 	Remedy against tapeworm Agroforestry. Hagenia is one of the species that contribute tremendousl y valuable biological attributes in fertile soil formation and conservation. Moreover, it has a wide range of products and environment al functions such as medicine, timber, firewood, fodder, and mulch.	http://www. worldagrofor estry.org/Sea /Products/AF Dbases/AF/as p/SpeciesInfo .asp?SpID=94 9 Measuring Soil Fertility under Hagenia abyssinica (Bruce) J. F. Gmel by the Biotest Method. (International Journal of Agronomy Volume 2010 (2010), Article ID 845087, 5 pages doi:10.1155/2 010/845087)

Hagenia abyssinica (African Redwood), Amharic: kosso / Reforestation, but also possible for agroforestry!

Table 14: Reforestation of degraded forest with native pioneer-tree species - Hagenia abyssinica

Macaranga spp.	(probably M.	capensis),	engl. Spir	ny macaranga,	Wild poplar
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Habitat / Ecology	Habitus	Problems / Concerns	Growing area	Mixt.	Plant ass.	Management	Remarks	Information / Sources
In evergreen forest and along stream banks.	Medium to large tree (10- 30m). Bark pale grey, smooth with whitish horizontal markings; trunk often buttressed in large specimens; branches often armed with short spines. Leaves spirally arranged, broadly ovate, up to 20 × 25 cm, more or less deeply cordate and often peltate at the base, 5-11-veined from the base, densely golden-gland dotted below; margin glandular-dentate to almost entire. Flowers in branched racemose inflorescences, greenish to creamy-yellow, unisexual, on different trees. Fruit subspherical, rarely 2- lobed, up to 6 × 10 mm, covered in yellowish-green glands when young, smooth, hairless and green when ripe.	Not found	Up to 1400 m From S Ethiopia south to S Africa In Kafa region among most common tree/shrub species recorded	Not found	Croton macrostachyus, Phonix reclinata, Vepris dainelli, Sapium ellepticum, Pouteria adolfifriedericii, Chionanthus mildbraedii, Draceaena steudneri, Schefflera volkensii, Milletia ferruginea, Chionanthus mildbraedii, Macaranga capensi s, and Psychotria orophila.	Not found	hollow stems that can serve as nesting space and occasionally provide nectar. The trees benefit because the ants attack herbivorous insects and either drive them away or feed on them	http://www.zimba bweflora.co.zw/sp eciesdata/species. php?species id=1 34990

Table 15: Reforestation of degraded forest with native pioneer-tree species - Macaranga spp.

Eucalyptus spec. (particularly, E. globulus, E. citriodor, E. camaldulensis, E. saligna, E. grandis)

Habitat / Ecology	Habitus	Problems/ Concerns	Growing area	Mixt.	Management	Remarks	Information / Sources
Eucalyptus		Replaced the slow-growing native	From 600	planting of E.	Yield: Up to 45 m³ /ha/ a	the	http://www.
species are		Juniperus procera	different	globulus is		presence of	etff.org/Articl
tolerant to		strong tendency of the local people	varieties 10	justified until the	Fast growing, requires little attention, grows	mycorrhizas	es/Eucalyptu
severe periodic		towards planting Eucalyptus	eucalyptus	current fuelwood	up from the roots when cut.	is an	<u>s.html</u>
moisture stress,		plantation. The local people are	species are	shortage is		advantage	
low soil fertility		replacing all the available fields	widely	eliminated. In the	Should be managed selectively, no clear-cut	to most	https://zidap
and fire and		including arable lands and farm	planted	long run, parts of		eucalyptus	<u>ps.boku.ac.at</u>
insect attack		yards with monoculture of	virtually in all	Ethiopian	can be harvested every ten years.	species	/abstracts/oe
		eucalyptus plantation. Eucalyptus	sites and	Eucalyptus		which	list.php?pal
		is planted along river courses, near	ecological	plantations may	E. globulus, for instance, has a strong tap	facilitates	D=3&paSID=
		wetlands, even on farm yards. Due	zones of	naturally alter in	root and good lateral root system that	accumulatio	<u>3536&paSF=-</u>
		to its economic feasibility, the	Ethiopia	composition into	makes it very reputable species for	n of	<u>1&paCF=0&p</u>
		attitude of the local people	except the	stands of	catchment protection.	nutrients	aLIST=0⟨
		changing rapidly in favour of this	most arid. In	indigenous		even in poor	<u>uage_id=DE</u>
		species.	most parts of	highland species,	The soil nutrient levels under eucalyptus	soils	
		The consequences of the above	the country,	e.g. Juniperus	forest could also be improved by adjusting		
		pressure are not limited on	e. g.,	procera,	spacing and introducing leguminous		
		degradation of the land. It has also	Hossahena	Podocarpus	planting. Mixing eucalyptus with acacia		
		a direct effect in the water balance	and Wollayta	gracilior and Olea	species (e. g A. nilotica which produces high		
		of the area that could result in	, eucalyptus	africana.	amount of litter, 8000kg/ha/yr) increase the		
		drying up of the perennial rivers	became the		litter fall and thereby improve the soil		
		and loss of biodiversity.	main stay of		nutrient bank.		
			the		.		
		Adverse reactions against	community		\rightarrow eucalyptus roots deeper than wheat and		
		eucalyptus planting are based on	for additional		protects the soil from eroding. This is why it		
		some ecological, technical and	income		makes sense to plant eucalyptus between		
		socio- economic arguments.	generation.		crops, plants and busnes, if not planted too		
					close. wheat and other crops will also grow		
					in son formeny planted with eucalyptus.		

Table 16: Species for Community plantation for wood supply - Eucalyptus spec.

Arundinaria alpine, **now Yushania alpina (**African alpine bamboo)

The local name of this species in Affan Oromo is Lemen, while in Amharic, it is known as Kerkeha

Habitat / Ecology	Habitus	Problems / Concerns	Growing area	Plant ass.	Management	Remarks	Information / Sources
Mountai	Y. alpina is a	Susceptible to termites and borers.	Mountain gorges and	Open	Total Area in Ethiopia: 148,000ha,	One of	ftp://ftp.fao
n	tufted,		tops, usually in Moist	canopy	130,000ha are in good condition	only two	.org/docrep
woodlan	sympodial	Currently, there are very few	and Wet Dega	of 5-12	B. farming can be a lucrative business. The	endigeno	/fao/010/ah
ds and	bamboo with	plantations of Y. alpina in Ethiopia.	agroclimatic zones, up to	m high	current price of bamboo poles of Y. alpina	us species	776e/ah776
highland	erect green	Most of the highland bamboos in the	3,000 m. The grass grows	trees.	ranges from 7-12 Birr per piece. Given the	of	<u>e00.pdf</u>
forests	culms ranging	country grow naturally in forests.	in dense stands with a	Poor	growth of the industrial bamboo sector in	bamboo	
	from 2 to 19.5		leafy canopy and stems	specime	the country, farmers who take up the		http://www
2200 –	meters in	The uncontrolled exploitation of this	so close that one can	n of	challenge of bamboo cultivation can		<u>.unido.org/f</u>
3200m	height. The	resource, however, has resulted in	only pass through with	Juniperu	virtually be assured of an extra source of		ileadmin/us
(3500)	diameter of	reduced yields and deterioration in	difficulty. A valuable	5	income.		<u>er media/P</u>
minimu	the culm	quality.	forest crop which	procera,			ublications/
m: 1500	ranges from 5		should not be	with	Current use of highland bamboo is for		Pub_free/G
mm/yr	to	Considering the economic importance	overexploited.	Hageina	furniture (traditional processors and		uidelines fo
mean:	12.5 cm.	of Y. alpina, the continuity of bamboo		and Erica	modern workshops), house construction,		<u>r_cultivating</u>
1700 -		supplies for local and urban uses will	Over the last 10 years,		fencing, water storage/ water pipes,		<u>Ethiopian</u>
2200mm		depend on the establishment of	the resource base has		baskets, agricultural tools, beehives,		highland ba
/yr		plantations and on the effective	been significantly		household utensils and various artifacts.		<u>mboo.pdf</u>
		management of existing forests.	reduced because large		Its potential industrial uses could be for		
Need			areas of indigenous		bamboo panels, bamboo curtain, gas		
moderat		The woody stems have many local	bamboo forests have		generator etc.		
ely		uses: roofing poles, fences, walls, local	been cleared for				
fertile		furniture, local spinning tools,	conversion to		Effective management involves systematic		
soils		containers for grain, basketry. The	agriculture. This is the		but selective cutting of mature culms.		
		stem is split into strips of different	case in the highland		Selective harvesting of the crop ensures a		
		sizes. Shoots, leaves and young stems	areas of the country.		sustainable supply of valuable and useful		
		can be used for fodder and are eaten			raw material. The removal of mature		
		by wild animals. Bamboo fencing has			culms also maintains the vigour of the		
		been used in soil-conservation			plant and allows for the continuous		
		structures.			generation of new shoots.		

Table 17: Species for Community plantation for wood supply - Arundinaria alpine

Casuarina cunninghamiana (Australian beefwood, Australian pine, beefwood, casuarina, coast beefwood, creek oak, fire oak, river oak, river she-oak)

Habitat / Ecology	Habitus	Problems / Concerns	Growing area	Management	Remarks	Information / Sources
	Casuarina	For very arid sites, A.	Grows in Dry	Good for erosion control with	Fairly fast	http://www.
It is moderately drought resistant	cunninghamian	tortilis, A. nilotica, C.	and	its network of fine subsurface	growing. In	worldagrofo
but is unable to tolerate semi-arid	a is a medium to	cunninghamiana	Moist Weyna	roots, also to stabilize	Australia,	restry.org/s
conditions unless some additional	large tree 12-35	and L. leucocephala	Dega and Dega	riverbanks	branchlets are	ea/Products
groundwater is available to	m in height, 30-	might be suitable, but	agroclimatic		used as	/AFDbases/
supplement rainfall. It is relatively	150 cm in	not C. africana and E.	zones, probably	a long-lived, relatively fast-	fodder when	af/asp/Speci
fire sensitive especially when	diameter. Bark	Globulus	in all regions of	growing tree with average	nothing else is	esInfo.asp?S
young. When planted outside its	finely fissured		Ethiopia,	height increments of 1-2	available (hence	<u>pID=476</u>
natural habitat, it adapts itself to	and scaly	Has an enormous	1,5~2,800 m.	m/year.	the name	
comparatively dry sites.	brown. Leaves	potential as biomass	The most		"beefwood").	http://diss-
	on new shoots	producer.	commonly	Seedlings require protection	The wood is very	epsilon.slu.s
Biophysical limits	erect.		grown of all	from browsing stock and fire	hard and thus	<u>e:8080/arch</u>
Altitude: 0-2 200 m ??, MAT: 13-29	Deciduous	The establishment of	Casuarina.	in initial stages of growth.	difficult to	<u>ive/0000093</u>
deg. C, MA rainfall: 500-1 500 mm	branchlets thin	profitable forest stands			saw and season,	<u>4/01/mehari.</u>
	and soft and	of such an important		airly good coppicing ability	though it is	<u>pdf</u>
Soil: mainly sands or sandy loams,	droop in various	species is determined		when young, and older trees	susceptible to	
but include clayey loams and	specimens.	by the right choice of		are capable of producing root	termite attack.	
gravel terraces of old river courses	Leaves like	provenance, because a		suckers.	The special root	
and infrequently clays. Grows in	teeth, less than	high level of genetic			association with	
light textured sands, and gravel	0.5 mm long, 6-	diversity exists		When introduced to exotic	a fungus enables	
including poor soils and eroded	8 in a ring at	within the species.		localities, inoculation of the	Casuarina to fix	
sites. Has been successfully	joints or nodes			seedlings with pure culture of	nitrogen.	
planted in acidic, neutral, alkaline	about 5 mm			effective strains of Frankia		
and saline soils.	apart			rhizobia is recommended to		
				enable the species to fix		
				atmospheric nitrogen.		
	1					

 Table 18: Species for Community plantation for wood supply - Casuarina cunninghamiana

Casuarina equisetifolia (Whistling Pine)

Habitat / Ecology	Habitus	Problems / Concerns	Growing area	Management	Remarks	Information / Sources
in Dry, Moist,	A tree to 20	The species is said	Cultivated and	Firewood, charcoal, poles, timber (construction), fodder	It has been	http://www.
and Wet Kolla	m with	to exhaust	naturalized in	(young leaves), mulch, soil conservation, soil	called 'the	worldagrofo
agroclimatic	"weeping"	moisture and	Ethiopia,	improvement, nitrogen fixation, ornamental, shade,	best	restrycentre
zones, 0-	foliage.	lower the	especially in	windbreak, dye, tannin (bark).	firewood in	.org/sea/Pr
1,400m. The	BARK: Grey-	watertable.	western Eritrea		the world'	oducts/AFD
extensive root	black		and Shewa	Fast growing. Side pruning to get a dear bole.		<u>bases/af/as</u>
system	cracked with	Tolerant to salt	regions,		Erosion	p/SpeciesInf
enables the tree	age. LEAYES:	water.		A planting density of 2 500 stems/ha is commonly used	control:	o.asp?SpID=
to grow in poor	Minute			but some farmers plant up to 8 000-10 000 stems/ha	Since it is	<u>477</u>
soils.	scale leaves	The tree		when fuelwood and small poles are the required product.	salt tolerant	
	just visible	suppresses		C. equisetifolia is a poor self-pruner. Pruning is necessary	and grows	
	on the green	undergrowth, and the dry branchlets		up to 2 m to make plantations accessible for maintenance	in sand, C. equisetifolia	
	branchlets,	on the ground may		Not fire resistant. It coppices only to a limited extent and	is used to	
	branchlets	become a fire		best results are obtained when cut young.	control	
	to 30 em	hazard.			erosion	
	hang down in	The charcoal		Timely thinning is essential (high light-demand).	along coastlines,	
	crowded tufts.	produces an intense heat with		For timber production, an intermediate thinning.	estuaries, riverbanks	
		little smoke or ash.		Young trees are susceptible to competition from weeds, especially grasses.	and waterways.	
				They are susceptible to drought until their roots reach the groundwater table, which may take up to 2-3 years after		
				life span of 40-50 years and displays fast early growth.		
				On favourable sites, it can yield an annual increment of 15 cubic m/ha of wood in 10 years		

Table 19: Species for Community plantation for wood supply - Casuarina equisetifolia

Pinus radiata (Monterey Pine, Radiata Pine)

Habitat / Ecology	Habitus	Problems / Concerns	Growing area	Management
1500-300 m	An evergreen timber tree	Trees are attacked by	Now widely	Firewood, poles, posts,
600-1600 mm	that grows to 50 m with a	woolly aphid and the	introduced in	timber (heavy and light
	straight	fungus Diplodea pinea.	Ethiopia in Moist	construction),
	trunk and upcurved		and Wet Weyna	ornamental, windbreak,
It does well on neutral to	branches, developing an	Seedlings are also	Dega and Dega	long-fibre pulp.
acid well-drained soils.	open, irregular	susceptible to damping-	agroclimatic zones	
	crown as it matures.	off fungus. The soft white	of Shewa, Kefa,	Can grow extremely fast.
Tolerates sand, wind,	BARK: Thick, dark brown,	wood is light and straight	and Arsi	Thinning, pruning.
frost, and drought.	deeply grooved	grained but it has a low	regions.	
	with age. LEAYES: Bright	resistance to decay and		
	blue-green needles, soft,	termite attack. This pine		
	sharply	is planted worldwide for		
	tipped, 10-15 em long, in bundles of 3, forming	paper pulp.		
	dense tufts.	susceptible to Armillaria		
	CONES: Mature female	root rot, common in		
	cones very large, shiny grev up to 15	Ethiopia		
	em long, with an oblique			
	base, in whorls of 3-6.			
	remaining on			
	the tree for many years.			

Table 20: Species for Community plantation for wood supply - Pinus radiata

Agroforestry with native multi use tree species

Erythrina brucei (Lucky bean tree)

Habitat / Ecology	Habitus	Problems / Concerns	Growing area	Plant ass.	Management	Remarks	Information / Sources
moist montane forest 1700-2700 m montane grassland 1500-3000m The environmental factors determining the variation in vegetation types in the montane grassland ecosystem are moisture, topography and human activity.	A small deciduous tree, usually 5-10 m, with a single trunk but thick spreading branches to a rounded crown. BARK: Thick and corky, branches prickly. LEAVES: Compound, with 3 oval leaflets, not hairy, the middle one stalked and largest to 23 x 16 em, nerves below and leaf stalks prickly. FLOWERS: In big heads on the bare tree, orange-red, occasionally pale	Since this ecosystem (grassland) is densely occupied by humans and, therefore, highly disturbed. Agricultural practices are expanding at the expenses of the destruction of the natural vegetation and the deterioration of the natural environments in general. Crop cultivation is practiced even at slopes more than 45 %, irrespective of the low yields to be expected at this type of ecosystem.	endemic to Ethiopia It is widespread in open woodland, upland forest edges or grasslands of the Moist and Wet Kolla and Weyna Dega agroclimatic zones, 500- 2,000 m.	Bale mountains: the vegetation belt between 1700 and 2100 m is characterized by tree species like Syzygium guineense, Polyscias fulva, Allophylus abyssinicus, Erythrina brucei, Croton macrostachyus and Canthium oligocarpum. Important timber trees like Ocotea kenyensis and Podocarpus falcatus are also found in this belt. The vegetation belt between 2100 and 2700 m is characterized by trees such as Hagenia abyssinica, Schefflera volkensii, Erythrina brucei, Galiniera saxifraga, Allophylus abyssinicus, Dombeya torrida, Ficus ovata, Prunus africana, Croton macrostachyus, Maytenus addat (endemic to Ethiopia) and Canthium oligocarpum	important advantage in that they can be easily propagated vegetatively. is known to possess useful agroforestry attributes, but these attributes have not been quantified. grows fast, is desirable for intercropping, and has relatively high leaf- nutrient concentration. Firewood, carving (bee- hives, mortars, drums), medicine (bark, roots), fodder (leaves), bee forage, mulch, nitrogen fixation, soil conservation, ornamental, necklaces and curios (seeds), ceremonial.	The tree is grown easily from large cuttings 5-10 em in diameter. It is traditionally used for live fences. It stands heavy pollarding and leaves are fed to cattle, though the leaf crop is not heavy. Along river courses the tree may not lose its leaves. recommended for live fencing, stream- bank and boundary planting and for soil conservation. It is moderately fire and termite resistant.	http://etflora.n et/biodiversity/ ecosystems-of- ethiopia/monat ane-grassland- ecosytem
	yellow,						

Table 21: Agroforestry with native multi use tree species - Erythrina brucei

Agroforestry with native multi use tree species

Millettia feruginia (Birbira)

There are two sub-species known to occur in Ethiopia. These are: *M. ferruginea* which is confined to the northern part of the country and *M. darasana* which occurs in southern provinces, particularly Sidamo region. Trees from central and western Ethiopia show mixture of the two species.

Habitat / Ecology	Habitus	Growing area	Mixt.	Management	Remarks	Information / Sources
performs well in moist lowland as well as dry, moist and wet semi- highland agro climatic zones of 1000- 2500 m above sea level.	large shady tree which grows up to length of 35 m high.	It is endemic to Ethiopia and widely distributed in the country A tree confined to Ethiopia (endemic), found in upland forests, rain forests and forest remnants in Shewa, Tigray, Kefa, Sidamo, Ilubabor, Gojam, Wolega, Bale,Harerge and Gonder regions. It performs well in Moist and Wet Kolla as well as Dry, Moist	the tree is extensively used as shade for coffee (<i>Coffea arabica</i>) in Hararge region, Eastern Ethiopia	tree is used for fish poisoning where mature pod and seed are ground to fine powder and is spread over the surface of water. Socioeconomic studies indicated that <i>Millettia</i> trees have good standing in the region both because of their desirable biological characteristics and because of their economic benefits. Maize plants grown on soils collected from underneath <i>Millettia</i> trees resulted in significantly better growth responses and higher dry matter yield as compared to the control	Firewood, timber (local construction), tool handles, household utensils, shade, fish poison (ground-up seeds).	http://www .etff.org/Ac heber/ETFF Acheber R eport.html http://www .springerlink .com/conte nt/l2115681 71r67222/ http://www .napreca.ne t/publicatio ns/11sympo sium/pdf/J- 88-96- Bekele.pdf

Table 22: Agroforestry with native multi use tree species - Millettia ferunginia

Agroforestry with native multi use tree species

Prunus africana (red stinkwood, mueri, bitter almond)

Habitat / Ecology	Habitus	Problems / Concerns	Growing area	Mixt.	Management	Remarks	Information / Sources
BIOPHYSICAL	evergreen tree,	Pests and diseases:	Distribution	Found in	high light requirement	produces	http://www.
LIMITS	10-24 (36 max.)	Fungi and insects infect fruits on the	appears to	association	and grows best in forest	high-quality	worldagrofo
Altitude: 900-3	m in height,	ground. A lepidopteran caterpillar feeds	be related to mean	with species	gaps.	firewood	restry.org/tr
400 m	with a	on leaves, and at low altitudes aphids	annual temperature	such as			eedb2/AFTP
Mean annual	stem diameter	attack developing leaf buds, leading to	and rainfall and/or	Albizia	Erosion control: Trees	Timber: The	DFS/Prunus
rainfall: 890-2	of 1 m; bark	defoliation. Moist conditions encourage	cloud cover.	gummifera,	can be grown along	wood is	africana.pd
600 mm	blackish-brown	infestation of powdery mildew and a		Anigera	contour ridges and	heavy, hard,	<u>f</u>
Mean annual	and rugged;	stem borer whose presence is indicated	A useful timber tree	adolfi-	terraces.	durable, close	
temperature:	branchlets	by resin exudation through small bore	widespread in	friederici,		and straight	http://www
18-26 deg.C	dotted	holes. This has been recorded in	montane and	Cassipourea	Shade or shelter: P.	grained,	<u>.cites.org/co</u>
	with breathing	Cameroon.	riverine	malosana,	africana provides useful	strong	mmon/prog
not shade-	spots, brown		forests of Harerge	Celtis	shade and acts as a		<u>/african-</u>
tolerant	and corky;	Commercial exploitation, habitat loss	(especially Dindin	africana,	windbreak.	medicinal:	<u>cherry/11-</u>
	twigs knobbly	and unsustainable harvesting have led	Forest), Ilubabor,	Podocarpus		harvesting of	<u>CUNNINGH</u>
a highland		to a decline in Prunus africana,	Kefa,	falcatus and	Soil improver: Leaves	the bark to	AM.pdf
forest tree,		threatening conservation of its genetic	Arsi, Wolega,	Polyscias	can be used as mulch	treat benign	
grows in the		diversity.	Sidamo, Gonder,	kikuyuensis	and green manure.	prostatic	http://phipp
humid and			Gojam and Shewa			hypertrophy	<u>s.conservat</u>
semi-humid		The species is listed as vulnerable in the	regions.				ory.org/ pd
highlands and		world list of threatened trees, owing to				It has the rare	<u>fs/botany-</u>
humid		its rapid population decline and	Usually it occurs in			ability to	<u>in-</u>
midlands. It		international trade. Wild-collection is no	high-rainfall areas in			regenerate its	action/Kristi
occurs in sub-		longer sustainable (and probably never	Moist and Wet			bark, as long	neStewart2.
Saharan Africa		was) where harvest seriously affects	Weyna			as the	<u>pdf</u>
		morbidity and mortality	Dega agroclimatic			vascular	
		rates of harvested populations.	zones, 1,500-			cambium	
			2,300m.			is not	
						destroyed.	

Table 23: Agroforestry with native multi use tree species - Prunus africana

d) Site selection

The different project components are motivated by different criteria which are summarized in the table below. To estimate the relevance of a criterion for site selection, different methods have been applied. The relevance is showing the importance according to an international context. Each plot is evaluated concerning the criteria of the table below. This method allows a ranking of the sites concerning prioritized implementation.

Criteria	Method	Relevance
Frosion	DEM Land cover Field trip	Security Soil conservation
Prior Land use	Change Detection	CDM - Kyoto
Fragmentation	GIS analysis	Biodiversity
BR Zonation	Core zone distance	LINESCO requirements
Infrastructure	GIS analysis	Soil conservation Forest restoration
linastructure		Forest protection, demarcation
Population density	GIS analysis PRA	Historical land cover
Forest loss		
1012311033	Change detection	
Acceptance of the	PRA	Community Participation
communities		
Communal land	Woreda Agriculture & Rural	Use rights/ responsibility sharing
	Development Office	
BR Zonation	Core zone distance	Conflict potential
Wood demand	PRA, Literature review	Wood demand
Population density	GIS analysis	
Road Network		Accessibility, Logistic
Forest loss	GIS analysis	Carbon sequestration
PFM	Change detection	Support other management activities
	GIS analysis	Wood demand
Settlements		Feasibility
Surface Derivatives	GIS analysis	
	DEM / Surface analysis	
Pilot sites	PRA	Education
Susceptibility towards	GIS analysis,	
erosion	DEM / Surface analysis	
Degradation of soil	Fiel visit (Relevé Sheet)	
	Criteria Erosion Prior Land use Fragmentation BR Zonation Infrastructure Population density Forest loss Acceptance of the communities Communal land BR Zonation Wood demand Population density Road Network Forest loss PFM Settlements Surface Derivatives Pilot sites Susceptibility towards erosion Degradation of soil	CriteriaMethodErosionDEM, Land cover, Field tripPrior Land useChange DetectionFragmentationGIS analysisBR ZonationCore zone distanceInfrastructureGIS analysis, PRAPopulation densityGIS analysis, PRAForest lossChange detectionAcceptance of the communitiesPRACommunal landWoreda Agriculture & Rural Development OfficeBR ZonationCore zone distanceWood demandPRA, Literature reviewPopulation density Road NetworkGIS analysisForest lossGIS analysisPFMGIS analysisSettlements Surface DerivativesGIS analysis DEM / Surface analysisPilot sites erosionPRA GIS analysis, DEM / Surface analysis

Table 24: Adopted main criteria for site selection

The final site selection consists of final sites which are stipulated with all relevant stakeholders and of sites which are assigned as candidate sites. In many cases the candidate sites are very promising and should be followed up. For detailed information of the site, please refer to the matrix sheets. The status "candidate" has different reasons:

- Land use right is unclear among all stakeholders
- Land use "fallowing" (indicates that farmers will claim this land), but no cultivation for years, land use right unknown
- The governmental stakeholder could not assure capacity for implementation due to the remote location
- The forest dwellers were previously punished from governmental side due to illegal settlement status and were expected to leave the side. But field visit revealed, they are still there

- Site was not accessible
- Necessary agreement with local communities could not be made
 - due to bad road condition (the site could not be visited)
 - o not enough participants in PRA
 - PRA material was not comprehensive (if introduced by rangers)

In total there are 85 sites stipulated by all stakeholders with a share of

- Reforestation: 622.71 ha (mean size 20.75 ha)
- Community Plantation: 1,688.62 ha (mean size 28.32 ha)
- Agroforesty: 736.58 ha (whole area, not only farm sites)

In total there 43 are candidate sites with a share of

- Reforestation: 728.41 ha (with a mean size of 36.41 ha)
- Community Plantation: 862.7 ha (mean size of 45.3 ha)
- Agroforesty: 249.23 ha (whole area, not only farm sites)
- PFM: 137.12

The following Matrix Sheets are describing in detail each selected site with socioeconomic data revealed from PRA, land use and existing land cover data based on relevé sheets. The sites are grouped towards the Woreda boundary. To enable an easy print out, one plot is shown per sheet.

i. <u>Woreda Adiyo</u>	2				
Site Assessmen	t – Reforestation				Plot NO: 1
Woreda: Adiyo Kebele: Kalisha			Elevation (m.	a.s.l.): 2591	,32
Location (Lat/Lo	on): 36,39190481 / 7,32187237	1	Estimated Area (na): 2 <i>,</i> 6	
Issue	Function			Priority	Relevance
	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR Maintenance	4	Activity within BR
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	2	Perforation in Core
	Biodiversity Increase (Enrichment Planting,	different native tree species)			
	Erosion Control (Soil Improvement)		Hazard	3	Undulating -
Improvement	Flood / Runoff Control (Water holding capacity)			2	
Improvement	Water Pollution Control			1	
	Rehabilitation of degraded forests		4	LUC	
	Riparian Forest Enhancement		1		
	Wetland Conservation	CDM	1		
Support	Support of Watershed Management / inter		1		
	Enhancement of Agricultural Productivity			1	
	Secret Meeting Sites			1	
other	Ownership: Communal (illegal settlement 2	2 HH)			
Site Characteris	stics: wood collection – medium, disturbance	-medium, grazing – high			
Current Land U	se / Land Cover: disturbed forest, species cor	nposition: Bambus spec., Millitia ferru	nginea, Sapium elli	pticum	
Closest (gravel)	road: 2,8 km				
Closest town: B	oka in 4,3 km				
Priority Key: 1=	not important; 2=minor important; 3=import	tant; 4=very important; blank=no infor	mation		

Site Assessmen	t – Community Plantation				Plot NO: 2			
Woreda: Adiyo Kebele: Medwutta			Elevation (m.a.s.l.):2425,59					
Location (Lat/Lo	on): 36,41116884 / 7,30056982		Estimated Area (h	a): 19,3				
Issue	Function		Context	Priority	Relevance			
Ductosticu	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR Maintenance	1				
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	1				
	Erosion Control (Soil Improvement)		Hazard	4	Forest loss in river			
	Flood / Runoff Control (Water holding capa	icity)		3				
Improvement	Water Pollution Control			2				
	Fertility of surrounding agriculture		4	Improvement of rainwater infiltration				
	Animal / Plant habitats			2				
	Supply of Construction Wood / Fuel Wood		4	Adjacent to Boqa				
	Amelioration of livelihood – sale of NTFP (3					
Cultural /	Amelioration of livelihood – sale of timber		1					
Economic	Increase of livestock fodder		4	shade				
	Medicines			2				
	Resin (subsistence / commercial)			1				
	Secret meeting sites			1				
other	Ownership: governmental							
Site Characteris	tics: high disturbance caused by grazing and	wood collection						
Current Land Us	Current Land Use / Land Cover: Upper Crown cover moderate, lower crown cover open (Millittia ferruginea, Sapium ellipticum, Bambus spec.)							
Closest (gravel)	road: 1,5 km							
Closest town: B	oka in 1 km							
Key: 1=not imp	Key: 1=not important; 2=minor important; 3=important; 4=very important; blank=no information							

Site Assessment – Community Plantation(candidate)Plot						Plot NO: 3
Woreda: Adiyo		Kebele: Alarigata	Elevation (m.a.s.l.):2455,33			l.):2455,33
Location (Lat/Lo	on): 36,39923189 / 7,2801952195		Estimated Area (ha): 18,2			
Issue	Function		Context		Priority	Relevance
Dretection	Core Zone Protection (Agricultural Land, wh	ich is ancient to core zones)	BR Mainter	nance	1	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmenta	tion	1	
	Erosion Control (Soil Improvement)		Hazard		4	Undulating - steep
	Flood / Runoff Control (Water holding capa	city)			3	
Improvement	Water Pollution Control				2	
	Fertility of surrounding agriculture				3	
	Animal / Plant habitats				1	
	Supply of Construction Wood / Fuel Wood (subsistence)				4	Adjacent to Boka
	Amelioration of livelihood – sale of NTFP (commercial)				2	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				1	
Economic	Increase of livestock fodder				3	
	Medicines				2	
	Resin (subsistence / commercial)				1	
	Secret meeting sites				1	
other	Ownership: communal					
Site Characteris	tics: medium disturbance caused by high graz	zing and medium wood collec	tion			
Current Land Us	se / Land Cover: Upper crown cover medium,	lower crown cover open (Mil	littia ferrugin	iea, Ficu	us spec., Ei	rythrina spec., Bambus
Closest (gravel) road: 0,3 km						
Closest town: B	oka in 1,3 km					
Key: 1=not imp	Key: 1=not important; 2=minor important; 3=important; 4=very important; blank=no information					

Site Assessment	t – Community Plantation (candi	date)			Plot NO: 4	
Woreda: Adiyo Kebele: Bekiyo Gindecha			Elevation (m.a.s.l.):2556,99			
Location (Lat/Lon): 36,55956741 / 7,26508216			Estimated Area (ha): 22,3			
Issue	Function		Context	Priority	Relevance	
Destaution	Core Zone Protection (Agricultural Land, wh	ich is ancient or close to core zones)	BR Maintenance	1		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	1		
	Erosion Control (Soil Improvement)		Hazard	4	Very steep (>35°)	
	Flood / Runoff Control (Water holding capa	city)		3		
Improvement	Water Pollution Control			4	Water supply for	
	Fertility of surrounding agriculture		2			
	Animal / Plant habitats			1		
	Supply of Construction Wood / Fuel Wood (4	Resource for Kaka		
	Amelioration of livelihood – sale of NTFP (2			
Cultural /	Amelioration of livelihood – sale of timber		1			
Economic	Increase of livestock fodder		2			
Leonomie	Medicines			1		
	Resin (subsistence / commercial)			1		
	Secret meeting sites			1		
other	Ownership: governmental		•		·	
Site Characteris	tics: minor disturbance due to low wood colle	ection and minor grazing				
Current Land Us	se / Land Cover: Upper crown cover medium,	Lower crown cover open (Millittia ferrug	ginea, Albizia gummifera	a, Schefllera a	abyssinica)	
Closest (gravel)	road: 2,3 km					
Closest town: A	ngiyo Kolla in 1,7 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	ery important; blank=no information				

Site Assessmen	t – Community Plantation					Plot 5
Woreda: Adiyo Kebele: Qochiyo			Elevation (m.a.s.l.):2282,42			
Location (Lat/Lo	Location (Lat/Lon): 36,555290 / 7,273810		Esti	mated Area (h	a): 21,2	
Issue	Function			ntext	Priority	Relevance
	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR	Maintenance	2	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Frag	gmentation	4	Enhancement of
	Biodiversity Increase (Enrichment Planting,	different native tree species)			2	
	Erosion Control (Soil Improvement)		Haz	ard	4	Forest loss in river
	Flood / Runoff Control (Water holding capacity)				4	PRA – water stress
Improvement	Water Pollution Control	Water Pollution Control			3	
	Rehabilitation of degraded forests				1	
	Riparian Forest Enhancement				4	
	Wetland Conservation			M	4	Adjacent to wetland
Support	Support of Watershed Management / interdisciplinary				1	
	Enhancement of Agricultural Productivity				1	
	Secret Meeting Sites				1	
other	Ownership: governmental					
Site Characteris	stics: disturbed riparian forest, no regeneratio	n				
Current Land U	se / Land Cover: UCC open, LCC open (Millitti	a ferruginea, Albizia gummifera, Schef	llera a	abyssinica)		
Closest (gravel)	road: 1,5 km					
Closest town: K	aka in 2,1 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	ery important; blank=no information				

Site Assessmen	t – Reforestation					Plot NO: 6	
Woreda: Adiyo Kebele: Keje Kata			Elevation (m.a.s.l.):2246,29			:2246,29	
Location (Lat/Lo	on): 36,67787056 / 7,19387671		Estimated	Area (h	a): 12,3		
Issue	Function		Context		Priority	Relevance	
	Core Zone Protection (Agricultural Land, wh	nich is ancient to core zones)	BR Mainte	enance	2		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragment	ation	4	Corridor between forest	
	Biodiversity Increase (Enrichment Planting,	different native tree species)			3		
	Erosion Control (Soil Improvement)		Hazard		4	Very steep (> 35°)	
	Flood / Runoff Control (Water holding capacity)				3		
Improvement	Water Pollution Control	Water Pollution Control					
	Rehabilitation of degraded forests				4	Forest boundary degraded	
	Riparian Forest Enhancement				4		
	Wetland Conservation		CDM		2		
Support	Support of Watershed Management / interdisciplinary				1		
	Enhancement of Agricultural Productivity				1		
	Secret Meeting Sites				1		
other	Ownership: governmental						
Site Characteris	tics: very steep slopes, very important to inte	grate erosion measurements					
Current Land Us	se / Land Cover: Riparian forest (Millittia ferru	uginea, Albizia gummifera, Sch	efllera abys	sinica)			
Closest (gravel) road: 1 km							
Closest town: Adiya Kaka in 9,5 km							
Key: 1=not important; 2=minor important; 3=important; 4=very important; blank=no information							
Site Assessment – Community Plantation(already demarked)Plot NO:							
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Woreda: Adiyo		Kebele: Boqa	Elevation (m.a.s.l.):2640,84				
Location (Lat/Lo	on): 36,44199783 / 7,2434289	l	Estimated Area (ha): 24,8				
Issue	Function		Context	Context		Relevance	
Destaution	Core Zone Protection (Agricultural Land, wh	nich is ancient to core zones)	BR Mainte	enance	1		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation		1		
	Erosion Control (Soil Improvement)		Hazard		3		
	Flood / Runoff Control (Water holding capa	icity)			1		
Improvement	Water Pollution Control				1		
-	Fertility of surrounding agriculture				2		
	Animal / Plant habitats				1		
	Supply of Construction Wood / Fuel Wood (subsistence)				4	Pop. Area: Qolla, Chare	
	Amelioration of livelihood – sale of NTFP (commercial)				3		
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				2		
Economic	Increase of livestock fodder				3		
Leonomie	Medicines				1		
	Resin (subsistence / commercial)				1		
	Secret meeting sites				2		
other	Ownership: governmental						
Site Characteris	tics: very disturbed forest cover due to grazir	ng and wood collection, DoAD	proposal				
Current Land Us	se / Land Cover: UCC medium, LCC open (Ery	thrina spec., Hagenia abyssinic	a, bamboo))			
Closest (gravel)	road: adjacent						
Closest town: Sl	haka, Boka in approx. 5 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no infor	mation				

Site Assessment – Community PlantationF						Plot NO: 9
Woreda: Adiyo		Kebele: Qochiyo		Elevation (m.a	.s.l.):2640,	11
Location (Lat/Lo	on): 36,55422022 / 7,28107178		Estimated Area (ha): 58,7			
Issue	Function		Context		Priority	Relevance
	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BRI	Maintenance	1	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Frag	gmentation	4	Connect forest
	Erosion Control (Soil Improvement)		Haz	ard	4	Partly very steep
	Flood / Runoff Control (Water holding capa	city)			3	
Improvement	Water Pollution Control				4	Water supply for
	Fertility of surrounding agriculture				1	
	Animal / Plant habitats				1	
	Supply of Construction Wood / Fuel Wood (subsistence)				2	
	Amelioration of livelihood – sale of NTFP (commercial)				1	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				1	
Economic	Increase of livestock fodder				3	
	Medicines	Medicines			2	
	Resin (subsistence / commercial)				1	
	Secret meeting sites				1	
other	Ownership: governmental					
Site Characteris propose of DoA	tics: very steep slopes, water protection, wat D (avoid Eucalyptus spec.)	er supply for Kaka town, riparian fores	st, avo	idance of fore	st fragmen	tation,
Current Land Us	se / Land Cover: Riparian forest, UCC medium	i, LCC open (Millittia ferruginea, Albizia	a gum	mifera, Schefll	lera abyssii	nica)
Closest (gravel)	road: adjacent					
Closest town: A	ngiyo Kolla in 1,2 km					
Key: 1=not impo	ortant; 2=minor important; 3=important; 4=v	ery important; blank=no information				

Site Assessment – Community PlantationPlot NO: 10							
Woreda: Adiyo		Kebele: Angiyo Yecha	Elevation (m.a.s.l.):1998,2				
Location (Lat/Lo	on): 36,52626542 / 7,2975261		Estimated Area	a (ha): 8,7			
Issue	Function		Context	Priority	Relevance		
	Core Zone Protection (Agricultural Land, wh	nich is close to core zones)	BR Maintenand	ce 1			
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	1			
	Erosion Control (Soil Improvement)		Hazard	1			
	Flood / Runoff Control (Water holding capa	acity)		1			
Improvement	Water Pollution Control			1			
	Fertility of surrounding agriculture			3			
	Animal / Plant habitats			2			
	Supply of Construction Wood / Fuel Wood (subsistence)			4	Adjacent to pop. Area Qochiyo		
	Amelioration of livelihood – sale of NTFP (commercial)			4	Good access to market		
Cultural /	Amelioration of livelihood – sale of timber products (commercial)			4	Good road access		
Economic	Increase of livestock fodder			2			
	Medicines			1			
	Resin (subsistence / commercial)			1			
	Secret meeting sites			1			
other	Ownership: governmental						
Site Characteris	tics: river protection, additional wood resour	ce for Kaka town, propose c	of DoAD				
Current Land Us	se / Land Cover: degraded forest (Olea welwi	tschii, Grevillea robusta, Eup	phorbia spec., Alt	oizia gummifer	a, Ficus spec.)		
Closest (gravel)	road: 1 km						
Closest town: K	aka in 4,3 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no in	formation				

Site Assessmen	Site Assessment – Community Plantation Plot NO: 11					
Woreda: Adiyo		Kebele: Angiyo Yecha		Elevation (m	.a.s.l.):2012,66	
Location (Lat/Lo	on): 36,53140331 / 7,29581177		Estimated Area	ı (ha): 15,4		
Issue	Function		Context	Priority	Relevance	
Declarities	Core Zone Protection (Agricultural Land, wh	ich is close to core zones)	BR Maintenand	ce 1		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	4	Buffer of primary forest	
	Erosion Control (Soil Improvement)		Hazard	3		
	Flood / Runoff Control (Water holding capa	city)		1		
Improvement	Water Pollution Control			1		
	Fertility of surrounding agriculture			2		
	Animal / Plant habitats			3		
	Supply of Construction Wood / Fuel Wood	(subsistence)		4	Adjacent to pop. Area Qochiyo	
	Amelioration of livelihood – sale of NTFP (commercial)			4	Good access to market	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)			3	Good road access	
Economic	Increase of livestock fodder			3		
	Medicines			1		
	Resin (subsistence / commercial)			1		
	Secret meeting sites			1		
other	Ownerships: governmental (2 HH recently le	eft the area – enforcement	by government)			
Site Characteris bee hive hangir	tics: river protection, additional wood resour ng, forest grazing, strong boundary demarcati	ce for Kaka town, grazing m on is needed	nedium, wood co	llection high,	propose of DoAD, used for	
Current Land Us	se / Land Cover: degraded forest, UCC mediu	m, LCC open (Grevillea robusta	a, Croton macrostac	hyus, Millittia fe	rruginea, Olea spec.)	
Closest (gravel)	road: 0,8 km					
Closest town: K	aka in 4,3 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	ery important; blank=no in	formation			
Site Assessmen	t – Community Plantation (car	ndidate/next year)			Plot NO: 12	
Woreda: Adiyo		Kebele: Boqa		Elevation (m	.a.s.l.):2632,21	

Location (Lat/Lo	on): 36,43749032 / 7,24121217	Estimated Area (h	a): 4,2			
Issue	Function	Context	Priority	Relevance		
Destaution	Core Zone Protection (Agricultural Land, which is ancient or close to core zones)	BR Maintenance	1			
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)	Fragmentation	1			
	Erosion Control (Soil Improvement)	Hazard	3			
	Flood / Runoff Control (Water holding capacity)		1			
Improvement	Water Pollution Control		1			
	Fertility of surrounding agriculture		2			
	Animal / Plant habitats		1			
	Supply of Construction Wood / Fuel Wood (subsistence)		4			
	Amelioration of livelihood – sale of NTFP (commercial)		3			
Cultural /	Amelioration of livelihood – sale of timber products (commercial)		2			
Economic	Increase of livestock fodder		3			
	Medicines		1			
	Resin (subsistence / commercial)		1			
	Secret meeting sites		2			
other	Ownership: governmental					
Site Characteris wood collection	stics: scattered trees, in Boqa Kebele, possible extension of Plot 8 (year 2012), very h n very high, recent forest loss (due to agricultural expansion)	nigh forest disturban	ce, grazing	very high,		
Current Land U	se / Land Cover: disturbed forest, UCC open, LCC open (Hagenia abyssinica, bamboo)				
Closest (gravel)	road: 0,3 km					
Closest town: S	haka in 5,5 km					
Key: 1=not important: 2=minor important: 3=important: 4=very important: hlank=no information						

Site Assessment – Community PlantationPlot NO: 13							
Woreda: Adiyo		Kebele: Alarigata	Elevation (m.a.s.l.):2428,24				
Location (Lat/Lo	on): 36,38447304 / 7,29302003	I	Estimated Area (ha): 38,0				
Issue	Function		Context		Priority	Relevance	
Destaution	Core Zone Protection (Agricultural Land, wh	nich is ancient to core zones)	BR Mainte	nance	1		
Protection	Protection Creation of Corridors (Gene Flow / Connectivity of Forest)		Fragmenta	ation	1		
	Erosion Control (Soil Improvement)		Hazard		4	Moderately steep(16° - 25°)	
	Flood / Runoff Control (Water holding capa	city)			2		
Improvement	Water Pollution Control				1		
	Fertility of surrounding agriculture				1		
	Animal / Plant habitats				2		
	Supply of Construction Wood / Fuel Wood (subsistence)				4	High wood demand	
	Amelioration of livelihood – sale of NTFP (commercial)				4	Good access to market	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				4	Good access to road	
Economic	Increase of livestock fodder				3		
	Medicines				1		
	Resin (subsistence / commercial)				1		
	Secret meeting sites				1		
other	Ownership: communal						
Site Characteris	tics: compensation of wood resource for clos	e located core zone, scattered	trees, recen	t defore	estation, pr	opose of DoAD	
Current Land Us	se / Land Cover: UCC medium, LCC medium (Bambus spec., Millittia ferrugi	nea, Sapium	ellipticu	um)		
Closest (gravel)	road: adjacent to main road						
Closest town: B	oka in 2,4 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no infor	mation				

ii. <u>Woreda Bita</u>

Site Assessmen	t – Reforestation	(not visited)			Plot NO: 1	
Woreda: Bita		Kebele: Amesha Mecheta	.a.s.l.):2093,38			
Location (Lat/Lo	on): 35,65965090 / 7,33863907	1	Estimated Area (h			
Issue	Function		Context	Priority	Relevance	
	Core Zone Protection (Agricultural Land, wl	hich is ancient or close to core zones)	BR Maintenance	4	LUC within BR core	
Protection Creation of Corridors (Gene Flow / Connectivity		tivity of Forest)	Fragmentation	3	Perforation	
	Biodiversity Increase (Enrichment Planting,	different native tree species)		3	LUC to agriculture	
	Erosion Control (Soil Improvement)		Hazard	4	Very steep (>35°)	
	Flood / Runoff Control (Water holding capacity)			3		
Improvement	Water Pollution Control			2		
	Rehabilitation of degraded forests			4	degradation of	
	Riparian Forest Enhancement			1		
	Wetland Conservation		CDM	1		
Support	Support of Watershed Management / inter	disciplinary		1		
	Enhancement of Agricultural Productivity			1		
	Secret Meeting Sites			1		
other	Ownership: governmental (illegal agricultur	ral expansion)				
Site Characteris	tics: : human activity within BR core zone, ve	ry steep area, grazing and farming acti	vity		·	
Current Land U	se / Land Cover: degraded forest					
Closest (gravel)	road: 6 km to trail					
Closest town: Ja	awra in 10 km					
Key: 1=not important; 2=minor important; 3=important; 4=very important; blank=no information						

Site Assessmen	t – Community Plantation (not visi	ted)			Plot NO: 2		
Woreda: Bita		Kebele: Meligawi	Elevation (m.a	a.s.l.):2072,	26		
Location (Lat/Lo	on): 35,80964182 / 7,42419988		Estimated Area (h	a): 42,3			
Issue	Function		Context	Priority	Relevance		
	Core Zone Protection (Agricultural Land, wh	ich is ancient or close to core zones)	BR Maintenance	4	LUC within BR core		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	2			
	Biodiversity Increase (Enrichment Planting, different native tree species)			3			
	Erosion Control (Soil Improvement)		Hazard	3			
	Flood / Runoff Control (Water holding capac	city)		3			
Improvement	Water Pollution Control			1			
	Rehabilitation of degraded forests			4	degradation of		
	Riparian Forest Enhancement			1			
	Wetland Conservation		CDM	1			
Support	Support of Watershed Management / interc		1				
	Enhancement of Agricultural Productivity			3			
	Secret Meeting Sites			1			
other	Ownership: governmental (status of settlers	s unclear) approx. 6-12 HH					
Site Characteris	tics: very steep slope, accessibility difficult, a	djacent to BR core zone in Woreda Ch	ena		·		
Current Land U	se / Land Cover: cultivation and grazing						
Closest (gravel)	road: 6 km to gravel road						
Closest town: A	ndirache in 5,3 km						
Key: 1=not imp	Key: 1=not important; 2=minor important; 3=important; 4=very important; blank=no information						

Site Assessment – Reforestation(not visited)Plot					
Woreda: Bita	H	Kebele: Shota	Elevation (m.a	.s.l.):1848,	91
Location (Lat/Lo	on): 35,59642371 / 7,33389138		Estimated Area (h	a): 45 <i>,</i> 1	
Issue	Function		Context	Relevance	
	Core Zone Protection (Agricultural Land, whic	h is ancient or close to core zones)	BR Maintenance	4	Settlement within
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Fragmentation	4	Perforation
	Biodiversity Increase (Enrichment Planting, different native tree species)			1	
	Erosion Control (Soil Improvement)		Hazard	4	Very steep (>35°)
	Flood / Runoff Control (Water holding capacity)			3	
Improvement	Water Pollution Control			1	
	Rehabilitation of degraded forests	rests		4	degradation of
	Riparian Forest Enhancement			2	
	Wetland Conservation		CDM	1	
Support	Support of Watershed Management / interdis	Support of Watershed Management / interdisciplinary		1	
	Enhancement of Agricultural Productivity			1	
	Secret Meeting Sites			1	
other	Ownership: governmental (status of settlers v	within BR core zone unclear) approx.	12 – 18 HH		
Site Characteris	tics: very steep slope, degraded forest, prelimin	nary used for grazing, accessibility di	fficult, settlers with	in BR core z	one
Current Land U	se / Land Cover: degraded forest, used for cultiv	vation and grazing			
Closest (gravel)	road: 11 km to trail				
Closest town: Ja	awra in 16 km				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=vei	ry important; blank=no information			

Site Assessment – Reforestation (not visited)					
Woreda: Bita		Kebele: Shota	Elevation (m.a	ı.s.l.):1921,	7
Location (Lat/Lo	on): 35,60091656 / 7,32733789		Estimated Area (h	a): 18,2	
Issue	Function		Context	Priority	Relevance
	Core Zone Protection (Agricultural Land, wh	ich is ancient or close to core zones)	BR Maintenance	4	Settlement within
Protection	Creation of Corridors (Gene Flow / Connecti	vity of Forest)	Fragmentation	3	
	Biodiversity Increase (Enrichment Planting, different native tree species)			1	
	Erosion Control (Soil Improvement)		Hazard	3	Steep (>26°)
	Flood / Runoff Control (Water holding capacity)			1	
Improvement	Water Pollution Control			1	
	Rehabilitation of degraded forests			4	degradation of
	Riparian Forest Enhancement			1	
	Wetland Conservation		CDM	1	
Support	Support of Watershed Management / interd	Support of Watershed Management / interdisciplinary		1	
	Enhancement of Agricultural Productivity			1	
	Secret Meeting Sites			1	
other	Ownership: governmental / private (unclear	property rights; possibly assigned as	resettlement area)		
Site Characteris	tics: steep slopes, activity (agriculture expans	ion, grazing)			
Current Land U	se / Land Cover: cultivation, degraded forest				
Closest (gravel)	road: 11 km to gravel road				
Closest town: Ja	awra in 16 km				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	ery important; blank=no information			

Site Assessment – Community Plantation and AgroforestryPlot N						Plot NO: 5
Woreda: Bita		Kebele: Yeda		Elevation (m.a	.s.l.):1815,	16
Location (Lat/Lo	on): 35,79345647 / 7,28774765	1	Es	timated Area (h	a): 35,5	
Issue	Function		Co	ntext	Priority	Relevance
Destastice	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR	Maintenance	3	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fra	agmentation	3	
	Erosion Control (Soil Improvement)		Ha	zard	4	Steep (>26°)
	Flood / Runoff Control (Water holding capa	city)			2	
Improvement	Water Pollution Control				1	
	Fertility of surrounding agriculture				1	
	Animal / Plant habitats				2	
	Supply of Construction Wood / Fuel Wood	(subsistence)			4	Pop. Area Bita Genet
	Amelioration of livelihood – sale of NTFP and timber products (commercial)				2	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				1	
Economic	Increase of livestock fodder				3	
	Medicines				1	
	Resin (subsistence / commercial)				1	
	Secret meeting sites				1	
other	Ownership: private (status of permission ur	clear, probably assigned for resettleme	ent)			
Site Characteris	tics: recent forest loss, conversion to farm lar	nd, very steep slope, susceptible towar	rds la	andslide, no ero	sion measu	ures taken so
far, Recommend	dation: if legal status of settlement strategy a	djustment $ ightarrow$ Agroforestry; and along (river	Chercheri enrie	chment pla	nting
(function as cor	nmunity plantation)					
Current Land Us	se / Land Cover: cultivation 90% (maize, ense	t, cotton), MPT 10% (Millittia ferrugine	ea, A	cokanthera sch	imperi, Cor	dia Africana)
Closest (gravel)	road: 0,8 km to gravel road					
Closest town: B	ita Genet in 1,5 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information				

Site Assessmen	t – Community Plantation					Plot NO: 6
Woreda: Bita		Kebele: Sheda		Elevation (m.a	ı.s.l.):1898,	1
Location (Lat/Lo	on): 35,81910749 / 7,30456103		Estimated Area (ha): 19,7			
Issue	Function		Co	ontext	Priority	Relevance
Drotostion	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR	Maintenance	3	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fra	agmentation	3	
	Erosion Control (Soil Improvement)				3	
	Flood / Runoff Control (Water holding capa	icity)			2	
Improvement	Water Pollution Control				1	
	Fertility of surrounding agriculture				2	
	Animal / Plant habitats				1	
	Supply of Construction Wood / Fuel Wood (subsistence)				4	Pop. Area Sheda
	Amelioration of livelihood – sale of NTFP and timber products (commercial)				1	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				2	
Economic	Increase of livestock fodder				2	
	Medicines				1	
	Resin (subsistence / commercial)				1	
	Secret meeting sites				1	
other	Ownership: governmental (illegal agricultur	re expansion, illegal forest grazing)				
Site Characteris	tics: adjacent to farmland, agricultural expan	sion, remnants of forest				
Current Land U	se / Land Cover: cultivation 40% (maize, ense	t), MPT 30%, shrub 10%, grass 20%				
Closest (gravel)	road: adjacent to trail					
Closest town: B	ita Genet in 5 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information				

Site Assessmen	t – Community Plantation					Plot NO: 7	
Woreda: Bita		Kebele: Ogadakity		Elevation (m.a.s.l.):2128,33			
Location (Lat/Lo	on): 35,69576349 / 7,51719241		Estin	Estimated Area (ha): 28,2			
Issue	Function		Cont	ext	Priority	Relevance	
Destaution	Core Zone Protection (Agricultural Land, which is close to core zones)		BR N	laintenance	3		
Protection	Creation of Corridors (Gene Flow / Connec	tivity of Forest)	Fragi	mentation	4	Corridor	
	Erosion Control (Soil Improvement)		Haza	rd	2		
	Flood / Runoff Control (Water holding capacity)				2		
Improvement	Water Pollution Control				1		
	Fertility of surrounding agriculture				1		
	Animal / Plant habitats				2		
	Supply of Construction Wood / Fuel Wood	(subsistence)			4	Pop. Area Yeshito Yeri	
	Amelioration of livelihood – sale of NTFP and timber products (commercial)				2		
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				2		
Economic	Increase of livestock fodder				3		
	Medicines				1		
	Resin (subsistence / commercial)				1		
	Secret meeting sites				1		
other	Ownership: communal						
Site Characteris	tics: degraded riparian forest, important cor	ridor to connect forest patches, roll	ing top	ography, high	wood colle	ection,	
agricultural exp	ansion. strong boundary demarcation is nee	ded					
	se / Land Cover: degraded riparian forest, OC	c medium, LCC open					
Closest (gravel)							
Closest town: G	eya in 4 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=	very important; blank=no informati	ion				

Site Assessment – Community Plantation(candidate/not visited)Plot							
Woreda: Bita		Kebele: Gaweti	Elevation (m.a	ı.s.l.):1548,78			
Location (Lat/Lo	on): 35,75832913 / 7,24978726	1	Estimated Area (ha): 68,7				
Issue	Function		Context	Priority	Relevance		
Destaution	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR Maintenance	1			
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	1			
	Erosion Control (Soil Improvement)		Hazard	4	Slopes > 35°		
Improvement	Flood / Runoff Control (Water holding capa	city)		3			
	Water Pollution Control			1			
	Fertility of surrounding agriculture			2			
	Animal / Plant habitats			1			
	Supply of Construction Wood / Fuel Wood	(subsistence)		4	Pop. Area Gaweti		
	Amelioration of livelihood – sale of NTFP ar	Amelioration of livelihood – sale of NTFP and timber products (commercial)		2			
Cultural /	Amelioration of livelihood – sale of timber products (commercial)			2			
Economic	Increase of livestock fodder			3			
	Medicines			1			
	Resin (subsistence / commercial)			1			
	Secret meeting sites			1			
other	Ownership: unclear						
Site Characteris	tics: woodlot stable since 2001, indicator for	sustainable forest management, impo	rtance for forest co	ver due to v	very steep		
slopes . vulnera Current Land U	ble towards landslide. high deforestation in t se / Land Cover: degraded forest	he surrounding. high pressure on fores	st resource (charcoa	l. wood col	llection)		
Closest (gravel)	road: 1 km to all weather road						
Closest town: Bita Genet in 3 km							
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information					

Site Assessment – Community Plantation Plot NO: 9							
Woreda: Bita		Kebele: Amesha Mecheta		Elevation (m.a.s.l.):1898,82			
Location (Lat/Lo	on): 35,70843550 / 7,30670844	l	Estimated Area (ha): 76,4				
Issue	Function		Context		Priority	Relevance	
Destaulies	Core Zone Protection (Agricultural Land, which is ancient or close to core zones)		BR Maintenance		1		
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Fra	gmentation	2		
	Erosion Control (Soil Improvement)		Ha	zard	4	Affected by	
Improvement	Flood / Runoff Control (Water holding capacity)				2		
	Water Pollution Control				2		
	Fertility of surrounding agriculture				2		
	Animal / Plant habitats				1		
	Supply of Construction Wood / Fuel Wood	(subsistence)			4	Pop. Area Dacha Difa	
	Amelioration of livelihood – sale of NTFP and timber products (commercial)				3		
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				3		
Economic	Increase of livestock fodder				3		
	Medicines				1		
	Resin (subsistence / commercial)				1		
	Secret meeting sites				1		
other	Ownership: communal						
Site Characteris	tics: rolling topography, vulnerable for landsl	ide, recent forest loss, recommended b	by Do	DAD			
Current Land Us	se / Land Cover: MPT 5%, shrub 40%, grass 5	5% (Millittia ferruginea, Syzygium guin	eese,	, (Delonix regia))		
Closest (gravel)	road: 2,2 km to trail						
Closest town: Jawra in 4,3 kmm							
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information					

Site Assessment – Community Plantation(not visited)Plot N							
Woreda: Bita		Kebele: Gaweti		Elevation (m.a.s.l.):1881,61			
Location (Lat/Lo	on): 35,81010069 / 7,26042660		Esti	Estimated Area (ha): 97,6			
Issue	Function		Cor	ntext	Priority	Relevance	
	Core Zone Protection (Agricultural Land, wh	Core Zone Protection (Agricultural Land, which is ancient or close to core zones)		Maintenance	3		
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Frag	gmentation	1		
	Erosion Control (Soil Improvement)		Haz	ard	3		
Improvement	Flood / Runoff Control (Water holding capa	icity)			3		
	Water Pollution Control				1		
	Fertility of surrounding agriculture				2		
	Animal / Plant habitats				1		
	Supply of Construction Wood / Fuel Wood (subsistence)				4	Pop. Area Gaweti	
	Amelioration of livelihood – sale of NTFP and timber products (commercial)				1		
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				2		
Economic	Increase of livestock fodder				2		
	Medicines				1		
	Resin (subsistence / commercial)				1		
	Secret meeting sites				1		
other	Ownership: governmental						
Site Characteris	tics: propose by DoAD, buffer of primary fore	est, degraded forest boarder					
Current Land U	se / Land Cover: degraded forest						
Closest (gravel)	road: adjacent to main road						
Closest town: B	ita Genet in 1,7 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information					

* boundary of primary forest will be enriched by fast growing species (non-native) to distinguish between primary forest (minor use) and silivicultural forest (community plantation)

Site Assessment – Community PlantationPlot NO: 11							
Woreda: Bita		Kebele: Sheda		Elevation (m.a.s.l.):1840,54			
Location (Lat/Lo	on): 35,82175077 / 7,28195585		Est	Estimated Area (ha): 38,3			
Issue	Function		Со	ontext	Priority	Relevance	
	Core Zone Protection (Agricultural Land, wh	Core Zone Protection (Agricultural Land, which is ancient or close to core zones)		Maintenance	3		
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Fra	agmentation	1		
	Erosion Control (Soil Improvement)		Ha	izard	3		
	Flood / Runoff Control (Water holding capa	acity)			3		
Improvement	Water Pollution Control				1		
	Fertility of surrounding agriculture				2		
	Animal / Plant habitats				1		
	Supply of Construction Wood / Fuel Wood (subsistence)				4	Pop. Area Sheda	
	Amelioration of livelihood – sale of NTFP and timber products (commercial)				1		
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				2		
Economic	Increase of livestock fodder				2		
	Medicines				1		
	Resin (subsistence / commercial)				1		
	Secret meeting sites				1		
other							
Site Characteris	tics: buffering primary forest (PFM candidate	e), high grazing, high wood collection, p	orop	ose by DoAD			
Current Land U	se / Land Cover: degraded forest						
Closest (gravel)	road: adjacent to main road						
Closest town: B	Closest town: Bita Genet in 3,7 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information					

* boundary of primary forest will be enriched by fat growing species (non-native) to distinguish between primary forest (minor use) and silivicultural forest (community plantation)

Site Assessment – Community Plantation(not visited)Plot						
Woreda: Bita		Kebele: Tuga	Elevation (m.a.s.l.):1458,1			
Location (Lat/Lo	on): 35,68542300 / 7,23183534	I	Estimated Area (ha): 91,4			
Issue	Function		Context	Priority	Relevance	
Destaulies	Core Zone Protection (Agricultural Land, wh	ore Zone Protection (Agricultural Land, which is ancient or close to core zones)		nce 2		
Protection	Creation of Corridors (Gene Flow / Connect	Creation of Corridors (Gene Flow / Connectivity of Forest)		n 3		
	Erosion Control (Soil Improvement)		Hazard	4	Affected by	
	Flood / Runoff Control (Water holding capa	city)		4		
Improvement	Water Pollution Control			3		
	Fertility of surrounding agriculture			4	Very compacted	
	Animal / Plant habitats			4	Eroded soil	
	Supply of Construction Wood / Fuel Wood	(subsistence)		4		
	Amelioration of livelihood – sale of NTFP ar	Amelioration of livelihood – sale of NTFP and timber products (commercial)				
Cultural /	Amelioration of livelihood – sale of timber products (commercial)			2		
Economic	Increase of livestock fodder			3		
	Medicines			1		
	Resin (subsistence / commercial)			1		
	Secret meeting sites			1		
other	Ownership: governmental					
Site Characteris	tics: very steep slopes, vulnerable towards la	ndslide, vacant grass land, no settleme	ents, propose of	f DoAD		
Current Land U	se / Land Cover: grass land 100%					
Closest (gravel)	road: adjacent to main road					
Closest town: D	ichi in 5 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information				

Site Assessmen	t – Community Plantation (r	not visited)				Plot NO: 14	
Woreda: Bita		Kebele: Oda	El	Elevation (m.a.s.l.):1526,11			
Location (Lat/Lo	on): 35,65123302 / 7,24252242	1	Estimated	Estimated Area (ha): 62,5			
Issue	Function		Context		Priority	Relevance	
Ductosticu	Core Zone Protection (Agricultural Land, which is ancient to core zones)		BR Mainte	nance	3		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmenta	ation	1		
	Erosion Control (Soil Improvement)		Hazard		4	Very steep (> 35°)	
	Flood / Runoff Control (Water holding capacity)				4	Improvement of infiltration	
Improvement	Water Pollution Control				2		
	Fertility of surrounding agriculture				2		
	Animal / Plant habitats				1		
	Supply of Construction Wood / Fuel Wood	(subsistence)			4	Good road access, pop. Area	
	Amelioration of livelihood – sale of NTFP and timber products (commercial)				1		
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				3		
Economic	Increase of livestock fodder				2		
Leononic	Medicines				1		
	Resin (subsistence / commercial)				1		
	Secret meeting sites				1		
other	Ownership: governmental						
Site Characteris	tics: forest loss (< 10 yr), very steep area, sus	ceptible towards landslide, bufferi	ng of primar	y forest,	, propose	of DoAD	
Current Land U	se / Land Cover: degraded forest						
Closest (gravel)	road: 1 km to main road						
Closest town: D	vichi in 5 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no informat	ion				

Site Assessmen	t – Reforestation					Plot NO: 22	
Woreda: Bita		Kebele: Amesha Mecheta	Elevation (m.a.s.l.): 2339,78				
Location (Lat/Lo	on): 35,67992938 / 7,32744890	1	Estimated Ar	Estimated Area (ha): 40,8			
Issue	Function		Context		Priority	Relevance	
	Core Zone Protection (Agricultural Land, wh	Core Zone Protection (Agricultural Land, which is ancient to core zones)		ance	4	BR core zone protection	
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Fragmentation		4	Perforation	
	Biodiversity Increase (Enrichment Planting, different native tree species)				1		
	Erosion Control (Soil Improvement)		Hazard		2		
Improvement	Flood / Runoff Control (Water holding capa	city)			1		
	Water Pollution Control				1		
	Rehabilitation of degraded forests				4	Curtail agricultural	
	Riparian Forest Enhancement				1		
	Wetland Conservation		CDM		1		
Support	Support of Watershed Management / inter	disciplinary			1		
	Enhancement of Agricultural Productivity	Enhancement of Agricultural Productivity			1		
	Secret Meeting Sites				1		
other	Ownership: governmental (illegal activity)						
Site Characteris	stics: rolling topography, low grazing, medium	n wood collection				·	
Current Land U	se / Land Cover: primary forest, UCC closed, I	LCC moderate (Pouteria adolfi-friede	rici, Croton macrost	tachyus,	Schefllera aby	yssinica, Syzygium guineese)	
Closest (gravel)	road: 4,5 km to trail						
Closest town: Ja	awra in 7,3 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inforr	mation				

iii. <u>Woreda Chena</u>

Site Assessmen	t – Reforestation (not visited)					Plot NO: 1
Woreda: Chena		Kebele: Chomecha	Elevati		vation (m.a.s.l.):2056,87	
Location (Lat/Lo	on): 35,81434621 / 7,42399119		Estimated	l Area (h	a): 12,2	
Issue	Function		Context		Priority	Relevance
	Core Zone Protection (Agricultural Land, wh	nich is within core zone)	BR Mainte	enance	4	Cultivation, settlement within BR core
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragment	ation	2	
	Biodiversity Increase (Enrichment Planting, different native tree species)				2	
	Erosion Control (Soil Improvement)		Hazard		3	
Improvement	Flood / Runoff Control (Water holding capacity)				2	
Improvement	Water Pollution Control				2	
	Rehabilitation of degraded forests				4	
	Riparian Forest Enhancement				3	
	Wetland Conservation		CDM		1	
Support	Support of Watershed Management / interdisciplinary				1	
	Enhancement of Agricultural Productivity				1	
	Secret Meeting Sites				1	
other	Ownership: governmental (illegal settlemental)	nt) approx. 3 – 6 HH				
Site Characteris (2 day horse tri	tics: recent forest perforation within core zor p)	ne, used for cultivation and graz	zing, rolling	topograj	phy, access	ibility very difficult
Current Land Us	se / Land Cover: cultivation 30% (probably m	aize), MPT (remnants of primar	y forest) 40	%, shrub	/grass land	30%
Closest (gravel)	road: 6 km to trail					
Closest town: A	Closest town: Andiracha in 7 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inforr	nation			

Site Assessment – PFM(candidate, not visited)						Plot NO: 3	
Woreda: Chena		Kebele: Chomecha		Elevation (m.a	ı.s.l.):1907,	43	
Location (Lat/Lo	on): 35,84808700 / 7,43872694		Est	Estimated Area (ha): 137,1			
Issue	Function		Context		Priority	Relevance	
Ductosticu	Core Zone Protection (Agricultural Land, w	hich is ancient or close to core zones)	BR	Maintenance			
Protection	Creation of Corridors (Gene Flow / Connect	tivity of Forest)	Fra	agmentation			
	Erosion Control (Soil Improvement)		Ha	zard			
Improvement	Flood / Runoff Control (Water holding capa	acity)					
	Water Pollution Control						
	Fertility of surrounding agriculture						
	Animal / Plant habitats						
	Supply of Construction Wood / Fuel Wood (subsistence)						
	Amelioration of livelihood – sale of NTFP (commercial)						
Cultural /	Amelioration of livelihood – sale of timber products (commercial)						
Economic	Increase of livestock fodder						
	Medicines						
	Resin (subsistence / commercial)						
	Secret meeting sites						
other	Ownership: governmental						
Site Characteris	tics: disturbed primary forest, adjacent to BR	core zone, could compensate high wo	od d	lemand if prope	erly manage	ed	
Current Land U	se / Land Cover: degraded forest						
Closest (gravel)	road: 9 km to trail (probably better access)						
Closest town: B	itahora in 6 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information					

Site Assessmen	t – Community Plantation (alternativ	ely Agroforestry)				Plot NO: 4	
Woreda: Chena	1	Kebele: Iramo		Elevation (m.a.s.l.):1907,79			
Location (Lat/Lo	on): 35,88915214 / 7,40232406	1	Estimated Area (ha): 48,4				
Issue	Function		Context		Priority	Relevance	
Destaution	Core Zone Protection (Agricultural Land, wh	hich is ancient to core zones) BR		BR Maintenance			
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragment	ation	2		
	Erosion Control (Soil Improvement)		Hazard		3		
	Flood / Runoff Control (Water holding capa	acity)			2		
Improvement	Water Pollution Control				3		
	Fertility of surrounding agriculture	of surrounding agriculture			4		
	Animal / Plant habitats				2		
	Supply of Construction Wood / Fuel Wood	(subsistence)			4	Pop. Area Bita Hora	
	Amelioration of livelihood – sale of NTFP (commercial)			1		
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				1		
Economic	Increase of livestock fodder				4	Release pressure from adjacent wetland	
	Medicines				1		
	Resin (subsistence / commercial)				1		
	Secret meeting sites				1		
other	Ownership: unclear						
Site Characteris	stics: forest loss on site and in surrounding, co	priversion to farm land, adjace	nt to wetlan	d, scatte	ered trees,	multifunctional site:	
compensate hig	gh wood demand, enhance river protection b	y enrichment of riparian forest	t, protectior	n of adja	cent wetlar	nd (cattle is grazed	
within wetland,	, need of additional livestock fodder)						
Current Land U	se / Land Cover: cultivation 90%, MPT 5%, sh	rub/grass land 5%,					
Closest (gravel)	road: 2 km to gravel road						
Closest town: a	djacent to Bitahora						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no infor	mation				

Site Assessment	t – Community Plantation					Plot NO: 5	
Woreda: Chena		Kebele: Agaro		Elevation (m.a.s.l.):1884,2			
Location (Lat/Lo	on): 35,92428059 / 7,28501574	1	Estimated Area (ha): 92,4				
Issue	Function		Context		Priority	Relevance	
Destaulies	Core Zone Protection (Agricultural Land, wh	nich is ancient to core zones)	BR Maint	enance	3		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragment	ation	4	Stepping stone between	
	Erosion Control (Soil Improvement)		Hazard		3		
	Flood / Runoff Control (Water holding capacity)				3		
Improvement	Water Pollution Control				1		
	Fertility of surrounding agriculture				2		
	Animal / Plant habitats				1		
	Supply of Construction Wood / Fuel Wood	(subsistence)			4	Pop. Area Agaro	
	Amelioration of livelihood – sale of NTFP (commercial)			2		
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				4		
Economic	Increase of livestock fodder				3		
	Medicines				1		
	Resin (subsistence / commercial)				1		
	Secret meeting sites				1		
other	Ownership: unclear (around 15-20 HH) → µ	probably assigned as resettleme	ent area 3 y	ears ago)		
Site Characteris detected aroun	tics: very recent deforestation, scattered tree d 15 – 20 HH	es, intense grazing, good road a	access, acco	rding to	DoAD vaca	nt area, site visit	
Current Land Us	se / Land Cover: cultivation 70%, MPT 20% (r	emnants of forest), shrub/grass	s land 10%				
Closest (gravel) road: adjacent to main road							
Closest town: Sl	hishinda in 4,8 km						
Key: 1=not impo	ortant; 2=minor important; 3=important; 4=v	/ery important; blank=no infor	mation				

Site Assessmen	t – Community Plantation					Plot NO: 6
Woreda: Chena	1	Kebele: Shayicha Meka		Elevatio	on (m.a.s.l.):1496,17
Location (Lat/Lo	on): 35,73406041 / 7,14988470		Estimated	Area (h	a): 98,3	
Issue	Function		Context		Priority	Relevance
Ductosticu	Core Zone Protection (Agricultural Land, wl	hich is ancient to core zones)	BR Mainte	nance	1	
Protection	Creation of Corridors (Gene Flow / Connect	tivity of Forest)	Fragmenta	tion	1	
	Erosion Control (Soil Improvement)		Hazard		4	Steep > 21°
	Flood / Runoff Control (Water holding capa	acity)			3	
ImprovementWater Pollution ControlFertility of surrounding agriculture				4		
				3		
	Animal / Plant habitats				4	Vicinity intense agriculture
	Supply of Construction Wood / Fuel Wood (subsistence)				4	Pop. Area Sayicha Meka
	Amelioration of livelihood – sale of NTFP (commercial)				2	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				2	
Economic	Increase of livestock fodder	Increase of livestock fodder			3	
	Medicines				2	
	Resin (subsistence / commercial)				1	
	Secret meeting sites				1	
other	Ownership: private (but recent landslide cle	eared LC)				
Site Characteris water), site acco	itics: open ground, beginning of recultivation ess difficult, possible place for tree nursery si	, river disturbance by landslide ite along Acho river	e (river is sup	plying d	lownstrean	n villages with fresh
Current Land U	se / Land Cover: bare soil, gravel					
Closest (gravel)	road: 3,5 km to gravel road					
Closest town: N	Jarai in 1,3 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no infor	mation			

Site Assessment – Community Plantation(not visited)Pl						Plot NO: 7
Woreda: Chena		Kebele: Kuta Shoraye		Elevation (m.a	.s.l.):1805,	75
Location (Lat/Lo	on): 35,95650598 / 7,26219462		Esti	mated Area (h	a): 17,6	
Issue	Function		Con	itext	Priority	Relevance
Ductosticu	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR I	Maintenance	2	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Frag	gmentation	2	
	Erosion Control (Soil Improvement)		Haz	ard	4	Slope > 21°
	Flood / Runoff Control (Water holding capa	city)			3	
Improvement	Water Pollution Control				1	
	Fertility of surrounding agriculture				3	
	Animal / Plant habitats				2	
	Supply of Construction Wood / Fuel Wood (subsistence)				4	Pop. Area Wana Bola
	Amelioration of livelihood – sale of NTFP (commercial)				3	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				2	
Economic	Increase of livestock fodder				3	
	Medicines				1	
	Resin (subsistence / commercial)				1	
	Secret meeting sites				1	
other	Ownership: unclear (no HH on site)					
Site Characteris	tics: very steep area, recent deforestation, de	egradation in adjacent primary forest,	proba	bly assigned as	s resettlem	ent area
Current Land Us	se / Land Cover: cultivation 60%, MPT 5%, shi	rub 10%, grass 25%				
Closest (gravel)	road: 2km to main road					
Closest town: D	imbra in 5 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information				

Site Assessment – Community Plantation(not visited)						Plot NO: 8
Woreda: Chena		Kebele: Kuta Shoraye		Elevation (m.a	.s.l.):1769,	2
Location (Lat/Lo	on): 35,96191831 / 7,25857729		Est	imated Area (h	a): 8 <i>,</i> 5	
Issue	Function		Со	ntext	Priority	Relevance
Destaulies	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR	Maintenance	2	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation		2	
	Erosion Control (Soil Improvement)		Ha	zard	4	Slope > 21°
Improvement	Flood / Runoff Control (Water holding capacity)				3	
	Water Pollution Control				1	
	Fertility of surrounding agriculture				3	
				2		
	Supply of Construction Wood / Fuel Wood (subsistence)				4	Pop. Area Wana Bola
	Amelioration of livelihood – sale of NTFP (commercial)				3	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				2	
Economic	Increase of livestock fodder				3	
	Medicines				1	
	Resin (subsistence / commercial)				1	
	Secret meeting sites				1	
other	Ownership: unclear (no HH on site)					
Site Characteris	tics: very steep area, recent deforestation, de	egradation in adjacent primary forest,	prob	ably assigned a	s resettlem	ent area
Current Land U	se / Land Cover: cultivation 60%, MPT 5%, shi	rub 10%, grass 25%				
Closest (gravel)	road: 2,3 km to main road					
Closest town: D	imbra in 5 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information				

Site Assessmen	t – Reforestation (no v	isited)				Plot NO: 9
Woreda: Chena		Kebele: Boba Bala	ala Elevat		evation (m.a.s.l.):1272,21	
Location (Lat/Lo	on): 35,88631870 / 7,14350223		Estimated	ated Area (ha): 2,8		
Issue	Function		Context		Priority	Relevance
	Core Zone Protection (Agricultural Land, wh	nich is ancient to core zones)	BR Mainte	enance	1	
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Fragmentation		4	Important to close / sustain
	Biodiversity Increase (Enrichment Planting, different native tree species)				3	
Erosion Control (Soil Improvement)		Hazard		3		
Improvement	Flood / Runoff Control (Water holding capa	city)			1	
	Water Pollution Control				1	
	Rehabilitation of degraded forests				1	
	Riparian Forest Enhancement				1	
	Wetland Conservation		CDM		1	
Support	Support of Watershed Management / inter	disciplinary			1	
	Enhancement of Agricultural Productivity				1	
	Secret Meeting Sites				1	
other	Ownership: unclear					
Site Characteris	tics: grass land, steep terrain, used for grazin	g, vulnerable for soil erosion				
Current Land Use / Land Cover: grass land 100%						
Closest (gravel)	road: 1 km to main road					
Closest town: C	henna in 1 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inforr	nation			

Site Assessmen	t – Reforestation (can	ididate, not visited)				Plot NO: 10
Woreda: Chena		Kebele: Boba Bala		Elevation (m.a	.s.l.):1674,2	29
Location (Lat/Lo	on): 35,87590043 / 7,15137432		Est	imated Area (h	ia): 1,4	
Issue	Function		Со	ntext	Priority	Relevance
_	Core Zone Protection (Agricultural Land, wl	hich is ancient or close to core zones)	BR	Maintenance	2	
Protection	Creation of Corridors (Gene Flow / Connect	tivity of Forest)	Fra	gmentation	4	Important to close / sustain corridor
	Biodiversity Increase (Enrichment Planting,	different native tree species)			1	
	Erosion Control (Soil Improvement)		На	zard	2	
Improvement	Flood / Runoff Control (Water holding capa	icity)			1	
	Water Pollution Control				1	
	Rehabilitation of degraded forests				1	
	Riparian Forest Enhancement				1	
	Wetland Conservation		CD	М	1	
Support	Support of Watershed Management / inter	disciplinary			1	
	Enhancement of Agricultural Productivity				1	
	Secret Meeting Sites				1	
other	Ownership: governmental					
Site Characteris	tics: very steep slope, susceptible towards la	ndslide, important function as corridor	r bet	ween two fores	t patches	
Current Land Us	se / Land Cover: grass land 100%					
Closest (gravel)	road: 3,5 km to main road					
Closest town: C	henna in 2 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information				

Site Assessmen	Site Assessment – Reforestation(not visited)Plot					
Woreda: Chena		Kebele: Shishinda	Elevation (m.a	ı.s.l.):1568,	56	
Location (Lat/Lo	on): 35,89926370 / 7,21070474		Estimated Area (h	a): 26,8		
Issue	Function		Context	Priority	Relevance	
	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR Maintenance	2		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	2		
	Biodiversity Increase (Enrichment Planting,	different native tree species)		2		
	Erosion Control (Soil Improvement)		Hazard	4	Slope > 21°	
Improvement	Flood / Runoff Control (Water holding capa	city)		3		
	Water Pollution Control			2		
	Rehabilitation of degraded forests			4	Recent forest loss	
	Riparian Forest Enhancement			2		
	Wetland Conservation		CDM	1		
Support	Support of Watershed Management / inter-	disciplinary		1		
	Enhancement of Agricultural Productivity			1		
	Secret Meeting Sites			1		
other	Ownership: governmental					
Site Characteris	tics: very steep area, corridor creation, very s	susceptible towards landslide				
Current Land U	se / Land Cover: grass land 100%					
Closest (gravel)	road: 2,4 to main roads					
Closest town: S	hishinda in 4,5					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information				

Site Assessmen	Site Assessment – Reforestation (not visited)					
Woreda: Chena		Kebele: Shishinda	Elevation (m.a	a.s.l.):1941,	97	
Location (Lat/Lo	on): 35,97059881 / 7,22993078		Estimated Area (ha): 12,4			
Issue	Function		Context	Priority	Relevance	
	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR Maintenance	1		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	4	Important to	
	Biodiversity Increase (Enrichment Planting,	different native tree species)		3		
	Erosion Control (Soil Improvement)		Hazard	4	Slope > 21°	
Improvement	Flood / Runoff Control (Water holding capa	city)		2		
	Water Pollution Control			1		
	Rehabilitation of degraded forests			4	Recent forest loss	
	Riparian Forest Enhancement			1		
	Wetland Conservation		CDM	1		
Support	Support of Watershed Management / intere	disciplinary		1		
	Enhancement of Agricultural Productivity			1		
	Secret Meeting Sites			1		
other	Ownership: governmental					
Site Characteris	tics: very steep area, susceptible towards lan	dslide, function as corridor between t	wo forest patches, r	ecent defoi	restation	
Current Land U	se / Land Cover: scattered trees grass land					
Closest (gravel)	road: 5,5km to main road					
Closest town: D	imbra in 7,5 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	ery important; blank=no information				

Site Assessmen	t – Community Plantation	(not visited)				Plot NO: 13
Woreda: Chena		Kebele: Wote Wora		Elevati	on (m.a.s.l.):1984,24
Location (Lat/Lo	on): 35,73106934 / 7,04748646		Estimated	l Area (h	a): 139,0	
Issue	Function		Context		Priority	Relevance
Drotoction	Core Zone Protection (Agricultural Land, wh	nich is ancient to core zones)	BR Mainte	enance	2	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragment	ation	2	
	Erosion Control (Soil Improvement)		Hazard		4	Recent landslide (2010)
	Flood / Runoff Control (Water holding capa	acity)			3	
Improvement	Water Pollution Control				1	
	Fertility of surrounding agriculture				2	
	Animal / Plant habitats				1	
	Supply of Construction Wood / Fuel Wood	(subsistence)			4	Good road access
	Amelioration of livelihood – sale of NTFP (commercial)			3	Good access to market
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)			3	Good road access
Economic	Increase of livestock fodder				3	
	Medicines				1	
	Resin (subsistence / commercial)				1	
	Secret meeting sites				1	
other	Ownership: governmental					
Site Characteris	tics: very degraded soil, affected by landslide	e, has to be stabilized, propose	by DoAD			
Current Land Us	se / Land Cover: open ground, debris, cultiva	tion 30%				
Closest (gravel)	road: 5,5 km to main road					
Closest town: W	Vacha in 4km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no infor	mation			

Site Assessment – Community Plantation(alternative Agroforestry)Plot					Plot NO: 14		
Woreda: Chena		Kebele: Boba Qocha	E	Elevatio	on (m.a.s.l.):1839,59	
Location (Lat/Lo	on): 35,83984907 / 7,13924943	1	Estimated A	rea (ha	rea (ha): 214,1		
Issue	Function		Context		Priority	Relevance	
Ductosticu	Core Zone Protection (Agricultural Land, wh	nich is ancient to core zones)	BR Maintena	ance	1		
Protection	Creation of Corridors (Gene Flow / Connect	ene Flow / Connectivity of Forest)		ion	2		
	Erosion Control (Soil Improvement)		Hazard		4	Recent landslide (2010)	
	Flood / Runoff Control (Water holding capacity)				3		
Improvement	Water Pollution Control				3		
	Fertility of surrounding agriculture				3		
	Animal / Plant habitats				2		
	Supply of Construction Wood / Fuel Wood (subsistence)				4	Good road access, pop. Area	
	Amelioration of livelihood – sale of NTFP (commercial)				2		
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				3		
Economic	Increase of livestock fodder				3		
	Medicines				1		
	Resin (subsistence / commercial)				1		
	Secret meeting sites				1		
other	Ownership: governmental (unclear)						
Site Characteris	tics: affected by landslide, intense cultivation	١					
Current Land Us	se / Land Cover: cultivation 60%, MPT 10%, s	hrub 10%, grass 10%, 10% grav	vel				
Closest (gravel)	road: 1,4 km to main road						
Closest town: W	/acha in 2 km						
Key: 1=not impo	ortant; 2=minor important; 3=important; 4=v	very important; blank=no infor	mation				

iv. Woreda Decha

Site Assessment – Reforestation(candidate – outside of BR boundary / not visited)Plot NO: 1					
Woreda: Decha	Kebe	ele: Yoka			
Location (Lat/Lo	on): 36,21879996 / 7,02415823		Estimated Area (h	a): 19,3	
Issue	Function		Context	Priority	Relevance
	Core Zone Protection (Agricultural Land, which is	ancient to core zones)	BR Maintenance	3	
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Fragmentation	4	Additional Connection of
	Biodiversity Increase (Enrichment Planting, different native tree species)			3	
	Erosion Control (Soil Improvement)		Hazard	4	Slope partly >21°
luciona	Flood / Runoff Control (Water holding capacity)			3	
Improvement	Water Pollution Control			1	
	Rehabilitation of degraded forests			3	
	Riparian Forest Enhancement			4	Fresh water support
	Wetland Conservation		CDM	1	
Support	Support of Watershed Management / interdiscipl	linary		1	
	Enhancement of Agricultural Productivity			2	
	Secret Meeting Sites			1	
other	Ownership: governmental				
Site Characteris	tics: very steep area, buffering of river inflow (Taka	a river)			
Current Land U	se / Land Cover: scattered trees, along stream inter	nse grazing			
Closest (gravel)	road: 3,5 km to main road				
Closest town: T	iffa in 6,4 km				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=very in	nportant; blank=no inforn	nation		

Site Assessment – Reforestation (candidate – outside of BR boundary / not visited)						
Woreda: Decha	K	Kebele: Yoka				
Location (Lat/Lo	on): 36,22958424 / 7,02843092		Estimated Area (ha): 13,2			
Issue	Function		Context	Priority	Relevance	
	Core Zone Protection (Agricultural Land, whic	h is ancient to core zones)	BR Maintenance	4	Core zone buffer	
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Fragmentation	3		
	Biodiversity Increase (Enrichment Planting, different native tree species)			3		
	Erosion Control (Soil Improvement)		Hazard	4	Slope > 21°	
Improvement	Flood / Runoff Control (Water holding capacit	τ γ)		3		
	Water Pollution Control			1		
	Rehabilitation of degraded forests			4	Degraded forest boundary	
	Riparian Forest Enhancement			4		
	Wetland Conservation		CDM	1		
Support	Support of Watershed Management / interdis	sciplinary		1		
	Enhancement of Agricultural Productivity			2		
	Secret Meeting Sites			1		
other	Ownership: governmental					
Site Characteris	tics: see PLOT 1		•		·	
Current Land U	se / Land Cover: remnants of riparian forest, int	ense grazing				
Closest (gravel)	road: 3,8 km to main road					
Closest town: T	iffa in 6 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=ver	y important; blank=no inforr	nation			

Site Assessment – Reforestation(candidate – outside of BR boundary / not visited)Plo						
Woreda: Decha	Ke	ebele: Yoka				
Location (Lat/Lo	on): 36,23002384 / 7,03438347		Estimated Area (ha): 2,9			
Issue	Function		Context	Priority	Relevance	
	Core Zone Protection (Agricultural Land, which	n is ancient or close to core zones)	BR Maintenance	4	Core zone	
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Fragmentation	3		
	Biodiversity Increase (Enrichment Planting, different native tree species)			3		
	Erosion Control (Soil Improvement)		Hazard	4	Slope > 21°	
Improvement	Flood / Runoff Control (Water holding capacity	<i>y</i>)		3		
	Water Pollution Control			1		
	Rehabilitation of degraded forests			4	Degraded forest	
	Riparian Forest Enhancement			4		
	Wetland Conservation		CDM	1		
Support	Support of Watershed Management / interdisc	ciplinary		1		
	Enhancement of Agricultural Productivity			2		
	Secret Meeting Sites			1		
other	Ownership: governmental					
Site Characteris	tics: see PLOT 1					
Current Land U	se / Land Cover: Shrub 80%, grass land 20%					
Closest (gravel)	road: 10 km to main road					
Closest town: T	iffa in 6,5 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=very	y important; blank=no information				
Site Assessment – Reforestation(candidate / partly outside of BR boundary)Plot NO:					Plot NO: 5	
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Woreda: Decha		Kebele: Ufa				
Location (Lat/Lo	on): 36,21784774 / 7,05946165		Estimated Area (h	ha): 19,3		
Issue	Function		Context	Priority	Relevance	
	Core Zone Protection (Agricultural Land, wh	ich is ancient to core zones)	BR Maintenance	2		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	4	Additional forest connection	
	Biodiversity Increase (Enrichment Planting,	different native tree species)		2		
	Erosion Control (Soil Improvement)		Hazard	4	Steep slope >26°	
Improvement	Flood / Runoff Control (Water holding capacity)			3		
improvement	Water Pollution Control			2		
	Rehabilitation of degraded forests			3		
	Riparian Forest Enhancement			4	Fresh water support	
	Wetland Conservation		CDM	1		
Support	Support of Watershed Management / interdisciplinary			1		
	Enhancement of Agricultural Productivity			1		
	Secret Meeting Sites			1		
other	Ownership: governmental					
Site Characteris wood collection	tics: degraded riparian forest, degraded prima n – low/medium	ary forest border, , very steep a	irea, susceptible tov	vards lands	lide, intense grazing,	
Current Land Us	se / Land Cover: cultivation 5%, MPT 40% (rer	mnants of riparian forest), shru	b 35%, grass land 20)%		
Closest (gravel)	road: 2 km to gravel road					
Closest town: N	1echa Ishena in 3,4 km					
Key: 1=not impo	ortant; 2=minor important; 3=important; 4=v	ery important; blank=no inforr	nation			

Site Assessmen	t – Reforestation				Plot NO: 6
Woreda: Decha		Kebele: Ufa	Elevation (m.a	a.s.l.):1425,	53
Location (Lat/Lo	on): 36,22499318 / 7,06351168		Estimated Area (h	a): 5,2	
Issue	Function		Context	Priority	Relevance
	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR Maintenance	4	BR core buffer
Protection	Creation of Corridors (Gene Flow / Connect	Kebele: Ufa 51168 gricultural Land, which is ancient or close to core zones) ene Flow / Connectivity of Forest) nrichment Planting, different native tree species) provement) Water holding capacity) led forests ement Management / interdisciplinary tural Productivity tal ler, understorey clearing to support coffee plantings, agr lium, LCC open, very disturbed understorey (Schefllera al t; 3=important; 4=very important; blank=no informatior	Fragmentation	1	
	Biodiversity Increase (Enrichment Planting,			2	
	Erosion Control (Soil Improvement)	Kebele: Ufa Elevation (m.a Estimated Area (h Context d, which is ancient or close to core zones) BR Maintenance nnectivity of Forest) Fragmentation iting, different native tree species) Hazard capacity) CDM interdisciplinary CDM vity	4	Steep slope >26°	
	Flood / Runoff Control (Water holding capa	city)		3	
Site Assessment – Woreda: Decha Location (Lat/Lon Issue (Protection (Improvement (Support (Support (Site Characteristic Current Land Use Closest (gravel) rc Closest town: Me	Water Pollution Control	Water Pollution Control		1	
	Rehabilitation of degraded forests			3	
	Riparian Forest Enhancement			4	Serve as boundary demarcation
	Wetland Conservation		CDM	1	
Support	Support of Watershed Management / inter-	disciplinary		1	
	Enhancement of Agricultural Productivity	Kebele: Ufa)6351168 n (Agricultural Land, which is ancient or close to core zones s (Gene Flow / Connectivity of Forest) a (Enrichment Planting, different native tree species) I Improvement) rol (Water holding capacity) trol graded forests ancement on ad Management / interdisciplinary ricultural Productivity s nental porder, understorey clearing to support coffee plantings, age medium, LCC open, very disturbed understorey (Schefillera road n rtant; 3=important; 4=very important; blank=no informatic		2	
	Secret Meeting Sites			1	
other	Ownership: governmental				
Site Characteris	tics: degraded forest border, understorey clea	aring to support coffee plantings, agric	ulture expansion		
Current Land U	se / Land Cover: UCC medium, LCC open, ver	y disturbed understorey (Schefllera ab	yssinica, Hygenia Ab	oyssinia, Pru	unus Africana)
Closest (gravel)	road: 2 km to gravel road				
Closest town: N	1echa Ishena in 3,4 km				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information			

Site Assessment – Reforestation(candidate)Plot NO: 11						
Woreda: Decha		Kebele: Chiri				
Location (Lat/Lo	on): 36,20370797 / 7,09959210	I	Estimated Area (ha): 9,8			
Issue	Function		Relevance			
	Core Zone Protection (Agricultural Land, wh	nich is ancient to core zones)	BR Maintenance	3		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	3		
	Biodiversity Increase (Enrichment Planting, different native tree species)			2		
	Erosion Control (Soil Improvement)		Hazard	4	Slope > 21°, soil degradation	
Improvement	Flood / Runoff Control (Water holding capacity)			3		
	Water Pollution Control			1		
	Rehabilitation of degraded forests			1		
	Riparian Forest Enhancement			4	Enhance fresh water supply	
	Wetland Conservation		CDM	1		
Support	Support of Watershed Management / interc	Support of Watershed Management / interdisciplinary		3		
	Enhancement of Agricultural Productivity			1		
	Secret Meeting Sites			1		
other	Ownership: governmental					
Site Characteris	tics: degraded riparian forest, high wood colle	ection, affected by erosion (gul	lying), agriculture ex	kpansion, v	ery steep slopes	
Current Land U	se / Land Cover: UCC open – medium, LCC me	edium				
Closest (gravel)	road: 0,5 km to main road					
Closest town: a	djacent to Ufa					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	ery important; blank=no inforr	mation			

Site Assessmen	t – Reforestation				Plot NO: 12
Woreda: Decha		Kebele: Chiri	Elevation (m.a	a.s.l.):1759,	98
Location (Lat/Lo	on): 36,20907552 / 7,12206515		Estimated Area (h	a): 9,1	
Issue	Function		Context	Priority	Relevance
	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR Maintenance	2	
Protection	Creation of Corridors (Gene Flow / Connect	Kebele: Chiri Est ral Land, which is ancient or close to core zones) B w / Connectivity of Forest) Fit nt Planting, different native tree species) Fit ent) H olding capacity) C sts C ment / interdisciplinary C oductivity C pen (Prunus Africana, Syzygium guineese, Millittia ferruginea, F portant; 4=very important; blank=no information	Fragmentation	3	
	Biodiversity Increase (Enrichment Planting,			2	
	Erosion Control (Soil Improvement)		Hazard	4	Slope > 21°, soil
	Flood / Runoff Control (Water holding capa	city)		3	
Improvement	Water Pollution Control			1	
	Rehabilitation of degraded forests			2	
	Riparian Forest Enhancement			4	Enhance fresh
	Wetland Conservation		CDM	1	
Support	Support of Watershed Management / interest	disciplinary		1	
	Enhancement of Agricultural Productivity	Kebele: Chiri 206515 (Agricultural Land, which is ancient or close to core zone: Gene Flow / Connectivity of Forest) Enrichment Planting, different native tree species) nprovement) I (Water holding capacity) ol aded forests cement Management / interdisciplinary ultural Productivity ental forest (in candidate core zone), intense grazing ien, LCC open (Prunus Africana, Syzygium guineese, Millittia ferru d		2	
	Secret Meeting Sites			1	
other	Ownership: governmental				
Site Characteris	tics: degraded riparian forest (in candidate c	ore zone), intense grazing			
Current Land U	se / Land Cover: UCC open, LCC open (Prunus /	Africana, Syzygium guineese, Millittia ferrugine	ea, Hagenia abyssinica,	Schefllera aby	vssinica)
Closest (gravel)	road: 2 km to main road				
Closest town: A	wurada in 2 km				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information			

Site Assessmen	t – Reforestation				Plot NO: 13
Woreda: Decha		Kebele: Chiri	Elevation (m.a	a.s.l.):1779,	74
Location (Lat/Lo	on): 36,20371544 / 7,11614877	l	Estimated Area (h	ia): 8,7	
Issue	Function		Context	Priority	Relevance
	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	: or close to core zones) BR Maintenance t) Fragmentation ve tree species) Hazard	1	
Protection	Creation of Corridors (Gene Flow / Connect	Kebele: Chiri Z F Z Itural Land, which is ancient or close to core zones) F Elow / Connectivity of Forest) F ment Planting, different native tree species) F ement) F er holding capacity) F orests F t C gement / interdisciplinary F Productivity F only single trees), grazing pressure high, C C Open (Prunus Africana, Syzygium guineese, Millittia ferruginea, important; 4=very important; blank=no information	Fragmentation	3	
	Biodiversity Increase (Enrichment Planting,			3	
	Erosion Control (Soil Improvement)		Elevation (m. Estimated Area (f Context ose to core zones) BR Maintenance Fragmentation e species) Hazard CDM CDM ce high, re high, eesse, Millittia ferruginea, Hagenia abyssinica,	4	Slope > 21°, soil
	Flood / Runoff Control (Water holding capa	city)		3	
Site Assessment – Woreda: Decha Location (Lat/Lon Issue F Protection C Improvement F Support 5 Support 5 Site Characteristic Current Land Use Closest (gravel) rc Closest town: Awr	Water Pollution Control	Water Pollution Control		1	
	Rehabilitation of degraded forests			1	
	Riparian Forest Enhancement			4	Enhance fresh
	Wetland Conservation		CDM	1	
Support	Support of Watershed Management / inter-	disciplinary		1	
	Enhancement of Agricultural Productivity	Kebele: Chiri 4877 gricultural Land, which is ancient or close to core zone ene Flow / Connectivity of Forest) richment Planting, different native tree species) rovement) Vater holding capacity) ed forests ment anagement / interdisciplinary ural Productivity al est(only single trees), grazing pressure high, , LCC open (Prunus Africana, Syzygium guineese, Millittia ferru ; 3=important; 4=very important; blank=no informati		1	
	Secret Meeting Sites		Elevation (m Estimated Area Context s) BR Maintenance Fragmentation Hazard CDM CDM	1	
other	Ownership: governmental				
Site Characteris	tics: degraded Riparian forest(only single tre	es), grazing pressure high,			·
Current Land U	se / Land Cover: UCC open, LCC open (Prunus /	Africana, Syzygium guineese, Millittia ferrugine	ea, Hagenia abyssinica,	Schefllera aby	vssinica)
Closest (gravel)	road: 1,5 km to main road				
Closest town: A	wurada in 1,5 km				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information			

Site Assessment – Agroforestry(candidate – outside of BR boundary / not visited)Plot NO						
Woreda: Decha		Kebele: Yoka				
Location (Lat/Lo	on): 36,22572468 / 7,02353552		Estimated Area (h	(ha): 199,7		
Issue	Function		Context	Priority	Relevance	
Dretection	Core Zone Protection (Agricultural Land, whi	ch is ancient to core zones)	BR Maintenance	4	Release pressure on BR core	
Protection	Creation of Corridors (Gene Flow / Connectiv	vity of Forest)	Fragmentation	2		
	Erosion Control (Soil Improvement)			2		
	Flood / Runoff Control (Water holding capaci	ty)		2		
Improvement	Water Pollution Control			1		
	Shade			2		
	Wind Protection			2		
	Timber (commercial)			2		
	Timber (subsistence)			4	Minimize wood extraction from primary forest	
	Fuel Wood			4		
Cultural /	Fertility Control			2		
Economic	Medicines			1		
	NTFP (commercial)			2		
	NTFP (subsistence)			2		
	Livestock fodder			3		
	Beehives			2		
other	Ownership: private					
Site Characteris	tics: see PLOT 1					
Current Land U	se / Land Cover: cultivation 60%, MPT 10%, sh	rub 15%, grass 15%				
Closest (gravel)	road: 3,6 km to main road					
Closest town: T	iffa in 6,5 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=ve	ery important; blank=no infor	mation			

Site Assessment – Agroforestry(partly outside BR boundary)Plot					Plot NO: 15		
Woreda: Decha		Kebele: Ufa		Elevat	ation (m.a.s.l.):1548,45		
Location (Lat/Lo	on): 36,22417130 / 7,05991407		Estimated	Area (h	a): 56,7		
Issue	Function		Context		Priority	Relevance	
Drotoction	Core Zone Protection (Agricultural Land, wh	ich is ancient to core zones)	BR Mainte	nance	4	Release pressure on BR core	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmenta	tion	1		
	Erosion Control (Soil Improvement)				4		
	Flood / Runoff Control (Water holding capa	city)			2		
Improvement	Water Pollution Control				1		
	Shade				1		
	Wind Protection				1		
	Timber (commercial)				2		
	Timber (subsistence)				4	Minimize wood extraction from primary forest	
	Fuel Wood				4		
Cultural /	Fertility Control				4	Surrounded by intense	
Economic	Medicines				1		
	NTFP (commercial)				2		
	NTFP (subsistence)				3		
	Livestock fodder				3		
	Beehives				3		
other	Ownership: private						
Site Characteristics: very steep slopes, erosion measures -> soil bunds, fallowing; intercropping (bean, cardamom, crop) to minimize soil degradation, 12 HH left area due to grave landslide problem, 3 years ago participation in FAO program (watershed management) to avoid erosion, recent deforestation, problem of drying streams							
Current Land Use / Land Cover							
Closest (gravel) roa	ad: 2,3 km to main road // Closest town: Mecha Ishena	a in 3,4 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	ery important; blank=no infor	mation				

Site Assessmen	t – Community Plantation (can	didate)				Plot NO: 18
Woreda: Decha		Kebele: Chiri		Elevation (m.a	.s.l.):1707,	34
Location (Lat/Lo	on): 36,21318514 / 7,12452269		Est	timated Area (h	a): 41 <i>,</i> 1	
Issue	Function		Со	ntext	Priority	Relevance
	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR	Maintenance	2	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fra	agmentation	2	
	Erosion Control (Soil Improvement)		На	zard	3	
	Flood / Runoff Control (Water holding capa	icity)			2	
Improvement	Water Pollution Control				1	
	Fertility of surrounding agriculture				3	
	Animal / Plant habitats				1	
	Supply of Construction Wood / Fuel Wood (subsistence)				4	Pop. Area Awurada
	Amelioration of livelihood – sale of NTFP (commercial)			2	
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)			3	
- Cultural / - Economic -	Increase of livestock fodder				3	
	Medicines				1	
	Resin (subsistence / commercial)				1	
	Secret meeting sites				1	
other	Ownership: communal (unclear)					
Site Characteris	tics: scattered trees, used for communal graz	ing, rolling topography				
Current Land U Hagenia abyssinica	se / Land Cover: cultivation 40% (maize), MP a, Schefllera abyssinica)	T 30%, shrub 10%, grass 20% (Prunus Af	rican	a, Syzygium guinee	ese, Millittia fo	erruginea,
Closest (gravel)	road: 1,7 km to main road					
Closest town: A	wurada in 2 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information				

Site Assessmen	t – Community Plantation	(not visited)				Plot NO: 19
Woreda: Decha		Kebele: Chiri	Elevation (m.a.s.l.):1638,59):1638,59	
Location (Lat/Lo	on): 36,21384321 / 7,13614093		Estimated	l Area (h	a): 9,3	
Issue	Function		Context		Priority	Relevance
Drotostion	Core Zone Protection (Agricultural Land, w	hich is ancient to core zones)	BR Mainte	enance	4	BR core buffer
Protection Protection Improvement M Cultural / Economic Cultural /	Creation of Corridors (Gene Flow / Connect	e Flow / Connectivity of Forest)		Fragmentation		
	Erosion Control (Soil Improvement)	n of Corridors (Gene Flow / Connectivity of Forest) Control (Soil Improvement) Runoff Control (Water holding capacity) Pollution Control of surrounding agriculture / Plant habitats of Construction Wood / Fuel Wood (subsistence) ration of livelihood – sale of NTFP (commercial) ration of livelihood – sale of timber products (commercial) e of livestock fodder	Hazard		3	
	Flood / Runoff Control (Water holding capa	acity)			2	
Improvement	Water Pollution Control				1	
	Fertility of surrounding agriculture				2	
	Int - Community Plantation (Not Visiting Community Plantation Ima Kebele Lon): 36,21384321 / 7,13614093 Kebele Function Core Zone Protection (Agricultural Land, which is an Creation of Corridors (Gene Flow / Connectivity of Erosion Control (Soil Improvement) Flood / Runoff Control (Water holding capacity) Kater Pollution Control Fertility of surrounding agriculture Animal / Plant habitats Supply of Construction Wood / Fuel Wood (subsisted Amelioration of livelihood – sale of NTFP (commed Amelioration of livelihood – sale of timber product Increase of livestock fodder Medicines Resin (subsistence / commercial) Secret meeting sites Ownership: communal / private (unclear) ristics: degraded forest boarder, close to core zone, ste Use / Land Cover: degraded forest Isolar 2,4 km to main road Beshibey in 2,5 km				1	
	Supply of Construction Wood / Fuel Wood (subsistence)				4	Pop. Area Awurada
	Amelioration of livelihood – sale of NTFP (commercial)				3	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				3	
Economic	Increase of livestock fodder				3	
	Medicines				1	
	Resin (subsistence / commercial)				1	
	Secret meeting sites				1	
other	Ownership: communal / private (unclear)					
Site Characteris	stics: degraded forest boarder, close to core z	one, steep slope				
Current Land U	se / Land Cover: degraded forest					
Closest (gravel)	road: 2,4 km to main road					
Closest town: B	eshibey in 2,5 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=	very important; blank=no infor	mation			

Site Assessment	t – Community Plantation					Plot NO: 20
Woreda: DechaKebele: ChiriElevation (m.a.s.l.):169			.):1690,77			
Location (Lat/Lo	on): 36,21378689 / 7,14268675		Estimated	Area (h	Area (ha): 16,2	
Issue	Function		Context		Priority	Relevance
Ductosticu	Core Zone Protection (Agricultural Land, wh	ich is ancient to core zones)	BR Mainte	enance	4	BR core buffer
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmenta	ation	1	
	Erosion Control (Soil Improvement)		Hazard		2	
	Flood / Runoff Control (Water holding capa	city)			1	
Improvement	Water Pollution Control				1	
	Fertility of surrounding agriculture				1	
	Animal / Plant habitats				1	
	Supply of Construction Wood / Fuel Wood (subsistence)				4	Pop. Area Awurada
	Amelioration of livelihood – sale of NTFP (commercial)				2	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				2	
Economic	Increase of livestock fodder				3	
	Medicines				1	
	Resin (subsistence / commercial)				1	
	Secret meeting sites				1	
other	Ownership: unclear					
Site Characteris boundary dema	tics: degraded forest boarder, close to core zo rcation necessary	one, recent forest loss, rolling t	topography,	close to	abort edge	e, strong forest
Current Land Us	se / Land Cover: UCC open, LCC open (Syzygiur	n guineese, Millittia ferruginea, Hage	enia abyssinica	, Scheflle	ra abyssinica	
Closest (gravel)	road: 1,4 to main road					
Closest town: Be	eshibey in 2,5 km					
Key: 1=not impo	ortant; 2=minor important; 3=important; 4=v	ery important; blank=no infor	mation			

Site Assessment	t – Reforestation (candidate	- not visited)				Plot NO: 21	
Woreda: Decha		Kebele: Modiyo Gombera		Elevatio	ation (m.a.s.l.):1845,83		
Location (Lat/Lo	on): 36,29240350 / 7,17990898		Estimated	l Area (h	Area (ha): 32,4		
Issue	Function	Context			Priority	Relevance	
	Core Zone Protection (Agricultural Land, wh	nich is ancient to core zones)	BR Mainte	enance	4	BR core Buffer	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragment	ation	1		
	Biodiversity Increase (Enrichment Planting,	different native tree species)			1		
	Erosion Control (Soil Improvement)		Hazard		4	Very steep slope >35°	
Improvement	Flood / Runoff Control (Water holding capacity)				1		
improvement	Water Pollution Control				1		
	Rehabilitation of degraded forests				4	Recent forest loss	
	Riparian Forest Enhancement				1		
	Wetland Conservation		CDM		1		
Support	Support of Watershed Management / inter	disciplinary			1		
	Enhancement of Agricultural Productivity				1		
	Secret Meeting Sites				1		
other	Ownership: governmental						
Site Characteris demarcation, pr	tics: recent forest loss, very steep slopes, adj ropose by DoAD	acent to BR core zone, highly re	commende	d to esta	ablish stron	g boundary	
Current Land Us	se / Land Cover: degraded forest border						
Closest (gravel)	road: 1 km to gravel road						
Closest town: A	ndaracha in 3,3 km						
Key: 1=not impo	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inform	nation				

Site Assessmen	t – Community Plantation (ca	indidate - not visited, no PRA)			Plot NO: 22
Woreda: Decha		Kebele: Modiyo Gombera		Eleva	tion (m.a.s.	.l.):1872 <i>,</i> 68
Location (Lat/Lo	on): 36,29420644 / 7,17679241		Estimated	Area (h	a): 108,9	
Issue	Function		Context		Priority	Relevance
Destaulies	Core Zone Protection (Agricultural Land, w	hich is close to core zones)	BR Mainte	nance	4	Release pressure of BR core
Protection	Creation of Corridors (Gene Flow / Connect	ctivity of Forest)	Fragmenta	ition	1	
	Erosion Control (Soil Improvement)		Hazard		4	Very steep slope >35°
	Flood / Runoff Control (Water holding cap	acity)			3	
Improvement	Water Pollution Control				1	
	Fertility of surrounding agriculture				1	
	Animal / Plant habitats				1	
	Supply of Construction Wood / Fuel Wood (subsistence)				4	Recent forest loss
	Amelioration of livelihood – sale of NTFP (commercial)					
Cultural /	Amelioration of livelihood – sale of timber products (commercial)					
Economic	Increase of livestock fodder					
	Medicines					
	Resin (subsistence / commercial)					
	Secret meeting sites					
other						
Site Characteris demarcation, p	tics: recent forest loss, very steep slopes, ad ropose by DoAD	jacent to BR core zone, highl	y recomment	ded to	establish st	rong boundary
Current Land U	se / Land Cover:					
Closest (gravel)	road: 1 km to gravel road					
Closest town: A	ndaracha in 3,3 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=	very important; blank=no inf	ormation			

Site Assessmen	t – Reforestation (c	andidate - not visited, no PRA)				Plot NO: 23	
Woreda: Decha		Kebele: Budi	El	levatio	n (m.a.s.l.	ו (m.a.s.l.):1820,47	
Location (Lat/Lo	on): 36,25000159 / 7,11753981	1	Estimated Ar	rea (ha	ı): 56 <i>,</i> 1		
Issue	Function		Context		Priority	Relevance	
	Core Zone Protection (Agricultural Land, wh	nich is ancient to core zones)	BR Maintena	ance	4	Forest loss within BR core	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentatio	on	4	Perforation	
	Biodiversity Increase (Enrichment Planting, different native tree species)				1		
	Erosion Control (Soil Improvement)		Hazard		4		
	Flood / Runoff Control (Water holding capacity)				3		
Improvement	Water Pollution Control				1		
	Rehabilitation of degraded forests				4	Recent forest loss	
	Riparian Forest Enhancement				1		
	Wetland Conservation		CDM		1		
Support	Support of Watershed Management / inter	Support of Watershed Management / interdisciplinary					
	Enhancement of Agricultural Productivity						
	Secret Meeting Sites						
other	Ownership: governmental						
Site Characteris	tics: very steep slopes, dried out forest, hum	an activity detected, propose o	f DoAD				
Current Land U	se / Land Cover: disturbed forest						
Closest (gravel)	road: 3,5 to gravel road						
Closest town: N	1ankira in 3,5 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	/ery important; blank=no inforr	nation				

Site Assessmen	t – Reforestation (ca	andidate - not visited, no PRA)				Plot NO: 24	
Woreda: Decha		Kebele: Yaha Checha	E	Elevatio	on (m.a.s.l.	ı.a.s.l.):1490,21	
Location (Lat/Lo	on): 36,25731365 / 7,07712545		Estimated A	Estimated Area (ha): 31,5			
Issue	Function		Context		Priority	Relevance	
	Core Zone Protection (Agricultural Land, wi	hich is ancient to core zones)	BR Mainten	nance	4	Forest loss within BR core	
Protection	Creation of Corridors (Gene Flow / Connect	tivity of Forest)	Fragmentat	ion	4	Perforation	
Biodiversity Increase (Enrichment Planting, different native		different native tree species)			2		
	Erosion Control (Soil Improvement)		Hazard		4		
	Flood / Runoff Control (Water holding capacity)				3		
Improvement	Water Pollution Control				1		
	Rehabilitation of degraded forests				4	Recent forest loss	
	Riparian Forest Enhancement				1		
	Wetland Conservation		CDM		1		
Support	Support of Watershed Management / interdisciplinary				1		
	Enhancement of Agricultural Productivity						
	Secret Meeting Sites						
other	Ownership: governmental						
Site Characteris	tics: very steep slope, susceptible towards la	ndslide, agricultural expansion	to BR core zor	ne, pro	pose by Do	AD	
Current Land U	se / Land Cover: degraded forest, farmland e	xpansion					
Closest (gravel)	road: 8,4 km to dry weather road						
Closest town: A	che Dacha in 3,7						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inforr	mation				

Site Assessmen	t – Community Plantation				Plot NO: 25	
Woreda: Decha		Kebele: Chiri		Elevation (m.a.s.l.):1843,51	
Location (Lat/Lo	on): 36,19739493 / 7,11254171		Estimated Area (h	Estimated Area (ha): 14,8		
Issue	Function		Context	Priority	Relevance	
	Core Zone Protection		BR Maintenance	3		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	1		
	Erosion Control (Soil Improvement)		Hazard	4	Steep slope along river	
	Flood / Runoff Control (Water holding capacity)			1		
Improvement	Water Pollution Control			1		
	Fertility of surrounding agriculture			4	Intense agriculture in vicinity	
	Animal / Plant habitats			1		
	Supply of Construction Wood / Fuel Wood (subsistence)			4	Release pressure on BR core zone	
	Amelioration of livelihood – sale of NTFP (commercial)			3		
Cultural /	Amelioration of livelihood – sale of timber products (commercial)			2		
Economic	Increase of livestock fodder			3		
Leonomie	Medicines			2		
	Resin (subsistence / commercial)			1		
	Secret meeting sites			1		
other	Ownership: governmental					
Site Characteris	tics: woodlot connecting river network, very	steep slope, recent fore	st loss, need of enri	chment pla	nting and proper	
management. c Current Land U	community suggests PFM se / Land Cover: UCC open, LCC open, forest g	grazing (Hagenia abyssin	ica, Schefllera abys	sinica, Prun	us Africana)	
Closest (gravel)	road: 1,3 km to main road					
Closest town: A	wurada in 1,8 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no	o information			

Site Assessment – Agroforestry(candidate)Plot					Plot NO: 26
Woreda: Decha		Kebele: Chiri			Elevation (m.a.s.l.):1912,29
Location (Lat/Lo	on): 36,17899524 / 7,13733970		Estimated Area (h	a): 18,5	
Issue	Function		Context	Priorit	y Relevance
Ductosticu	Core Zone Protection		BR Maintenance	1	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	1	
	Erosion Control (Soil Improvement)			4	
	Flood / Runoff Control (Water holding capa	city)		4	
Improvement	Water Pollution Control			4	
	Shade			3	
	Wind Protection			3	
	Timber (commercial)			4	According to PRA \rightarrow missing
	Timber (subsistence)			4	According to PRA \rightarrow missing
	Fuel Wood			4	According to PRA \rightarrow missing
Cultural /	Fertility Control			3	
Economic	Medicines			1	
	NTFP (commercial)			2	
	NTFP (subsistence)			2	
	Livestock fodder			3	
	Beehives			3	
other	Ownership: private				
Site Characteris	tics: very steep slope, adjacent to main road	and town Beshik	pey, degraded soil, w	ulnerab	le towards landslide
Current Land U	se / Land Cover: cultivation 50%, MPT 20%, s	hrub 20%, grass	10%		
Closest (gravel)	road: adjacent to main road				
Closest town: a	djacent to Beshibey				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; k	plank=no informatio	n	

Site Assessmen	t – Community Plantation (ca	andidate)			Plot NO: 27
Woreda: Decha		Kebele: Chiri		Elevation (m.a.s.l.):1893,39
Location (Lat/Lo	ocation (Lat/Lon): 36,17463035 / 7,13954769 Estimated Area (ha): 13,2				
Issue	Function		Context	Priority	Relevance
Dretection	Core Zone Protection		BR Maintenance	1	
Protection	Creation of Corridors (Gene Flow / Connectiv	vity of Forest)	Fragmentation	3	
	Erosion Control (Soil Improvement)		Hazard	4	Slope > 16°
	Flood / Runoff Control (Water holding capacity)			2	
Improvement	Water Pollution Control			1	
	Fertility of surrounding agriculture			3	
	Animal / Plant habitats			1	
	Supply of Construction Wood / Fuel Wood (subsistence)			4	According to PRA \rightarrow missing
	Amelioration of livelihood – sale of NTFP (commercial)			2	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)			2	Could be compensated by PLOT 26
Economic	Increase of livestock fodder			3	
	Medicines			2	
	Resin (subsistence / commercial)			1	
	Secret meeting sites			1	
other	Ownership: unclear				
Site Characteris	tics: degraded forest patch, very steep slope, a	already communally use	ed		
Current Land Us	se / Land Cover: UCC medium, LCC medium				
Closest (gravel)	road: adjacent to main road				
Closest town: a	djacent to Beshibey				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=ve	ery important; blank=no	o information		

Site Assessmen	t – Community Plantation (not visit	ted)			Plot NO: 28
Woreda: Decha	Ket	oele: Shapa		Elevation (m.a.s.l.):1581,53
Location (Lat/Lo	on): 36,25485876 / 7,21404994		Estimated Area (h	na): 14 <i>,</i> 3	
Issue	Function		Context	Priority	Relevance
Destantia	Core Zone Protection		BR Maintenance	1	
Protection	Creation of Corridors (Gene Flow / Connectivity	of Forest)	Fragmentation	1	
	Erosion Control (Soil Improvement)		Hazard	3	
	Flood / Runoff Control (Water holding capacity)			2	
Improvement	Water Pollution Control			2	
	Fertility of surrounding agriculture			2	
	Animal / Plant habitats			3	
	Supply of Construction Wood / Fuel Wood (subsistence)			4	Pop Area Anderach
	Amelioration of livelihood – sale of NTFP (commercial)			3	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)			1	
Economic	Increase of livestock fodder			2	
	Medicines			1	
	Resin (subsistence / commercial)			1	
	Secret meeting sites			1	
other	Ownership: governmental				
Site Characteris	stics: degraded riparian forest, intense agriculture,	steep slope			
Current Land U	se / Land Cover: UCC open, LCC open				
Closest (gravel)	road: 1 km to gravel road				
Closest town: A	ndracha in 1 km				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=very i	mportant; blank=nc	information		

v. Woreda Gawata

Site Assessmen	t – Community Plantation					Plot NO: 1
Woreda: Gawat	a	Kebele: Medabo		Elevation (m.a.s.l.):15	94,39
Location (Lat/Lo	on): 35,99936484/ 7,50789542	1	Estim	ated Area (h	a): 3 <i>,</i> 7	
Issue	Function		Conte	ext	Priority	Relevance
Ductosticu	Core Zone Protection (Agricultural Land, wi	hich is close to core zones)	BR M	aintenance	4	BR core buffer
Protection	Creation of Corridors (Gene Flow / Connect	tivity of Forest)	Fragn	nentation	1	
	Erosion Control (Soil Improvement)		Hazaı	rd	3	
	Flood / Runoff Control (Water holding capa	acity)			2	
Improvement	Water Pollution Control				1	
	Fertility of surrounding agriculture				1	
	Animal / Plant habitats				3	
	Supply of Construction Wood / Fuel Wood	(subsistence)			3	
	Amelioration of livelihood – sale of NTFP (commercial)				2	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)				1	
Economic	Increase of livestock fodder				1	
	Medicines				3	
	Resin (subsistence / commercial)				1	
	Secret meeting sites				1	
other	Ownership: governmental (but private inte	rvention by Abamecha Abagero)				
Site Characteris	tics: previously illegally settled, vacant area s	since May 2011, remnants of farm	land (m	aize, sugarca	ne, coffee)	, sheet erosion
Current Land U Millittia ferrugi	se / Land Cover: cultivation 70%, multiple tre nea, Acokanthera schimperi)	e species 5%, shrub 10%, grass 15	5% (Coro	dia Africana,	Croton ma	crostachyus,
Closest (gravel)	road: 5,5 km					
Closest town: S	aja in 7,3 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no informat	tion			

Site Assessmen	t – Reforestation					Plot NO: 2	
Woreda: Gawat	ta	Kebele: Kasha		Elevatio	evation (m.a.s.l.):1943,71		
Location (Lat/Lo	on): 36,07021509 / 7,45219299	1	Estimated	Area (h	a): 18,9		
Issue	Function		Context		Priority	Relevance	
	Core Zone Protection (Agricultural Land, wh	nich is close to core zones)	BR Mainte	enance	4	BR core buffer	
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Fragment	ation	4	perforation	
	Biodiversity Increase (Enrichment Planting, different native tree species)				3		
	Erosion Control (Soil Improvement)		Hazard		1		
Improvement	Flood / Runoff Control (Water holding capacity)				3		
	Water Pollution Control				2		
	Rehabilitation of degraded forests	ehabilitation of degraded forests			4	cultivation	
	Riparian Forest Enhancement				1		
	Wetland Conservation		CDM		4		
Support	Support of Watershed Management / inter-	Support of Watershed Management / interdisciplinary			3		
	Enhancement of Agricultural Productivity				1		
	Secret Meeting Sites				1		
other	Ownership: communal						
Site Characteris	stics: recently deforested, vacant land, used for	or grazing, hot air condition due	e to absence	of trees	5		
Current Land U	se / Land Cover: 100% grass land						
Closest (gravel)	road: 2,7 km						
Closest town: K	eja Kata in 3,6 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inforr	mation				

Site Assessmen	t – Reforestation					Plot NO: 3	
Woreda: Gawat	a	Kebele: Qolla		Elevatio	levation (m.a.s.l.):1798,12		
Location (Lat/Lo	on): 35,97653136 / 7,47761296		Estimated Area (ha): 13,7				
Issue	Function		Context		Priority	Relevance	
	Core Zone Protection (Agricultural Land, wh	nich is ancient to core zones)	BR Mainte	nance	4	BR core buffer	
Protection	Creation of Corridors (Gene Flow / Connect	of Corridors (Gene Flow / Connectivity of Forest)		Fragmentation		perforation	
	Biodiversity Increase (Enrichment Planting, different native tree species)				4		
	Erosion Control (Soil Improvement)		Hazard		1		
Improvement	Flood / Runoff Control (Water holding capacity)				1		
	Water Pollution Control				1		
	Rehabilitation of degraded forests				4		
	Riparian Forest Enhancement				1		
	Wetland Conservation		CDM		1		
Support	Support of Watershed Management / interdisciplinary				1		
	Enhancement of Agricultural Productivity				1		
	Secret Meeting Sites				1		
other	Ownership: governmental				1		
Site Characteris	tics: disturbance of intact forest, active agric	ulture expansion, 5 households	affected				
Current Land U	se / Land Cover: cultivation 60%, multiple tree species	10%, shrub 15%, grass 15% (Schefllera a	byssinica, Olea w	elwitschii,	Croton macro	stachyus, Sapium ellipticum)	
Closest (gravel)	road: 8,4 km						
Closest town: N	1acheto in 6,4 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=\	very important; blank=no inforr	mation				

Site Assessmen	t – Reforestation					Plot NO: 4	
Woreda: Gawat	a	Kebele: Duma		Elevatio	levation (m.a.s.l.):2004,63		
Location (Lat/Lo	on): 36,09325880 / 7,46688736	1	Estimated Area (ha): 8,9				
Issue	Function		Context		Priority	Relevance	
	Core Zone Protection (Agricultural Land, wh	nich is ancient to core zones)	BR Mainte	nance	4	Serve as boundary	
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Fragmenta	tion	4	perforation	
	Biodiversity Increase (Enrichment Planting, different native tree species)				1		
	Erosion Control (Soil Improvement)		Hazard		1		
Improvement	Flood / Runoff Control (Water holding capacity)				2		
	Water Pollution Control				1		
Rehabilitation of degraded forests					4	Enrichment planting	
	Riparian Forest Enhancement				1		
	Wetland Conservation		CDM		1		
Support	Support of Watershed Management / interdisciplinary				1		
	Enhancement of Agricultural Productivity				1		
	Secret Meeting Sites				1		
other	Ownership: communal						
Site Characteris	tics: activity within BR core zone, previously	settled (2010), vacant				·	
Current Land U	se / Land Cover: remnants of cultivation 80%	, grass land 20%					
Closest (gravel)	road: 2,7 km						
Closest town: K	obech in 2,6 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	/ery important; blank=no inforr	mation				

Site Assessmen	t – Reforestation					Plot NO: 5
Woreda: Gawat	a	Kebele: Saja		Elevation (m.a.s.l.):2002,89		
Location (Lat/Lo	on): 36,03638609 / 7,49435341		Estimated Area (ha): 93,4			
Issue	Function		Context		Priority	Relevance
	Core Zone Protection (Agricultural Land, wh	nich is ancient to core zones)	BR Maint	enance	4	Serve as boundary
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Fragment	ation	1	
	Biodiversity Increase (Enrichment Planting, different native tree species)				3	
	Erosion Control (Soil Improvement)		Hazard		4	Steep slope > 26°
	Flood / Runoff Control (Water holding capa	city)			3	
Improvement	Water Pollution Control				1	
	Rehabilitation of degraded forests				4	Severe forest loss
	Riparian Forest Enhancement				1	
	Wetland Conservation		CDM		1	
Support	Support of Watershed Management / interdisciplinary				1	
	Enhancement of Agricultural Productivity				3	
	Secret Meeting Sites				1	
other	Ownership: governmental (illegal agricultur	ral expansion)				
Site Characteris	tics: agricultural expansion along natural fore	est border, grazing areas				
Current Land U	se / Land Cover: cultivation 60%, multiple tree species	10%, shrub 15%, grass 15% (Cordia Africa	ana, Croton ma	crostachyu	s, Millittia ferru	ıginea)
Closest (gravel)	road: 0,1 km					
Closest town: S	aja in 1,8 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inforr	mation			

Site Assessmen	t – Community Plantation				Plot NO: 6	
Woreda: Gawat	а	Kebele: Saja		Elevation (n	n.a.s.l.):1956,27	
Location (Lat/Lo	on): 36,04200076 / 7,48604163	I	Estimated Area (ha): 16,4			
Issue	Function		Context	Priority	Relevance	
	Core Zone Protection		BR Maintenance	2		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	3		
	Erosion Control (Soil Improvement)		Hazard	4	Steep slope > 21°	
Improvement	Flood / Runoff Control (Water holding capacity)			3		
	Water Pollution Control			2		
	Fertility of surrounding agriculture			3		
	Animal / Plant habitats			1		
	Supply of Construction Wood / Fuel Wood (subsistence)			4	Release pressure of BR core zones	
	Amelioration of livelihood – sale of NTFP (commercial)			3		
Cultural /	Amelioration of livelihood – sale of timber products (commercial)			1		
Economic	Increase of livestock fodder			3		
	Medicines			1		
	Resin (subsistence / commercial)			1		
	Secret meeting sites			1		
other	Ownership: governmental					
Site Characteris	tics: scattered trees between rivers, steep are	ea, used for grazing				
Current Land Us	se / Land Cover: UCC open, LCC open, grass la	and 50% (Cordia Africana, C	roton macrostachyus,	Millittia ferrug	inea, Acokanthera schimperi)	
Closest (gravel)	road: 1,9 km					
Closest town: S	aja in 2,9 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	ery important; blank=nd	o information			

Site Assessmen	t – Reforestation					Plot NO: 7
Woreda: Gawat	ta	Kebele: Yeshana Turana	Elevation (m.a.s.l.):1635,22			
Location (Lat/Lo	on): 35,97122842 / 7,48170359		Estimated Area (ha): 0,4			
Issue	Function		Context		Priority	Relevance
	Core Zone Protection (Agricultural Land, which is close to core zones)		BR Maintenance		3	
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Fragmentation		4	perforation
	Biodiversity Increase (Enrichment Planting, different native tree species)				1	
Erosion Control (Soil Improvement)			Hazard		3	Moderately steep
Improvement	Flood / Runoff Control (Water holding capa	city)			2	
	Water Pollution Control				1	
	Rehabilitation of degraded forests				4	Recent forest loss
	Riparian Forest Enhancement				1	
	Wetland Conservation		CDM		1	
Support	Support of Watershed Management / interdisciplinary				1	
	Enhancement of Agricultural Productivity				1	
	Secret Meeting Sites				1	
other	Ownership: governmental					
Site Characteris	stics: perforation within intact forest, cultivate	ed with maize, sugarcane, coffe	e			
Current Land U	se / Land Cover: cultivation 80%, MPT 5%, gra	ass 15% (Cordia Africana, Croto	n macrosta	chyus, M	lillittia ferru	ıginea)
Closest (gravel)	road: 9,1 km					
Closest town: N	/lacheto in 7,3 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inforr	nation			

Site Assessmen	t – Reforestation					Plot NO: 8	
Woreda: Gawat	ta	Kebele: Gawa Mecha	Elevation (m.a.s.l.):1842,28				
Location (Lat/Lo	on): 36,02477363 / 7,45342119		Estimated	Estimated Area (ha): 20,5			
Issue	Function		Context		Priority	Relevance	
	Core Zone Protection (Agricultural Land, which is ancient to core zones)		BR Maintenance		4	Serve as boundary	
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Fragmentation		3		
	Biodiversity Increase (Enrichment Planting, different native tree species)				1		
	Erosion Control (Soil Improvement)		Hazard		3		
Improvement	Flood / Runoff Control (Water holding capa	city)			3		
	Water Pollution Control				1		
	Rehabilitation of degraded forests	ehabilitation of degraded forests			4	recent forest loss due to illegal settlement	
	Riparian Forest Enhancement				1		
	Wetland Conservation		CDM		1		
Support	Support of Watershed Management / inter-	Support of Watershed Management / interdisciplinary			1		
	Enhancement of Agricultural Productivity				1		
	Secret Meeting Sites				1		
other	Ownership: governmental						
Site Characteris	stics: active LU conversion, overgrazing, comp	acted soil				·	
Current Land U	se / Land Cover: degraded forest, UCC open,	LCC open (Schefllera abyssinica, Ole	ea welwitschii,	, Croton m	acrostachyus	, Sapium ellipticum)	
Closest (gravel)	road: 2,3 km						
Closest town: N	/lacheto in 1,5 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inforr	mation				

Site Assessmen	t – Reforestation (candidate – propose	for 2013)				Plot NO: 9
Woreda: Gawat	a	Kebele: Saja	Elevation (m.a.s.l.):2016,76			
Location (Lat/Lo	on): 36,04588078 / 7,46292968		Estimated Area (ha): 311,6			
Issue	Function	Context			Priority	Relevance
	Core Zone Protection		BR Maintena	ance	1	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation		4	Strong corridor between BR core zones
	Biodiversity Increase (Enrichment Planting,	Biodiversity Increase (Enrichment Planting, different native tree species)			4	Surrounded by agriculture
Erosion Control (Soil Improvement)					4	Partly steep
Improvement	Flood / Runoff Control (Water holding capa	city)			3	
	Water Pollution Control				4	River system serves around 200 HH
	Rehabilitation of degraded forests				2	
	Riparian Forest Enhancement				4	Enrichment planting
	Wetland Conservation		CDM		1	
Support	Support of Watershed Management / interdisciplinary				2	
	Enhancement of Agricultural Productivity				1	
	Secret Meeting Sites				1	
other	Ownership: governmental					
Site Characteris	tics: enrichment of riparian forest, could con	nect forest patches, very steep a	area			
Current Land U	se / Land Cover: scattered trees, grazing area	, UCC open, LCC open				
Closest (gravel)	road: 0,1 km					
Closest town: S	Closest town: Saja in 0,5 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inform	nation			

Site Assessmen	t – Reforestation					Plot NO: 10
Woreda: Gawat	a	Kebele: Saja	Elevation (m.a.s.l.):2040,23):2040,23
Location (Lat/Lo	on): 36,07615224 / 7,47929698	1	Estimated	Area (h	a): 31,2	
Issue	Function	Context			Priority	Relevance
	Core Zone Protection (Agricultural Land, wh	Core Zone Protection (Agricultural Land, which is ancient to core zones)		nance	4	Forest loss/settlement within
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Fragmentation		3	bircore
	Biodiversity Increase (Enrichment Planting, different native tree species)		-		1	
Erosion Control (Soil Improvement)		Hazard		1		
Improvement	Flood / Runoff Control (Water holding capa	city)			1	
	Water Pollution Control				1	
	Rehabilitation of degraded forests				4	
	Riparian Forest Enhancement				1	
	Wetland Conservation		CDM		1	
Support	Support of Watershed Management / interdisciplinary				1	
	Enhancement of Agricultural Productivity				1	
	Secret Meeting Sites				1	
other	Ownership: communal (illegal settlement)					
Site Characteris	tics: used for grazing, start to expand farm la	nd				
Current Land U	se / Land Cover: grass land and single trees					
Closest (gravel)	road: 1,9 km					
Closest town: Saja in 3 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inforr	mation			

Site Assessmen	t – Reforestation					Plot NO: 11	
Woreda: Gawat	ta	Kebele: Kasha		Elevation (m.a.s.l.):2125,18			
Location (Lat/Lo	on): 36,08032474 / 7,46141222		Estimated	Estimated Area (ha): 16,8			
Issue	Function	Context			Priority	Relevance	
	Core Zone Protection (Agricultural Land, which is ancient to core zones)		BR Mainte	enance	4	Serve as boundary demarcation	
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Fragmentation		3		
	Biodiversity Increase (Enrichment Planting, different native tree species)				1		
Erosion Control (Soil Improvement)		Hazard		2			
Improvement	Flood / Runoff Control (Water holding capa	city)			1		
	Water Pollution Control				1		
	Rehabilitation of degraded forests				4	Recent forest loss	
	Riparian Forest Enhancement				1		
	Wetland Conservation		CDM		1		
Support	Support of Watershed Management / interdisciplinary				1		
	Enhancement of Agricultural Productivity				1		
	Secret Meeting Sites				1		
other	Ownership: communal						
Site Characteris	stics: used for grazing, agricultural expansion,	heavy disturbance of forest bo	undary				
Current Land U	se / Land Cover: grass land 100%, (Millittia fe	rruginea, Cordia Africana, Pout	eria adolfi-f	riederici)		
Closest (gravel)	road: 4 km						
Closest town: Saja in 4 km							
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inform	mation				

Site Assessmen	t – Reforestation					Plot NO: 12	
Woreda: Gawat	a	Kebele: Kasha	El	evation (m.a	ı.s.l.):2048,	23	
Location (Lat/Lo	on): 36,08587969 / 7,46130023		Estimated Area (ha): 8,1				
Issue	Function		Conte	ext	Priority	Relevance	
	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR M	aintenance	4	Serve as boundary	
Protection	Creation of Corridors (Gene Flow / Connect	ion Kebele: Kasha Elevation 969 / 7,46130023 Estimated Are Context Context Protection (Agricultural Land, which is ancient or close to core zones) BR Maintenar Corridors (Gene Flow / Connectivity of Forest) Fragmentation Increase (Enrichment Planting, different native tree species) Increase (Enrichment Planting, different native tree species) ttrol (Soil Improvement) Hazard off Control (Water holding capacity) Increase (Dependence of the second of t	mentation 4		perforation		
	Biodiversity Increase (Enrichment Planting,				1		
	Erosion Control (Soil Improvement)				3		
Improvement	Flood / Runoff Control (Water holding capa	Flood / Runoff Control (Water holding capacity)			1		
	Water Pollution Control				1		
	Rehabilitation of degraded forests	ehabilitation of degraded forests				Enrichment	
	Riparian Forest Enhancement				1		
	Wetland Conservation		CDM		1		
Support	Support of Watershed Management / inter-	disciplinary			1		
	Enhancement of Agricultural Productivity				1		
	Secret Meeting Sites				1		
other	Ownership: communal						
Site Characteris	tics: remnants of farm land, agricultural expa	insion, clearing of forest within core zo	one				
Current Land U	se / Land Cover: grass land 100% (Millittia fer	ruginea, Prunus Africana, Pouteria ado	olfi-fried	lerici, Crotor	n macrostad	chyus)	
Closest (gravel)	road: 3,6 km						
Closest town: K	obech in 3,9 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information					

Site Assessment – Community PlantationPlot NO: 13							
Woreda: Gawat	а	Kebele: Medabo	E	Elevation (m.a.s.l.):1565,49			
Location (Lat/Lo	on): 36,02999761 / 7,51498297	I	Estimated Area	Estimated Area (ha): 60,0			
Issue	Function		Context	Priority	Relevance		
Destaution	Core Zone Protection (Agricultural Land, wh	Core Zone Protection (Agricultural Land, which is close to core zones)		ce 4			
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	4			
Erosion Control (Soil Improvement)		Hazard	3	Sheet erosion			
Improvement	Flood / Runoff Control (Water holding capacity)			2			
	Water Pollution Control			1			
	Fertility of surrounding agriculture			1			
	Animal / Plant habitats			3			
	Supply of Construction Wood / Fuel Wood	(subsistence)		4	Release pressure of primary forest		
	Amelioration of livelihood – sale of NTFP (commercial)			2			
Cultural /	Amelioration of livelihood – sale of timber products (commercial)			1			
Economic	Increase of livestock fodder			1			
	Medicines			1			
	Resin (subsistence / commercial)			1			
	Secret meeting sites			1			
other	Ownership: Communal (until May 2011 ille	gal settlement)					
Site Characteris	tics: still occupied by agriculture (maize, suga	ircane, coffee), steep area, v	ulnerable to land	dslide			
Current Land Us	se / Land Cover: cultivation 70%, MTS 5%, shrub 10)%, grass 15%, (Cordia Africana, C	roton macrostachyu	s, Millittia ferrugi	inea, Acokanthera schimperi)		
Closest (gravel)	road: 1,9 km						
Closest town: B	oginda in 3,3 km						
Key: 1=not impo	ortant; 2=minor important; 3=important; 4=v	ery important; blank=no in	formation				

Site Assessmen	t – Community Plantation				Plot NO: 14		
Woreda: Gawat	a	Kebele: Saja		Elevation (m.a.s.l.):2046,41			
Location (Lat/Lo	on): 36,04628557 / 7,49562631		Estimated Area (ha): 15,6				
Issue	Function		Context	Priority	Relevance		
Drotostion	Core Zone Protection		BR Maintenance	1			
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	3			
Improvement	Erosion Control (Soil Improvement)		Hazard	4	Steep > 26°		
	Flood / Runoff Control (Water holding capacity)			3			
	Water Pollution Control			1			
	Fertility of surrounding agriculture			4	Soil degradation, sheet erosion, gullying		
	Animal / Plant habitats			1			
	Supply of Construction Wood / Fuel Wood	(subsistence)		4	Wood resource for Saja, release pressure of BR core zone		
	Amelioration of livelihood – sale of NTFP (commercial)		3			
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)		2			
Economic	Increase of livestock fodder			2			
	Medicines			1			
	Resin (subsistence / commercial)			1			
	Secret meeting sites			1			
other	Ownership: governmental						
Site Characteris	tics: scattered trees, used for grazing, adjace	nt to river network, high	wood collection				
Current Land U	se / Land Cover: scattered trees, grass land (C	ordia Africana, Croton macro	stachyus, Millittia ferru	ıginea, Pouter	ia adolfi-friederici)		
Closest (gravel)	road: 0,7 km						
Closest town: S	aja in 2 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no	o information				

Site Assessmen	t – Community Plantation					Plot NO: 15	
Woreda: Gawat	ta	Kebele: Kasha		Elevation (m.a.s.l.):1807,42			
Location (Lat/Lo	on): 36,08921390 / 7,43102487	1	Estimated	Estimated Area (ha): 66,4			
Issue	Function		Context		Priority	Relevance	
Ductosticu	Core Zone Protection (Agricultural Land, wh	Core Zone Protection (Agricultural Land, which is ancient to core zones)		nance	4	BR core buffer	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmenta	ation	4	perforation	
	Erosion Control (Soil Improvement)		Hazard		3		
	Flood / Runoff Control (Water holding capacity)				3		
Improvement	Water Pollution Control				1		
	Fertility of surrounding agriculture				2		
	Animal / Plant habitats				1		
	Supply of Construction Wood / Fuel Wood (subsistence)				4	Recent forest loss on site and in vicinity	
	Amelioration of livelihood – sale of NTFP (commercial)			1		
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)			1		
Economic	Increase of livestock fodder				3		
	Medicines				1		
	Resin (subsistence / commercial)				1		
	Secret meeting sites				1		
other	Ownership: communal (illegal settlement)						
Site Characteris	stics: activity very close to the BR core zone, u	used for grazing, agriculture ex	pansion				
Current Land U	se / Land Cover: cultivation 85%, MPT 15% (C	Croton macrostachyus, Dracaer	na afromonta	ane)			
Closest (gravel)	road: 2,8 km						
Closest town: K	eja Kata in 2,2 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no infor	mation				

Site Assessmen	t – Community Plantation					Plot NO: 16	
Woreda: Gawat	a	Kebele: Duma		Elevation (m.a.s.l.):1839,54			
Location (Lat/Lo	on): 36,10184674 / 7,45281027	1	Estimated	Estimated Area (ha): 73,1			
Issue	Function	Conte			Priority	Relevance	
Ductosticu	Core Zone Protection (Agricultural Land, wh	nich is ancient to core zones)	BR Mainte	nance	4	BR core buffer	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmenta	tion	3		
	Erosion Control (Soil Improvement)		Hazard		1		
	Flood / Runoff Control (Water holding capa	icity)			1		
Improvement	Water Pollution Control				1		
	Fertility of surrounding agriculture				2		
	Animal / Plant habitats				1		
	Supply of Construction Wood / Fuel Wood (subsistence)				4	Recent forest loss on site and in vicinity	
	Amelioration of livelihood – sale of NTFP (commercial)			1		
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)			1		
Economic	Increase of livestock fodder				3		
	Medicines				3		
	Resin (subsistence / commercial)				1		
	Secret meeting sites				1		
other	Ownership: Communal (illegal settlement,	9 HH)					
Site Characteris	tics: grass land/agriculture within intact fores	st					
Current Land U	se / Land Cover: cultivation 70%, MTS 5%, shrub 10	0%, grass 15%, (Cordia Africana, Crot	on macrostachy	yus, Milli [.]	ttia ferrugine	a)	
Closest (gravel)	road: 1,9 km						
Closest town: Kobech in 2,7 km							
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no infor	mation				

Site Assessmen	t – Community Plantation					Plot NO: 17	
Woreda: Gawat	ta	Kebele: Gawa Mecha		Elevation (m.a.s.l.):1788,10			
Location (Lat/Lo	on): 36,04698138 / 7,44165777		Estimated Ar	Estimated Area (ha): 20,1			
Issue	Function		Context		Priority	Relevance	
Ductosticu	Core Zone Protection (Agricultural Land, which is close to core zones)		BR Maintena	ance	4	BR core buffer	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentati	on	3		
	Erosion Control (Soil Improvement)		Hazard		3		
	Flood / Runoff Control (Water holding capacity)				2		
Improvement	Water Pollution Control				1		
	Fertility of surrounding agriculture				1		
	Animal / Plant habitats				1		
	Supply of Construction Wood / Fuel Wood (subsistence)				4	Forest loss on site and in vicinity, release pressure on BR core	
	Amelioration of livelihood – sale of NTFP (commercial)			3		
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)			3		
Economic	Increase of livestock fodder				1		
	Medicines				3		
	Resin (subsistence / commercial)				1		
	Secret meeting sites				1		
other	Ownership: Communal (illegal agricultural	expansion)					
Site Characteris	stics: used for grazing, agricultural expansion,	degraded forest					
Current Land U	se / Land Cover: cultivation 70%, MTS 15%, shrub 1	10%, grass 5%, (Cordia Africana, C	roton macrostach	iyus, M	illittia ferrugi	inea)	
Closest (gravel)	road: 0,3 km						
Closest town: K	eja Kata in 2,3 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no int	formation				

Site Assessment – Community Plantation Plot NO: 18							
Woreda: Gawat	a	Kebele: Duma		Elevation (m.a.s.l.):2022,19			
Location (Lat/Lo	on): 36,09454786 / 7,46447168		Estimated Ar	Estimated Area (ha): 18,6			
Issue	Function	Conte			Priority	Relevance	
Ductosticu	Core Zone Protection (Agricultural Land, wh	nich is close to core zones)	BR Maintena	nce	4	BR core protection	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentatio	on	4	Perforation	
	Erosion Control (Soil Improvement)		Hazard		2		
Improvement	Flood / Runoff Control (Water holding capa	acity)			1		
	Water Pollution Control				1		
	Fertility of surrounding agriculture				1		
	Animal / Plant habitats				1		
	Supply of Construction Wood / Fuel Wood (subsistence)				4	Severe forest loss in vicinity	
	Amelioration of livelihood – sale of NTFP (commercial)				1		
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)			1		
Economic	Increase of livestock fodder				3		
	Medicines				2		
	Resin (subsistence / commercial)				1		
	Secret meeting sites				1		
other	Ownership: Communal (illegal agriculture e	expansion, 8 HH on site)	·				
Site Characteris	tics: forest perforation, close to BR core zone	e, recent activity					
Current Land U	se / Land Cover: cultivation 80%, MTS 15%, shrub 2	10%, grass 5%, (Cordia Africana, C	roton macrostach	yus, M	illittia ferrugi	nea, Acokanthera schimperi)	
Closest (gravel)	road: 2,6 km						
Closest town: Kobech in 2,9 km							
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inf	formation				
Site Assessmen	t – Community Plantation					Plot NO: 19	
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Woreda: GawataKebele: KashaElevation (m.a.s.l.):2109,				.):2109,73			
Location (Lat/Lo	on): 36,08024552 / 7,46458709	1	Estimated A	Area (h	a): 55,0		
Issue	Function		Context		Priority	Relevance	
Destaulies	Core Zone Protection (Agricultural Land, wh	nich is ancient to core zones)	BR Mainten	nance	4	BR core buffer	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentat	tion	4	Perforation	
	Erosion Control (Soil Improvement)		Hazard		2		
	Flood / Runoff Control (Water holding capa	icity)			2		
Improvement	ImprovementWater Pollution ControlFertility of surrounding agriculture				1		
	Fertility of surrounding agriculture				3		
	Animal / Plant habitats	Vood (subsistence)			1		
	Supply of Construction Wood / Fuel Wood	(subsistence)			4	Severe forest loss in vicinity	
	Amelioration of livelihood – sale of NTFP (commercial)			1		
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)			1		
Economic	Increase of livestock fodder				3		
	Medicines				2		
	Resin (subsistence / commercial)				1		
	Secret meeting sites				1		
other	Ownership: Communal (illegal settlement,	HH 19)					
Site Characteris	tics: agricultural patch in intact forest, used f	or grazing and shifting cultivat	ion (only durir	ng rain	y season)		
Current Land U	se / Land Cover: 100% grass land (fallow)						
Closest (gravel)	road: 3,6 km						
Closest town: S	aja in 3,7 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no infor	mation				

Site Assessmen	t – Community Plantation				Plot NO: 20
Woreda: Gawat	Kebele: Gawa Mecha Elevation (m.a.s.l.):1840,5				.s.l.):1840,57
Location (Lat/Lo	on): 36,02478931 / 7,44868822		Estimated Are	a (ha): 30,7	
Issue	Function		Context	Priority	Relevance
Destaulies	Core Zone Protection (Agricultural Land, wh	nich is close to core zones)	BR Maintenan	ce 4	BR core buffer
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	n 3	
	Erosion Control (Soil Improvement)		Hazard	2	
	Flood / Runoff Control (Water holding capacity)			1	
Improvement	Water Pollution Control			1	
	Fertility of surrounding agriculture			1	
Animal / Plant habitats				2	
	Supply of Construction Wood / Fuel Wood (subsistence)			4	Very recent deforestation
	Amelioration of livelihood – sale of NTFP (commercial)			1	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)			1	
Economic	Increase of livestock fodder			3	
	Medicines			1	
	Resin (subsistence / commercial)			1	
	Secret meeting sites			1	
other	Ownership: Communal (occupied by 2 HH v	vithout permission)			
Site Characteris	tics: very close human activity to BR core zon	e			
Current Land U	se / Land Cover: cultivation 80%, MTS 15%, shrub 1	10%, grass 5%, (Schefllera abyssin	ica, Olea welwitschi	i, Croton macrost	achyus, Sapium ellipticum)
Closest (gravel)	road: 2,4 km				
Closest town: N	lacheto 1,4 km				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inf	formation		

Site Assessmen	t – Community Plantation				Plot NO: 21
Woreda: Gawat	ta	Kebele: Saja		Elevation (m.a.s.l.):2164,43
Location (Lat/Lo	on): 36,08644491/ 7,50654015		Estimated Area (ha): 48,8	
Issue	Function		Context	Priority	Relevance
Ductosticu	Core Zone Protection		BR Maintenance	1	
Protection	Creation of Corridors (Gene Flow / Connecti	vity of Forest)	Fragmentation	2	
	Erosion Control (Soil Improvement)		Hazard	3	
	Flood / Runoff Control (Water holding capa	city)		3	
Improvement	Water Pollution Control			1	
	Fertility of surrounding agriculture			3	
Animal / Plant habitats			1		
	Supply of Construction Wood / Fuel Wood (subsistence)			4	Good road access, could supply Saja / Medabo with additional wood
	Amelioration of livelihood – sale of NTFP (o	commercial)		3	
Cultural /	Amelioration of livelihood – sale of timber p	products (commercial)		2	
Economic	Increase of livestock fodder			3	
	Medicines			1	
	Resin (subsistence / commercial)			1	
	Secret meeting sites			1	
other	Ownership: Communal (illegal settlement)				
Site Characteris	stics: rolling, vulnerable to soil degradation, us	ed for grazing, propose	of DoAD		
Current Land U	se / Land Cover: cultivation 40%, MTS 15%, shrub 3	0%, grass 15%, (Cordia Africa	ina, Croton macrostach	nyus, Millittia f	ferruginea)
Closest (gravel)	road: 0,2 km				
Closest town: S	aja in 1,9 km				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	ery important; blank=nd	o information		

Site Assessmen	t – Community Plantation (ca	ndidate)			Plot NO: 22
Woreda: Gawat	ta Ki	ebele: Saja		Elevation (m.a.s.l.):2041,35
Location (Lat/Lo	on): 36,07219675 / 7,48686380		Estimated Area (h	na): 21,0	
Issue	Function		Context	Priority	Relevance
	Core Zone Protection		BR Maintenance	1	
Protection	Creation of Corridors (Gene Flow / Connectivit	ty of Forest)	Fragmentation	4	Serve as stepping stone in agricultural matrix
	Erosion Control (Soil Improvement)		Hazard	1	
Improvement	Flood / Runoff Control (Water holding capacity)			4	Soil degradation, gullying
	Water Pollution Control			2	
	Fertility of surrounding agriculture			3	
	Animal / Plant habitats			2	
	Supply of Construction Wood / Fuel Wood (subsistence)			4	Additional wood resource
	Amelioration of livelihood – sale of NTFP (commercial)			1	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)			1	
Economic	Increase of livestock fodder			3	
	Medicines			2	
	Resin (subsistence / commercial)			3	
	Secret meeting sites			1	
other	Ownership: governmental				
Site Characteris	stics: improvement of riparian forest cover, safeg	uard connectivity of	forest patches		
Current Land U	se / Land Cover: cultivation 40%, MPT 20%, shru	ıb 20%, grass 20%, mo	ost cultivations are	set as fallov	V
Closest (gravel)	road: 1,5 km				
Closest town: S	aja in 1,2 km				
Key: 1=not imp	ortant: 2=minor important: 3=important: 4=very	v important: blank=nd	information		

Site Assessmen	t – Community Plantation					Plot NO: 23
Woreda: Gawat	ta	Kebele: Medabo	Kebele: MedaboElevation (m.a.s.l.):1545,5			545,5
Location (Lat/Lo	on): 36,05380614 / 7,53294647		Estima	ted Area (h	a): 15 <i>,</i> 1	
Issue	Function		Contex	t	Priority	Relevance
	Core Zone Protection (Agricultural Land, wh	nich is close to core zones)	BR Mai	ntenance	3	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragme	entation	4	Connectivity between wetland and forest
	Erosion Control (Soil Improvement)		Hazard		1	
	Flood / Runoff Control (Water holding capa	acity)			3	
Improvement	Water Pollution Control				3	
	Fertility of surrounding agriculture				1	
	Animal / Plant habitats				3	
	Supply of Construction Wood / Fuel Wood	(subsistence)			3	
	Amelioration of livelihood – sale of NTFP (commercial)			3	
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)			1	
Economic	Increase of livestock fodder				4	Decrease pressure on wetland
	Medicines				1	
	Resin (subsistence / commercial)				1	
	Secret meeting sites				1	
other	Ownership: unclear (should be communal,	but used for private cultivation)				
Site Characteris	stics: along and on wetland scattered tree pat	ch, agriculture expansion				
Current Land U	se / Land Cover: cultivation 60% (mostly fallo	w), MPT 25%, shrub 10%, grass 59	%			
Closest (gravel)	road: 0,8 km					
Closest town: B	oginda in 1,2 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no informa	tion			

Site Assessmen	t – Community Plantation alternative Agrofo	restry				Plot NO: 24
Woreda: Gawat	a	Kebele: Duma		Elevation (m.a	.s.l.):1837,2	28
Location (Lat/Lo	on): 36,11599800 / 7,47514978		Es	timated Area (h	a): 24 <i>,</i> 0	
Issue	Function		Со	ntext	Priority	Relevance
Destaulies	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR	Maintenance	3	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fra	agmentation	1	
	Erosion Control (Soil Improvement)		На	zard	4	Steep slope > 26°
	Flood / Runoff Control (Water holding capa	icity)			2	
Improvement	Water Pollution Control				4	Water supply for Kobech
	Fertility of surrounding agriculture				1	
	Animal / Plant habitats				1	
	Supply of Construction Wood / Fuel Wood	(subsistence)			4	Pop. Area Kobech
	Amelioration of livelihood – sale of NTFP (commercial)			2	
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)			2	
Cultural / Economic Economic Economic Economic Economic Economic Economic Economic Economic Economic Economic Economic	Increase of livestock fodder				2	
	Medicines				1	
	Resin (subsistence / commercial)				1	
	Secret meeting sites				1	
other	Ownership: Communal (approx. 7 HH)					
Site Characteris	tics: legal settlement but area susceptible to	landslide and soil erosion, very close t	o BR	core zone, very	y high wood	d collection
Current Land U	se / Land Cover: Cultivation 80%, MPT 5%, sh	rub 5%, grass land 10%				
Closest (gravel)	road: 0,3 km					
Closest town: K	obech in 0,4 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=\	very important; blank=no information				

vi. Woreda Gesha

Site Assessmen	t – Reforestation				Plot NO: 40
Woreda: Gesha		Kebele: Meligawa	Elevation (m.a	a.s.l.):2403,	44
Location (Lat/Lo	on): 35,86582458 / 7,68967750		Estimated Area (h	ia): 43,5	
Issue	Function		Context	Priority	Relevance
	Core Zone Protection (Agricultural Land, whi	ch is ancient or close to core zones)	BR Maintenance	3	
Protection	Creation of Corridors (Gene Flow / Connectiv	vity of Forest)	Fragmentation	4	Perforation
	Biodiversity Increase			4	Sustain bamboo forest
	Erosion Control (Soil Improvement)		Hazard	4	Prevent soil erosion
Protection Improvement Support	Flood / Runoff Control (Water holding capaci	ity)		3	
	Water Pollution Control			2	
	Rehabilitation of degraded forests			4	Dried out bamboo forest
	Riparian Forest Enhancement			1	
	Wetland Conservation		CDM	3	
Support	Support of Watershed Management / interdi	isciplinary		1	
	Enhancement of Agricultural Productivity			1	
	Secret Meeting Sites			2	
other	Ownership: governmental				
Site Characteris	tics: dried out bamboo forest (2010/2011) , im	mediate reforestation would prevent	settlement, steep	slopes	
Current Land U	se / Land Cover: vacant, dried bamboo, grass la	and / debris			
Closest (gravel)	road: 8,4 km to trail (difficult seedling transpo	rt)			
Closest town: A	garo Shuniti in 8,4 km				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=ve	ery important; blank=no information			

Site Assessmen	t – Reforestation					Plot NO: 41
Woreda: Gesha		Kebele: Meligawa		Elevation (m.a	.s.l.):2391,3	34
Location (Lat/Lo	on): 35,87247172 / 7,69371590	1	Est	imated Area (h	a): 8,5	
Issue	Function		Со	ntext	Priority	Relevance
	Core Zone Protection (Agricultural Land, wi	hich is ancient or close to core zones)	BR	Maintenance	3	
Protection	Creation of Corridors (Gene Flow / Connect	Kebele: Meligawa Elevation (m Estimated Area (Context nich is ancient or close to core zones) BR Maintenance ivity of Forest) Fragmentation different native tree species) Hazard city) CDM disciplinary Image: constant of constant	4	Perforation		
	Biodiversity Increase (Enrichment Planting,	different native tree species)			4	Sustain bamboo forest
	Erosion Control (Soil Improvement) Flood / Runoff Control (Water holding capacity) Water Pollution Control		Ha	zard	3	Prevent soil erosion
Site Assessment – Woreda: Gesha Location (Lat/Lon): Issue Fu Protection Bi Improvement Fi M Support Su Support Su En Site Characteristics Current Land Use / Closest (gravel) roa Closest town: Agar	Flood / Runoff Control (Water holding capa	icity)			3	
	Water Pollution Control				2	
	Rehabilitation of degraded forests				4	Dried out bamboo forest
	Riparian Forest Enhancement				1	
	Wetland Conservation		CD	М	3	
Support	Support of Watershed Management / inter	disciplinary			1	
	Enhancement of Agricultural Productivity				1	
	Secret Meeting Sites				2	
other	See PLOT 40					
Site Characteris	stics: See PLOT 40					-
Current Land U	se / Land Cover: See PLOT 40					
Closest (gravel)	road: 8,9 km to trail					
Closest town: A	garo Shuniti in 9,4 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information				

Site Assessmen	t – Reforestation					Plot NO: 42
Woreda: Gesha		Kebele: Meligawa		Elevation (m.a	ı.s.l.):2366,	72
Location (Lat/Lo	on): 35,87759142 / 7,69645129	L	Est	timated Area (h	a): 5 <i>,</i> 0	
Issue	Function		Со	ntext	Priority	Relevance
	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR	Maintenance	3	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fra	agmentation	4	Perforation
	Biodiversity Increase (Enrichment Planting,	different native tree species)			4	Sustain bamboo forest
	Erosion Control (Soil Improvement)		На	zard	3	Prevent soil erosion
Improvement Flood / Run Water Pollu	Flood / Runoff Control (Water holding capa	city)			3	
	Water Pollution Control				2	
	Rehabilitation of degraded forests		Frag species) Haza		4	Dried out bamboo forest
	Riparian Forest Enhancement				1	
	Wetland Conservation		CD	M	3	
Support	Support of Watershed Management / inter	disciplinary	Elevation Estimated Are Context s) BR Maintenar Fragmentatio Hazard Hazard CDM		1	
Issue Protection Improvement Support Support Site Characteristic Current Land Use Closest (gravel) ro Closest town: Aga	Enhancement of Agricultural Productivity				1	
	Secret Meeting Sites				2	
other	See PLOT 40					
Site Characteris	stics: See PLOT 40					
Current Land U	se / Land Cover: See PLOT 40					
Closest (gravel)	road: 9,4 to trail					
Closest town: A	garo Shuniti in 9,4 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=\	very important; blank=no information				

Site Assessmen	t – Reforestation					Plot NO: 1	
Woreda: Gesha		Kebele: Didifa		Elevatio	levation (m.a.s.l.):2151,91		
Location (Lat/Lo	on): 35,74319973 / 7,56049991		Estimate	d Area (h	a): 11,7		
Issue	Function		Context		Priority	Relevance	
	Core Zone Protection		BR Main	tenance	2		
Protection	Creation of Corridors		Fragmen	tation	4	Connectivity of Forest	
	Biodiversity Increase (Enrichment Planting,	different native tree species)	Elevation Estimated Area (Context BR Maintenance Fragmentation rent native tree species) Hazard Hazard CDM linary tural expansion) aintain forest connectivity, safeguard perenn ide highland forest)		3		
Erosion Control (Soil Improvement)		Hazard		2			
Improvement	Flood / Runoff Control (Water holding capacity)				2		
Improvement	Water Pollution Control				3		
	Rehabilitation of degraded forests				3		
	Riparian Forest Enhancement				4	Wetland protection	
	Wetland Conservation		CDM		1		
Support	Support of Watershed Management / inter	disciplinary			2		
	Enhancement of Agricultural Productivity				1		
	Secret Meeting Sites				1		
other	Ownership: communal (used privately $ ightarrow$ as	gricultural expansion)					
Site Characteris	tics: disturbed riparian forest, important site	to maintain forest connectivity,	, safeguard	perennia	al freshwat	er, connection	
between two w	retlands and intact forest cover						
Current Land U	se / Land Cover: scattered trees, cultivation (riverside highland forest)					
Closest (gravel)	road: 0,6 km						
Closest town: A	lem Zare in 3,7 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inforr	nation				

Site Assessmen	t – Reforestation					Plot NO: 2	
Woreda: Gesha		Kebele: Didifa	E	levatio	on (m.a.s.l.)	n (m.a.s.l.):2145,63	
Location (Lat/Lo	on): 35,76344927 / 7,57301126	L	Estimated A	nated Area (ha): 8,6			
Issue	Function		Context		Priority	Relevance	
	Core Zone Protection		BR Mainten	ance	2		
Protection	Creation of Corridors		Fragmentat	ion	4	Connectivity of Forest	
	Biodiversity Increase (Enrichment Planting,	Kebele: Didifa Estimated Context BR Mainte BR Mainte Fragmenta Inting, different native tree species) Hazard g capacity) CDM / interdisciplinary CDM / interdisciplinary Int site to maintain forest connectivity, safeguard pation (Schefllera abyssinica, Croton macrostachyus nt; 4=very important; blank=no information			4		
	Erosion Control (Soil Improvement)		Hazard		2		
Improvement F V R R V V	Flood / Runoff Control (Water holding capacity)				2		
	Water Pollution Control				3		
	Rehabilitation of degraded forests				4		
	Riparian Forest Enhancement				4		
	Wetland Conservation		CDM		1		
Support	Support of Watershed Management / inter-	Support of Watershed Management / interdisciplinary			2		
	Enhancement of Agricultural Productivity				1		
	Secret Meeting Sites				1		
other							
Site Characteris	tics: disturbed riparian forest, important site	to maintain forest connectivity	, safeguard pe	erennia	l freshwate	er	
Current Land U	se / Land Cover: scattered trees, cultivation (Schefllera abyssinica, Croton ma	acrostachyus,	Syzygi	um guinee:	se)	
Closest (gravel)	road: adjacent to food trail						
Closest town: A	lem Zare 2,2 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inforr	nation				

Site Assessmen	t – Reforestation (on a long term, estab	lishment of PFM)			Plot NO: 3
Woreda: Gesha		Kebele: Kicho	Eleva	ation (m.a.s.l.)):2354,55
Location (Lat/Lo	on): 35,81728911 / 7,58104450		Estimated Area	(ha): 10,6	
Issue	Function		Context	Priority	Relevance
	Core Zone Protection (Agricultural Land, wh	nich is close to core zones)	BR Maintenand	e 3	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	4	corridor
	Biodiversity Increase (Enrichment Planting,	different native tree species)	Elevation Estimated Area (ha Context nes) BR Maintenance Fragmentation pecies) Hazard CDM CDM CDM CDM Africana)	3	
	Erosion Control (Soil Improvement)		Hazard	3	
Improvement	Flood / Runoff Control (Water holding capa	city)		2	
	Water Pollution Control			1	
	Rehabilitation of degraded forests			4	Scattered trees
	Riparian Forest Enhancement			1	
	Wetland Conservation		CDM	1	
Support	Support of Watershed Management / interest	disciplinary		1	
	Enhancement of Agricultural Productivity			1	
	Secret Meeting Sites			1	
other	Ownership: Communal				
Site Characteris	tics: degraded forest with frequent human ad	ctivity (agricultural expansion, g	razing)		
Current Land U	se / Land Cover: degraded forest (Pouteria ad	olfi-friederici, Prunus Africana)			
Closest (gravel)	road: 1,5 km				
Closest town: U	luca in 3,6 km				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inforr	nation		

Site Assessmen	t – Community Plantation					Plot NO: 4		
Woreda: Gesha		Kebele: Kicho		Elevation (m.a.s.l.):2011,88				
Location (Lat/Lo	on): 35,80371062 / 7,55023463		Es	timated Area (h	a): 68,5			
Issue	Function		Со	ontext	Priority	Relevance		
	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR	Maintenance	2			
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fra	agmentation	3			
	Erosion Control (Soil Improvement)		На	izard	4	Slope >21°		
	Flood / Runoff Control (Water holding capa	city)			3			
Improvement	Water Pollution Control				2			
	Fertility of surrounding agriculture				1			
	Animal / Plant habitats			2				
	Supply of Construction Wood / Fuel Wood	(subsistence)			4	Good road access		
	Amelioration of livelihood – sale of NTFP (commercial)			4	Honey trees needed (Scheflera abyssinica)		
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)			2			
Economic	Increase of livestock fodder				2			
	Medicines				1			
	Resin (subsistence / commercial)				1			
	Secret meeting sites				1			
other	Ownership: Communal							
Site Characteris	tics: very steep, vulnerable towards landslide	es, high wood collection, grazing mediu	ım, ι	urgent				
Current Land U	se / Land Cover: degraded forest, UCC moder	ate, LCC moderate (Pouteria adolfi-frie	ederi	ici, Szygium guir	neense)			
Closest (gravel)	road: 0,6 km							
Closest town: U	luca in 2,8 km							
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information						

Site Assessmen	t – Reforestation					Plot NO: 5
Woreda: Gesha		Kebele: Emiriky		Elevation (m.a	.s.l.):2109,2	27
Location (Lat/Lo	on): 35,73145546 / 7,64526264		Est	timated Area (h	ia): 11,1	
Issue	Function		Context		Priority	Relevance
	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR	Maintenance	1	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fra	agmentation	4	Corridor between two forest patches
	Biodiversity Increase (Enrichment Planting,	different native tree species)			3	
	Erosion Control (Soil Improvement)		На	zard	2	
	Flood / Runoff Control (Water holding capacity)				3	
Improvement	Improvement Water Pollution Control				3	
	Rehabilitation of degraded forests	ation of degraded forests			3	
	Riparian Forest Enhancement				4	Scattered trees, intense agriculture in surrounding
	Wetland Conservation		CD	M	1	
Support	Support of Watershed Management / interest	disciplinary			1	
	Enhancement of Agricultural Productivity				1	
	Secret Meeting Sites				1	
other	Ownership: communal					
Site Characteris	tiCS: disturbed riparian forest, grazing high, wood coll	lection high, rolling topography, important cor	ridor	for forest patch co	nnection	
Current Land U	se / Land Cover: degraded forest, UCC open,	LCC open (Szygium guineense, Scheflle	era a	byssinica, Croto	n macrosta	ichyus)
Closest (gravel)	road: 1,6 km to trail					
Closest town: A	ta Tatek in 2,1 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information				

Site Assessmen	t – Reforestation					Plot NO: 6	
Woreda: Gesha		Kebele: Wechito Yeri	Elevation (m.a.s.l.):1960,18				
Location (Lat/Lo	on): 35,72765053 / 7,71145118		Estimated Area (ha): 8,5				
Issue	Function		Context		Priority	Relevance	
	Core Zone Protection		BR Maint	enance	1		
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest) F		Fragmentation		4	Corridor of forest patches	
Biodiversity Increase (Enrichment Planting, different native tree species)					2		
	Erosion Control (Soil Improvement)		Hazard		3		
looperst	Flood / Runoff Control (Water holding capa	city)			1		
Improvement Water Pollution Control					2		
	Rehabilitation of degraded forests				3		
	Riparian Forest Enhancement				4	Conjunction of river streams, recent forest loss	
	Wetland Conservation		CDM		3		
Support	Support of Watershed Management / inter	disciplinary			1		
	Enhancement of Agricultural Productivity				1		
	Secret Meeting Sites				1		
other	Ownership: communal (but legally used for	private cultivation)					
Site Characteris	tics: very important site to maintain forest co	onnectivity, very steep slopes, s	heet erosio	n			
Current Land U	se / Land Cover: cultivation 70%, MPT 10%, s	hrub 10%, grass land 10%					
Closest (gravel)	road: 1,5 km to trail						
Closest town: B	ihata in 4,2 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inforr	nation				

Site Assessment – Agroforestry(candidate)Plot NO: 7					
Woreda: Gesha		Kebele: Danity			Elevation (m.a.s.l.):223,89
Location (Lat/Lo	on): 35,77043250 / 7,58719205		Estimated Area (h	a): 31,1	
Issue	Function		Context	Priorit	y Relevance
Drotostion	Core Zone Protection		BR Maintenance	2	
Creation of Corridors (Gene Flow / Conn		ivity of Forest)	Fragmentation	2	
	Erosion Control (Soil Improvement)			4	Steep slope >26°, degraded soil
	Flood / Runoff Control (Water holding capa	city)		3	
Improvement	Water Pollution Control			1	
	Shade			2	
	Wind Protection			2	
	Timber (commercial)			4	Good supply for Daka town
	Timber (subsistence)			4	Surrounded by intense agriculture
	Fuel Wood			4	Good supply for Daka town
Cultural /	Fertility Control			4	Degraded soil, gullying
Economic	Medicines			1	
	NTFP (commercial)			2	
	NTFP (subsistence)			2	
	Livestock fodder			4	Decrease pressure on adjacent wetland
	Beehives			1	
other	Ownership: private				
Site Characteris	tics: very steep site, so far no measures to co	ntrol, sheet eros	ion, need of technic	cal supp	ort, high wood collection, high grazing
Current Land Use	Land Cover: Scattered trees, cultivation 40%, MPT 40% (remnar	nts of primary forest), 20	%grass (Schefllera abyssinica,	, Croton ma	crostachyus, Szygium guineense)
Closest (gravel)	road: 2,8 km				
Closest town: D	aka in 0,9 km				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; b	olank=no informatio	n	

Site Assessmen	t – Community Plantation				Plot NO: 8	
Woreda: Gesha		Kebele: Amero Atta	Elevation (m.a.s.l.):2127,30			
Location (Lat/Lon): 35,74022282 / 7,64571929			Estimated Area (ha): 8,0			
Issue	Function		Context	Priority	Relevance	
Drotostion	Core Zone Protection		BR Maintenance	e 1		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	1		
	Erosion Control (Soil Improvement)		Hazard	4	Rolling slope > 12°	
	Flood / Runoff Control (Water holding capacity)			2		
Improvement	Water Pollution Control			1		
Fertility of surrounding agriculture			3			
	Animal / Plant habitats			1		
	Supply of Construction Wood / Fuel Wood (subsistence)			4	Stable woodlot (size) for last 10 years, enrichment planting recommended	
	Amelioration of livelihood – sale of NTFP (commercial)		2		
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)		2		
Economic	Increase of livestock fodder			3		
	Medicines			1		
	Resin (subsistence / commercial)			1		
	Secret meeting sites			1		
other	Ownership: Communal					
Site Characteris	tics: scattered trees, high wood collection, hi	gh grazing, need of addi	tional wood resou	rce, rolling		
Current Land U	se / Land Cover: UCC open, LCC open (Szygiu	m guineense, Schefllera	abyssinica, Croton	macrostach	yus)	
Closest (gravel)	road: 1,2 km to trail					
Closest town: A	ta Tatek in 1,6 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	/ery important; blank=nd	o information			

Site Assessmen	t – Community Plantation				Plot NO: 9	
Woreda: Gesha	1	Kebele: Gechito Yeri	Elevation (m.a.s.l.):2092,77			
Location (Lat/Lo	on): 35,75411901 / 7,66259759		Estimated Area (ha): 12,4			
Issue	Function		Context	Priority	Relevance	
	Core Zone Protection		BR Maintenance	2		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	4	Connection between forest patches and wetland	
	Erosion Control (Soil Improvement)		Hazard	3		
	Flood / Runoff Control (Water holding capa	acity)		1		
Improvement	Water Pollution Control			1		
	Fertility of surrounding agriculture			1		
	Animal / Plant habitats			1		
	Supply of Construction Wood / Fuel Wood (subsistence)			3		
	Amelioration of livelihood – sale of NTFP (commercial)		2		
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)		4	Good supply for close town Ata Tatek	
Economic	Increase of livestock fodder			3		
	Medicines			1		
	Resin (subsistence / commercial)			1		
	Secret meeting sites			1		
other	Ownership: governmental					
Site Characteris	stics: degraded riparian forest, adjacent to we	etland, overgrazing				
Current Land U	se / Land Cover: UCC open, LCC open (Szygiu	m guineense, Schefllera	abyssinica)			
Closest (gravel)	road: 0,3 km to trail					
Closest town: A	ta Tatek in 0,4 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no	o information			

Site Assessmen	t – Community Plantation				Plot NO: 10	
Woreda: GeshaKebele: Gechito Yeri				Elevation (m.a.s.l.):2095,63	
Location (Lat/Lo	on): 35,74352610 / 7,65881766		Estimated Area (ha): 15,4			
Issue	Function		Context	Priority	Relevance	
Drotoction	Core Zone Protection		BR Maintenance	1		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	1		
	Erosion Control (Soil Improvement)		Hazard	4	Compacted soil, importance to maintain / enrich forest cover (density)	
	Flood / Runoff Control (Water holding capa	icity)		3		
Improvement	Water Pollution Control			1		
Fertility of surrounding agriculture				2		
	Animal / Plant habitats			1		
	Supply of Construction Wood / Fuel Wood	(subsistence)		3		
	Amelioration of livelihood – sale of NTFP (commercial)		2		
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)		4	Good supply for close town Ata Tatek	
Economic	Increase of livestock fodder			2		
	Medicines			1		
	Resin (subsistence / commercial)			1		
	Secret meeting sites			1		
other						
Site Characteris	tics: degraded forest, recent human activity,	need of additional wood	resource, overgraz	zing, high w	ood collection, soil erosion	
Current Land U	se / Land Cover: UCC open, LCC open (Szygiu	m guineense, Bambus sp	ec., Schefllera aby	ssinica)		
Closest (gravel)	road: 0,6 km to trail					
Closest town: A	ta Tatek in 0,3 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no	o information			

Site Assessmen	t – Reforestation					Plot NO: 11	
Woreda: Gesha		Kebele: Amero Atta		Elevatio	on (m.a.s.l.):2111,90	
Location (Lat/Lo	on): 35,75078928 / 7,64786437		Estimated Area (ha): 18,7				
Issue	Function				Priority	Relevance	
	Core Zone Protection Protection Creation of Corridors (Gene Flow / Connectivity of Forest)		BR Maintenance		2		
Protection			Fragmenta	ation	4	Corridor between two forest patches	
	Biodiversity Increase (Enrichment Planting, different native tree species)				3		
	Erosion Control (Soil Improvement)		Hazard		3		
	Flood / Runoff Control (Water holding capa	city)			2		
Improvement	Water Pollution Control				1		
	Rehabilitation of degraded forests				2		
	Riparian Forest Enhancement				4	Enrichment of riparian forest	
	Wetland Conservation		CDM		4	Protection of close by wetland	
Support	Support of Watershed Management / inter	disciplinary			2		
	Enhancement of Agricultural Productivity				1		
	Secret Meeting Sites				1		
other	Ownership: governmental						
Site Characteris	tics: very degraded riparian forest, adjacent t	to wetland, agricultural expansi	on, high gra	zing			
Current Land Us	se / Land Cover: UCC open, LCC open (Szygiu	m guineense, Croton macrostac	chyus), cultiv	ation 40)%		
Closest (gravel)	road: trail crossing,						
Closest town: A	ta Tarek in 1 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	/ery important; blank=no inforr	nation				

Site Assessment – Agroforestry Plot NO: 12						
Woreda: Gesha		Kebele: Bat Og	ity Elevation (m.a.s.l.):2587,47			
Location (Lat/Lo	on): 35,83685220 / 7,67370503	L	Estimated Area (h	ia): 215,	0	
Issue	Function		Context	Priori	ty Relevance	
Drotostion	Core Zone Protection		BR Maintenance	1		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	1		
	Erosion Control (Soil Improvement)			4	Distinct topography with slopes up to 35°	
	Flood / Runoff Control (Water holding capa	city)		3		
Improvement	Water Pollution Control			2		
	Shade			3		
	Wind Protection			2		
	Timber (commercial)			2		
	Timber (subsistence)			3		
	Fuel Wood			4	Pop. Areas Meligawa, Bat Ganity, Shupa Waho	
Cultural /	Fertility Control			4	Degraded soil, affected by gullying	
Economic	Medicines			1		
	NTFP (commercial)			2	No appropriate road access	
	NTFP (subsistence)			4	Espec. Honey	
	Livestock fodder			4	Site surrounded by intense agriculture	
	Beehives			1		
other	Ownership: private					
Site Characteris	tics: Very steep slopes, degraded soil, no eros	sion measures so	o far, susceptible tow	wards la	ndslide	
Current Land U	se / Land Cover: cultivation 70% (maize, ense	t), MPT 10%, shr	rub 5%, grass 15%			
Closest (gravel)	road: 7,1 km to trail					
Closest town: B	ihata in 7,4 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; k	olank=no informatio	n		

Site Assessmen	t – Agroforestry				Plot NO: 13	
Woreda: Gesha		Kebele: Bat Og	gity Elevation (m.a.s.l.):2311,99			
Location (Lat/Lo	on): 35,79273118 / 7,64591495	1	Estimated Area (h	a): 113,2	L	
Issue	Function		Context	Priorit	y Relevance	
Drotostion	Core Zone Protection		BR Maintenance	1		
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Fragmentation	1		
	Erosion Control (Soil Improvement)			4	Severe soil degradation, recent forest loss	
	Flood / Runoff Control (Water holding capa	city)		1		
Improvement	Water Pollution Control			1		
	Shade			2		
	Wind Protection			1		
	Timber (commercial)			4	Access to town Ata Tatek	
	Timber (subsistence)			4	Surrounded by intense agriculture	
	Fuel Wood			4	Release pressure from nearby primary forest	
Cultural /	Fertility Control			4		
Economic	Medicines			1		
	NTFP (commercial)			2		
	NTFP (subsistence)			1		
	Livestock fodder			3		
	Beehives			4	Recommendation: Schefllera abyssinica	
other	Ownership: private					
Site Characteris	tics: very steep area, susceptible to landslide	e, intense agricul	ture	·		
Current Land U	se / Land Cover: cultivation 80%, MPT 10%, S	hrub 5%, grass 5	6% (Croton macrostachy	vus, Olea v	velwitschii, Croton macrostachyus)	
Closest (gravel)	road: 2,9 km to trail					
Closest town: A	ta Tatek in 4,4 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; l	blank=no informatio	n		

Site Assessment – Agroforestry Plot NO: 14						
Woreda: Gesha Kebele: Bat Ganity					Elevation (m.a.s.l.):2671,09	
Location (Lat/Lo	on): 35,82989317 / 7,61856318		Estimated Area (h	a): 72,3		
Issue	Function		Context	Priorit	y Relevance	
Drotostion	Core Zone Protection		BR Maintenance	1		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	1		
	Erosion Control (Soil Improvement)			4	Server forest loss on steep slopes>26°	
	Flood / Runoff Control (Water holding capa	city)		3		
Improvement	Water Pollution Control			1		
	Shade			3		
	Wind Protection			2		
	Timber (commercial)			1		
	Timber (subsistence)			4	Pop pressure in Kebele Bat Ganity, protection of forest in BR candidate zone	
	Fuel Wood			4		
Cultural /	Fertility Control			3		
Economic	Medicines			3		
	NTFP (commercial)			1		
	NTFP (subsistence)			2		
	Livestock fodder			3		
	Beehives			1		
other	Ownership: private					
Site Characteris	tics: very steep slope, recent deforestation, h	high danger of la	ndslide, intense cult	ivation,	no erosion measure	
Current Land U	se / Land Cover: cultivation 85%, shrub 5%, g	rass land 10%				
Closest (gravel)	road: 4,9 km					
Closest town: D	bibdib in 4,2 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; k	olank=no informatio	n		

Site Assessmen	t – Agroforestry					Plot NO: 15
Woreda: Gesha	1	Kebele: Kicho		Eleva	ation (m.a.	s.l.):2278,14
Location (Lat/Lo	on): 35,79870031 / 7,55914818	1	Estimated Ar	ea (ha	a): 75,5	
Issue	Function		Context		Priority	Relevance
Drotoction	Core Zone Protection (Agricultural Land, wh	nich is close to core zones)	BR Maintena	ince	3	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentatio	on	1	
	Erosion Control (Soil Improvement)				4	Soil degradation, rill erosion,
	Flood / Runoff Control (Water holding capa	city)			3	
Improvement	Water Pollution Control				1	
	Shade				2	
	Wind Protection				2	
	Timber (commercial)				4	Good road access
	Timber (subsistence)				3	
	Fuel Wood				4	Release pressure on adjacent
Cultural /	Fertility Control				4	Declining yield
Economic	Medicines				1	
	NTFP (commercial)				1	
	NTFP (subsistence)				3	
	Livestock fodder				3	
	Beehives				3	
other	Ownership: private					
Site Characteris	stics: very steep slopes, susceptible towards la	andslide, degraded soil, low	fertility			
Current Land U	se / Land Cover: cultivation 85% (maize, ense	et), shrub 5%, grass land 10%	0			
Closest (gravel)	road: 0,2 km					
Closest town: L	Juca in 3,4 km					
Key: 1=not imp	Key: 1=not important; 2=minor important; 3=important; 4=very important; blank=no information					

Site Assessmen	t – Agroforestry				Plot NO: 16
Woreda: Gesha		Kebele: Kicho	Elevation (m.a	a.s.l.):2103,	40
Location (Lat/Lo	on): 35,79037566 / 7,55744518		Estimated Area (h	a): 75 <i>,</i> 4	
Issue	Function		Context	Priority	Relevance
Drotostion	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR Maintenance	3	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	1	
	Erosion Control (Soil Improvement)			4	Soil degradation,
	Flood / Runoff Control (Water holding capa	city)		3	
Improvement	Water Pollution Control			1	
	Shade			2	
	Wind Protection			2	
	Timber (commercial)			2	Good road
	Timber (subsistence)			4	
	Fuel Wood			4	Release pressure on adjacent
Cultural /	Fertility Control			4	Declining
Economic	Medicines			1	
	NTFP (commercial)			1	
	NTFP (subsistence)			3	
	Livestock fodder			3	
	Beehives			3	
other	Ownership: private				
Site Characteris	tics: very steep slopes, susceptible towards la	andslide, degraded soil, low fertility			
Current Land U	se / Land Cover: cultivation 85% (maize, ense	t), shrub 5%, grass land 10%			
Closest (gravel)	road: 0,2 km				
Closest town: L	Juca in 3,4 km				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information			

vi<u>i. Woreda Gimbo</u>

Site Assessment – Community Plantation(Candidate – unclear land use rights)Plot No				Plot NO: 1	
Woreda: Gimbo)	Kebele: Hamani		Elevation (m	n.a.s.l.):1948,55
Location (Lat/Lo	on): 36,30781112 / 7,36167714		Estimated Area (ha): 54,4	
Issue	Function		Context	Priority	Relevance
Ductosticu	Core Zone Protection		BR Maintenance	1	
Protection	Creation of Corridors (Gene Flow / Connectivity of Forest)		Fragmentation	3	
	Erosion Control (Soil Improvement)		Hazard	4	Steep slope>26°
	Flood / Runoff Control (Water holding capa	icity)		4 Problem with dried out stream	
Improvement	Water Pollution Control			3	
	Fertility of surrounding agriculture			2	
	Animal / Plant habitats			1	
	Supply of Construction Wood / Fuel Wood (subsistence)			4	At the moment exploitation of
	Amelioration of livelihood – sale of NTFP (commercial)		1	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)			1	No market access
Economic	Increase of livestock fodder			3	
	Medicines			2	
	Resin (subsistence / commercial)			3	
	Secret meeting sites			1	
other	Ownership: communal / private (status of permi	ssion unclear) around 30 HH			
Site Characteris	tics: very steep area, landslide (2010), between governmental pin	ne plantation and primary forest, PFN	∕l site established (Baqa), g	rave fresh water sh	nortage, perennial steams dried out
Current Land Us	se / Land Cover: cultivation 70%, MPT 10%, s	hrub 5%, grass 15% (Schei	Ilera abyssinica, Croton	macrostachyus, F	Prunus africana, Olea welwitschii)
Closest (gravel)	road: adjacent to trail // Closest town: Diri in	n 2 km			
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no	o information		
Remark: Unsust	tainable use of gov. pine plantation for fire w	ood supply (selective cu	tting of young, sle	nder trees di	ue to inappropriate
narvesting tools	s - consequence: no regeneration				

Site Assessmen	t – Reforestation (next year	· implementation)				Plot NO: 2
Woreda: Gimbo)	Kebele: Hamani		Elevatio	on (m.a.s.l.):1837,38
Location (Lat/Lo	on): 36,30665263 / 7,36479018	l	Estimated	Area (h	a): 36,4	
Issue	Function		Context		Priority	Relevance
	Core Zone Protection		BR Mainte	enance	1	
Protection	Creation of Corridors (Gene Flow / Connect	ion of Corridors (Gene Flow / Connectivity of Forest) F		ation	3	
	Biodiversity Increase (Enrichment Planting,	different native tree species)			2	
	Erosion Control (Soil Improvement)		Hazard		4	Steep slope >26°, affected by landslide (4 HH left area)
	Flood / Runoff Control (Water holding capacity)				4	problem of dried out streams
Improvement	Water Pollution Control				2	
Rehabilitation of degraded forests					1	
	Riparian Forest Enhancement				4	
	Wetland Conservation	/etland Conservation			1	
Support	Support of Watershed Management / inter-	Support of Watershed Management / interdisciplinary			4	Support of FAO watershed management
	Enhancement of Agricultural Productivity				1	
	Secret Meeting Sites				1	
other	Ownership: communal					
Site Characteris	tics: (See PLOT 1) degraded riparian forest, g	rave problems of fresh water ac	cess, degrad	ded soil	on opening	s, intense grazing
Current Land U	se / Land Cover: UCC medium, LCC open (Alt	pizia gummifera, Cordia Africana	a, Schefllera	abyssin	ica)	
Closest (gravel)	road: See PLOT 1					
Closest town: S	ee PLOT 1					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inforr	mation			

Site Assessmen	t – Reforestation (at least enrichme	nt planting at southern PLOT edge)			Plot NO: 4
Woreda: Gimbo)	Kebele: Michity	Elevation (m.a	a.s.l.):1964,	83
Location (Lat/Lo	on): 36,09969351 / 7,30257092	L	Estimated Area (h	a): 21,2	
Issue	Function		Context	Priority	Relevance
	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR Maintenance	4	BR core buffer
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	1	
	Biodiversity Increase (Enrichment Planting,	different native tree species)		3	
	Erosion Control (Soil Improvement)		Hazard	3	
	Flood / Runoff Control (Water holding capacity)				
Improvement	Water Pollution Control			2	
	Rehabilitation of degraded forests			4	Degraded forest border
	Riparian Forest Enhancement			1	
	Wetland Conservation		CDM	1	
Support	Support of Watershed Management / inter	disciplinary		1	
	Enhancement of Agricultural Productivity			1	
	Secret Meeting Sites			1	
other	Ownership: Private (but agricultural expans	ion to primary forest, southern border	-)		
Site Characteris	tics: steep slopes, agricultural expansion, understore	y clearing for coffee plantation, forest grazing,	Agroforestry is commo	n practice	
Current Land U	se / Land Cover: cultivation 70%, MPT 20%, s	hrub 5%, grass 5% (Millittia ferruginea,	, Cordia Africana, So	hefllera ab	yssinica)
Closest (gravel)	road: adjacent to main road				
Closest town: G	ari in 1,4 km				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information			
Remarks: Recor	mmendation towards BR Zonation: Enlarge b	uffer around BR core zone. Due to road	d access, high distu	rbance	

Site Assessmen	t – Community Plantation					Plot NO: 5
Woreda: Gimbo)	Kebele: Kutti		Elevation (m.a	.s.l.):1825,	82
Location (Lat/Lo	on): 36,19372751 / 7,44717243		Es	timated Area (h	a): 9 <i>,</i> 3	
Issue	Function		Co	ontext	Priority	Relevance
Destaution	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR	R Maintenance	4	BR core buffer
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fra	agmentation	2	
	Erosion Control (Soil Improvement)		Ha	azard	3	
	Flood / Runoff Control (Water holding capa	city)			1	
Improvomont	Water Pollution Control				1	
improvement	Fertility of surrounding agriculture				2	
Animal / Plant habitats					4	High wild life density→potential for tourism
	Supply of Construction Wood / Fuel Wood	(subsistence)			4	Release pressure of primary forest
	Amelioration of livelihood – sale of NTFP (commercial)			1	
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)			3	
Economic	Increase of livestock fodder				4	Forest grazing
	Medicines				1	
	Resin (subsistence / commercial)				1	
	Secret meeting sites				1	
other	Ownership: communal					
Site Characteris	${\sf tics:}$ rolling topography, soil degradation (fallow practiced), illega	l agricultural / coffee plantation expansion, public well, ve	ery fre	quent observations of li	on /leopard (!)	
Current Land U	se / Land Cover: scattered trees, understorey cleare	ed for coffee plantation, cultivation 20% (illega	al), sh	irub 30%, grass 30%	%, 20% degrad	ded forest
Closest (gravel)	road: 0,5 km to main road					
Closest town: K	uti in 2,3 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information				

Site Assessment – Reforestation(alternatively Agroforestry)P						Plot NO: 6	
Woreda: Gimbo)	Kebele: Kutti		Elevation (m.a	ı.s.l.):1690,	65	
Location (Lat/Lo	on): 36,20132660 / 7,45992269		Est	Estimated Area (ha): 21,1			
Issue	Function		Со	ntext	Priority	Relevance	
	Core Zone Protection (Agricultural Land, wh	nich is ancient or close to core zones)	BR	Maintenance	4	BR core buffer	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fra	gmentation	2		
	Biodiversity Increase (Enrichment Planting,	different native tree species)			3		
	Erosion Control (Soil Improvement)		Haz	zard	4	Steep slope >26°	
Flood / Runoff Control (Water holding capacity)		city)			1		
Improvement	Water Pollution Control				1		
Rehabilitation of degraded forests					4	Recent forest loss	
	Riparian Forest Enhancement				1		
	Wetland Conservation		CD	Μ	1		
Support	Support of Watershed Management / interdisciplinary				1		
	Enhancement of Agricultural Productivity				3		
	Secret Meeting Sites				1		
other	Ownership: Private (since 3 years fallowing	due to soil degradation)					
Site Characteris	tics: very degraded soil, used for communal g	grazing, gullying, area close to core zor	ne, ag	riculture expar	nsion		
Current Land U	se / Land Cover: MPT (remnants of forest) 20	%, shrub 30%, grass 50% (Schefllera abys	sinica,	, Gravillia robusta,	Croton macr	ostachyus)	
Closest (gravel)	road: 1 km to main road						
Closest town: K	uti in 1,7 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no information					

Site Assessmen	t – Community Plantation					Plot NO: 7
Woreda: Gimbo)	Kebele: Tula		Eleva	ation (m.a.s	s.l.):1843,05
Location (Lat/Lo	on): 36,17440133 / 7,44753463		Estimated A	rea (h	a): 33,7	
Issue	Function		Context		Priority	Relevance
Drotostion	Core Zone Protection (Agricultural Land, wi	hich is close to core zones)	BR Mainten	ance	3	
Protection	Creation of Corridors (Gene Flow / Connect	tivity of Forest)	Fragmentat	ion	1	
	Erosion Control (Soil Improvement)		Hazard		4	Gullying, steep slopes >26°, degraded soil
	Flood / Runoff Control (Water holding capa	acity)			2	
Improvement	Water Pollution Control				3	
	Fertility of surrounding agriculture				2	
	Animal / Plant habitats				1	
	Supply of Construction Wood / Fuel Wood	(subsistence)			4	Release pressure of primary forest
	Amelioration of livelihood – sale of NTFP ((commercial)			2	
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)			4	Good road access
Economic	Increase of livestock fodder				4	Instead of using site as grazing, compensate with fodder trees
	Medicines				1	
	Resin (subsistence / commercial)				1	
	Secret meeting sites				1	
other	Ownership: Communal					
Site Characteris	tics: very degraded soil thus only fallowing, ι	used for communal grazing, g	gullying, area	close t	o core zone	2
Current Land Us	se / Land Cover: shrub 20%, grass 80%					
Closest (gravel)	road: adjacent to main road					
Closest town: K	asha in 0,5 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inf	formation			

Site Assessmen	t – Community Plantation					Plot NO: 8
Woreda: Gimbo)	Kebele: Michity		Elevati	on (m.a.s.l.)):2326,82
Location (Lat/Lo	on): 36,08695854 / 7,26110589		Estimated	l Area (h	a): 38,9	
Issue	Function		Context		Priority	Relevance
Ductosticu	Core Zone Protection (Agricultural Land, wi	hich is ancient to core zones)	BR Maint	enance	4	BR core buffer
Protection	Creation of Corridors (Gene Flow / Connect	tivity of Forest)	Fragment	ation	4	Perforation
	Erosion Control (Soil Improvement)		Hazard		3	
	Flood / Runoff Control (Water holding capacity)				2	
Improvement	Water Pollution Control				1	
Fertility of surrounding agriculture				3		
	Animal / Plant habitats				3	
	Supply of Construction Wood / Fuel Wood	(subsistence)			4	Additional wood support of for Michity, Daga
	Amelioration of livelihood – sale of NTFP (commercial)			3	
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)			1	
Economic	Increase of livestock fodder				1	
	Medicines				1	
	Resin (subsistence / commercial)				1	
	Secret meeting sites				1	
other	Ownership: communal (recent settlement a	approx. 3 yr ago) unclear prope	erty rights,	approx. :	12 HH	
Site Characteris	tics: very recent settlement, causes forest pe	rforation, expansion of agricul	ture, steep	area, so	far no soil e	erosion observed
Current Land U	se / Land Cover: cultivation 80% (maize), MP	T 10% , shrub 5%, grass 5%				
Closest (gravel)	road: adjacent to trail (very remote, 5 km to	gravel road)				
Closest town: G	iari in 5 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no infor	mation			

Site Assessmen	t – Reforestation	(not visited)			Plot NO: 9
Woreda: Gimbo)	Kebele: Shocha	Eleva	tion (m.a.s.l.):2075,84
Location (Lat/Lo	on): 36,35887228 / 7,37077399		Estimated Area	(ha): 28,5	
Issue	Function		Context	Priority	Relevance
	Core Zone Protection (Agricultural Land, wl	nich is close to core zones)	BR Maintenance	e 3	
Protection	Creation of Corridors (Gene Flow / Connect	tivity of Forest)	Fragmentation	4	Perforation
	Biodiversity Increase (Enrichment Planting,	different native tree species)		3	
	Erosion Control (Soil Improvement)		Hazard	4	
	Flood / Runoff Control (Water holding capa	icity)		1	
Improvement	Water Pollution Control			1	
	Rehabilitation of degraded forests			4	Steep slope >26°
	Riparian Forest Enhancement			1	
	Wetland Conservation		CDM	1	
Support	Support of Watershed Management / inter	disciplinary		1	
	Enhancement of Agricultural Productivity			1	
	Secret Meeting Sites			1	
other	Ownership: communal (according to DoAD)			
Site Characteris	stics:		·		·
Current Land U	se / Land Cover: cultivation 100%				
Closest (gravel)	road: 4 km to all weather road				
Closest town: L	Jorka in 1,3 km				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inforr	mation		

Site Assessment – Reforestation		(candidate/no visited)			Plot NO: 10		
Woreda: Gimbo)	Kebele: Meligawa		Elevatio	on (m.a.s.l.):1810,98	
Location (Lat/Lo	on): 36,26183565 / 7,29348361	1	Estimated	Area (h	a): 8 <i>,</i> 1		
Issue	Function		Context		Priority	Relevance	
	Core Zone Protection (Agricultural Land, wh	nich is within candidate core)	BR Mainte	nance	4	BR candidate core buffer	
Protection Creation of Corridors (Gene Flow / Connectivity of		ivity of Forest)	Fragmenta	ition	4	perforation	
	Biodiversity Increase (Enrichment Planting, different native tree species)				1		
	Erosion Control (Soil Improvement)		Hazard		3		
	Flood / Runoff Control (Water holding capa	city)			1		
Improvement	Water Pollution Control				1		
	Rehabilitation of degraded forests				4	Degraded forest border	
	Riparian Forest Enhancement				1		
	Wetland Conservation		CDM		1		
Support	Support of Watershed Management / inter	disciplinary			1		
	Enhancement of Agricultural Productivity				1		
	Secret Meeting Sites				1		
other	Ownership: governmental (illegal settlemental)	nt)					
Site Characteris	tics: perforation within intact forest						
Current Land U	se / Land Cover						
Closest (gravel) road:2,3 km to all weather road							
Closest town: Kaja Kela in 3,4 km							
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=\	/ery important; blank=no inforr	nation				

Site Assessment – Reforestation (candi		(candidate/no visited)				Plot NO: 11
Woreda: Gimbo)	Kebele: Hamani		Elevati	on (m.a.s.l.):1708,68
Location (Lat/Lo	on): 36,25821752 / 7,30540546	1	Estimated	l Area (h	a): 31,9	
Issue	Function		Context		Priority	Relevance
	Core Zone Protection		BR Mainte	enance	3	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragment	ation	4	Perforation
	Biodiversity Increase (Enrichment Planting,	different native tree species)			3	
	Erosion Control (Soil Improvement)		Hazard		1	
	Flood / Runoff Control (Water holding capa	city)			1	
Improvement	Water Pollution Control				1	
	Rehabilitation of degraded forests				4	Patch inside of primary forest (but stable for years)
	Riparian Forest Enhancement				1	
	Wetland Conservation		CDM		1	
Support	Support of Watershed Management / interdisciplinary				1	
	Enhancement of Agricultural Productivity				1	
	Secret Meeting Sites				1	
other	Ownership: private					
Site Characteris	stics:					
Current Land U	se / Land Cover: 100% agriculture					
Closest (gravel) road: 1,6 to all weather road						
Closest town: Kaya Kela in 2,3 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	/ery important; blank=no inforr	nation			

Site Assessment – AgroforestryPlot NO: 12						
Woreda: Gimbo)	Kebele: Kayakela		Elevation (m.a.s.l.):1700,51	
Location (Lat/Lo	on): 36,22240886 / 7,29683320		Estimated Area (h	na): 49 <i>,</i> 0		
Issue	Function		Context	Priority	Relevance	
Ductosticu	Core Zone Protection		BR Maintenance	1		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	3		
	Erosion Control (Soil Improvement)		Hazard	3		
	Flood / Runoff Control (Water holding capa	city)		1		
Improvement	Water Pollution Control			1		
	Fertility of surrounding agriculture			1		
Animal / Plant habitats			1			
	Supply of Construction Wood / Fuel Wood	(subsistence)		4 Pop. Area Bonga		
	Amelioration of livelihood – sale of NTFP (commercial)		1		
Cultural /	Amelioration of livelihood – sale of timber products (commercial)			4	Pop. Area Bonga, good road access	
Economic	Increase of livestock fodder			3		
	Medicines			1		
	Resin (subsistence / commercial)			1		
	Secret meeting sites			1		
other	Ownership: private (HH 14)					
Site Characteris	tics: recent forest loss (< 10yr), conversion to	farm land, very steep te	errain, soil erosion (gullying)		
Current Land Us	se / Land Cover: cultivation 70 % (maize, bear	n, enset)				
Closest (gravel)	road: 1 km to all weather road					
Closest town: K	aya Kela in 1,7 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	ery important; blank=no	o information			
Site Assessmen	t – Community Plantation				Plot NO: 13	
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Woreda: Gimbo)	Kebele: Ufudo		Elevation (m.a.s.l.):1772,09		
Location (Lat/Lo	on): 36,21735941 / 7,37182676	1	Estimated Area (Area (ha): 8,4		
Issue	Function		Context	Priority	Relevance	
Core Zone Protection			BR Maintenance	2	-	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	1		
	Erosion Control (Soil Improvement)		Hazard	3		
	Flood / Runoff Control (Water holding capa	icity)		2		
Improvement	Water Pollution Control			1		
	Fertility of surrounding agriculture			3		
	Animal / Plant habitats			2		
	Supply of Construction Wood / Fuel Wood	/ood / Fuel Wood (subsistence)		4	Better woodlot management needed, already used as community plantation, enrichment with espec. Schefllera	
	Amelioration of livelihood – sale of NTFP (commercial)		2	abyssinica, Hagenia abyssinica	
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)		3		
Economic	Increase of livestock fodder			3		
	Medicines			1		
	Resin (subsistence / commercial)			1		
	Secret meeting sites			1		
other	Ownership: communal		•			
Site Characteris 2012 when clos	tics: small degraded woodlot, which needs pased by governmental forest is under concession	roper management and ons (missing wood resou	assigned property r rce)	rights, Situa	tion will become worse in	
Current Land U	se / Land Cover: degraded forest, UCC mediu	m, LCC medium (Gravillia	a robusta, Prunus A	fricana, Mil	littia ferruginea)	
Closest (gravel)	road					
Closest town						
Key: 1=not impo	ortant; 2=minor important; 3=important; 4=v	/ery important; blank=nc	o information			

viii. <u>Woreda Saylem</u>

Site Assessmen	t – Reforestation					Plot NO: 1
Woreda: Saylen	n	Kebele: Senteriya	Elevation (m.a.s.l.):2266,59			
Location (Lat/Lon): 35,82433483 / 7,76609354		1	Estimated Area (ha): 12,1			
Issue	Function		Context	Pr	iority	Relevance
	Core Zone Protection		BR Maintenance			
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentati	ion 4		Strengthen river buffer, important corridor between two forest patches
Biodiversity Increase (Enrichment Planting, different native tree species)			4		Severe forest loss on site	
	Erosion Control (Soil Improvement)		Hazard	2		
Improvement	Flood / Runoff Control (Water holding capacity)			3		
improvement	Water Pollution Control			3		
	Rehabilitation of degraded forests			1		
	Riparian Forest Enhancement			4		
	Wetland Conservation		CDM	2		
Support	Support of Watershed Management / interdisciplinary			1		
	Enhancement of Agricultural Productivity			3		
	Secret Meeting Sites			2		
other				1		
Site Characteris	tics: Buffer of river, protect riparian forest, w	ater conservation, important si	de to maintair	n connecti	vity of f	forest patches
Current Land Us	se / Land Cover: degraded riparian forest (Scl	nefllera abyssinica, Acokanthera	a schimperi, Pr	runus Afri	cana, Sz	zygium guineense)
Closest (gravel)	road: 0,2 km to trail					
Closest town: A	garo Shuniti in 3,3 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no inforr	mation			

Site Assessment – Community Plantation Plot NO: 2					
Woreda: Saylen	1	Kebele: Senteriya	Elevation (m.a.s.l.):2236,05		
Location (Lat/Lo	on): 35,81231650 / 7,77245973	1	Estimated Area	ha): 11,3	
Issue	Function		Context	Priority	Relevance
Ductosticu	Core Zone Protection		BR Maintenance	1	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	4	Connection between forest patches
	Erosion Control (Soil Improvement)		Hazard	4	Steep slopes along river channel
	Flood / Runoff Control (Water holding capa	icity)		2	
Improvement	Water Pollution Control			3	
	Fertility of surrounding agriculture			3	
	Animal / Plant habitats			1	
	Supply of Construction Wood / Fuel Wood (subsistence)			4	In surrounding severe forest loss
	Amelioration of livelihood – sale of NTFP (commercial)			3	
Cultural /	Amelioration of livelihood – sale of timber products (commercial)			4	Good road access
Economic	Increase of livestock fodder			3	
	Medicines			2	
	Resin (subsistence / commercial)			1	
	Secret meeting sites			1	
other	Ownership: governmental				
Site Characteris	tics: Buffer of river, protect riparian forest, water con	servation, recent deforestation	on, wood collection m	edium, high gra	azing, steep slope
Current Land Us	se / Land Cover: degraded riparian forest (Sch	nefllera abyssinica, Acoka	anthera schimperi,	Prunus Afric	cana, Szygium guineense)
Closest (gravel)	road: 1,7 km to trail				
Closest town: A	garo Shuniti in 3,3 km				
Key: 1=not important; 2=minor important; 3=important; 4=very important; blank=no information					

Site Assessmen	t – Community Plantation				Plot NO: 3		
Woreda: Saylen	n	Kebele: Shunity	Elevation (m.a.s.l.):2090,97				
Location (Lat/Lon): 35,78507403 / 7,74794413			Estimated Area (Estimated Area (ha): 37,7			
Issue	Function		Context	Priority	Relevance		
Drotostion	Core Zone Protection		BR Maintenance	3			
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	1			
	Erosion Control (Soil Improvement)		Hazard	3	Slopes > 16°		
	Flood / Runoff Control (Water holding capa	city)		1			
Improvement	Water Pollution Control			1			
	Fertility of surrounding agriculture			1			
	Animal / Plant habitats			2			
	Supply of Construction Wood / Fuel Wood (subsistence)			4	Decrease pressure on BR candidate core		
	Amelioration of livelihood – sale of NTFP (commercial)			4	Already used for bee hive hanging		
Cultural /	Amelioration of livelihood – sale of timber products (commercial)			4	Good access to Agaro Shunity		
Economic	Increase of livestock fodder			3			
	Medicines	Medicines		1			
	Resin (subsistence / commercial)			1			
	Secret meeting sites			1			
other	Ownership: governmental (was occupied by	y settlement 2010)					
Site Characteris	tics: Due to vicinity to Chella and Agaro Shuniti, high	wood demand, very high hur	man activity in the last	10 years, stroi	ngly rolling slopes, degraded soil		
Current Land U	se / Land Cover: degraded riparian forest, MF	PT 90%, shrub 10%					
Closest (gravel)	road: 1,2 km to trail						
Closest town: A	garo Shuniti in 1,7 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=nd	o information				

Site Assessmen	t – Community Plantation (combinatior	n with Agroforestry)			Plot NO: 4	
Woreda: Saylen	Woreda: Saylem Kebele: Shunity			Elevation (m.a.s.l.):2269,47	
Location (Lat/Lo	on): 35,79139913 / 7,72429250		Estimated Area (ha): 43,6			
Issue	Function		Context	Priority	Relevance	
Ductosticu	Core Zone Protection		BR Maintenance	1		
Protection	Creation of Corridors (Gene Flow / Connecti	vity of Forest)	Fragmentation	3		
	Erosion Control (Soil Improvement)		Hazard	4	Severe recent forest loss	
	Flood / Runoff Control (Water holding capac	city)		3		
Improvement	Water Pollution Control			1		
	Fertility of surrounding agriculture			3		
	Animal / Plant habitats			2		
	Supply of Construction Wood / Fuel Wood (subsistence)			4	Pop. Area Shunity, prevent from forest exploitation in surrounding forest	
	Amelioration of livelihood – sale of NTFP (co	ommercial)		2		
Cultural /	Amelioration of livelihood – sale of timber p	roducts (commercial)		4	Adjacent to main road	
Economic	Increase of livestock fodder			3		
	Medicines			1		
	Resin (subsistence / commercial)			1		
	Secret meeting sites			1		
other	Ownership: private (partly legally given to la	ndless people 2010)				
Site Characteristics	s: partially given to landless people, very steep area, hi	gh human activity in last 10	years, important for wa	ater protection	n, additional wood source for	
Current Land U	se / Land Cover: degraded forest, inside cultiva	ation (maize false banar	na)			
Closest (gravel)	road: 0,2 to trail					
Closest town: A	garo Shunti in 1,7 km					
Key: 1=not important: 2=minor important: 3=important: 4=very important: blank=no information						

Site Assessmen	t – Community Plantation				Plot NO: 5	
Woreda: Saylen	1	Kebele: Yuna Homi		Elevation (n	n.a.s.l.):2123,96	
Location (Lat/Lon): 35,79959383 / 7,90805077			Estimated Area (Estimated Area (ha): 20,6		
Issue	Function		Context	Priority	Relevance	
Drotostion	Core Zone Protection		BR Maintenance	3		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	3		
	Erosion Control (Soil Improvement)		Hazard	2		
	Flood / Runoff Control (Water holding capa	city)		1		
Improvement	Water Pollution Control			1		
	Fertility of surrounding agriculture			1		
	Animal / Plant habitats			2		
	Supply of Construction Wood / Fuel Wood (subsistence)			4	Severe forest degradation in vicinity, due to intense wood collection and understorey clearing, prevention needed	
	Amelioration of livelihood – sale of NTFP (commercial)			2		
Cultural /	Amelioration of livelihood – sale of timber products (commercial)			1		
ECONOMIC	Increase of livestock fodder			3		
	Medicines			1		
	Resin (subsistence / commercial)			1		
	Secret meeting sites			1		
other	Ownership: governmental					
Site Characteris	tics: very recent deforestation, rolling topogr	aphy, used for grazing, h	igh wood collectio	n		
Current Land U	se / Land Cover: degraded riparian forest (Aco	kanthera schimperi, Szygium	guineense, Croton ma	acrostachyus, S	chefllera abyssinica)	
Closest (gravel)	road: 0,4 km					
Closest town: D	el in 8,6					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	ery important; blank=no	o information			

Site Assessmen	t – Community Plantation				Plot NO: 6	
Woreda: Saylen	n	Kebele: Yuna Ginda	Elevation (m.a.s.l.):2189,31			
Location (Lat/Lo	on): 35,81907981 / 7,85087808		Estimated Area (ha): 16,5		
Issue	Function		Context	Priority	Relevance	
Drotoction	Core Zone Protection		BR Maintenance	1		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	2		
	Erosion Control (Soil Improvement)		Hazard	2		
	Flood / Runoff Control (Water holding capa	city)		3		
Improvement	Water Pollution Control			3		
	Fertility of surrounding agriculture			1		
	Animal / Plant habitats			2		
	Supply of Construction Wood / Fuel Wood (subsistence)			4	Mostly recommended to plant trees for livestock feeding to release pressure on adjacent wetland	
	Amelioration of livelihood – sale of NTFP (commercial)			2		
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)		2		
Economic	Increase of livestock fodder			4		
	Medicines			1		
	Resin (subsistence / commercial)			1		
	Secret meeting sites			1		
other	Ownership: governmental					
Site Characteris	tics: conservation of ecosystem between wetland and	d river, high human activity (e	expanding agriculture)	, rolling topogr	aphy, wetland protection	
Current Land U	se / Land Cover: degraded riparian forest UC	C open, LCC open (Schef	llera abyssinica, Cr	oton macros	stachyus, Prunus africana)	
Closest (gravel)	road: 1 km to trail					
Closest town: D	el in 2,2 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	ery important; blank=nd	o information			

Site Assessmen	t – Community Plantation				Plot NO: 7	
Woreda: Sayler	n	Kebele: Senteriya		Elevation (n	n.a.s.l.):2230,28	
Location (Lat/Lon): 35,83063900 / 7,83609776			Estimated Area (ha): 16,0			
Issue	Function		Context	Priority	Relevance	
Drotostion	Core Zone Protection		BR Maintenance	e 1		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	2		
	Erosion Control (Soil Improvement)		Hazard	3		
	Flood / Runoff Control (Water holding capa	city)		1		
Improvement	Water Pollution Control			1		
	Fertility of surrounding agriculture			1		
	Animal / Plant habitats			1		
	Supply of Construction Wood / Fuel Wood (subsistence)			4	Adjacent to Del (according to PRA, not much woodlot in home gardens due to labour in town)	
	Amelioration of livelihood – sale of NTFP (co	ommercial)		1		
Cultural /	Amelioration of livelihood – sale of timber p	products (commercial)		4	Good road access	
Economic	Increase of livestock fodder			3		
	Medicines			1		
	Resin (subsistence / commercial)			1		
	Secret meeting sites			1		
other	Ownership: communal					
Site Characteris	tics: buffer degraded riparian forest, steep slo	opes, medium grazing, sl	neet erosion, high	wood collect	tion	
Current Land U	se / Land Cover: riparian forest UCC open, LCC	C open (Croton macrosta	achyus, Szygium gu	uineense)		
Closest (gravel)	road: 0,2 to trail					
Closest town: D	vel in 0,9 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	ery important; blank=no	o information			

Site Assessmen	t – Agroforestry				Plot NO: 8	
Woreda: Sayler	n	Kebele: Agaro	Pgity Elevation (m.a.s.l.):22255,49			
Location (Lat/Lo	on): 35,77948099 / 7,72812189		Estimated Area (ł			
Issue	Function		Context	Priorit	y Relevance	
Ductosticu	Core Zone Protection		BR Maintenance	1		
Protection	Creation of Corridors (Gene Flow / Connect	tivity of Forest)	Fragmentation	1		
	Erosion Control (Soil Improvement)			4	Degraded soil, steep slopes >26°	
	Flood / Runoff Control (Water holding capa	icity)		3		
Improvement	Water Pollution Control			2		
	Shade			3		
	Wind Protection			2		
	Timber (commercial)			3		
	Timber (subsistence)			4	Avoid exploitation of adjacent forest (BR	
	Fuel Wood			4	within last 10 years (due to resettlement)	
Cultural /	Fertility Control			4		
Economic	Medicines			1		
	NTFP (commercial)			2		
	NTFP (subsistence)			2		
	Livestock fodder			3		
	Beehives			4	Recommendation: Schefllera abyssinica	
other	Ownership: private					
Site Characteris	stics: Very steep area, soil protection, avoidar	nce of erosion, su	sceptible to landsli	de, legal	ly assigned for resettlement (2005)	
Current Land U	se / Land Cover: cultivation 70% (maize, false	e banana), MRT 1	.0%, shrub 10%, gra	ss land 1	10%	
Closest (gravel)	road: adjacent trail					
Closest town: C	hella in 1 km					
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; l	olank=no informatio	on		

Site Assessment – Agroforestry Plot NO: 9							
Woreda: Sayler	n	Kebele: Shunity	د الالالالالالالالالالالالالالالالالالال				
Location (Lat/Lo	on): 35,76538008 / 7,74081077		Estimated Area (ha): 32,7				
Issue	Function		Context	Priorit	y Relevance		
Ductosticu	Core Zone Protection		BR Maintenance	2			
Protection	Creation of Corridors (Gene Flow / Connect	tivity of Forest)	Fragmentation	2			
	Erosion Control (Soil Improvement)			4	Strongly rolling slopes >16°		
	Flood / Runoff Control (Water holding capa	city)		3			
Improvement	Water Pollution Control			2			
	Shade			3			
	Wind Protection			3			
	Timber (commercial)			2			
	Timber (subsistence)			4	Pop. Area Chella town		
	Fuel Wood			4	Prevent wood extraction from adjacent forest		
Cultural /	Fertility Control			2			
Economic	Medicines			1			
	NTFP (commercial)			2			
	NTFP (subsistence)			2			
	Livestock fodder			3			
	Beehives			3			
other							
Site Characteris	tics: soil protection, very steep area, intense	agriculture, no e	erosion measures so	far			
Current Land U	se / Land Cover: cultivation 75% (maize, false	e banana), MPT 5	%, shrub 10%, grass	s land 10	%		
Closest (gravel)	road: 2,2 km to trail						
Closest town: C	hella in 0,6 km						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; k	plank=no informatio	n			

Site Assessmen	t – Community Plantation (candidate)			Plot NO: 10		
Woreda: Saylen	n	Kebele: Shunity		Elevation (m.a.s.l.):2100,43		
Location (Lat/Lo	on): 35,78301065 / 7,73410732		Estimated Area (ha): 28,1				
Issue	Function		Context	Priority	Relevance		
Declarities	Core Zone Protection		BR Maintenance	1			
Protection	Creation of Corridors (Gene Flow / Connection	ivity of Forest)	Fragmentation	1			
Erosion Control (Soil Improvement)		Hazard	4	Strongly rolling slope>16°			
	Flood / Runoff Control (Water holding capa	city)		1			
Improvement	Water Pollution Control			1			
	Fertility of surrounding agriculture			1			
	Animal / Plant habitats			1			
	Supply of Construction Wood / Fuel Wood (subsistence)			4	Prevent wood extraction from adjacent forest		
	Amelioration of livelihood – sale of NTFP (commercial)			1			
Cultural /	Amelioration of livelihood – sale of timber products (commercial)			4	Pop. Area Chella town		
Economic	Increase of livestock fodder			3			
	Medicines			1			
	Resin (subsistence / commercial)			1			
	Secret meeting sites			1			
other	Ownership: government (unclear use rights)				•		
Site Characteris	tics: Additional wood resource for Chella, ver	y high human activity du	uring the last 10 yea	ars, river pro	otection, very steep area		
Current Land U	se / Land Cover: cultivation 80% (maize, false	banana), MPT 5%, shrul	o 10%, grass land 5	%			
Closest (gravel)	road: 0,5 to trail						
Closest town: C	hella in 1,4 km						
Key: 1=not imp	Key: 1=not important: 2=minor important: 3=important: 4=very important: blank=no information						

Site Assessmen	t – Community Plantation				Plot NO: 11	
Woreda: Saylen	n	Kebele: Gechity		Elevation (m.a.s.l.):2099,52	
Location (Lat/Lo	on): 35,81604924 / 7,93808239		Estimated Area (Estimated Area (ha): 19,6		
Issue	Function		Context	Priority	Relevance	
Drotostion	Core Zone Protection		BR Maintenance	2		
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	2		
	Erosion Control (Soil Improvement)		Hazard	4	Rolling slope >12°, recent forest loss	
	Flood / Runoff Control (Water holding capa	city)		3		
Improvement	Water Pollution Control			1		
	Fertility of surrounding agriculture			1		
	Animal / Plant habitats			1		
	Supply of Construction Wood / Fuel Wood (subsistence)			4	Prevent from wood extraction of surrounding forest	
	Amelioration of livelihood – sale of NTFP (commercial)			2		
Cultural /	Amelioration of livelihood – sale of timber	products (commercial)		2		
Economic	Increase of livestock fodder			3		
	Medicines	Medicines		1		
	Resin (subsistence / commercial)			1		
	Secret meeting sites			1		
other	Ownership: governmental					
Site Characteris	stics: recent deforestation, used for grazing, ve	ery steep slope, control	agricultural expans	ion,		
Current Land U	se / Land Cover: degraded forest, UCC open, LCC op	oen (Acokanthera schimperi,	Szygium guineense, Cr	oton macrosta	achyus, Schefllera abyssinica)	
Closest (gravel)	road: 2,5 km					
Closest town						
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	very important; blank=no	o information			

Site Assessmen	t – Agroforestry				Plot NO: 12
Woreda: Saylen	Woreda: Saylem Kebele: Dino			Elevation (m.a.s.l.):2219,54	
Location (Lat/Lon): 35,83295552 / 7,84564187		Estimated Area (ha): 17,6			
Issue	Function		Context	Ρ	Relevance
Ductosticu	Core Zone Protection		BR Maintenance	1	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentation	3	
	Erosion Control (Soil Improvement)			4	Steep slope >26°, soil erosion (gully, rill)
	Flood / Runoff Control (Water holding capac	city)		4	Compacted soil, high surface runoff
Improvement	Water Pollution Control			2	
	Shade			3	
	Wind Protection			3	
	Timber (commercial)			2	
	Timber (subsistence)			4	Recent forest loss, vicinity to town Del
	Fuel Wood			4	Prevent from forest extraction
Cultural /	Fertility Control			4	Try to minimize application of fertilizers
Economic	Medicines			1	
	NTFP (commercial)			2	
	NTFP (subsistence)			1	
	Livestock fodder			3	
	Beehives			2	
other	Ownership: governmental				
Site Characteris	tiCS: very steep area, avoidance of soil degradation, s	usceptible of landsl	ide, intense agriculture,	wetlar	nd protection, medium grazing, , sheet erosion
Current Land U	se / Land Cover: cultivation 80% (maize, false	banana), MPT 1	5%, shrub 5% (Croto	n ma	crostachyus, Syzygium guineese)
Closest (gravel)	road: adjacent trail				
Closest town: D	el in 1,8 km				
Key: 1=not imp	ortant; 2=minor important; 3=important; 4=v	ery important; b	lank=no informatio	n	
Site Assessment – Reforestation Plot NO: 13					

Woreda: SaylemKebele: Tachiby		Kebele: Tachiby	Elevation (m.a.s.l.):2369,49			:2369,49
Location (Lat/Lo	on): 35,86880045 / 7,70057214		Estimated Area (ha): 116,2			
Issue	Function		Context		Priority	Relevance
	Core Zone Protection)		BR Maint	enance	1	
Protection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragment	tation	4	Perforation
	Biodiversity Increase (Enrichment Planting,	different native tree species)			3	Sustain Bamboo forest
	Erosion Control (Soil Improvement)		Hazard		4	Partially steep slopes >62°
	Flood / Runoff Control (Water holding capa	city)			2	
Improvement	Water Pollution Control				1	
	Rehabilitation of degraded forests				4	Dried bamboo forest
	Riparian Forest Enhancement				4	River / wetland protection
	Wetland Conservation		CDM		4	Adjacent wetland
Support	Support of Watershed Management / interdisciplinary				1	
	Enhancement of Agricultural Productivity				1	
	Secret Meeting Sites				1	
other	Ownership:					
Site Characteris	tics: Reforestation of dried bamboo forest, st	ill vacant site, should be recove	ered, steep	area, wet	land protec	ction
Current Land Use / Land Cover: dried bamboo forest, grass land						
Closest (gravel) road: 7,5 km to trail						
Closest town: A	Closest town: Agaro Shuniti in 7,5 km					
Key: 1=not important; 2=minor important; 3=important; 4=very important; blank=no information						

ix. Summary of all selected sites

Woreda	Component	Number of plots	Size of Plots in	Remarks
			hectare	
Adiyo	Reforestation	1	2.5	this year/ next year
		6	12.3	this year/ next year
	Community Plantations	2	19.3	this year/ next year
		3	18.2	candidate
		4	22.3	candidate
		5	21.2	this year/ next year
		6	12.2	this year/ next year
		8	24.8	this year
		9	58.7	this year
		10	15.3	next year
		11	8.6	next year
		12	4.2	candidate
		13	37.9	this year/ next year
	Agroforestry	-	-	-
Bita	Reforestation	1	44.8	candidate
		3	45.05	candidate
		4	18.2	candidate
		22	40.8	this year
	Community Plantations	2	42.3	candidate
		5	35.5	this year
		6	19.7	this year
		7	28.2	this year
		8	68.7	candidate
		9	76.3	this year
		10	97.57	candidate
		11	38.2	this year
		13	91.3	candidate

Woreda	Component	Number of plots	Size of Plots in	Remarks
			hectare	
		14	62.4	this year/ next year
	Agroforestry	-	-	-
Chena	Reforestation	1	12.2	candidate
		9	2.7	candidate
		10	1.4	candidate
		11	26.8	candidate
		12	12.3	candidate
	Community Plantations	4	48.3	this year/ next year
		5	92.3	this year/ next year
		6	98.3	this year/ next year
		7	17.5	candidate
		8	8.5	candidate
		13	139	candidate
		14	214	this year/ next year
	PFM	3	137.1	candidate
Decha	Reforestation	1	19.3	candidate
		3	13.2	candidate
		4	2.8	candidate
		5	19.2	candidate
		6	9.06	this year
		11	8.7	candidate
		12	9	this year
		13	8.7	this year
		21	32.4	candidate
		23	56.1	candidate
		24	31.5	candidate
	Community Plantations	18	41.1	candidate
		19	9.2	candidate
		20	16.23	this year
		22	108.8	candidate

Woreda	Component	Number of plots	Size of Plots in	Remarks
			hectare	
		25	14.7	this year
		27	13.1	candidate
		28	14.2	candidate
	Agroforestry	14	199.6	candidate
		15	56.6	this year/ next year
		26	18.5	candidate
Gewata	Reforestation	2	18.9	this year
		3	13.6	this year
		4	8.8	this year
		5	93.4	this year/ next year
		7	0.3	this year
		8	20.5	this year
		9	311.6	candidate
		10	31.1	this year/ next year
		11	16.7	this year
		12	8	this year/ next year
	Community Plantations	1	3.7	this year
		6	16.3	this year
		13	59.9	this year
		14	15.5	this year
		15	66.4	this year/ next year
		16	73.03	this year/ next year
		17	20.1	this year
		18	18.5	this year/ next year
		19	54.9	this year/ next year
		20	30.6	this year/ next year
		21	48.7	this year
		22	21.03	candidate
		23	15	this year/ next year
		24	23.9	this year/ next year

Woreda	Component	Number of plots	Size of Plots in	Remarks
			hectare	
	Agroforestry	-	-	-
Gesha	Reforestation	1	11.6	this year
		2	8.5	this year
		3	10.5	this year/ next year
		5	11.1	this year/ next year
		6	8.4	this year
		40	43.4	this year
		41	8.4	this year
		42	4.9	this year
	Community Plantations	4	68.4	this year/ next year
		8	8	this year
		9	12.4	this year
		10	15.4	this year/ next year
	Agroforestry	7	31	candidate
		12	215	this year/ next year
		13	113	this year/ next year
		14	72.2	this year/ next year
		15	75.4	this year/ next year
		16	75.4	this year/ next year
Gimbo	Reforestation	2	36.3	next year
		4	21.2	this year
		6	21	this year
		9	28.4	candidate
		10	8.1	candidate
		11	31.9	candidate
	Community Plantations	1	54.3	candidate
		5	9.2	this year
		7	33.7	this year
		8	38.9	this year
		13	8.4	this year

Woreda	Component	Number of plots	Size of Plots in	Remarks
			hectare	
	Agroforestry	12	48.9	this year/ next year
Saylem	Reforestation	1	11.3	this year/ next year
		13	116.2	this year
	Community Plantations	2	12.1	this year/ next year
		3	37.6	this year/ next year
		4	43.5	this year/ next year
		5	20.5	this year/ next year
		6	16.5	this year/ next year
		7	15.9	this year/ next year
		10	28.1	candidate
		11	19.5	this year/ next year
	Agroforestry	8	29.2	this year/ next year
		9	32.6	this year/ next year
		12	17.6	this year/ next year

Table 25: Selected Sites on Woreda level

7. Lessons learned

After finishing the field trips to the study region some general experiences and lessons learned can be formulated which might serve for future project implementations.

a. Project planning

The component "Forest & Community Analysis" is part of the NABU Project "Climate Protection and Primary Forest Preservation - A Management Model using the Wild Coffee Forests in Ethiopia as an Example", scheduled to take place at the beginning. Former research in the region, local partners and a collection of different spatial data enable to step into the analysis in an early stage. Due to the early state of the whole project, administrative and personnel structures were initiated but not fully operational. Therefore, this component could use the potential of synergetic effects with other project partners and subcontractors only to a minor extent. Once the framework is fully established, all project components should try to use synergetic effects for gap filling and saving resources. Parallel to the sub-component, there were different project partners and subcontractors in the Kafa region with overlapping issues and motivations but correspondence and the exchange of data was difficult.

To guarantee a maximum benefit of different components for local implementation, regular update meetings with all project partners are required. Establishing a sophisticated platform for the exchange of information and data is just as mandatory as this. Only a holistic approach will ensure to become able to make "a forest out of many single trees".

Be flexible in project design. In this analysis, it was assumed that the implementation of "Community Plantation" could be realized on large but connected communal land. The site visits and stakeholder meetings revealed, that communal land exists only on very patchy areas, the spatial extent and location is poorly described and it can be pointed out that it is assigned for a distinct LU with a hierarchy of rights for different stakeholders. It was not realistic to focus only on communal land for "Community Plantation" site selection, but it was feasible to search for areas which were left due to different reasons or sites where farmers are forced to practice fallowing due to insufficient yield. The former intention to consider sites which are connected to the road network or easy to reach could not be considered as strong criteria, due to a general limitation of appropriate sites. Due to the number of selected sites, their distribution and bad road access, it was not possible to visit all different sites for PRA implementation. The strategy was changed in that manner, to work together with the NABU rangers and draw relevant information by performing in-depth interviews. The spatial distribution of the sites might cause implementation difficulties concerning the transport of seedlings or establishment of tree nurseries and the monitoring of very distributed, remote plots will be a challenge.

In general, it is very challenging to find land without private claim (legal or illegal) in the Kafa region. Private investors, re-settlers, landless youth and demographic pressure in general claim land for their activities. Actually remote non-forest areas are assigned to land use purpose in the matter of agriculture or pasture farming and even very unfavorable sites (e.g. affected by mass-movement erosion, very steep slopes) are frequently cultivated.

The production of GIS models based on spatial criteria, to sort out a pre-selection of favorable sites can be useful if the study area is heterogeneous and a sound collection of spatial data exists. But best information about sites with "non-use" can be drawn out by personal communication on site. For the selection of communities where PRA could be conducted the model results provided good congruence. Due to the altered project design and limited time for travelling to remote areas, the participation of local staff was very valuable. During a workshop in Bonga for recently employed Rangers the handling of GPS was exercised and tasks were discussed. The participation of local staff is the best guarantee for sustainability. A local contact person, who can assist the Rangers, is recommended.

b. Spatial Data

A well-known assumption states that approximately 80 percent of all data have a spatial link. Spatial data or geo-data describe objects of the real world which have a distinct position in a reference system. Almost all human activities take place in "space" or occupy it and are in dialogue with their environment.

Transparent and consistent spatial data is a pre-requisite for sound spatial planning and decision making.

In Kafa region, various NGOs already established a wide range of geo-data. The nature of most projects is a temporary activity in a project region. Staff and technical resources are bound to the project fund, thus after closing a project most collected spatial information disappears "in space". The Dutch NGO SUPAK developed a geo-dataset with valuable information for the Kafa region. Unfortunately, due to missing metadata the SUPAK dataset partially could only be harmonized with the data collected for this component.

Being able to draw out a reasonable site selection in approximately 6 month within a study area of 745.000 ha (BR size), a consistent spatial data set was needed. It was not realistic to collect all relevant data on site within the timeframe of the project. Thus, previously collected data of geoSYS, the national geodatabase (National Forest Priority Areas) and SUPAK data (administrative boundaries) were used. For the gain of information about recent participatory forest management sites (PFM) it was important to strengthen the collaboration with local NGOs, such as the Kaffa Forest Coffee Farmers Cooperative Union (KFCU). They are willing to share their experiences of conducted PRA for PFM site selection; furthermore the collaboration was important to get spatial data of recently established PPP PFM sites.

c. Project components

i. <u>In general</u>

For discussions with rural communities it is important to be able to stress out the exact benefits for the community of planned procedures and activities. The motivation to participate will increase, if participants not only know the main goals and general effects of the action (which was transported by showing the scenarios of pre-/ post-landuse) but also their duties and personal share of participation. The implementation of the action, and the use rights have to be communicated to show transparency.

If potential forest area is detected on satellite images and via GIS analysis but there are no trees remaining on the site, it is likely that this has an underlying reason. It is more efficient to tackle the cause of deforested sites, than to reforest systematically. In the analysis, a lot of potential sites were visited in vein due to information which could not be revealed by RS and GIS analysis (e.g. fallowing due to highly degraded soil, intense communal grazing).

It was recognized; that in areas allocated for resettlement (of oromian people) erosion measures were exemplary practiced (Gimbo/ Kutti). In-depth interviews show that the acceptance towards new practices is likely higher if successfully applied somewhere else in the community. Further studies should be carried out, if re-settlers from other regions could be involved to promote

erosion-preventing measures.

One major concern of rural communities is the demand of technical assistance beside the supply of plant material for being able to implement the project activity (all components). The assistance should preferably take place on-site and not in training centers. In Gimbo the training in DoAD centers (e.g. for watershed management, erosion measures) is common practice, but farmers can only adopt suggestions of methods if they would be related more closely to their problems and a model of 'good practice' is shown.

Especially around urban areas such as Wushwush town, people do not maintain home gardens with sufficient wood resource (woodlots). Thus, forest around industry is additionally under pressure for wood demand.

ii. Reforestation

The awareness of forest loss is present in all stakeholder groups, but possible effects are assessed differently. Rural communities in general are fully aware of the consequences the forest loss might cause. The acceptance of communities for reforestation is remarkably higher, if the project activity has strong relation to environmental issues they are concerned of. A real threat (like sites affected by landslide or drying streams) mobilizes people to act on that and they are grateful for assistance. In this case, reforestation seems to be a good option and will be supported by local communities. Hence, selected sites to be reforested are severely degraded (due to such agents as soil erosion, landslides, or other physical constraints). But the reforestation of areas that are severely degraded might be challenging and studies have to be carried out to identify species that do not need fertile soils, grow fast and produce a good amount of organic matter.

A different criterion for reforestation is the fragmentation of forests within Kafa. Deforestation and conversion of land use to agricultural land in closed forests is an increasing threat. The perforation of forests is observed to be a hot spot of anthropogenic action (steady increase during years) causing forest loss. Hence, it was a major concern to find the underlying reasons for this phenomenon and align the project activity to minimize perforation of forests. An underlying reason for forest settlements are re-settlers from other regions, who settle down in the forest without permission. It is challenging to find appropriate measures or incentives for the re-settlers to cooperate and support the implementation of reforestation.

iii. Agroforestry

The criteria for selecting sites to introduce agroforestry systems had been unclear during the running analysis for a long time. First strategy seemed to be promising and was pursued until the last third of the analysis. This strategy is still favored due to the potential it offers concerning education and as multiplier. The beneficial institution should be public and preferably related to environmental issues. The local coordinator (Bonga) suggested the Farmers training centers (FTC) for participation. Realizing the importance of educating and training for the rural communities in agricultural practices, the government established around 1610 FTCs in the whole SNNPR. Implementing Agroforestry systems in FTCs could help to promote the benefits of multipurpose tree species to a wide range of farmers.

The second strategy suggested, is to supply farmers facing soil degradation on-site with plant

material. To distribute plant material without return service (e.g. small fee) could resolve that individual farmers do not foster the cultivation sufficiently. Furthermore, if the selection of some pilot farmers is not done one exclusion criteria, this strategy could create competition between farmers. The best criteria to select pilot farmers include the evaluation of the accessibility to the site (easy for monitoring) and the degree of degradation of farm land.

In general, the farmers are willing to cooperate and work together with foresters and DoAD. Until now, there are selected regions for implementation, which fulfill the latter named criteria. During group discussions, the willingness to participate was confirmed, but the final selection of specific farm sites should depend on the location of the tree nursery to avoid additional transportation costs.

The farmers need technical assistance for implementation. This is essential for a successful integration. It might be helpful to show already established, well-managed Agroforestry systems of the region. One contact with an agroforestry farmer in Gimbo (Gari) could already be established (Ato Hyrdin Ibrahim /phone 0917385612) that could assist as model farmer for training purposes of target farmers. He has good experience in Agroforestry system development/ maintenance and managing around 2.5 ha farm land with integrated Agroforestry methods. He is willing to participate in the matter of demonstrating and training.

iv. Community Plantations

The initial intention, to establish the community plantations on communal land could not be realized due to absence, identification problems and unappropriate size of patches. Therefore, other land had to be acquired. Due to discrepancies of official information (governmental stakeholders) and the real situation it was most promising to get valuable information on site by interviewing local communities and key informants. This time-consuming strategy requires a lot of travelling and only weak spatial indicator for potential sites could be developed. The most challenging problem was the missing register of real estate. This forced a strategy of triangulate information to get reliable results which finally could be selected as 'Community Plantation' sites. But it can be assumed, if implementation and benefit sharing of the 'Community Plantations' is successful, this model will be accepted and supported within the whole study area. The experience with the PFM model shows that, if accepted by local communities, the model is adopted by different organizations and well known among the local people. Often they address a request to the Kebele administrative to take part in a PFM program.

d. Forest loss

Interviews, group discussions and analysis of spatial data could indicate that forest is extremely threatened if no proper boundary demarcation is present. In interviews, this was the most frequent solution named to overcome the problem of forest loss. It was indicated that the selection of an exotic tree species could remarkably contribute to a respected forest border. Private investors in Kafa Zone use Eucalyptus spec. as boundary demarcation trees. In combination with a good sustainable forest management (like PFM), these procedures seem promising.

The "round-tables" showed that high expectations exist concerning Carbon crediting. It is expected, that these initiatives can solve the issues of forest loss by giving additional monetary value to the forest while it remains intact. This point was often raised of governmental representatives but even in some communities during PRA (e.g. Gimbo / Michity)

e. Stakeholder

i. <u>Governmental representatives</u>

Spatial information supports decision making, thus additional material such as comprehensive maps and computer aided visualization were a good starting point for discussions.

A good tool to stress out the importance of the analysis and the urgent need for action is the identification of multitemporal land-use scenarios that would have occurred on the land with and without the project activity. Printed on maps which are handed over should be feasible for the discussion participants and should include the continuation of the pre-project land use with possible effects (e.g. forest loss, erosion, fresh water supply, fire wood access) and positive effects of project activities for future development. For identifying realistic land-use scenarios, sets of multitemporal satellite images, PRA, feedback from stakeholders and the local coordinator were appropriate sources.

The DoAD - as partner of the project - has good facilities (GPS) and staff (forest experts) to give valuable recommendation on site selections. For the discussion, it was good to request the participation of forest experts. The interest and motivation to discuss about the project action varied a lot among different Woredas. The discussions held in the Woredas Adiyo, Bita, and Gawata were helpful and led to immediate agreement and further additional site suggestions.

ii. Local Communities

Participatory Rural Appraisal (PRA) was implemented to present the analysis intentions and find out the willingness of participation. It is important to build trust and rapport for a successful PRA; otherwise you won't get reliable information.

In communities without previous experience of conducting a PRA, it was necessary to explain all details of the analysis (Gimbo/ Hamani) and give examples of other studies that have taken place in communities similar to theirs. If confidence is build, the group discussion and further interviews will be fruitful. Communities with experience in development projects (Decha/ Ufa) and programs (FAO watershed, PFM) are very cooperative. They have already benefited from different programs, thus it might be possible that they try to manipulate their response in a way, that they gain the biggest advantage out of the program. Therefore, the group discussion is very important and can also serve as verification of the in-depth interviews.

Producing sketch maps is not only a very communicative tool (everybody can draw and use a map, even if the person was not at school), but very helpful in assessing vast areas for the one or the other component. It is valuable to highlight the very good orientation and spatial memory of the local people. It was very easy to transfer the information into a GIS.

PRA should be implemented on different time points during the year. In dry season, problems of drought and water shortage were indicated as a main problem while PRA carried out in the rain season highlighted the effects of erosion.

Conflicts related to forest resource use are very prominent in interviews. The share of forest resource between different interest-groups (private investors, re-settlers, and landless youth) and the absence of clearly defined and regulated property rights in relation to natural resource and services create uncertainty and impede a sustainable management of forests.

But communities raise awareness concerning the legalization of collective resource management. At the moment, the best model for the entitlement legalization of forest resource and its security empowerment seem to be the mechanisms of Participatory Forest Management (PFM). Due to its tradition in the Kafa region and well-established PFM projects, even remote communities have noticed the system and are interested in participation. Consequently, the awareness level of PFM among communities is much higher compared to other resource management concepts such as the "Regional Forest Priority Areas" or UNESCOS MAB biosphere reserve approach. This seems to be the reason for the existence and eligibility of PFM and BR Zonation on congruent sites. The coexistence of both structures can profit of synergetic effects.

8. Map production

For the map production very heterogeneous data sources were used. The homogenization/ preprocessing of geodata were performed with different software packages namely:

- GPS read out: GPSbabel
- GIS: ArcGIS 9.3.1 (ESRI), SAGA GIS and
- Remote Sensing: ERDAS Imagine 2010, ENVI 4.4, ILWIS
- Cartographic representation and design was done in ArcGIS 10

Incorporated data have been collected from different projects. Due to a lack of a seamless geodatabase for Kafa and rapid changes of the road infrastructure, it was necessary to integrate own GPS recordings.

- previous own projects within Kafa Region in conjunction with forest cover, namely:
 - $_{\odot}$ $\,$ Field work in 05/2008 in conjunction with the Msc. Thesis of Elisabeth Dresen
 - Consultancy agreement with NABU 06/2009 concerning cartographic representation of Biosphere Reserve Boundary
 - Consultancy agreement with GEO schützt den Regenwald e.V. concerning change detection and forest loss estimation of PFM areas
- existent spatial data from other (previously) active NGOs and others in Ethiopia, namely:
 - SUPAK database (no metadata existent, needs clarification)
 - National Geodatabase (received by Sisay Nune in 2008, not suitable for a cartographic representation of 1 : 50.000)
- Satellite Imagery:
 - o ASTER (10/2009, 01/2007, 01/2005) with a resolution of 15x15 m
 - Landsat ETM+(02/2001) with a resolution of 15x15 m (by resolution merge)
 - DigitalGlobe (8-Band Challenge) with 2m (0.48 m Pan) → 11/11/2010

Data	Acquisition time	Resolution		
Satellite imagery				
 ASTER SPOT DigitalGlobe Landsat 	2008 – 2010 (full coverage) – 2013 (full coverage/year) 100 sqkm) coverage)	2005 2010 (~ 2002 (full	15 m 2.5 m 0.48 – 2 m 3 m	30
Vector data:				
 own field data SUPAK national geodatabase 	2008-2011 (streets, LULC, protected areas etc) 1: 5,000 1 2002 (?) (LULC, census, infrastructure) (?) 100,000 (?) 1: (administrative borders, RFPA, other PA) 1,000,000 (?) 1:			

 Open Street Map PFM sites 	(?) streets Kaffa Forest Coffee Farmers Cooperative Union	1: 5,000 (?)
Topographic Maps (EMA)	1977 - 1985	1 : 50,000

Table 26: Data Source in general

Due to different spatial representation of all geodata, they were transformed to the coordinate system UTM37 /WGS 84. This was most suitable to overlay GIS layers onto Satellite images. For cartographic representation the local adopted coordinate system Adindan (Zone 36/ Zone 37 North) with ellipsoid Clark 1880 was preferred due to better accuracy.

For a seamless workflow of implementation (logistic planning, planting, tree nursery establishment, investigating potential synergetic effect), thematic maps with all site proposals are generated on woreda level. The map scale 1 : 50.000 is not appropriate to show very small sites in detail, but consistent labeling of the sites will ensure a good reference for the Matrix sheets and the detailed site description (can be found in the Appendix).

Labeled site	Labeled site (map extract of Woreda "Adiyo")					
Appending Matrix						
Appending	Matrix					
Site Assessmen	t – Community Plantation	(candidate)				Plot NO: 3
Woreda: Adiyo	Woreda: Adiyo Kebele: Alarigata Elevation (m.a.s.l.):2455,33				l.):2455,33	
Location (Lat/Lon): 36,39923189 / 7,2801952195 Estimated Area (ha): 18,2						
lssue	Function Cont				Priority	Relevance
Protection	Core Zone Protection (Agricultural Land, which is ancient to core zones) BR Maintenance 1					
Frotection	Creation of Corridors (Gene Flow / Connect	ivity of Forest)	Fragmentati	ion	1	

Table 27: How to read the maps?

Different additional information is integrated in the thematic maps, which did not have prior importance for the site selection analysis. This information is crucial for orientation in the field. All information and its source data can be found in the following table.

Additional Information on Maps	Data Source

Points of Interest (Church, Schools)	Topographical Maps 1:50,000 (EMA), GPS
	recordings
Height Points	Topographical Maps 1:50,000 (EMA)
Rivers	Topographical Maps 1:50,000 (EMA), SPOT5, hydrological model (DEM)
Town area & names	SPOT5, Topographical Maps 1:50,000 (EMA)
Roads	GPS recordings
Contour lines	DEM
Hillshade	DEM
Tree nurseries	GPS recordings
Land Use / Land Cover	ASTER ('10), SPOT5 ('11)

Table 28: Additional Information on Maps and their data source

9. <u>Recommendations on the future status of forest and socioeconomic issues / project</u> planning adaptation

This chapter will give a summary on problems occurred and recommendations in general and concerning the site selection. This might help to adopt the project planning.

a. Geodata – Kafa Biosphere reserve

- It was found, that the different zones are patchy due to different source data (Landsat 2001, SUPAK data). It is recommended to revise the BR Zonation geodata taking into consideration the most recent Satellite images. In the figure below, one example is given:



Figure 4: Patchy BR Zonation

- Very different information exists about the size and the different zones of the Kaffa Biosphere Reserve. It is recommended to integrate the missing core zones.
- In some areas, the BR core zone is not protected by a candidate core zone or a buffer zone. It is recommended to have a buffer of min. 100 meter around BR core zones. Examples can

be found in the table below



Figure 5: BR Core Zone unprotected

- In one case the BR core zone is very close to border of the BR (Kebeles: Yoka, Ufa, Sheda)



Figure 6: BR Core zone very close to BR boundary

- An inconsistent handling of roads (Gawata) concerning zonation was found. It is recommended to either include roads into core zones, or to exclude them consequently.



Figure 7: Inconsistent handling of road network

- It was found that the candidate core zone is often located on agriculture land.
- "Collect once, use many times". Consistent methods of data collection and storage are required. Especially for the geodata the rangers are recording. If possible, supply rangers with GPS mobile phones, that they can send text messages with coordinates to a local coordinator.

b. Specific recommendations

- Supply all rangers with sufficient (technical) material: It was always highlighted from the rangers that they have problems in using the GPS devices from DoAD (especially in Chena)
- More focus on agriculture expansion, population pressure, more efficient agriculture, resettlements
- Resettlements are often located on inappropriate areas (steep slopes, inside forest): It is possible to strengthen the cooperation with the governmental side; this will be a win-win situation for the project goal and for farmers.
- There is a discrepancy in supplying synthetic fertilizers and using them! Rural farmers would rather shift to biological fertilizers but technical assistance and governmental or zonal support is missing
- Ensure clean distinction between management models (PFM) and protection status (BR Zonation)
- Focus on property rights! According to PRA the boundary demarcation is most important
- Introduce "clean cooking" label for gastronomy \rightarrow "we cook without primary forest wood" \rightarrow awareness creation
- Promote BR at local level, especially in rural communities situated close to core zone (information gap)
- New LULC classification exclusively based on SPOT5 satellite imagery with combined technique of spectral and object-based classification. This technique could serve also for further stratification of the forest.

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11. <u>Annex</u>

a) Annex 1: In depth description of sites (distributed to Rangers)










Detailed site description for Action sites of Bita			
Plot	Satellite Image (March 2011)	Site Description	
No			
1	D Amesha Mecheta	Size: 44,86 ha Action: Reforestation Function: Human activity within the Core Zone, recent development (< 4 years), agriculture expansion, very steep area (>35°) Location: Close (west) to River Gay in Amesha Mecheta Kebele	
2	Neitgant	Size: 42,31 Action: Community Plantation Function: Very recent activity close to core zone (<50m), disturbed forest with scattered trees, preliminary used for grazing but also agriculture expansion Location: Kebele Meligawi, west of border to Chena Woreda, north of Shonga mountain	

3	Shot:	Size: 45,06 ha Action: Reforestation Function: Activity within core zone, core zone protection, recent human activity (5 – 10 households), curtail perforation of primary forest, steep terrain, hazard (landslide) control Location: In Shota kebele, between river Getechi and Shoshi
4		Size: 18,17 ha Action: Reforestation (or Community Plantation with strong demarcation) Function: Activity within core zone, core zone protection, steep terrain, hazard (landslide) control Location: close to PLOT 3 (south-east)
5		Size: 35,51 Action: Community Plantation & Agroforestry Function: additional wood resource for town Bita Genet (approx. 1,5 km), land used for communal grazing and fallowing, scattered trees, river protection Location: west side (and along) river Chercheri,



9	Tuga Dacha Dlfa	Size: 76,4 Action: Community Plantation Function: Additional wood resource, recent land cover change (< 8 years), north of river Meni, curtail of forest fragmentation Location: north of river Meni, north-west of Bita Genet
10	reti Biada Beach Beach Gurech	Size: 97,58 ha Action: Community Plantation Function: east side→protection of Meni river, buffering of primary forest, curtail agriculture expansion, wood resource compensation Location: in Kebele Gaweti to boarder Gurech, Beqo, Yeda Kebele, south side of main road
11	reda Gaveti	Size: 38,28 ha Action: Community Plantation Function: curtail agriculture expansion, buffering of primary forest (candidate PFM area), used for grazing, understorey is already cleared Location: north of main road, east of Bita Genet



Detaile	d site description for Action sites of Chena	
Plot	Satellite Image (March 2011)	Site Description
No		

1	Chormacha Chormacha	Size: 12.24 ha Action: Reforestation Function: Recent human activity within core zone of Biosphere Reserve, active spot Location: In Shonga forest, close to the border of Bita Woreda (Meligawa Kebele), around 10 households
4	Channeolta Channeolta	Size: 48,39 ha Action: Community Plantation Function: Additional wood source for very populated area (north of Bitahora) Location: North of Bitahora, around River Geni and River Matewi
5	chens Agaro	Size: 92,36 ha Action: Community Plantation Function: Very recent deforestation, conservation of wetland and water resource, intense use for grazing Location: Adjacent to main road, in Kebele Agaro







Detailed Site description of Woreda GIMBO

Plot	Satellite Image (2011)	Site Description
No		



5		Size: 9,3 ha Action: Community Plantation Function: Additional wood source for populated area around Kuti Kebele close to Tula town, activity within the core zone \rightarrow coffee plantation, steep area \rightarrow soil protection Location: East of Tula town
6	6 Kuti	Size: 21,9 ha Action: Reforestation Function: Activity very close to the core zone, very degraded soil, privately owned but since 3 years fallow, nowadays used for grazing Location: Dadiban forest
7	Basha Cheraba	Size: 33,73 ha Action: Community Plantation Function: Additional wood source for very populated area (Tula, Kasha) Location: Between Kasha and Tula

















Site se	Site selection for Saylem in the frame of ICI (NABU) - "Forest and Community Analysis"		
Plot	Satellite Image (SPOT, March 2011)	Description	
No			
1	Since ity and the second	Size: 11.34 ha Action: Community Plantation, enrichment planting (50 meter buffer along Hawuri River) Function: Buffer of river, protect riparian forest, water conservation Location: Riparian buffer of Hawuri River, east part of site Plot 2	



6	Datashett Chalashett	Size: 16.25 ha Action: Community Plantation Function: conservation of ecosystem between wetland and river, high human activity (expanding agriculture) Location: North of Yadota, along river Sor
7	Da Benteriya	Size: 16 ha Action: Community Plantation on Communal land (?) Function: Additional wood source for Yadota (direct vicinity), water conservation due to river vicinity Location:
8	Challe Of the state of the stat	Size: 29.3 ha Action: Agroforestry (5 – 8 pilot farmers) Function: Very steep area, soil protection, avoidance of erosion, susceptible to landslide Location: south of Chella
9	Cheller	Size: 32.66 ha Action: Agroforestry (3 – 5 pilot farmers) Function: soil protection, very steep area, intense agriculture Location: North of Chella, along the Shulika river

10		Size: 28.13 ha Action: Community
		Plantation Function: Additional
		wood resource for
	Shunity 100	Chella, very high human activity during the last 10
		years, river protection
		(Shulika) Location: Northern side
		of Shulika river, north of
	Chall	Chella
	Agaro o	
11		Size: 19.59
		Action: Community Plantation
		Function: Additional
		wood resource of populated Kebele Miso.
		site within intact forest
	saven	\rightarrow avoid spread of human activity
		Location: In Gechity
		Kebele, north of Sotalo River, south of Dawara
		River River
	Coch	
12		Size: 17.26
		Function: very steep
		area, avoidance of soil
		degradation, susceptible of landslide, intense
		agriculture, wetland
		protection Location: Dino Kebele
		north of wetland, close to
	Senterryg	River Sor
13		Size: 116.24 ha
		Action: Reforestation Function: Reforestation
		of dried bamboo forest,
		still vacant site, should be recovered, steep area
		wetland protection
		Location: Adjacent to Woreda Gesha along
	a second s	River Duchi, close to
		wetland
	Meligawa	

PFM Name	KEBELE Name	Share of PFM on Kebele (%)
Baqa	Baqa	23,10
Baqa	Hamani	76,90
Budi	Awasho	2,06
Budi	Mankira	8,84
Budi	Chiri	10,29
Budi	Budi	78,71
Budi	Ufa	0,11
Gawa Mecha	Saja	5,92
Gawa Mecha	Tagera	3,30
Gawa Mecha	Gawa Mecha	90,77
Gomma	Wediyo	99,96
Kahin	Gedam	73,24
Kahin	Modiyo Gombera	22,18
Kahin	Awasho Qofira	4,06
Kahin	Gidi Longela	0,52
Keja-Araba	Bonga	1,98
Keja-Araba	Qeja Araba	52,11
Keja-Araba	Yeba	45,11
Keja-Araba	Mesqela	0,80
Kejakata	Kasha	100,00
Mankira	Gedam	0,01
Mankira	Modiyo Gombera	23,22
Mankira	Awasho Qofira	3,03
Mankira	Awasho	9,61
Mankira	Mankira	50,52
Mankira	Yanga	10,75
Mankira	Chiri	0,01
Mankira	Budi	2,22
Mankira	Yaha Checha	0,62
Meshamello	Belteta	8,73
Meshamello	Qonda	12,49
Meshamello	Achuwa	0,01
Meshamello	Mesha Mello	78,77
Nada	Immicho	0,00
Nada	Tula	1,62
Nada	VVediyo	98,17
Nada	κυπι	0,08
Orora	Duma	2,49
Orora	Kasria	97,51
uesni Osshi	Budi	9,38
uesni Osshi	Uta	3,54
Qeshi (YOKA	3,43
Qeshi (wenta	13,82
Qeshi .	Qesni Maha Ohaaha	43,88
Qeshi Qeshi	Tana Checha	20,90
Qeshi Qeshi	Qesni Voho Ohooho	22,01
Geshi Terrere	Yana Checha	11,49
Tagera		5,69
Tagera Tagera		10,57
Tagera	Medaho	7/16
Tula	Tula	50.53
Tula	Cheraba	40.72
Tula	lega	8,75
Ufa	Chiri	23,10
Ufa	Budi	1,88
Uta	Uta	75,03
Yanga	Mankira	41,09
Yanga	Yanga	49,24
Yanga	Yaha Checha	9,68
Yanga	Modiyo Gombera	22,71
Yanga	Hega	24,00
Tanga Vanga	Vando	0,30 A a a c
Yanga	Yaha Checha	20,04
Yanda	Yanda	100.00
	1	

b) Annex 2: Table: Share of PFM sites on different Kebele

c) Annex 3: Questionnaire for Group discussion

Group and key informant Discussion

Main Issues: Forest loss, Declining forest resources, Efficiency of farm land, farm land expansion

1. Some general questions:

1.1. How many households are around this area / in your community?

2. Resources / Forest

2.1. Did you experience any change in forest cover and/or density?

2.2. Who has access to:

a) the forest resource / plantation resource (of the community, apart the community)

b) water access

2.3. Who is controlling the access and use?

2.4. Are there problems to share the forest resource?

2.5. Why do you think the forest is declining?

2.6. Do you have suggestions, how to overcome the problem of forest loss?

2.7. Have you heard about different development programs, such as Participatory Forest Management (PFM)

2.8. What is the general opinion about such programs? Are there fears to participate in such programs?

3. Resources / Agriculture, Livestock

3.1. What climatic problems do you face affecting your farming activity?

a) Water shortage (drying streams/rivers, soil moisture stress, air moisture reduction, decline amount and duration of dew)

b) Soil condition (fertility change, soil moisture, soil structure, soil temperature)

c) Rain (irregularity/unpredictability, shortage, late coming and early stop, high intensity, short duration, affect crop drying, affect animal fodder availability).

d) Temperature (heat increase in dry season and extreme cold in wet season, day heat inhibits, field/outdoor work, affect animal productivity)

3.2. Which other impacts have been observed affecting your farming activities?

a) Land availability (population pressure, resettlement)

b) Competition between commercial interest and subsistence (expansion of concession areas, ...)

3.3. Is there enough fodder / grazing land for your livestock?

3.4. What is mostly needed / missing in the community?

	Subsistence	Commercial
Edible flora		
Edible fauns (e.g. honey)		
Construction material		
Fuels		
Fodder		

4. Erosion / Soil Degradation

4.1. Is erosion a threat in your community, and how many people might be affected?

4.2. What are the effects of erosion?

- a) Landslide
- b) Productivity of farmland
- c) Water availability, water holding capacity

4.3. What are adoption measures taken by the community?

- a) Contour farming
- b) Terraces
- c) Soil bunds / Stone bunds
- d) Mulching
- e) Fallowing
- f) Grass strips
- g) Controlled grazing
- h) Tree planting
- i) Micro-basin / Check dam
- j) Multiple cropping

4.4. What measurements need to be done?

- a) Of whom?
- b) Are there limitations in the system / or the need for support?
- Financial limitations, human capacity, knowledge transfer, training needs...)

5. What do you think will be the future development of your community?

- a) Population development (increasing, decreasing, distribution of land)
- b) Farmland (Productivity, Expansion, Variety of Crops, Dominative Crop)
- c) Forest resources (Importance, Availability of wood / NTFP, Access, Decrease/Increase)
- d) Education (Importance, Facility of schools)

d) Annex 4: Questionnaire In-depth interviews

Questionnaire for In-depth Interviews

Part 1 General Information

- 1. Name:
- 2. Sex: Male / Female
- 3. Age: 15 22 / 23 33 / 34 45 / 46 60 / > 60
- 4. Family Members: 1 5 / 6 10 / 11 15 / > 15
- 5. Origin: Indigenous / Resettler / Moved in /

 \rightarrow If he/she moved in

- 1. When did you move to that place?
- 2. For what reason?

Part 2 Livelihood

1. Land ownership

0.25 - 1 ha / 1 - 2.5 ha / 2.5 - 5 ha / > 5 ha / landless

2. Main livelihood support

crop / coffee / forest / livestock / labour

3. Specify, which crop you have on your farmland: maize / enset / teff / haricot bean /

other:

- Which livestock do you keep and how many numbers: chicken no.__/goat no.__ sheep no.__/cattle no.__
- 5. Do you have enough land for agricultural activities? Yes / No
- 6. Was there a change in your crop yield in the last years? No change / Increase / Decrease
- 7. What was the nature (productivity, erosion, etc) of your land before 10 years?

- What is the main source of feeding your livestock? Communal grazing / crop residue / forest / single grazing
- 9. Have you heard about agroforestry? Yes / No

ightarrow if YES

1. Do you practice it?

Yes / No

2. For what reason do you practice agroforestry?

Wood supply / multiple products / erosion control / livestock fodder / it was advised / other reason:

 \rightarrow if NO

10. Why do you <u>not</u> practice agroforestry?

Have never heard of it / I don't see a benefit / I don't have enough financial / human resources to practice / other:

Part 3 Wood demand

- For what purpose do you need the wood? Fuel wood / construction wood / charcoal / sale / other:
- 2. How much do you need daily for fuel wood consumption?

 $(\rightarrow$ Ask question how much each person can carry every day? Estimate how much kg each person is carrying! Who is responsible to carry the wood? Children) women))

- 3. Where do you get the wood from? Governmental owned forest / private forest / communal forest / homegarden / agroforestry / other:
- 4. Is the resource you use for fuel wood enough to fulfil your demand? Yes / No
- 5. What should be more frequently available? Fuel wood / Construction wood / other:

Part 4 Forest

- For what purpose do you use the forest? Wood collection / Non-timber forest products collection / hanging beehives / secret meeting site / rituals / grazing /shade for livestock / other:
- 2. Which product out of the forest is the most important for you? Wood / Non-timber forest products (NTFP)
- Please, specify the Non-timber forest products you use: (→ ask for resin, roots, leafs, herbs, ...)
- 4. Has the forest cover changed? Yes / No

 \rightarrow if YES

1. What has changed? Area / density / area & density / other:

Part 5 Erosion

1. Do you have a problem of erosion in your farm? Yes / No /

 \rightarrow if YES

- 1. On site / or off site ?
- 2. What kind of measures you have taken to control it? If not, why?
- 3. What are the factors that affect your decision to control erosion?
- 4. Do you have access to training/education about how to control erosion? Yes / No
 - 1. By Whom?
 - 2. How often?
 - 3. Do you participate?
- What are the methods you use to avoid erosion? (Contour farming, Terraces, Soil bunds, Stone bunds, Mulching, Fallowing, Grass strips, Controlled grazing, Tree planting, Microbasin, Check dam, Multiple cropping)

Part 6 Future Perspective

1. What do you plan/ or wish to do in the future?

Extend farming activities, Extend livestock, Getting more resource out of the forest, Enrichment of crop (different crop than nowadays), plant more multipurpose tree species, No changes, other:

2. Do you see any limitations to realize your plans or is there a need for support?

Financial limitations, human capacity, knowledge transfer, training needs, Competition with other farmers

3. What do you think will be the most limited resource in future?

Fuel wood, Wood for construction, NTFP, Land to expand farming activities, Land for grazing the livestock

e) Annex 5: Relevé Sheets

Relevé Sheet to record Land Cover & Use (Agroforestry / Community Plantation)

Plot observation:	Date:				
Kebele:	Locality (N,W,S,E):				
GPS No.:	N:	E:			
Landform:		Slope class (flat, rolling, steep, very steep)			
Accessibility:					
Erosion (gully, landslide, stones, degraded soil) other:					
Ownership:					
Land use (cultivation%, multipurpose trees%, shrub%, grass%)					
Tree Species on site:					
Crop types on farm land:					

Remarks	

Relevé Sheet to record Land Cover & Use (Reforestation / Enrichment Planting PLOTS)

Plot observation	on:			Date:		
Kebele:		Locality (N,W,S,E):				
GPS No.:		N: E:				
Landform:	orm:			Slope class (flat, rolling, steep, very steep)		
Accessibility:						
Ownership:						
Grazing (high	, medium; l	ow, none)Wood collection (high, medium; low, none)				m; low, none)
Disturbance (high, medium; low, none)						
Crown cover & Species Composition		Closed		Moderate (<70%)	Ope	en (<30%)
	Upper					
	Lower					
Dominant Tree Species (upper / lower) with Scientific Name						
Description of Regeneration size, age	Natural (> 2m)					
Remarks						

f) Annex 6: Share of core zone area on administrative boundary (Kebele level)

WEREDA	Kebele Name	Kebele Size (ha)	Core Area (ha)	Percentage (%)
Gawata	Yeshana Turana	16606,19	0,16	0,00
Gawata	Saja	3504,81	1,83	0,05
Gawata	Saja	3504,81	844,14	24,09
Gawata	Immicho	1344,52	0,07	0,01
Gawata	Immicho	1344,52	247,88	18,44
Gawata	Tagera	1255,89	3,95	0,31
Gawata	Tagera	1255,89	20,43	1,63
Gawata	Duma	1590,78	273,21	17,17
Gawata	Kasha	6023,53	667,28	11,08
Gimbo	Tula	2851,05	544,50	19,10
Gawata	Gawa Mecha	2140,69	267,87	12,51
Chena	Chomecha	5273,22	915,44	17,36
Bita	Hamani	5995,12	696,21	11,61
Bita	Washero	9349,13	2934,51	31,39
Gimbo	Yeyibitto	4698,36	0,15	0,00
Bita	Amesha Mecheta	8936,73	1864,36	20,86
Gimbo	Bitta Chega	4814,36	751,27	15,60
Bita	Shota	6928,12	1714,21	24,74
Adiyo	Kalisha	2197,71	315,85	14,37
Adiyo	Angiyo Qolla	5627,53	15,14	0,27
Bita	Yina	3598,33	61,07	1,70
Chena	Gopa	1526,48	66,87	4,38
Adiyo	Alarigata	2496,56	180,99	7,25
Adiyo	Chare Guta	2461,64	1691,52	68,72
Adiyo	Rosha	3264,76	2542,53	77,88
Adiyo	Chega	2252,32	429,11	19,05
Decha	Gedam	942,90	19,53	2,07
Decha	Modiyo Gombera	3193,09	466,99	14,62
Adiyo	Mecha	2590,50	522,80	20,18
Tello	Achi'ino	1067,44	16,43	1,54
Decha	Erimo	1682,16	56,76	3,37
Tello	Shinato	1177,72	5,64	0,48
Decha	Awasho Qofira	799,28	139,80	17,49
Tello	Shosha	1744,98	281,85	16,15
Decha	Awasho	1032,05	290,24	28,12
Decha	Mankira	1146,29	15,99	1,40
Decha	Chiri	4189,96	612,54	14,62
Decha	Budi	1393,19	380,24	27,29
Decha	Ufa	2668,59	779,00	29,19
Decha	Yoka	3594,98	1147,55	31,92
Chetta	Wertta	2837,99	364,18	12,83
Gimbo	Michity	5758,46	974,64	16,93
Decha	Daga	8625,95	1985,05	23,01
Decha	Qeshi	1799,38	241,20	13,40
Decha	Yaha Checha	3146,74	290,77	9,24
Adiyo	Boqa	4412,29	249,15	5,65
Decha	Gessa	2592,80	0,07	0,00
Decha	Ogiya	3060,61	198,76	6,49
Gawata	Medabo	8056,89	1310,90	16,27
Gawata	Wediyo	6852,83	523,39	7,64
Gimbo	Kutti	3817,94	248,07	6,50
		4		