Biannual Report

EthioTrees – Tembien Project

July 2018 – July 2019

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Submitted by: EthioTrees vzw

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Summary

Project overview	
Reporting period	July 2018 – July 2019
Geographical areas	Dogua Tembien (Tembien Highlands), Tigray Region, Ethiopia
Technical specifications in use	See approved PDD EthioTrees

Note: Exceptionally, EthioTrees submits this biannual report, in order to request issuance for 9 new sites that were added in July 2018. As of 2020, these new sites will be incorporated in the standard annual report, running from February till February.

Table 1: Summary table

Project indicators	Historical	Added/ Issued this period (July 2018-July 2019)	Total
No. smallholder households with PES agreements	0	0	0
No. community groups with PES agreements (where applicable) by Feb 2019	9	9	18
Approximate number of households (or individuals) in these community groups	1650	*1793*	*3443*
Area under management (ha) where PES agreements are in place	1174	718	1892
Total PES payments made to participants (USD)	31,793*	35,389** (= from issuance of Feb. 2019)	67,182
Total sum held in trust for future PES payments (USD**)	2,947	0	0
Allocation to Plan Vivo buffer (tCO_2)	2,278	619	2,897
Saleable emissions reductions achieved (tCO_2)	20,498	5,572	26,070

Unsold Stock at time of Submission (PVC)	
Vintage Feb 2018 - Feb 2019	48

Plan Vivo Certificates (PVCs) issued to date	**20,498**
Plan Vivo Certificates requested for issuance (July 2018 – July 2019 Vintage)	**5572**
Plan Vivo Certificates available for future issuance	**0**
Total PVCs issued (including this report)	**26,070**

* USD values based on EUR to USD conversion rates on 28/02/2019 (source: www.xe.com)

** USD values based on EUR to USD conversion rates on 05/09/2019 (source: www.xe.com); the amount of 35,389 USD is mainly derived from the issuance of Feb. 2019, and to date most investment decisions are still under discussion by the communities to be implemented after the rainy season.

Part A: Project updates

A1: Key events

- Formation of the associations / focus groups in 9 newly added exclosures was completed at the earliest phase of the vintage period, i.e. by July 2018. The new exclosures are: May Baeti, Lafa, Daero Hidag, Togul, Sesemat, Adi Meles, Chele Quot, Katna Ruba, and Gojam Sefra. Collection of baseline data was finished at these 9 exclosures by July 2018 (see Annex 2 for full baseline presentation). The lithology, soil, climate, elevation, location and management of all of these exclosures are coherent with the applicability criteria outlined in Part G of the Project Design Document (PDD). This has been also confirmed by the project validator, who has previously visited these sites in addition to the original project sites (see Annex 4).
- The baseline data of 9 new sites were gathered and the data collection at these sites was finalized in July 2018.
- In one site, Seret, EthioTrees is working together with the NGO WeForest. The site Seret is to be added in the PES project later (probably in 2020), as the project development in this location is fully in line with the approved PDD of EthioTrees. While EthioTrees is the main developer of the PES project, serving as the Coordinator, the project at Seret is managed in the field by WeForest. A memorandum of understanding was concluded between the two parties. EthioTrees Ethiopia will audit the Seret project once per year, in order to ensure that the project complies with the EthioTrees PDD and PES agreement. However, as several practical issues still need to be clarified further, especially within the PDD, the site of Seret is not included in this issuance request.
- Several trainings have been organised over the reporting period: 1 training per exclosure (n = 9) was organized, covering the newly added exclosures. Training focussed either on environmental management of the exclosure, or on the valorization of the non-timber forest products derived from these exclosures. Special attention was given to marketing training, in order to strengthen the negotiation position of the participating communities when selling the non-timber forest products. Environmental investments (percolation ponds, planting) were made.
- Further developments of the scientific VLIR-South Initiative between Ghent University (Belgium) and Mekelle University (Ethiopia) over the course of 2018 and 2019. The aim of this 2-year SI project is to estimate the valorization potential of ecosystem services from exclosures in the Tembien Highlands. The project analyses different ecosystem services and estimates their potential for involvement in the Plan Vivo scheme. The project is also investigating whether sustainable essential oil production can increase the cash income of landless farmers. In so doing, the project (i) gives scope for future valorization of ecosystem services in larger parts of north Ethiopia (thus outreaching to include other potential exclosures), and (ii) enhances the capacity of the Departments at Mekelle University (Business, Environmental Management and

Chemistry), including their capacity to conduct participatory action research. Over the course of 2018, five Ethiopian MSc. students and two Belgian MSc. students enrolled in the South Initiative programme, supported by EthioTrees. Final results are expected by December 2019.

- At the beginning of January 2019, the EthioTrees project was showcased on Tigray Television – the regional television station – thus presenting the project mission to a broad audience across Tigray.
- In its long-term strategy, EthioTrees aims to regenerate forest patches in two altitudinal belts of Dogua Tembien Highland - an upper belt in the May Zegzeg catchment (draining towards Geba, where roughly 15 smaller exclosures are located) and a lower belt (steep slopes towards Geba, where roughly 4 larger exclosures are located) - following best practices in forest landscape restoration, with the aim to support naturally-assisted regeneration, improve ecosystem services and community resilience.
- EthioTrees cooperated with the Springer (publishing house) initiative to finalize a "tourist" GeoGuide for the Tembien Highlands. The GeoGuide series publishes travel guide type short monographs focused on areas and regions of geo-morphological and geological importance including Geoparks, National Parks, World Heritage areas and Geosites. The GeoGuide of Dogua Tembien was published in July 2019. In the future, we aim to get Dogua Tembien listed as a UNESCO Global Geopark.
  For the guide, please see: https://www.springer.com/gp/book/9783030049546

A2: Successes and challenges

- Main successes included the collection of all required baseline data in the new exclosures, the organisation of trainings, and the accomplishment of the formation of the associations and focus groups in the new exclosures.
- The main challenge included the creation of awareness of environmental degradation and management by the local population (still in terms of cattle grazing).
- Trainings and group discussions have taken place. The main focus of these discussions was the protection of the exclosures (keeping out the grazing) and on management of the exclosures (seedling planting and seedling irrigation, and soil and water conservation (percolation ponds, soil bunds and trenches)). Site-specific trainings were also organized, concerning improved market access for incense at incense-producing exclosures and management of bee hives at honey-producing exclosures.

A3: Project developments

Below, we give an overview of the project developments that have affected the governance, operations, contractual relationships or legal basis of the project:

- Expansion of the closely connected scientific VLIR-South Initiative between Ghent University (Belgium) and Mekelle University (Ethiopia) over the course of 2018 and 2019. Seven MSc. students are involved, as well as four University departments. One chemistry thesis focuses on the optimization of the extraction of aromatic oil from *Boswellia papyrifera* (the dominant frankincense tree of Tigray) resins.
- Plan Vivo maps and PES-agreements, also supported by the *tabia* administrations, have been made.
- Formations of some associations were formalized. Examples of certificates of registration are available upon request.
- There are no relevant updates to the project documentation.

A4 Future Developments

- Further activities next year will include trainings, seedling planting and seedling irrigation, and the installation of soil and water conservation structures such as percolation ponds, trenches and soil bunds.
- After this expansion phase, the project aims to stop expanding over the next year, in order to consolidate the current areas.
- The baseline data of the exclosures added to the project in July 2018 is provided in Annex 2. Plan Vivo Certificates for these sites are requested for issuance *ex post*.

- # Project activities

B1: Project activities generating Plan Vivo Certificates

- We list the technical specifications being used in the project, the area covered and participants using these specifications in table 2 below. We only include those areas where PES agreements have been signed.

Table 2: Project activity summary

Name of technical specification	Area (Ha)	No smallholder households	No Community Groups
Ecosystem Restoration in the Tembien Highlands	1892 ha	1650 (previous periods) + 1793 (added here) = 3443 in total	18

- EthioTrees had expanded the number of exclosures with nine new sites by July 2018. These included May Baeti, Lafa, Daero Hidag, Togul, Sesemat, Adi Meles, Chele Quot, Katna Ruba, and Gojam Sefra. These 9 exclosures comply with the following criteria:

1. These 9 project sites are located on limestone lithology;
2. Soils of these project sites are dominated by Leptosols, Regosols, and Cambisols and not by Vertisols;
3. Sites are located between 12–15° N latitude and 36° 30'–40° 30' E longitude;
4. All sites have tropical semi-arid climate;
5. The altitude of the project sites varies between 1500 and 3000 m ASL;
6. Grass harvesting (using a cut and carry system) is permitted in accordance with the PES agreement;
7. The exclosures are located on former degraded rangelands or wastelands and not on former croplands or important grazing lands;
8. There is a set of clear rules (village by-laws) to regulate exclosure establishment and to ensure that the local population can receive ecosystem services of non-forest timber products;
9. There was willingness to establish a formal association or focus group of landless farmers;
10. To avoid increased grazing pressure elsewhere in the village, there is clear effort by the local population to encourage livestock feeding in the stable.

The compliance with these criteria has been also confirmed by the project validator, who has previously visited these sites in addition to the original project sites (see Annex 4).

B2: Project activities in addition to those generating Plan Vivo Certificates

- Trainings were organized to support non-timber forest production, including incense production in Katna Ruba. Around the Seret site (issuance request not included in this report), community members are engaged in a variety of project activities for income generation purposes. They are trained to nurture the seedlings at community-nurseries and then plant and protect the saplings. Alongside this, the project targets women and young adults for training in additional livelihood initiatives to satisfy their nutritional, financial and energy needs in ways that ease pressure on the forest. These initiatives include apiculture, agroforestry and fodder production. Locals are trained to harvest grasses sustainably through a cut and carry system, which will then be divided amongst community members to feed livestock in place of open grazing. Honey is very attractive livelihood option for the community. There are two bee-hive cooperatives set up in the Seret area. In Seret, two nurseries were started that are now in operation: Mygoa and May'sehe.

- # Plan Vivo Certificate issuance submission

C1: Contractual statement

- This issuance is based on Plan Vivo maps and signed PES agreements with participants complying with all the minimum requirements stated in these agreements.

C2: Issuance request for projects where issuance is made on the basis of ongoing activities on land already managed by the project (calculated *ex-post*).

Table 3: Statement of tCO2 reductions available for issuance as Plan Vivo Certificates based on activity for reporting period July 2018 – July 2019.

Area ID	Total area (ha)	Tech. Spec	Saleable ER's (tCO_2) available from previous periods	Total ER's (tCO_2) achieved this period	ER's minus leakage of 2%	% Buffer	No. of PVCs allocated to buffer from ER's achieved this period	Saleable ER's (tCO_2) from this period	Issuance request (PVCs)	ER's (tCO_2) available for future issuances
May Baeti	*45.96*	*Ecosystem restoration*	0	291.64	285.81	10	28.58	257.23	257.23	-
Lafa	*44.97*	*Ecosystem restoration*	*0*	228.75	224.18	10	22.42	201.76	201.76	-
Daero Hidag	*112.05*	*Ecosystem restoration*	*0*	936.77	918.03	10	91.80	826.23	826.23	-
Togul	*36.00*	*Ecosystem restoration*	0	190.12	186.32	10	18.63	167.69	167.69	-
Sesemat	*46.00*	*Ecosystem restoration*	0	510.17	499.97	10	50.00	449.97	449.97	-
Adi Meles	*64.79*	*Ecosystem restoration*	0	399.71	391.72	10	39.17	352.54	352.54	-
Chele Quot	*50.00*	*Ecosystem restoration*	0	277.82	272.26	10	27.23	245.04	245.04	-
Katna Ruba	*44.00*	*Ecosystem restoration*	0	480.40	470.79	10	47.08	423.71	423.71	-
Gojam Sefra	*275.00*	*Ecosystem restoration*	0	3002.52	2942.47	10	294.25	2648.22	2648.22	-
TOTAL	718.77		**0**	6317.90	6191.54	10	619.15	5572.39	5572.39	**-**

C3: Allocation of issuance request

- The table below details the allocation of issuances from this project.

Table 4: Allocation of issuance request

Buyer name/ Unsold Stock	No. PVCs transacted	Registry ID (if available) or Project ID if destined for Unsold Stock	Tech spec(s) associated with issuance
Ethiotrees (first issuance)	*4,873*	*104000000014099*	*Ecosystem Restoration*
Ethiotrees (second issuance)	*5,856*	*104000000014099*	*Ecosystem Restoration*
Ethiotrees (third issuance)	*9,769*	*104000000014099*	*Ecosystem Restoration*
Ethiotrees (this issuance)	*5,572*	*104000000014099*	*Ecosystem Restoration*
TOTAL	**26,070**	*104000000014099*	*Ecosystem Restoration*

C4: Data to support issuance request

- We provide the monitoring data for areas of land and participants which support our issuance request in Annex 1.

Part D: Sales of Plan Vivo Certificates

D1: Sales of Plan Vivo Certificates

- To date, 20,450 Plan Vivo Certificates have been sold.

Table: Sales of Plan Vivo Certificates

Buyer	Year of transaction	Credits bought (tCO2-e)	Value per tonne (USD*)
Carbon Sink (IT)	2018	5000	
Zero Mission (SE)	2018	5000	
Carbon Sink (IT)	2019	5000	
Zero Mission (SE)	2019	5450	

*USD values based on EUR to USD conversion rates on 05/09/2019 (source: www.xe.com)

Part E: Monitoring results

E1: Ecosystem services monitoring

- We provide annual monitoring results that support the request for new issuances in Annex 1.
- All monitoring targets were achieved.
- No corrective actions needed to be agreed with participants during this reporting period.

E2: Maintaining commitments

- As no participants have resigned or been removed from the project, or had Plan Vivo Certificates allocated against their activities, we do not provide a table with their details in Annex 3.

E3: Socioeconomic monitoring

- We provide the results of monitoring of socioeconomic impacts (survey) every 5 years after baselining (impact indicators). Nevertheless, on a yearly basis, the project monitors its activities (yearly activity-based indicators).

These activities include in this reporting period the organization of 9 training sessions at the different sites.

The restoration project has also clear benefits for the wider communities living around the project exclosures. The most important factors include reduction of erosion and gullying, conservation of soil nutrients and groundwater. For instance, forest restoration will locally benefit water availability for the upslope communities. Overall, we expect a net gain in (ground)water availability, also for the upslope communities. More socioenvironmental investments will be made in 2019 and 2020, through the sales of the Plan Vivo credits.

E4: Environmental and biodiversity monitoring

- The South Initiative of Mekelle and Ghent University is expanding the existing monitoring program that is successfully applied to the previous 9 exclosures towards >2000 hectares (18 exclosures), in order to achieve (statistically) meaningful monitoring data distributed

across the Tembien Highlands. The used monitoring activities are already tested within the 9 exclosures, but a dataset of 18 exclosures will allow comparisons and seek relations between different environmental-explaining factors.

- Besides biomass and soil carbon estimations, the South Initiative also includes monitoring of hydrology. Samples for hydraulic conductivity were taken from different exclosed and adjacent non-exclosed area.

- Based on correlations between soil carbon, above-ground biomass and explaining factors (topography, geomorphology, human activity), the Initiative will create a map of carbon storage potential in the Tembien Highlands. Based on the datasets and the participatory "plan vivo" maps, different scenarios of long-term carbon sequestration will be developed by the end of 2019.

- The Initiative is further examining hydrodistillation activities. The Initiative experimented with different distillation set-ups at the Chemistry Department of Mekelle University to enhance the quantity (yield) and quality (chromatography) of the incense oil. Chromatography was performed on the samples to identify the abundances of the different (organic-)chemical components of the oil. Results of the analysis will be used to expand the distillation innovation center and organise different trainings on aromatic oil distillation.

- The research results will be finalized by 5 MSc candidates from Mekelle University and two MSc candidates from Ghent University (separate funding). A research assistant is permanently assisting with monitoring activities in the field, and will join the EthioTrees project in 2020. The Initiative will also provide two training sessions on environmental economics and GIS at Mekelle University. Dissemination of the results and developments is planned in joint meetings / training days between EthioTrees, Mekelle University researchers and local communities.

- No other changes to the monitoring plans or protocols of the project need to be reported in the updates section of this report.

Part F: Impacts

F1: Evidence of outcomes

- We report research outcomes, patterns or trends from ongoing monitoring or other information which supports the impacts – socio-economic, environmental or cultural – which the project has had every 5 years after baselining. In annex 3, we provide a short description of activities with photographs. Up to date, no scientific publications resulting from the project are available yet.

Part G: Payments for Ecosystem Services

G1: Summary of PES by year

- To date, 31,795 USD* in PES payments were made, in accordance with the PES agreements. The budget was allocated in line with the PES allocation key:
  - Adi Lehtsi: 8,321 USD = 236 776 ETB (budget of VP Feb 2016 – Feb 2017)
  - Gidmi Gestet: 2,759 USD = 78 513 ETB (budget of VP Feb 2016 – Feb 2017)
  - Meam Atali: 3,360 USD = 95 587 ETB (budget of VP Feb 2016 – Feb 2017)
  - Adi Lehtsi: 7,361 USD = 209 444 ETB (budget of VP Feb 2017 – Feb 2018)
  - Gidmi Gestet: 1,798 USD = 51 180 ETB (budget of VP Feb 2017 – Feb 2018)
  - Meam Atali: 2,399 USD = 68 255 ETB (budget of VP Feb 2017 – Feb 2018)
  - May Genet: 1,812 USD = 51,557 ETB (budget of VP Feb 2017 – Feb 2018)
  - May Hibo: 1,801 USD = 51,233 ETB (budget of VP Feb 2017 – Feb 2018)
  - Afedena: 2,183 USD = 62,115 ETB (budget of VP Feb 2017 – Feb 2018)
- The different investments as result of another 35,389 USD** from the issuance of February 2019 is still being discussed by the communities.

  *USD values were based on EUR to USD conversion rates on 28/02/2019 (source: www.xe.com)

  ** USD values were based on EUR to USD conversion rates on 05/09/2019 (source: www.xe.com)

- There are no funds being held by the project coordinator at reporting period end and there are no withheld payments at reporting period end.

- All payments are made in line with the terms of PES agreements signed.

Part H: Ongoing participation

H1: Recruitment

- Recruitment of the associations / focus groups in the nine added exclosures was completed at the earliest phase of the vintage period, i.e. by July 2018. Collection of baseline data was finished at these 9 exclosures by July 2018 (see Annex 2). All sites comply with the eligibility criteria set out in the PDD.

H2: Project Potential

- No participant or area under management is on the project's 'waiting list' i.e. where a PES agreement is not yet signed but a *plan vivo* is in use.

H3: Community participation

- We briefly report on the community meetings held throughout the reporting period and attach the pictures of these to annex 2 and 3.

Part I: Project operating costs

I1: Allocation of costs

- We completed the table below summarizing project costs during the reporting period and the sources of income used to meet these costs. The costs (excluding Plan Vivo investments) were fully covered using private donations and limited subsidies.

Table 7: Allocation of costs (for the Feb 2018 – Feb 2019 reporting period).

Expense	Narrative	Amount (USD$)	Contribution from sale of PVCs	Contribution from other sources
Investments	Costs for soil and water investments, planting	8,500	0%	100%
Functioning	Materials, paper, equipment, transport costs	4,200	30%	70%
Personnel	Wages for project coordinator and distillation expert	5,600	30%	70%
Plan Vivo investments	See the socioecological investments described in section A1	31,233	100%	0%

Annexes

Annex 1. Monitoring results that supports the issuance request

Ecosystem Services Monitoring (note: red circle indicates which target value was met)

Activity	Activity Indicator (measure annually)	Annual Targets			Results
		Full Target Achievement	Partial Target Achievement	Missed Target	
Restoration activities	Area of each exclosure undergoing active restoration activities	>10%	=10%	<10%	May Baeti > 10% Lafa > 10% Daero Hidag > 10% Togul > 10% Sesemat > 10% Adi Meles > 10% Chele Quot > 10% Katna Ruba > 10% Gojam Sefra > 10% → *Guarding and restoration activities were covering all areas*
Tree Planting	Number of seedlings	4000 seedlings	3000-4000	<4000 seedlings	*13510 seedlings planted*
	Survival Rate	>30%	25-30	<30%	*Most recent survival rate estimate: 50.4%*

Socioeconomic Monitoring

Activity	Activity Indicator (measure annually)	Annual Targets			Results
		Full Target Achievement	Partial Target Achievement	Missed Target	
Capacity-Building	Number of organized trainings for landless farmers (M/V) per year per exclosure	1		0	May Baeti = 1 Lafa = 1 Daero Hidag = 1 Togul = 1 Sesemat = 1 Adi Meles = 1 Chele Quot = 1 Katna Ruba = 1 Gojam Sefra = 1
	Participants from more vulnerable groups (women, youth, elderly people)	>25%		<25%	*At all sites > 35%*
Availability of	Beneficiaries	>3	<3	<1	*In all exclosures: cut-*

grass fodder	of grass fodder per exclosure				*and-carry system implemented*
Countering displaced grazing	Number of observations of displaced grazing mentioned during the yearly meeting of association, other NTFP users and the village council	<2	2	>2	May Baeti = 0 Lafa = 0 Daero Hidag = 0 Togul = 0 Sesemat = 0 Adi Meles = 1 Chele Quot = 0 Katna Ruba = 0 Gojam Sefra = 0
Countering timber harvesting on public lands	Number of observations of timber harvesting on public lands mentioned during the yearly meeting of association, other NTFP users and the village council	<2	2	>2	May Baeti = 0 Lafa = 0 Daero Hidag = 0 Togul = 0 Sesemat = 0 Adi Meles = 0 Chele Quot = 0 Katna Ruba = 0 Gojam Sefra = 0

Environmental Monitoring

Activity	Activity Indicator (measure annually)	Annual Targets			Result and mitigating actions
		Full Target Achievement	Partial Target Achievement	Missed Target	
Water Management	Number of Percolation Ponds per exclosure	2	<2	<1	May Baeti = 2 Lafa = 2 Daero Hidag = 2 Togul = 2 Sesemat = 2 Adi Meles = 2 Chele Quot = 2 Katna Ruba = 2 Gojam Sefra = 2

Annex 2. Baseline data

Here we add the baseline data and credit estimation for the 9 new sites: May Baeti, Lafa, Daero Hidag, Togul, Sesemat, Adi Meles, Chele Quot, Katna Ruba, and Gojam Sefra. We follow the same methodology and table formats as described in the approved PDD.

Soil and biomass data

NR	Exclosure	Compart-ment	Average circum-ference (cm)	Average diameter (cm)	St. dev. of diameter (cm)	Average crown diameter (cm)	Aver. height (cm)	Aver. number of trees per plot	Carbon content per compar-tment (ton C / ha)	Carbon content all comp (ton C /ha)	Average soil organic carbon content (ton C / ha)	TICS (ton C / ha)	Area (ha)
		A (20x20 m)	13,29	4,23	2,06	1,86	2,12	65,08	4,35				
		B (10x10 m)											
1	May Baeti	C (5x5 m)	4,18	1,33	0,57	0,71	1,04	20,75	1,42	5,77	62,15	67,92	45,96
		A (20x20 m)	13,3	4,23	1,89	2,18	2,42	207,33	13,27				
		B (10x10 m)											44,97
2	Lafa	C (5x5 m)	4,14	1,32	0,51	0,76	1,28	13,83	0,89	14,15	60,63	74,78	
		A (20x20 m)	11,18	3,56	1,94	1,59	2,33	120,63	5,9				
		B (10x10 m)											112,05
3	Daero Hidag	C (5x5 m)	4,41	1,4	0,44	0,58	1,32	15,47	1,07	6,97	49,97	56,94	
		A (20x20 m)	13,56	4,32	1,58	2,75	2,08	115,38	7,07				
		B (10x10 m)											
4	Togul	C (5x5 m)	6,74	2,15	1,14	1,04	1,26	11,25	2,63	9,69	64,03	73,72	36,00
		A (20x20 m)	14,48	4,6	2,31	1,74	2,34	116	9,65				
		B (10x10 m)											
5	Sesemat	C (5x5 m)	4,82	1,54	0,63	0,51	1,17	12,55	1,18	10,82	31,24	42,06	46,00
		A (20x20 m)	13,5	4,29	2,09	2,26	2,3	100,23	6,97				
		B (10x10 m)											
6	Adi Meles	C (5x5 m)	5,39	1,72	0,73	0,85	1,23	7,54	0,93	7,9	60,98	68,88	64,79
		A (20x20 m)	11,56	3,68	1,71	1,81	2,59	190,88	9,05				
		B (10x10 m)											
7	Chele Qot	C (5x5 m)	4,36	1,39	0,44	0,64	1,8	9,5	0,64	9,69	62,53	72,22	50,00
		A (20x20 m)	16,99	5,41	5,07	-	2,36	97,5	22,10				
		B (10x10 m)											
8	Katna Ruwa	C (5x5 m)	6,15	1,96	1,01	-	1,04	5,33	0,98	23,08	NA	43	44,00
		A (20x20 m)	18,28	5,8	5,32	-	2,6	88,18	22,44				
		B (10x10 m)											
9	Gojam Safra	C (5x5 m)	5,76	1,76	0,84		1,42	6,54	0,90	23,33	NA	43	275,00
		A (20x20 m)											
		B (10x10 m)											
10	Seret	C (5x5 m)	see Annex 4							3,37	44,99	48,36	56,00

Carbon benefit calculation

TCB = (TCclimax – TICS) / 20

This yields:

TCB (May Baeti) = (TCclimax – TICS) / 20 = (102.5 – 67.92) / 20 = 1.729 tC/ha/yr

TCB (Lafa) = (TCclimax – TICS) / 20 = (102.5 – 74.78) / 20 = 1.386 tC/ha/yr

TCB (Daero Hidag) = (TCclimax – TICS) / 20 = (102.5 – 56.94) / 20 = 2.278 tC/ha/yr.

TCB (Togul) = (TCclimax – TICS) / 20 = (102.5 – 73.72) / 20 = 1.439 tC/ha/yr

TCB (Sesemat) = (TCclimax – TICS) / 20 = (102.5 – 42.06) / 20 = 3.022 tC/ha/yr

TCB (Adi Meles) = (TCclimax – TICS) / 20 = (102.5 – 68.88) / 20 = 1.681 tC/ha/yr.

TCB (Chele Quot) = (TCclimax – TICS) / 20 = (102.5 – 72.22) / 20 = 1.514 tC/ha/yr

TCB (Katna Ruba) = (TCclimax – TICS) / 20 = (102.5 – 43.00) / 20 = 2.975 tC/ha/yr

TCB (Gojam Sefra) = (TCclimax – TICS) / 20 = (102.5 – 43.00) / 20 = 2.975 tC/ha/yr

Summary

By taking into account the area of each of the 9 exclosures and the project period (20 years), as well as the molar conversion factor of 3.67 (Mekuria et al., 2011), we calculated the total benefits for all project areas combined.

TCB (May Baeti) = 1.729 x 45.96 ha x 3.67 = 291.64 tCO2 per year

TCB (Lafa) = 1.386 x 44.97 ha x 3.67 = 228.75 tCO2 per year

TCB (Daero Hidag) = 2.278 x 112.05 ha x 3.67 = 936.77 tCO2 per year

TCB (Togul) = 1.439 x 36.00 ha x 3.67 = 190.12 tCO2 per year

TCB (Sesemat) = 3.022 x 46.00 ha x 3.67 = 510.17 tCO2 per year

TCB (Adi Meles) = 1.681 x 64.79 ha x 3.67 = 399.71 tCO2 per year

TCB (Chele Quot) = 1.514 x 50.00 ha x 3.67 = 277.82 tCO2 per year

TCB (Katna Ruba) = 2.975 x 44.00 ha x 3.67 = 480.40 tCO2 per year

TCB (Gojam Sefra) = 2.975 x 275.00 ha x 3.67 = 3002.52 tCO2 per year

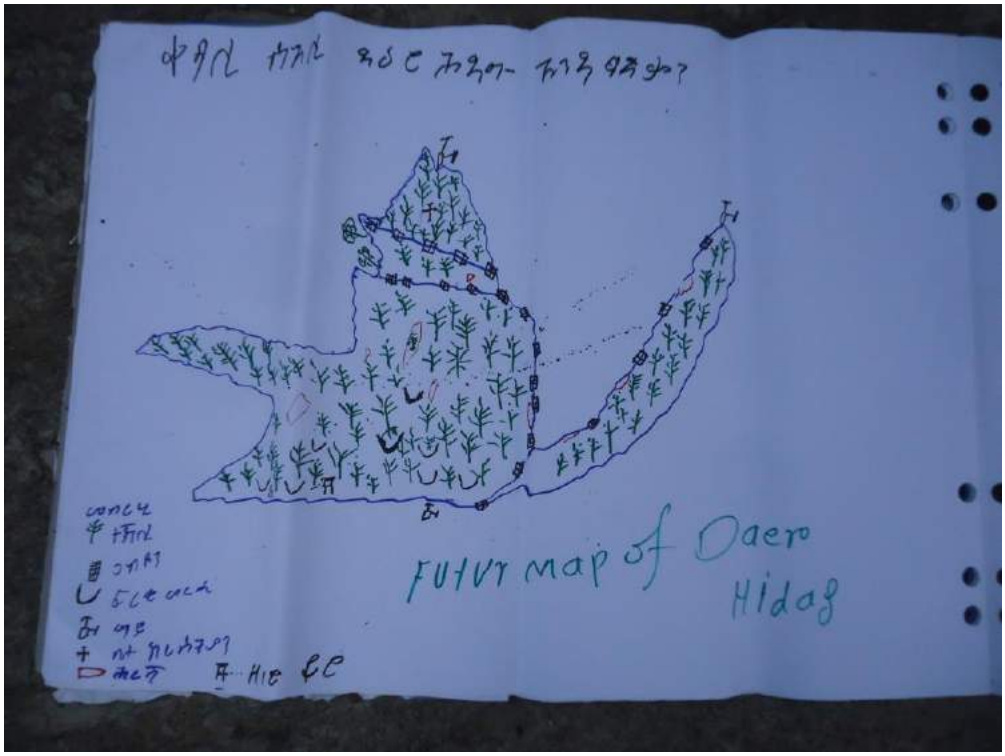
Total Carbon Benefits of the added sites = **6317.9 tCO2 per year**

Plan Vivo maps

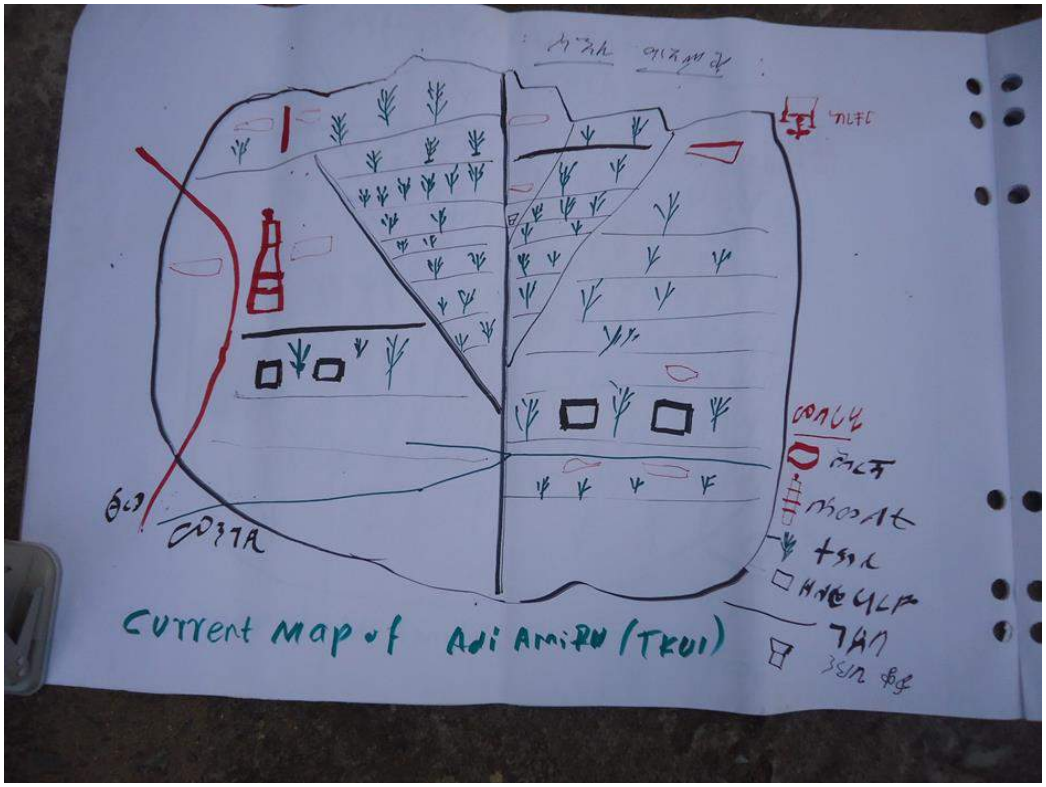
May Baeti

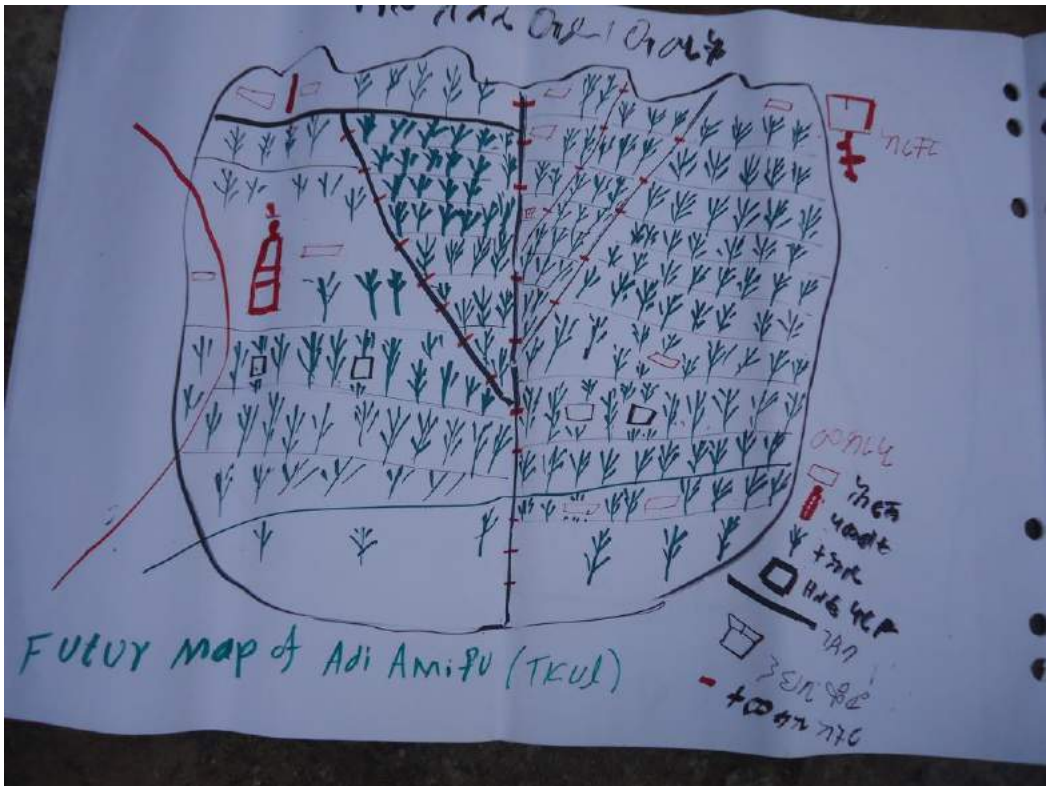
Lafa

Daero Hidag



Togul

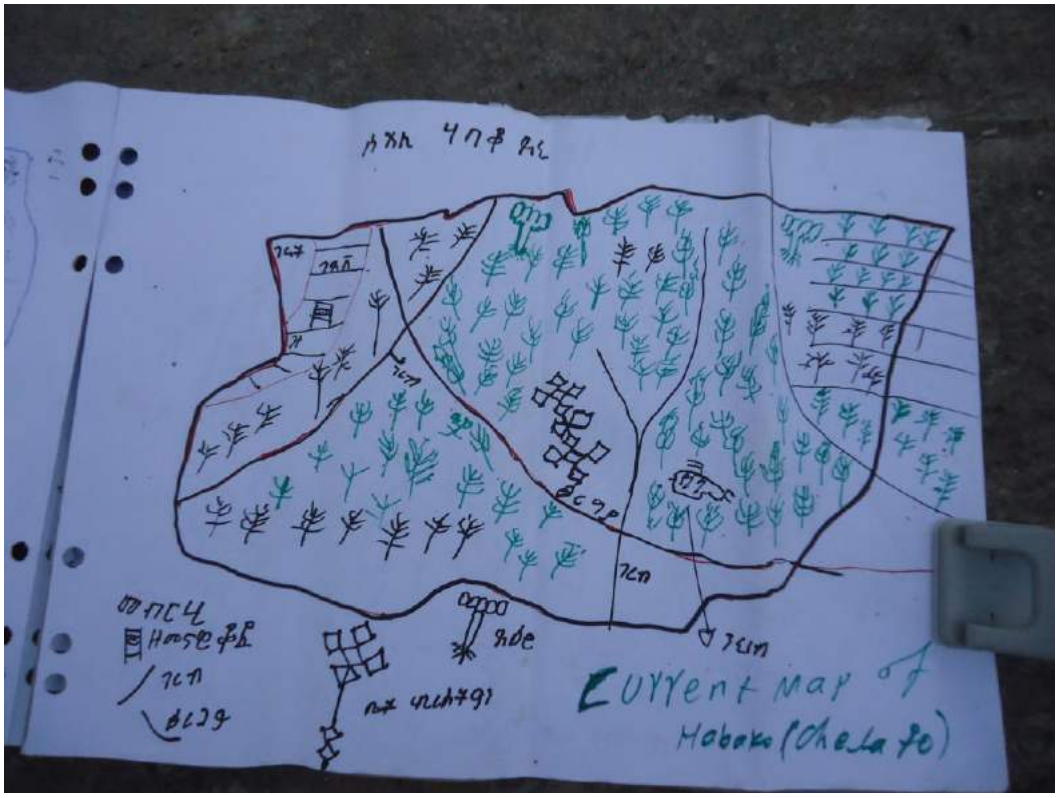




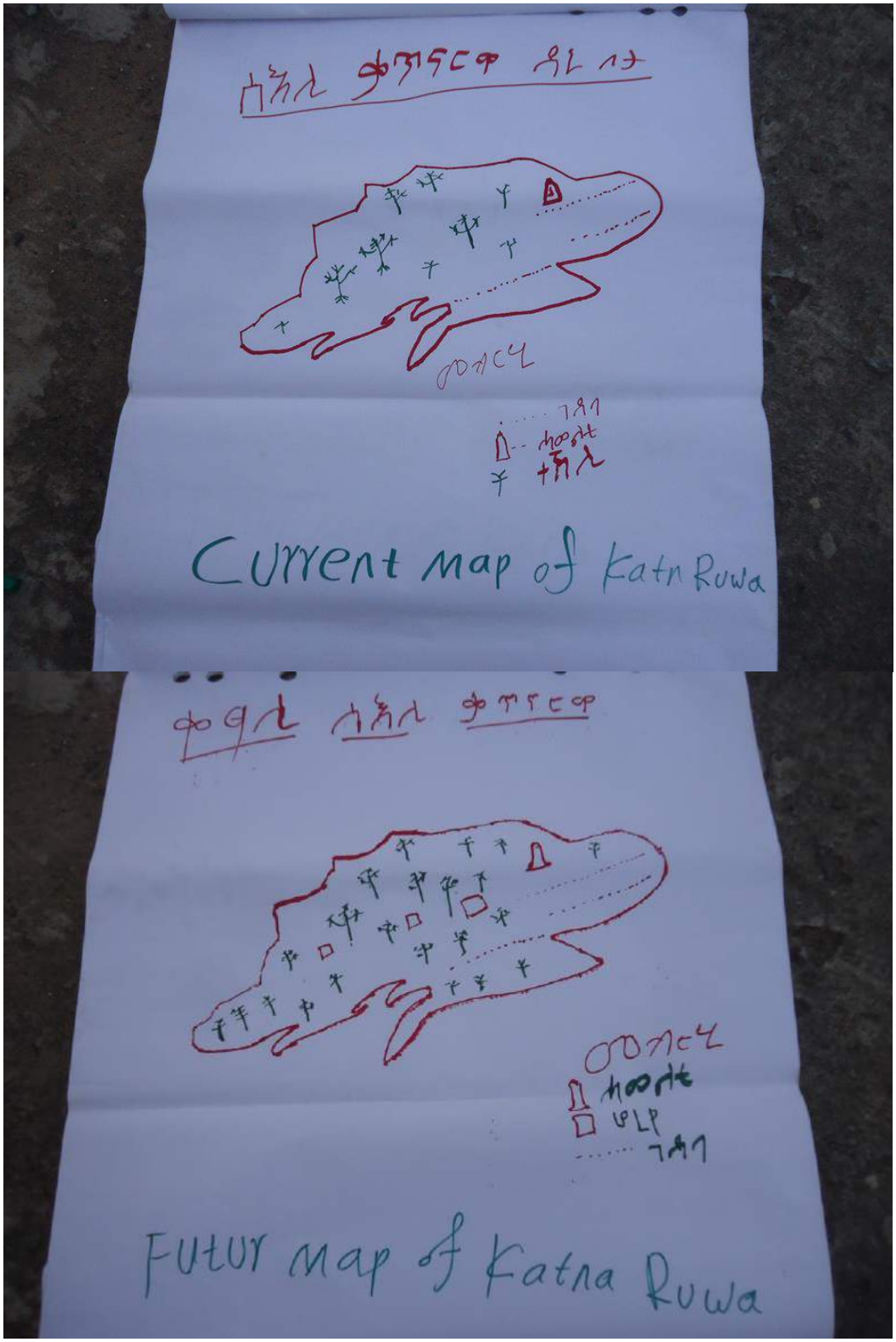
Sesemat

Adi Meles

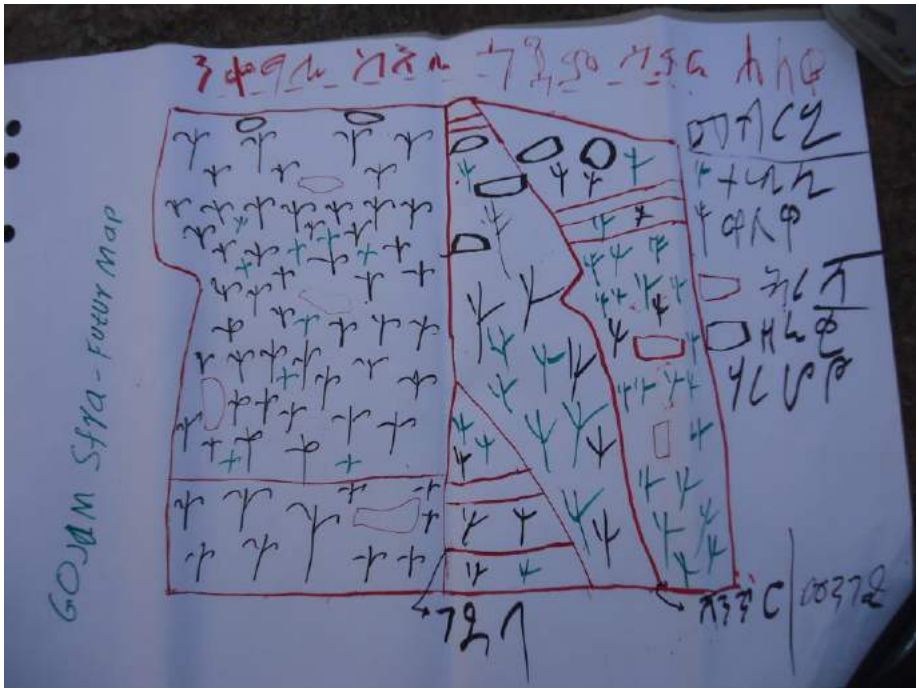
Chele Quot



Katna Ruba



Gojam Sefra



Annex 3. Meeting and activity reports (summary)

Most recent EthioTrees quarterly activity report

EthioTrees Quarterly Activity Report 2019

September 2019

1) Introduction

In this short quarterly report, EthioTrees presents its most relevant activities over the previous quarter. The aim is non-technical: for the technical summaries, we refer to the annual reports of Plan Vivo.

We will present the following aspects of the project:

(i) Community meetings

(ii) Reservoir construction

(iii) Tree planting, soil and water conservation and water harvesting

(iv) Feeding boxes

(v) Gender equality and empowerment

(vi) School construction

In addition to these aspects, the following achievements were made:

- Further developments of the scientific VLIR-South Initiative between Ghent University (Belgium) and Mekelle University (Ethiopia) over the course of 2019. The aim of this 2-year SI project is to estimate the valorization potential of ecosystem services from exclosures in the Tembien Highlands. The project analyses different ecosystem services and estimates their potential for involvement in the Plan Vivo scheme. The project is also investigating whether sustainable essential oil production can increase the cash income of landless farmers. In so doing, the project (i) gives scope for future valorization of ecosystem services in larger parts of north Ethiopia (thus outreaching to include other potential exclosures), and (ii) enhances the capacity of the Departments at Mekelle University (Business, Environmental Management and Chemistry), including their capacity to conduct participatory action research. Over the course of 2019, five Ethiopian MSc. students and 2 Belgian MSc. students enrolled in the South Initiative programme, supported by EthioTrees. Final results are expected by December 2019.

- At the beginning of January 2019, the EthioTrees project was showcased on Tigray Television – the regional television station – thus presenting the project mission to a broad audience across Tigray.

- EthioTrees cooperated with the Springer (publishing house) initiative to finalize a “tourist” GeoGuide for the Tembien Highlands. The GeoGuide series publishes travel guide type short monographs focused on areas and regions of geo-morphological and geological importance including Geoparks, National Parks, World Heritage areas and Geosites. The GeoGuide of Dogua Tembien was published in May 2019. To date, a network is being created to support the recognition for Dogua Tembien as an official UNESCO Global Geopark. *UNESCO Global Geoparks are single, unified geographical areas where sites and landscapes of international geological significance are managed*

with a holistic concept of protection, education and sustainable development. Their bottom-up approach of combining conservation with sustainable development while involving local communities is becoming increasingly popular (UNESCO, 2019).

2. Community meetings

The project works closely with rural households near young exclosures in different villages in Dogua Tembien. During the **first phases** of the project activities, awareness, acceptance and participation of these rural communities in the project are assessed and ensured by the local coordinator. At each exclosed area, the project engages a group of 10-40 landless farmers of different gender and age. A landless farmer represents a household without valid land certificate. The project aims to engage farmers under a 50-50% gender balance.

As all participating farmers are 'landless', they are often relatively young (20-40 years old). The landless farmers are often organised in exclosure associations. The associations elect a representative through a democratic election. The members of the association are 'under rotation' responsible to manage a part of the exclosure (including the patrolling process and the daily management) and are able to benefit from ecosystem services from the exclosure.

After **'plan vivo' maps** are established, EthioTrees organizes discussions sessions and **trainings** to optimally manage a part of the exclosure (guarding proccess, enrichment planting of trees, soil and water conservation, honey production, frankincense cultivation, limited timber production, grasses for livestock feeding in stable). In addition, at least once a year, a discussion session per exclosure is organized, in order to **decide on the investments** coming from the Plan Vivo sales.

We refer to the "passport of exclosures" file for the list of meetings per exclosure group; below we add some examples with photographs of meetings that took place.

To illustrate the impact of training on NTF production, the price evolution of frankincense (before and after project intervention) evolved from 28 ETB /kg to 50-60 ETB/kg. With an average of 4500 kg / association, this delivers an added value of + 144 000 ETB/year (association).

The price of honey went from 200 to 400 ETB/kg with the installation of an extractor machine (while 1 beehive delivers app. 50 kg / year).

Figure 1: Meeting with community in Meam Ataly (dd. 07/02/2019). One main purpose was how the participants could keep the exclosure free of livestock and cutting. Discussions continued on how to clear the soil from the new pond.

Figure 2 (a & b): Meeting with community in Endaslassie society (Gereb gunful, Adiy meles and Chelaqo). A main purpose of the meeting was to have common understanding between EthioTrees and the participants with regards to the exclosure, how Ehiotree could deliver benefits, and how to prepare plan vivo maps.

Figure 3 (a - d): Further meeting with the community in Endaslassie society (Gereb gunful, Adiy meles and Chelaqo), when the focus group was preparing plan vivo maps.

3. Reservoir construction

Access to safe drinking water is one of the most pressing issues in the villages of the North Ethiopian Highlands. Several communities decided to address this issue by investing the Plan Vivo credits in drinking water reservoirs. Excavation of two ponds took place in Adilihsti (Hizaety Gidmy and Horeyo Gidmy). EthioTrees started with a labor force that included around 80 people of the community. The plan was for them to directly participate during the excavation and get benefits of the pond. As it turned out, this was quite heavy work. Therefore, a tender document was prepared and was given to a contractor through a least bidding system. Digging was done through machine (excavator and dump track).

Figure 4 (a & b). Excavation with labor force at Hzaety Gidmy (Adilhtsi).

Figure 5 (a & b). Final excavated pond of Hizaty Gidmy.

Figure 6 (a & b). Excavated pond of Horeyo Gidmy (before and after installation)

For illustration purpose, the dimension of one pond in Adi Lehtsi is 3119 m^3 while the other pond is 2390 m^3.

Another pond was expanded in Gdmi Gestat with machine. In Gedmi Gestate (Adi keshefo) the dimensions include 26.5 x 15 x 4.4m and 8 x 1.6 x 0.6m.

Figure 7 (a -c). Excavation of pond at Adikeshefo.

Also at the Mean Atali site, a pond was expanded with machine. The dimensions included 31 x 10.5 x 3.1 m and 9 x 7 x 1.65 m.

Figure 8 (a - d). Excavation of pond at Adikeshefo. The upper left side is at the start; the upper right side shows the excavation after the works. After some rain and at end of the rainy season, the pond is happily full of water.

4. Tree planting, soil and water conservation and water harvesting

The project further coordinated and supported the associations of landless farmers in maintaining the exclosures, including implementing soil and water conservation activities and planting additional trees to further support the natural regeneration.

The project assists the natural regeneration of the indigenous vegetation, partly through improved management and partly through enrichment planting activities. Enrichment planting to further support the forestation activity and to support biodiversity improvements focusses on indigenous vegetation (Olea, Juniperus, Dodonea, Cordia, Celtis, Acacia); Eucalyptus is not planted in the project areas. The project also implements soil and water conservation activities, including stone bunds, soil bunds, percolation ponds and moisture harvesting structures such as ‘half moons’ to trap runoff

water. The project continuously monitors biodiversity, including both plants and trees as well as (qualitatively) animals (mammals and birds). The survival rate of planted seedlings in 2018 is 50.4%

*Figure 9 (a – d). Moisture harvesting activities at Meam Atali. EthioTrees started to excavate 2 big (6*3*2 m) percolation ponds and 25 moisture harvesting trenches (3*1*1 m) as moisture harvesting structures in the exclosure.*

Figure 10 (a-c). Seedling planting at May Genet (pictures at 17/06/2019) with training of youngsters focusing on small pit excavation for planting seedlings in the exclosure, as well as micro-irrigation.

Figure 11. Irrigation trenches at Sesemat (up), Maibaati (middle) and Gemgema (down). About 20-24 percolation ponds were installed at each site – spatially separated as it provides a good advantage to capture the run off water for infiltration.

5. Feeding boxes

As indicated in all PES agreements, both the associations, other customary NTFP users and the village councils pledge to monitor and counter potential displaced grazing. Livestock feeding in the stable (i.e. through feed boxes) is thus stimulated through trainings, installation of feeding boxes and drinking boxes. Observations of displaced grazing are reported.

EthioTrees selected 40 people from Adi Lihitsi and Meam Atali and provided them with 1.5 quintal - 2 quintal cement and plaster. The participants collected sand and stone masonry to construct feeding boxes at the side wall of their houses.

Figure 12. Making a cattle drinking spot near the reservoir of Meam Ataly with supporting cement – in order to save the animal fodder from wastage; and different feeding boxes near the houses.

Figure 13. Importance of keeping the cattle in the stable and out of the forest, illustrated throught the difference between grazing lands and exclosure lands in Gemgema.

6. Gender equality and empowerment

As an experiment, EthioTrees organized an awareness creation session with regards to the plan vivo planning of the project separately for men and women committees in May Genet. Thus, the village existing map and the future map were designed in separate groups, showing the impact of gender on the spatial planning priorities of the village.

Figure 14. Focus groups preparing plan vivo maps for women and men separately.

7. School construction

In all sites there was participation of community members on road maintenance, water and soil conservation. In Afedena specifically, the community decided to invest part of the plan vivo credits for the construction of the school. EthioTrees helped to transport 9 trucks with stones from the surroundings.

Figure 15. Collecting stone masonry to construct the school and excavation of the foundations.

Annex 4. Statement from the validator

07/09/2019

Dear Sir/Madam

I have seen the criteria discussed in the PDD. I confirm that the lithology, soil, climate, elevation, location and management of exclosures in the proposed expansion sites* are similar with the previously validate site; and the project can be replicated/expanded.

Wolde Mekuria (PhD)

* May Baeti, Lafa, Daero Hidag, Togul, Sesemat, Adi Meles, Chele Quot, Katna Ruba, and Gojam Sefra