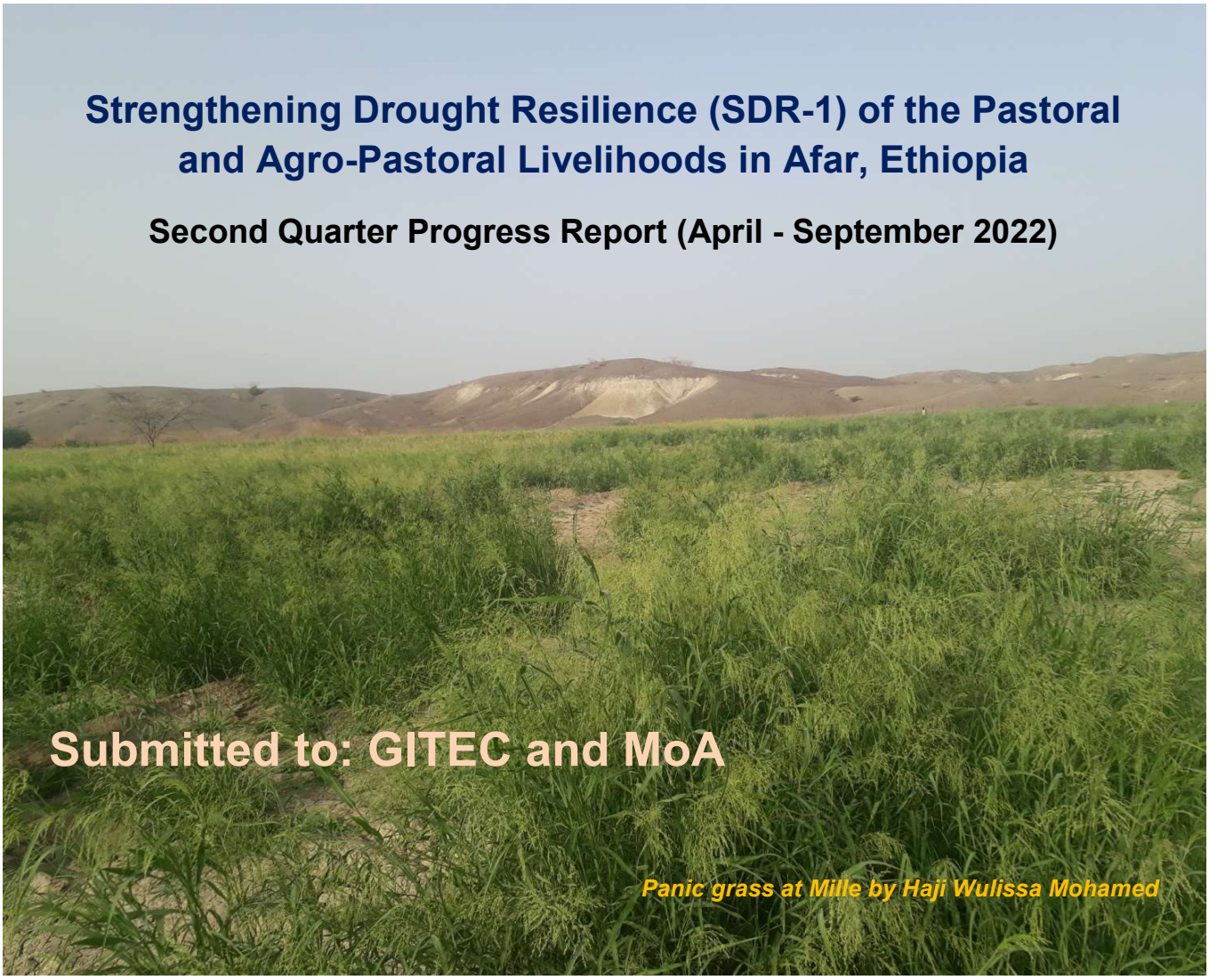
Support for Sustainable Development (SSD)

Strengthening Drought Resilience (SDR-1) of the Pastoral and Agro-Pastoral Livelihoods in Afar, Ethiopia

Second Quarter Progress Report (April - September 2022)



Submitted to: GITEC and MoA

Panic grass at Mille by Haji Wulissa Mohamed

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Addis Ababa

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I. Introduction

Support for Sustainable Development (SSD) is a national, non-profit, charity organization established in May 2003 to support the development initiatives of the poor, neglected, and marginalized communities of Ethiopia. SSD has re-registered and accorded legal entity with registration number 0034 on September 23, 2019 as local organization in accordance with Civil Society Organization's Proclamation No. 1113/2019 by Agency for Civil Society Organizations, Federal Democratic Republic of Ethiopia. SSD envisions "Pastoralists and farming communities in rural and peri-urban areas free from poverty and marginalization". Its Mission is to "Enhance the capacities of communities to become self-sustained through integrated community development programs".

SSD and Ministry of Agriculture, Natural Resources Management Directorate (MoA) have entered a Project Partnership Agreement on the 18th of February 2022.

This report therefore covers from the first up to third quarter project progress implemented during February – September 2022.

II. Main Achievements

Table 1: Summary of achievements

S/N	Description of activities	Unit	Plan	Actual	Deliverables
1	**Planning and kick-off of project activities (1a-1d completed in the 1st Q & reported accordingly)**				
a	Consultative meeting with MoA and GITEC on partnership modality	No.of meetings	3	3	Completed in previous quarters
b	Preparation and signing of partnership agreement	No. of days	5	5	„
c	Preparation and approval of detail work plan including field assessment	No.	1	1	„
d	SSD staff deploying and opening of project office	No. of offices	1	1	„
e	Sensitization of community and local sector offices about the project outcomes and sharing of roles	No. of meetings	8	8	„
2	**Strengthening of pastoralist / agro-pastoralist communities' capacities in sustainable rangeland management and natural resources development**				
a	Identify stakeholders and rangeland users from the target areas	No. of meetings	8	8	Completed in previous quarters
b	Identify rangeland and other natural resources that the local community use	No. of institution	8	8	„
c	Resource mapping including and planning including rangeland, Prosopis and other natural resources	No. of institution	8	8	„
d	Establish rangeland management institutions	No. of institution	2	3	„
	Analyze existing community institutions (SWOT)		8	8	„
e	Community briefing about the mapped rangeland areas and its developments	No. of communitty	8	5	@ Yaldi, Eliwuha, Woransonahormati, Mille 01 and Wanaba
f	Provide training for rangeland committee, Woreda experts and community institutions on resource dispute prevention and resolution	No. of communitty	3	4	@ Yaldi, Eliwuha, Woransonahormati and Wanaba
	Explore existing resource conflicts and resolution mechanisms explaining best practice	No. of communitty	8	8	@all communities
g	Facilitate development of bylaws for managing of the controlled grazing area	No. of communitty	2	4	@ Yaldi, Eliwuha, Woransonahormati and

					Wanaba
	Explore existing community by-laws governing the utilization of NR (SWOT)	No. of communitty	8	8	@all communities
h	Ensuring equitable access to resources and opportunities of women and poor and disadvantaged households	No. of communitty	3	4	@ Yaldi, Eliwuha, Woransonahormati and Wanaba
	Explore existing community by- laws with regard to equity in access to benefits	No. of communitty	8	4	@ Yaldi, Eliwuha, Woransonahormati and Wanaba
3	**Assessing the feasibility of Natural Resource Management/NRM Contracts in the Frame of SDR 1**				
a	Get information and understand the concept of **NRM Contracts** as it is successfully applied in other countries and in German financial cooperation	No.of NRM Contracts	1	1	Copmpleted in previous quarters
b	Assess comprehensively the feasibility of **NRM Contracts** in the frame of the project, especially linked to rangeland rehabilitation and management	No. of study	1	1	„
c	Develop **NRM Contracts** that can support sustainable long-term management of rehabilitated rangeland areas (incl. protection of this areas)	No. of contract	1	1	„
d	Provide an environmental and social impact assessment of developed Natural Resource Management Contracts.	No. of study	1	1	ESIA carried out using checklist
4	**Assessing the feasibility and development potential of riverbed/riverbank cultivation for dry season forage and cash crop production**				
a	Assessing the feasibility of riverbed/riverbank cultivation of seasonal and perennial rivers by use of residual flow and moisture after flooding and/or by pump irrigation	No. of communitty	4	4	Completed in previous quarters
b	Identifying most suitable locations in permanent/seasonal rivers for riverbed cultivation in terms of nutrient status of river sediments, seasonal flood patterns and acceptance/interest of agro-pastoralists communities	No. Of communitty	4	4	„
c	Provide an environmental and social impact assessment of riverbed/riverbank	No. of study	1	1	ESIA carried out using checklist
5	**Assessing the potential use of Bentonite from local deposits for the promotion of Bentonite sub-surface dams and run-off water harvesting ponds for improved livestock and communal water supply**				

a	Staff orientation on bentonite identification, assessment and cost estimation (completed)	No. of training	1	1	Completed in previous quarters
b	Assess the sealing quality of existing Bentonite deposits in Afar region	Lab. Test	1	1	„
c	Assessing the availability, accessibility, and cost of Bentonite from existing deposits	No. of study	1	1	„
d	Providing a cost estimation for the construction of Bentonite sub-surface dams and Bentonite sealed water harvesting ponds	No. of study	1	1	
e	Identify Potential sites for subsurface dam site construction using Bentonite	No. of study	1	1	Completed in previous quarters
f	Provide an environmental and social impact assessment of Bentonite sub-surface dams for water supply and riverbed cultivation	No. of study	1	1	
6	**Assess the feasibility for the establishment of decentralized small-scale irrigation schemes**				
a	Assess the feasibility of community nurseries for contract seedling production in degraded dry season forage reserves and for commercial tree planting where feasible	No. of communitty	4	4	Completed in previous quarters
b	Assess the feasibility of irrigated, intensive forage plots using highly productive forage species (Lablab, Alfalfa, others)	No. of communitty	4	4	„
c	Provide an environmental and social impact assessment for small-scale irrigation schemes	No. of study	1	1	ESIA carried out using checklist
7	**Identify additional small-medium scale irrigation schemes by river diversion including Chifra II for intensive forage and cash**				
a	Identify suitable locations for one or two additional irrigation schemes of up to 200 ha.	No. of sites	2	2	Completed in previous quarters
b	Explain the potentials, technological and economic viability, social acceptance, and risks for the selected scheme locations.	No. of study	2	2	
c	Estimate the number of beneficiary households per proposed scheme.	No. of HHs	-	1,200	Completed in previous quarters
d	Provide an environmental and social impact assessment for small-scale irrigation	No. of study	1	1	ESIA carried out using checklist

1. Planning and kick-off of project activities

1(a). Consultative meeting with MoA and GITEC on partnership modality

SSD conduct three meetings in different times with MoA and GITEC to set the partnership modality and how to implement the SDR1 project activities in the selected 8 communities in Afar where GITEC previously present.

1(b). Preparation and signing of partnership agreement

GITEC prepare the partnership agreement in consultation with SSD and made signed it with MoA at federal level. The partnership agreement document finally shared to Afar natural resource department for follow up and provides the necessary support for SSD while implementing the project.

1(c). Preparation and approval of detail work plan including field assessment

SSD and GITEC jointly prepare the work plan and the field assessment schedules and finally delivered to MoA and approved and let SSD to soon implement the project activities at the selected communities in six districts such as Ada'ar, Mile, Chifra, Gulina, Yallo and Teru.

1(d). SSD staff deploying and opening of project office

In order to implement and monitor the project activities, SSD opened project office at Eliwuha in Ada'ar woreda by hiring staff residence and office. After this SSD employed and deployed 4 project staff and allocate one field vehicle.

1 (e) Sensitization of community and local sector offices about the project outcomes and sharing of roles

During the reporting period, sensitization of the community and local sector offices about the project outcomes and sharing of roles and responsibilities towards rangeland management and natural resources development were carried out. To this effect, all of the 8 target communities and respective sector offices were sensitized and actively involved during the resource mapping and other assessment studies. The target Woredas and communities are depicted in the table below.

Table 2: List of project target Woredas and communities

S/N	Name of Woreda	Name of Community (Kebele)	Remark
1	Ada'ar	Yaldi	Reseeded site
		Eliwuha	Reseeded site
2	Mille	Mille 01	
3	Chifra	Wanaba	Reseeded site
4	Gulina	Wanasana Harigarbo	
5	Yallo	Udaili	
6	Teru	Digdiga	
		Debaho	
	#6 Woredas	**#8 Communities**	

2. Strengthening of pastoralist / agro-pastoralist communities' capacities

In order to strengthen pastoralist communities capacities in sustainable rangeland management and natural resource development under SDR1 project the following main project activities are carried out in the target and communities.

2 (a). Identify stakeholders and rangeland users from target areas

The stakeholders existed in each 6 Woredas and 8 communities have been identified. The process of stakeholder identification was carried out with active participation of respective Woreda Livestock Agriculture and Natural Resources Development Office (WoLANRDO) Kebele leaders other sector offices as well as community representatives. Stakeholder analysis was conducted to identify potential partners working in similar areas of interest.

The identification of relevant stakeholders in relation to rangeland management and natural resources development enables the project for potential collaboration and avoid duplication of efforts.

The stakeholders identified as in most of the target Woredas include; Lowland Livelihood Resilient Project (LLRP), GITEC, GIZ, VSF-Germany, Islamic Relief, Goal Ethiopia, WFP, Save the Children, Action for Integrated & Sustainable Development Association (AISDA), Organization for Sustainable Development, GCF, and COOPI are NGOs along with government partners identified as major stakeholders across the six project-targeted Woredas.

LLRP, which is a government affiliated project and financed by WFP, has a wider coverage and reaches many parts of the project targeted Woredas. As indicated by the participants in KIIs, many of them have experiences of working with pastoralists and agro-pastoralists which can be used as partners as appropriate.

Moreover, the rangeland users have been identified in those three communities who have been managing the pilot reseeded sites. The following table shows the identified target rangeland users.

Table 3: The identified rangeland users at Yaldi, Eliwuha and Wanaba communities

No	Name of woreda	Name of kebele	Target HHs			Population		
			Male	Female	Total	Male	Female	Total
1	Ada'ar	Yaldi	140	90	230	530	669	1,199
		Eliwuha	163	137	300	722	632	1,354
2	Chifra	Wanaba	761	327	1,088	3,474	2,729	6,203
	Total		**1,064**	**554**	**1,618**	**4,726**	**4,030**	**8,756**

Source: Woreda LANRDO

2 (b). Identify rangeland and other natural resources that the local community uses

In order to identify the availability and types of natural resources, a focus group discussion was carried out with Kebele leaders, clan and religious leaders, women representatives, experts from Woreda government office and other community members. Moreover, transect walk and GPS were also used as a data collection tool to identify and geo-reference some important rangeland and natural resources. Thus, accordingly, the assessment team identified a range of rangeland and other natural resources that the local community uses at each of 8 project communities.

Fig 1: Focus group discussion to identify natural resources

Major natural resources identified by the discussants were vast rangeland areas, livestock consists of (cattle, goats, sheep, camel and donkey), Prosopis, ground water excavated and sealed, 'Ellas' (traditional wells), perennial rivers, construction sand, stone and gravel and Bentonite resource. Details of the natural resource identified are listed below in the table.

Table 4: List of some natural resources identified

Woreda	Name of kebeles	Pilot Rangeland area (ha)	Livestock	Prosopis juliflora	Ground water	Earth dam	Ellas	Perennial River	Sand	Stone & gravel site	Bentonite
Ada'ar	Yalid	100	36,389	65% of Kebele	6	1	3 sites				1 site
	Eliwuha	100	26,297	90% of Kebele	2						
Mille	01 kebele	100	4,450	5% of Kebele	3			1	1 site		8 sites
Chifra	Wanaba	100	74,856		2			1			
Gulina	Wanasana Harigerbu	100	35,119	None	1		1 site				
Yallo	Udaile	100	14,606	85% of Kebele	none						
Teru	Debaho	100	51,405	50% of Kebele	1				1	1 site	
	Digdiga	100	51,700	30% of Kebele	2						

Source: PRA exercise results and WoLANRDO

Table 5: Type and number of livestock population in project targeted Kebeles

S/N	Type of Livestock	Total size	Percent
1	Camels	28,465	**10**
2	Cattle	52,619	**18**
3	Sheep	90,487	**31**
4	Goats	118,411	**40**
5	Donkeys	4,840	**2**
	Total	**294,822**	**100**

Source: Woreda LANRDO

2 (c). Resource mapping and planning including rangeland, Prosopis and other natural resources

During the course of the assessment process made with each pastoral community, a short briefing about the objective of the assessment, thematic issues to be focused, and on interview procedures was often provided as an entry point to set the tone for effective and interactive discussion. This introductory note was usually delivered by SSD - community facilitators and Woreda experts.

Participatory resource mapping was also used to identify key natural resources, livestock resources, rangeland areas, physical features, available infrastructures, administrative boundaries, migratory routes of the community and livestock, Prosopis invaded areas as well as project sites.

Figure 2: Community resource mapping at Eliwuha and Yaldi

Figure 3: Community resource mapping at Wanaba community

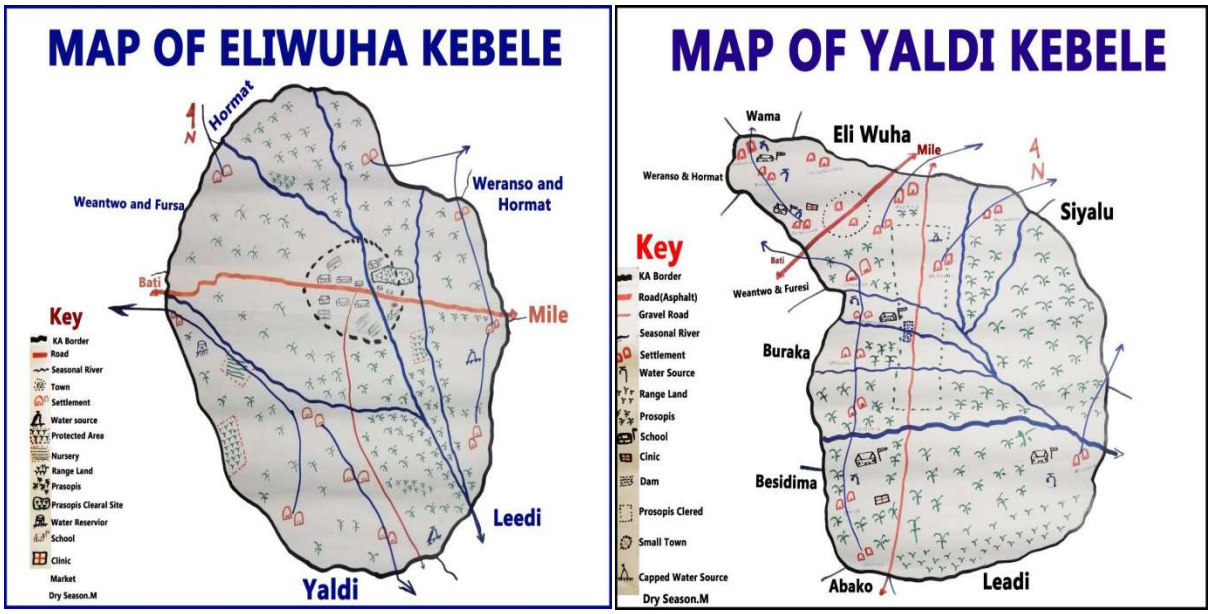

Figure 4: Community resource maps of Eliwuha and Yaldi Kebeles

During the resource mapping process, on average 8-15 community representatives, who are well aware of the respective Kebele resources, were participated in each of the target communities.

Table 6: Number of communities participated in the FGDs

S/N	Nam of Kebeles	Woreda	Number of FGD participants			Remark
			Male	Female	Total	
1	Millie 01	Millie	10	3	13	
2	Eli Wuha	Adaár	8	3	11	
3	Yaldi	"	10	3	13	
4	Wanaba	Chifra	11	4	15	
5	Wanasana Harigerbu	Gulina	10	0	10	
6	Udaili	Yallo	7	3	10	
7	Debaho	Teru	8	3	11	
8	Digdiga	"	8	4	12	
	Total	**-**	**72**	**23**	**95**	
	Percent	**-**	**76%**	**24%**	**100%**	

2 (d). Establish rangeland management institutions

i. Kebele Rangeland Management Committee (KRMC)

Kebele level rangeland management committees established in each of 8 target communities to set up local level rangeland management institution which will lead the overall management of rangeland and natural resources and ensure sustainable utilization.

Table 7: Kebele level rangeland management committee

S/N	List of committee members	Responsibility	Remark
1	Kebele Chairperson	Chairperson	
2	Development Agent	Secretary	
3	Clan Leader	Member	
4	Head of Kebele Women's Affair	Member	
5	Religious Leader	Member	
6	Head of Kebele Youth	Member	
7	Tabia Leader	Member	

The KRMC is expected to jointly work with the Woreda Rangeland Management Committee (WRMC) so as to execute rangeland management activities and reduce pasture shortage in the respective target Kebeles.

ii. Woreda Rangeland Management Committee (WRMC)

The Woreda level rangeland management committee is established to coordinate the overall Woreda level rangeland and natural resources management interventions in close collaboration with KRMC and other stakeholders and ensure sustainable management of rangelands and natural resources. Thus, 8 WRMCs have been established in each of the target Woredas in the frame of the following table.

Table 8: Woreda level rangeland management committee

S/N	List of committee members	Responsibility	Remark
1	Woreda LANRDO	Chairperson	
2	Office of Water Resources	Secretary	
3	Office of Women's Affair	Member	
4	Woreda Office of Justice	Member	
5	Woreda Office of Youth	Member	

2.(e) Community briefing about the mapped rangeland areas and its developments

Community briefing on maps carried out in 5 the target Kebeles at the presence of community leaders and representatives. The major resources available in the Kebele such as dry and perennial rivers, water points, ponds, Ellas, pasture areas, vegetation covers as well as social institutions like dry weather roads, human and animal health centers, schools and villages were presented at the Kebele maps and the community members attended the briefing session appreciated and approved the maps produced by their representatives.

Moreover, the community members have been well aware of the resources available in their Kebele and initiated to further plan and develop their resources to get more benefits in a sustainable way.

Fig 5: Participants on map briefings

Table 9: Map Briefing Target Woredas, Kebeles and Participants

No	Target Woredas and Kebeles	Map briefing participants total			Remarks
		Male	Female	Total	
1	Ada'ar woreda				
	Yeldi kebele	62	34	96	
	Eliwuha kebele	66	33	99	
	Woransona-Hormat	39	11	50	
2	Chifra woreda				
	Wanaba kebele	80	19	99	
3	Mille				
	Mille 01	36	11	47	
	Total	**283**	**108**	**391**	

2.(f) Provide training for rangeland committee, Woreda experts and community institutions on resource dispute prevention and resolution

Training on resource dispute prevention and resolution was organized and conducted at Yaldi, Eliwuha, Woransonahormati in Ada'ar and Wanaba Kebele in Chifra Woredas. Major training topics given to the trainees were focused on rangeland utilization and management, prevention and resolution of disputes among communities rose due to rangeland utilization and the development and approval of by laws that help to guide and control the risks to be happening to the closed and reseeded rangeland areas. In addition to these, issues such as, what were they loose from natural rangeland resources, what type of technologies must apply to the degraded rangeland areas, how to use the reseeded fodder grasses properly and avoiding invasive parthinum grass from range areas were also raised and thoroughly discussed.

The training participants were the rangeland institutions including community representatives from range users, clan leaders, religious leaders, women and youth representatives, development workers and the concerned Woreda pastoral head and natural resource experts who can deal with the rangeland development issues and have direct relation with the wider community members. The

training facilitator was from Regional BoLANRD and he addressed the topics in a participatory way for two days of duration in each of the target community. On the training programs, two experts from GITEC participated and motivated the trainees to contribute on the efforts to develop/ rehabilitate the ruined rangeland areas started at their Kebeles avoiding any resource dispute while developing and using the range areas.

Table 10: Training participants

No	Target woredas and kebeles	Community participants			Woreda participants		
		Male	Female	Total	Male	Female	Total
1	Ada'ar woreda				6	.	6
	Yeldi	35	15	50			
	Eliwuha	34	16	50			
	Woransonahormat	39	11	50			
2	Chifra woreda				6	1	7
	Wanaba	37	13	50			
	Total	**145**	**55**	**200**	**12**	**1**	**13**

Fig 6: Training participants on dispute prevention and resolution

2.(g) Facilitate development of bylaws for managing of the controlled grazing area

In order to make formal and to be able to get legal support from local government in relation to rangeland management and utilization, community by-laws have paramount importance. Thus, based on the regional standard rangeland management by-law, community representatives of each target Kebele invited and discussed on the standard by-law and finally approved their by-law after incorporating some penalty articles as per their local conditions.

Thus, the rangeland management institutions and users of Yeldi, Eliwuha, Woransona-hormati Kebeles in Ada'ar and Wanaba Kebele in Chifra Woreda have developed their own formal rangeland management by-laws in addition to their customary laws to manage and control the proposed and

reseeded rangeland areas. These rangeland by-laws of each target Kebele were approved by the people who came for map briefing sessions. On the event, a total of 391 community representatives (108 women) were participated as shown in the table 2 above. The final endorsed by-law documents have been shared among key Woreda stakeholders such as Woreda Office of Justice so as to support whenever issues come to their office for providing final measures.

2.(h) Ensuring equitable access to resources and opportunities of women and poor and disadvantaged households

According to FGD, the customary law in Afar was not allowed women, poor and disadvantaged households to have equal access to resources belongs to their clan system and opportunities available as there is a patriarchal system that govern the social system. But now this is changed and show some rooms especially for women to share and control household assets as their men brothers.

The project increased awareness to the Kebele heads, clan leaders, other influential persons and the community who have attended trainings, meetings and map briefing sessions on creating equitable access to resources and opportunities to women, poor and disadvantaged groups while sharing the rangeland and other natural resources available in their Kebeles and opportunities to participate on management of the resources.

3. Assessing the feasibility of Natural Resource Management Contracts

3. (a) Get information and understand the concept of NRM Contracts as it is successfully applied in other countries and in German financial cooperation

In terms of providing an environmental and social impact assessment of developed Natural Resource Management Contracts (NRMC), major environmental and social issues identified using checklist. A more elaborated report will be included in the assessment report.

3.(b) Assess comprehensively the feasibility of NRM Contracts in the frame of the project, especially linked to rangeland rehabilitation and management.

Taking into account the draft tools, feasibility assessment carried out in 4 Woredas i.e. Ada'ar, Mille, Chifra and Teru based on the agreed work plan.

The following table shows the potential communities for the application of most of the draft financial

tools.

Table 11: Potential communities for NRMC application

S/N	Financial tool that can be applied	Woredas and Kebele/ Communities	Remark
1	Protection of reseeded rangeland through cash for seeds incentive	▪ Ada'ar (Eliwuha and Yaldi) ▪ Mille (01 Kebele) ▪ Chifra (Wanaba) ▪ Teru (Debaho)	
2	Rehabilitation of Dry Season Forage Reserve (DSFR)	▪ Ada'ar (Yaldi)	
3	Prosopis pod collection and processing	▪ Ada'ar (Eliwuha and Yaldi) ▪ Teru (Debaho)	
4	Intensive rain fed forage production		Lack of sufficient rain fall raised as a short-coming
5	Intensive irrigated forage production	▪ Ada'ar (Burka) ▪ Mille (Dilena Gerarro) ▪ Chifra (Taboji and Gegana Burteni)	
6	Cash compensation for rootstock removal after Prosopis clearing	▪ Ada'ar (Eliwuha and Yaldi) ▪ Teru (Debaho)	
7	Labor compensation for removing re-sprouting Prosopis seedlings	▪ Ada'ar (Eliwuha and Yaldi) ▪ Teru (Debaho)	
8	Labor compensation for fencing of communal forage reserves "Kalos"	▪ Ada'ar (Yaldi) ▪ Teru (Digdiga)	
9	Use of NRMC for maintenance of water resource development structures		The available water resources infrastructures (deep wells) are beyond community capacity to maintain
10	Use of NRMC for SWC measures	▪ Ada'ar (Eliwuha and Yaldi) ▪ Mille (01 Kebele) ▪ Chifra (Wanaba) ▪ Teru (Debaho)	
11	Protection of rehabilitated sites and pilot trial sites by NRMC	▪ Ada'ar (Eliwuha and Yaldi) ▪ Mille (01 Kebele) ▪ Chifra (Wanaba) ▪ Teru (Debaho and Digdiga)	
12	NRMC for procurement of animal feed from external sources	▪ Ada'ar (Eliwuha and Yaldi)	

3.(c) Develop NRM Contracts that can support sustainable long-term management of rehabilitated rangeland areas (incl. protection of this areas)

Major riverbed/bank cultivation environmental and social issues identified using checklist. The interventions have positive impacts in terms of generating income and improving agro-pastoralists livelihood, creating job opportunities and enhance resource use efficiency especially water and land resources. However, the cultivation practices may also cause negative impacts on human, livestock and the environment such as improper use and application of agrochemicals, lack of proper use of PPE (Personal Protective Equipment), oil and fuel leakage, and cutting of trees for fencing

(deforestation). Thus, overall assessment report has been compiled as per the standard checklist and will be included in the final assessment report.

An effort was made to develop a model natural resources management contract. The draft Model NRM Contract will be shared and discussed with the community, Woreda LANRDO staff and GITEC for further enrichment and application in the next quarter. The Model NRM contract is attached in **Annex 1**.

3.(d) Provide an environmental and social impact assessment of developed Natural Resource Management Contracts

In terms of providing an environmental and social impact assessment of developed Natural Resource Management Contracts (NRMC), major environmental and social issues identified using checklist. A more elaborated report will be included in the final assessment report.

4. Assessing the development potential of riverbed/riverbank cultivation

4.(a). Assessing the feasibility of riverbed/riverbank cultivation of seasonal and perennial rivers by use of residual flow and moisture after flooding and/or by pump irrigation

Feasibility assessment was carried out in Ada'ar, Mille, Chifra and Teru Woredas to identify potential sites for river bank/bed cultivation for dry season forage and cash crop production. Hence, there are good river bank cultivation practices in Ada'ar (at Burka River using gravity and pump irrigation), Mille (at Mille River using pump irrigation) and Chifra (at Mille river using gravity irrigation).

Fig 7: River bank cultivation (forage & food crop) at Burka River of Ada'ar Woreda

Fig 8: Forage and Cash crop cultivation by Haji Wulissa Mohamed at Mille River (Mille Woreda)

Fig 9: Cash crop cultivation by Group of agro-pastoralists at Mille River (Mille Woreda)

Fig 10: Food and Cash crop cultivation by Group of agro-pastoralists at Mille River (Chifra Woreda)

4.(b). Identifying most suitable locations in permanent/seasonal rivers for riverbed cultivation in terms of nutrient status of river sediments, seasonal flood patterns, and acceptance/interest of agro-pastoralists communities

As shown in the above pictures, there are suitable locations for river bank cultivation in Millie,

Ada'ar and Chifra Woredas. Though there are wonderful river bank cultivation practices, it was difficult to get not only traditional practices but also feasible potential river beds that have fertile soil to propose for future interventions. However, in Digdiga Kebele (Awura River) of Teru Woreda, there is one site relatively have better river course and soil deposit but needs further study in relation to suitability of the soil and location.

As per the discussion with the target agro-pastoralists who are engaged in river bank cultivation, they are interested to enhance their efforts to produce more forage, cash and food crops. However, they also mentioned various bottlenecks that they face such as lack of technical and input support from concerned government and other development partners, lack of market linkage especially for fodder producers, challenges in relation to maintenance and operation cost of water pumps etc.

4.(c). Provide an environmental and social impact assessment of riverbed/riverbank

In relation to environmental and social impact assessment of river bed/bank cultivation, major environmental and social issues identified using checklist. The river bank cultivation interventions have positive impacts in terms of generating income and improving agro-pastoralists livelihood, creating job opportunities and enhance resource use efficiency especially water and land resources. However, the cultivation practices may also cause negative impacts on human, livestock and the environment such as improper use and application of agrochemicals, lack of proper use of PPE (Personal Protective Equipment), oil and fuel leakage, and cutting of trees for fencing (deforestation). Thus, management plan to enhance positive impacts and reduce negative impacts will be included in the assessment report.

5. Assessing the potential use of Bentonite

5 (a). Staff orientation on Bentonite identification, assessment and cost estimation

A meeting was conducted at SSD office by calling GITEC to clearly understand and what will be expected from SSD on Bentonite field assessment result. In addition, a meeting have also been organized and conducted at Eliwuha town and a filed visit was done at a place where Bentonite processing plant installed by private company and its quarry site. After the field visit again a meeting was done at Semera at GITEC office and discussed on the Bentonite and implementation of other project activities.

5 (b). Assess the sealing Quality of Existing Bentonite deposits in Afar Region

In order to identify the basic physical and chemical properties of the collected Bentonite samples

from each site, the samples have been submitted to Ethiopian geological survey institute laboratory. The Bentonite can have various properties (physical & chemical) and these properties varies depending on the purpose of the Bentonite to be used and hence the laboratory has been requested to identify those properties that can only affect to construction of sand dams. Among the physical properties of the Bentonite which is useful for the construction of sub surface sand dam, its sealing quality and this property will be identified by the laboratory test. In addition, other chemical and physical properties of the collected samples will be reported after the laboratory analysis. All the laboratory analysis result and its interpretations will be presented in the study report after receiving the laboratory result.

5 (c). Assessing the availability, accessibility, and cost of Bentonite from existing deposits

Assessment has been made in the two Woredas, Mille and Ada'ar, to identify Bentonite deposits at different Potential sites or Kebeles and the identified potential sites have been geo referenced. From these sites samples also collected and submitted to laboratory for its physical and chemical analysis. The total number of samples collected was from nine sites, one from Ada'ar Woreda and the remaining eight samples from Mille Woreda. In order to identify unique characteristics of Bentonite from each site and classify it in to different category, samples have submitted to geological survey laboratory and the result will be reported as soon as the analysis completed.

5.(d) Providing a cost estimation for the construction of Bentonite sub-surface dams and Bentonite sealed water harvesting ponds

As the source of Bentonite is distributed throughout the seven study Woredas, cost of each sand dam identified in these Woredas will be done separately. Finally average cost of Bentonite will be set. The cost estimation for Bentonite Sub surface dam is underway and will be included in the assessment report.

5 (e). Identify Potential sites for subsurface dam site construction using Bentonite

Along with Bentonite deposit sites assessment, suitable sites for Bentonite sub surface dam i.e., Sub surface dam to be constructed by using Bentonite has been studied in different Kebeles of seven Woredas of Afar Region.

As per the plan the assessment has been made in seven Woredas (*Ada'ar, Mille, Chifra, Gulina, Yalo, Kori and Teru)*. The study was conducted together with respective Woreda experts and community representatives. All the visited sites are where the community is suffering from

chronic water shortages. As observed in the field, the community is using the available water from hand dug wells of various depth excavated by their own efforts. At these areas, if appropriate technology is applied like sand dam, the available water quantity would be improved and the water shortage problem could minimize. In total, 13 potential sites have been identified. Depending on screening criteria, out of the 13 identified potential sites, a few sub surface dam sites would be recommended for further study.

Table 12: Potential sites identified of Bentonite Sub-Surface Dams

S.N	Zone	Woreda	Kebele	Coordinates		
				X	Y	Z
1	Awusi Rasu	Ada'ar	Yaldi	639225	1243399	821.6
2	Awusi Rasu	Ada'ar	Yaldi	639909.37	1245378.22	
3	Awusi Rasu	Ada'ar	Yaldi	$11^0$15'33.06"	40^0 15'6.57"	
4	Awusi Rasu	Ada'ar	Waranso	$11^0$15.857'	40021.587'	
5	Awusi Rasu	Ada'ar	Yaldi	645918	1234086	696
6	Awusi Rasu	Kori	Adaalana Melke'e	708163	1382738	612
7	Awusi Rasu	Kori	Okare	716068.18	1365893.51	616
8	Awusi Rasu	Chifra		626555.57	1257381.45	962
9	Awusi Rasu	Chifra	Wamanaendalkelo	615468	1274464	939
10	Fantena Rasu	Gulina	Mulinaasale	596309	1338801	948
11	Fantena Rasu	Gulina	Fokisa	590906	1348994	1151
12	Fantena Rasu	Teru	Alalu	639431.03	1369326.8	646
13	Fantena Rasu	Yalo	Dibna	594415	1373550	996

5.(f). Provide an environmental and social impact assessment of Bentonite sub-surface dams for water supply and riverbed cultivation

The major environmental and social impacts in Bentonite Subsurface Dams for Water Supply and riverbed cultivation have been identified. Both positive and negative impacts as well as management plans will be included in the assessment report which is already underway.

6. Assess the feasibility for the establishment of decentralized small-scale irrigation schemes

6.(a). Assess the feasibility of community nurseries for contract seedling production in degraded dry season forage reserves and for commercial tree planting where feasible

The objective of this assessment was to identify sites for the establishment of decentralized community nurseries using small scale irrigation schemes for contract seedling production. Thus, in light of this, assessment was carried out in 4 target Woredas of the project and there are feasible sites and interested agro-pastoralists for the establishment community nurseries for

contract seedling production in Ada'ar (at Burka River using gravity and pump irrigation as well as at Yaldi KA using pump irrigation from community pond), Mille (at Mille River using pump irrigation) and Chifra (at Mille river using gravity irrigation). Table 11 below shows detail information about the identified potential sites and agro-pastoralists including GPS coordinates.

Table 13: Potential sites identified for community nurseries using contract seedling

S/N	Woreda	Kebele	No. of potential sites	GPS location/Coordinates	Remark
1	Ada,ar	Burka	1	11^0 13' 2" N and 40^0 6' 7" E	A group of #30 agro-pastoralists using pump irrigation
			3	11^0 12' 59" N and 40^0 7' 23" E 11^0 13' 1" N and 40^0 7' 19" E 11^0 12' 50" N and 40^0 7' 1" E	#3 agro-pastoralists with an average of 0.3-0.5ha of land size using gravity irrigation
		Yaldi	1	11^0 12' 57" N and 40^0 21' 13" E	Using pump irrigation from Lakiba communal pond
2	Mille	Gegana Burteni	1	11^0 30' 47" N and 40^0 28' 18" E	A group of #50 agro-pastoralists using pump irrigation currently producing food and cash crops on about 5ha of land
		Delina Geraro	1	11^0 24' 09" N and 40^0 51' 50" E	Haji Wulisa Mohammed, agro-pastoralist with 3ha using pump irrigation
3	Chifra	Taboji	1	11^0 37' 41" N and 40^0 1' 54" E	About 41 agro-pastoralists and more than 21 ha of land using gravity irrigation at mille river

6.(b). Assess the feasibility of irrigated, intensive forage plots using highly productive forage species (Lablab, Alfalfa, others)

As per the assessment, the above identified (6a) potential sites and agro-pastoralists are also feasible for intensive forage plots using highly productive forage species (Lablab, Alfalfa, others). Some of them are currently producing forage plants such as panic grass like Haji Wulissa Mohamed of Mille. However, providing technical and material support will be crucial to enhance their production and management capacity.

6.(c). Provide an environmental and social impact assessment for small-scale irrigation schemes

With regard to the environmental and social impact assessment for small-scale irrigation schemes, major impacts have been identified using checklist. The establishment of community nurseries using small scale irrigation schemes will have positive impacts in terms of generating income and improving agro-pastoralists livelihood as well as in enhancing resource use efficiency especially water and land resources. However, the cultivation practices may also

cause negative impacts on human, livestock and the environment such as improper use and application of agrochemicals, lack of proper use of PPE (Personal Protective Equipment), oil and fuel leakage, and cutting of trees for fencing (deforestation). Thus, management plan to enhance positive impacts and reduce negative impacts will be included in the assessment report.

7. Identify additional small-medium scale irrigation schemes by river diversion

7 (a). Identification of Suitable site for two irrigation schemes

An irrigation scheme, Chifra II, has been identified for its potential to irrigate 260ha and benefit about 750HHs in Chifra Woreda. The head work site is identified to command the proposed irrigable area. This scheme is expected to serve both existing traditional irrigation users on the right side of the river (mille) and new plain land for irrigation. The main canal of the scheme should run more than 6km to feed the remote proposed farm area. Moreover, the canal also has to cross a number of natural depressions to reach irrigated farm land safely conveyed by crossing structures.

Additional potential irrigation site has been identified in Gulina Woreda. The source of water for this scheme is Gulina River which crosses the Woreda town - Kelewan. The river has enough amount of discharge at 15km upstream of the town Gulina. The flow decreases as we go downstream of the proposed site and become dry around the town. The flow available during this driest season at the proposed confirms its reliable capacity to serve for irrigation at least two times in a year.

7 (b). Potentials, technological and economic viability, social acceptance and risks for the identified schemes

SSD chief engineer together with project staff and PADO staff has conducted an in-depth study and analysis on the potentials of the source, technological and economic visibility, social acceptance and associated risks of the identified schemes. The detail feasibility assessment report will be delivered as a separate report in future. The key aspects are discussed below.

The proposed headwork site for Chifra II irrigation scheme has stable and good abutment condition. As the width of the river at this site is relatively short, the diversion or intake structure to be built here is economical as compared with the benefit it gives to the community. Though the project shares water from the existing Chifra I irrigation project built by SSD, the river still has

enough flow during driest season to develop the proposed irrigable area. After assessing the physical situation of the site for irrigation infrastructure required, the study team has held discussion with the community and concerned government sector office on the Chifra II irrigation scheme. From the outcome of the discussion, it was clear that the existing project, Chifra I irrigation, has changed positively the understandings of all parties because of the benefits the beneficiary are obtaining from this scheme. Hence, all have shown interest on the proposed project and committed to support the project idea and ready to discharge their responsibility in any case.

Additional potential Irrigation site that identified in Gulina Woreda has originated from high land of Amhara Region. The river is dry around the town of the woreda; the identified site with better discharge is found at 15km upstream the Woreda town. As the study was in driest season, it has been proposed for its enough discharge capacity for irrigation development. Currently, it is serving for livestock and human consumption. The site is not only suitable for its ample flow capacity at this spot, but also the available firm and stable abutment and foundation condition for construction. The current plain land proposed for irrigable area is located on the right side of the river, grazing land and partly covered with shrubs. The command area is also near to the diversion site, the topography and soil type found in the command area is also suitable for irrigated agriculture.

As per the discussion held with Woreda pastoralist office head, the communities are very happy if the source is further developed into modern irrigation scheme. The local community would get multiple benefits. As the proposed scheme is near to the town, there is market accessibility for the farmers to supply the urban dwellers with fruits and vegetables and benefit from the scheme by increasing their income, improve feed for their livestock, improve their food security, etc. Local construction materials are also available within the head work area and accessibility to the construction site and query sites is not difficult as well. Therefore, the study team strongly recommends both potential schemes considering all elements of technical, social and economic aspects benefits could be developed, and benefit much the local community.

7 (c). Estimate the number of beneficiary households per proposed schemes

On the right side of Mille River following the river edge, there are a lot of community members practicing irrigated agriculture by using pumping system from the river. The number of community beneficiary on these traditional irrigation plots are known (documented) and these community members will also be the beneficiary of the proposed Chifra II irrigation project.

The new irrigable area on the other side of asphalt road is large as compared with the existing traditional irrigation plots, hence considering the capacity of the river flow and after allocating portion of the flow to downstream users; it can command large area of agricultural land accommodating more number of beneficiaries. Generally, the beneficiary community or Kebeles are identified during this assessment and more than 750HHs will become beneficiary of the scheme. The other scheme identified in Gulina Woreda has the capacity to develop more than 150ha and serve more than 450 HHs of Gulina Woreda community members.

7(d) provide an Environmental and social impact assessment for small scale irrigation schemes.

The major environmental and social impacts in small-medium scale irrigation schemes by river diversion have been identified. Both positive and negative impacts as well as management plans will be included in the assessment report which is already underway.