



# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



## Site Selection and Prioritization for Piloting Forage Feed Business Models in Ethiopia



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The U.S. Government's Global Hunger & Food Security Initiative

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**Feed the Future Consortium Partners** in the Feed the Future Global Supporting Seed Systems for Development activity:



## ACRONYMS

CIAT	International Center for Tropical Agriculture
FAO	Food and Agricultural Organization
LLRP	Lowlands Livelihood Resilience Project
RiPA	Resilience in Pastoral Areas
S34D	Supporting Seed Systems for Development
SNNPR	Southern Nations, Nationalities and Peoples Region
USAID	United States Agency for International Development

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## INTRODUCTION

Livestock production is an integral part of mixed farming systems in Ethiopia, playing a key role in the Ethiopian economy. However, livestock productivity (e.g., milk yield) is low, due in part to such challenges as drought and lack of sustainable year-round feed supply. Livestock production largely depends on natural pasture and cultivated forage is exercised to a limited extent. Livestock feed is transported to distant places to meet emergency needs.

Forage densification is currently being practiced in many countries. Results from a survey conducted by Feed the Future Global Supporting Seed Systems for Development (S34D) in 2020 showed increased interest by various stakeholders – including government, feed companies, and dairy farms – in forage densification technologies, in addition to high potential for increasing livestock production and productivity and managing associated emergency situations.

In order to improve the quality of livestock feed in Ethiopia, S34D has examined economics-driven business models that use cultivated, forage-based feed. Moreover, to ensure year-round feed supply, S34D explored feed preservation technologies that turn forages into pellets or blocks.

In March 2023, S34D conducted an assessment of potential sites in Ethiopia with the support of HEDBEZ Business & Consultancy PLC in order to support site selection and prioritization of the initial sites for piloting proposed business models. Assessment objectives included:

- Scouting potential sites for large scale forage production and forage-based densification in Ethiopia;
- Assessing the contextual parameters at each site that potentially enable / hinder production and densification;
- Developing a framework to summarize potential strengths, challenges, and opportunities at each site; and
- Providing recommendations and suggestions of site-specific potential business propositions.

## APPROACH

### Overview of the major tasks and approach

Initial sampling steps included focusing -in on the sites for cultivation of improved forages and selecting area-specific forages. A diagnostic study was conducted to assess forage and feed production and marketing and to understand the impact of conflict and drought in the feed supply system. The findings were presented at a stakeholder workshop in October 2020. The workshop participants identified potential sites for forage cultivation and densification.

Secondly, the assessment focused on the warehouse sites for establishing feed banks and garnered government support for such a system. The availability of land, water (irrigation schemes), electricity, and road networks were also reviewed. In order to understand if the local situations had changed after the workshop, a pre-screening interview was conducted by the S34D team and the consultant, with stakeholders in each of the potential sites identified at the October 2020 workshop. Based on the interview, Dugda woreda was dropped due to its fragmented and small size and the high competition for irrigated land between forage, vegetables, and wheat. The Borana area was dropped due to conflict.

Lastly, site visits were made to collect site-specific details and observe the situation. Interviews were conducted face-to-face at the Head Quarters of Resilience in Pastoral Areas (RiPA) north and virtually with the project staff in Afar and Somali regions.

## Selection of sites for data collection

Following the screening interview, the following potential sites for forage cultivation and densification were identified among those suggested at the October 2022 workshop (**Table 1**). The sites fall in five regions, namely Afar, Oromia, Sidama, Somali and Southern Nations, Nationalities, and Peoples Region (SNNPR). The socio-cultural and natural environment in the selected sites differ. As discussed below, the livelihood and production systems are also different.

**Table 1. Potential sites identified to test the proof of concept**

No.	Region	Zone	Woreda/site	Contact Organization
1	SNNPR	South Omo	Dasenech	RiPA South
2	Oromia	West Arsi	Bishan Guracha	Anan Agro Industry
3	Oromia	West Arsi	Shala	Anan Agro Industry
4	SNNPR	Dawuro	Loma	Anan Agro Industry
5	Sidama	Yirgale	Dale	Dereje Ejamo
6	Afar	Zone 1	Dubti	RiPA North
7	Afar	Zone 1	Mile	RiPA North
8	Afar	Zone 3	Gewane	RiPA North
9	Somali	Siti Zone	Covers 6 woredas	RiPA North
10	Somali	Gode	Covers 5 woredas	RiPA North
11	Oromai	West Hararghe	Chiro	RiPA North

## Interview and site visit

In each of the sites, project managers, forage experts, and farm owners were interviewed. In total, 14 persons were interviewed: 2 from Mercy Corps headquarters in Addis Ababa, RiPA south coordinator in Addis Ababa (virtual) were interviewed on general issues and 10 who work at the specific sites were interviewed (**Table 2**).

**Table 2. Persons interviewed during the data collection**

No.	Name	Telephone	Organization	Site
1	Eskindir Yosef	+2519313333	Anan Agro-Industry PLC	Bishan Guracha, Shalla & Loma
2	Anan Jemal (F)	+251920923974	Anan Agro-Industry PLC	Bishan Guracha
3	Samson Esrael	+251913577659	iDE team leader	Dasenech woreda
4	Amare Kebede	+251916075875	RiPA South	Dasenech woreda
5	Mantegaftot Yohanis	NA	Goal Ethiopia	Dasenech woreda
6	Siri Tirfe	NA	Kerech Multipurpose Farmers Cooperatives	Dasenech woreda
7	Dereje Ejano	+251916516396	Mero Dairy Farm	Yirgalem
8	Abdurehman Mohammed	+251910079102	MercyCorps in Afar (RiPA North)	Afar sites (Dubti, Mile and Gewane)
9	Mohammed Muhammed	+251915049970	MercyCorps in Siti Zone, Somali (RiPA North)	Siti zone, Somali region
10	Bedri Yusuf	+251913127244	MercyCorps in Gode Zone, Somali (RiPA North)	Gode zone, Somali region

Including primary interviews to source data, attention was directed to capturing the following issues during the site visits:

- Current forage production system, use of irrigation and irrigation potential and source of energy used for irrigation.
- Access to road, storage facilities and electric supply especially 3-phase for operating densification machine.

- Machinery for forage cultivation, balling and transporting.

The interviews were conducted using the data collection instruments prepared for the purpose (Annex 1).

### ***Summary of the study approach:***

Step 1: Different S34D studies, assessments, stakeholder consultations, and workshops (in-person and virtual) led to a database comprising lists of entities and relevant institutions engaged in forage production.

Step 2: The database was further augmented using information from ongoing USAID project implementation managers and staff members.

Step 3: S34D created two survey instruments. The first is a short screening survey for phone interviews, and then second, a relatively longer survey for on the ground interviews held in person at the sites.

Step 4: Interviews were conducted on the ground and data and information assimilated. After data analysis, a third round of follow-ups and clarifications were sought after through voice chats and emails.

Step 5: Based on densification requirements, and other contextual factors, an analytical framework was designed to assess strengths, weaknesses, challenges, and opportunities for each of the sites and then ranking the sites using their relative pros and cons.

Step 6: Recommendations for consideration, and potential business propositions.

## **DESCRIPTION OF SITES**

### **Forage production – area and system**

***Area cultivated with forage:*** Forage production depends on several factors. The existence of cultivated forage practices indicates the suitability of the natural conditions for forage cultivation, as well as the demand for associated products. Thus, the extent to which forage has been cultivated and the potential for expanding the production was assessed. Availability of irrigation for cultivated forage enables year-round forage production, supply of green forage and increase forage yield. **Table 3** summarizes the area already allocated to forage cultivation, irrigated forage land and potential for expansion of forage cultivation. It also shows the forage varieties under cultivation.

**Table 3. Area under forage cultivation (current and new potential expansion)**

Sites	Area cultivated with forage (ha)	Irrigated area (ha)	Potential area for expansion (ha)	Forage variety
Dasenech	31	31	38.5	Largely Panicum; Rhodes and Alfalfa on small area only by few cases
Dubti	100	50	50	Panicum Alfalfa, and Rhodes grass
Mile	3	3	100	Panicum
Gawane	10	10	0	Panicum and Sudan grass
Siti	32.5	32.5	155	Sudan grass and Panicum
Gode	500	300	70	Sudan grass
Yirgalem	131	0	30	Elephant grass
Bishan Guracha	1.0	1	0	Alfalfa (0.8 ha) and Elephant grass (0.2ha)
Shala*	22		20	Planned to plant Panicum
Loma	600		1700	Local grass

\* Note: Received investment license to start forage cultivation using water form Hawassa Lake

***Forage variety:*** Panicum is the dominant variety of forage cultivated, followed by Sudan grass and Elephant grass. Alfalfa, major protein source, is cultivated and effectively used at Anan Agro-industry PLC. Rhodes is



also cultivated in a few of the sites studied. Access to quality forage seed and knowledge of animal nutrition limit the extent of forage cultivation.

**Forage cultivation system:** The forage production system depends on indigenous knowledge such as intercropping with other crops, irrigated or rainfed, large or small scale. Some location specific production systems are summarized in **Table 4**.

**Table 4. Contextual characteristics by sites**

Sites	Ownership	Planting system	Watering	Scale of production
Dasenech	Group but members operate parcel of land individually	Sole	Irrigated	Small as individual but considered large scale when clusters are considered
Dubti	Private limited	Sole/mono crop	Irrigated	Large scale
Mile	Individual	Sole/mono crop	Irrigated	Small (could expand)
Gawane	Individual	Sole/mono crop	Irrigated	Small scale
Siti	Individuals	Sole/mono crop	Irrigated	Small scale; scattered
Gode	Cooperative	Sole/mono crop	Irrigated	Large scale
Yirgalem	Individuals	Intercropped with Enset and fruit trees	Rainfed	Small scale
Bishan Guracha	Private limited	Sole; rotation practiced	Irrigated	Small scale
Shala*	Private limited	Sole (planned)	Rainfed	Large scale
Loma	Private limited	Mixed local grass	Rainfed	Large scale

\* A new site licensed for forage cultivation

In Dasenech woreda, RiPA supported groups of agro-pastoralists to cultivate forage varieties: Panicum is widely grown while rodhus, Alfalfa and Sudan grass are also found in few cases. The existing forage producing groups of RiPA operates in four farm clusters, two groups as one cluster on eight ha, another two groups on a nine ha cluster, while the remaining two groups work separately having four ha of land each, totaling 31 ha (see **Table 3**). Moreover, cooperatives about 17.5 ha of land with possible expansion for forage production.

The main source of the irrigation water for farmers' crop and forage production is pumped from Omo river using irrigation infrastructure constructed, managed, and operated by the government. The irrigation infrastructure primarily consists of four heavy-duty pumps and a diesel electric generator that supplies power to the pumps and farm structures (canals and division boxes), all of which were constructed by government. Moreover, the government has also been fully covering electric generator fuel, lubricant, operation, and maintenance costs of the pumps and generator. The government (woreda) also provides extension support, inputs (seed and seedlings), and machinery (tractor for land cultivation, baler to balling hay) to farmers engaged in crop and forage production. Solar-powered electric supplies light for the Dasenech woreda town residents; however, there was no solar-powered pump in the area.



**Forage cultivation by settling agro-pastoralists in Dasanech woreda, South Omo**

In Yirgalem, several dairy farmers own small plots of land used for forage cultivation, dominantly elephant grass. Due to land shortages and lack of irrigation water (due to the topography of the farmland), mixed farming of forage crops, fruit trees (avocado, banana), coffee, and *enset* (false banana) is practiced. There are about 15 licensed entrepreneurs engaged in dairy farming, each of which have six ha of land. These entrepreneurs cultivate forage to feed their dairy cows both in fresh and hay forms. Moreover, a 15-member cooperative – each of whom own 2.5 ha (for a total of 37.5 ha) – also cultivate forage intercropped with other crops such as sugar cane and fruit trees.



**Intercropped forage cultivation in Yirgalem, Dale woreda, Sidama region**



***Anan Agro-Industry PLC:*** Anan Agro-Industry PLC owns and manages a high standard dairy farm located on two ha of land in Bishan Guracha in Oromia. One ha is used for rotated alfalfa and elephant grass forage cultivation. The forage farm is irrigated and green feed is produced and supplied to the dairy farm throughout of the year. The company also has a large plot of land for rainfed forage production in Loma, SNNPR. The forage is baled and supplied to back to the farm as well as sold. Moreover, it received license to start large-scale forage cultivation within the Shala woreda in Oromia.



**Anan Agro-industry –forage field and tractor purchased (125 HP) for Shala forage cultivation**

***Forage cultivation in Afar:*** RiPA partnered with three forage cultivators in Afar – one in Dubti, one in Mile, and one in Gewane. The cultivator in Dubti is registered to cultivate forage on 100 ha of land using a gravitational irrigation system constructed by the government for state farms. The irrigation system, however, has been damaged, and thus the company plans to make use of the cost-sharing opportunity provided by RiPA to renovate the system, whereby RiPA covers purchase of items for the renovation and the farms cover the other costs like wage. To date, cultivation has generally started on 5 ha of land and gradually expanded to cover 50 ha. The partner in Mile has historically produced forage on small area for its livestock; however, the farm has an opportunity to expand forage cultivation to abandoned state farm area. The farm works with RiPA to renovate its irrigation system through a cost-sharing approach. The Gewane farm has planned to produce forage varieties, but price competition from vegetable production makes forage production a less-desirable alternative.

The regional government produces forages to meet emergency feed needs. The World Bank Funded Lowland Livelihood Resilience Project (LLRP), hosted by the regional government president’s office, implements livelihood and emergency interventions in 22 woredas. The LLRP activities overlap with RiPA in the Dubti and Amibara woredas. The project is owned by the government, which finances all costs of forage production

and management and distributes forage freely especially during emergency period. In Amibara, it cultivated panicum and rhodes grasses on 50 ha of land.

**Forage production in Somali:** RiPA North also aims to support forage cultivation and marketing in the Somali region, especially in the Siti and Gode zones. In Siti Zone, five partners – each with an average of 6.5 ha (totaling 32.5 ha) – are involved in forage production. Three of the partners are located in Erer woreda, while two are located in different kebeles in Adiyale woreda. The largest partner has 15 ha and cultivates green forage (Sudan grass and panicum) for its own cattle. The partners have only been in business for the last year and thus have minimal previous experience. Production is undertaken using irrigation; however, there is competition with fruit and vegetable production, which attract higher prices.

In the Gode Zone, the process of partner selection for forage cultivation was not completed when the data was collected. However, there is the Bawako Agricultural Cooperative Union, which produces Sudan grass for personal use and sales in the Berano woreda of Gode zone. The union has 500 ha of forage land, of which, 300 ha is irrigated. RiPA is not partnering with the union. The union has 500 ha of forage land of which 300 ha is irrigated. Sudan grass is produced for own use and sales.

### Yield of cultivated forage

Forage cultivation yields have not been well established, with estimates varying greatly. The weight of harvested forage also depends on moisture content. At Bishan Guracha, the assessment team estimated fresh alfalfa yields to be 300 ton/ha (**Table 5**). This figure is based on a sample harvest of 1m x 1 m. Local grass produced with only rainfall is estimated to only yield less than 1 ton/ha/year. Production had not yet commenced in Shala. In Dubti, forage was harvested from five ha of land, but the key informant stated that estimating the yield was difficult since the forage left in the field to dry was looted by someone. In fact, the forage stand should be guarded against the communities' livestock since the community allows animals to graze in cultivated fields. In Mile, all forage harvest was used for own livestock and no yield estimate was established. Production had not yet commenced in Gawane.

**Table 5. Yield of cultivated forage**

Region	Site	Variety	Yield (Ton/ha/year)
SNNPR	Dasenech	Panicum	100
Oromia	Bishan Guracha	Alfalfa and Elephant grass	300
Oromia	Shala	Planned: Panicum	Not estimated
SNNPR	Loma*	Local grass	0.6
Sidama	Yirgalem	Elephant grass	45
Afar	Dubti	Panicum Alfalfa, and Rhodes	Not estimated
Afar	Mile	Panicum	Not estimated
Afar	Gawane	Panicum and Sudan grass	Not estimated
Somali	Siti*	Sudan grass and panicum	2.5
Somali	Gode*	Sudan grass	14.4

\* Converted at 1 Bale= 12 kg

### Purpose of forage cultivation

Cultivated forage is produced largely for one of two purposes – personal livestock feed or income generation through sales (**Table 6**) – which depends on if the firms have a dairy farm or cultivate forage for commercial purposes. On average, 44% of the cultivated forage is used by the producers who own livestock feed while 56% of the amount produced is sold.

**Table 6. Proportion of cultivated forage used for own livestock feed and sales (% of production)**

Sites	Utilization	
	Own livestock feed	Sales
Dasenech	55	45
Bishan Guracha	100	0
Loma	27	73
Yirgalem	70	30
Dubti	0	100
Mile	100	0
Gawane	0	100
Siti	20	80
Gode	25	75
<b>Average</b>	<b>44.1</b>	<b>55.9</b>

### Infrastructure, facilities, and utilities

Infrastructure, facilities, and utilities determine the potential for densification. Access roads, electricity, storages, and machinery are crucial. **Table 7** summarizes the situation of the sites across these enabling factors.

**Table 7. Access road, electricity, storage, and machinery at different sites**

Sites	Electricity	Access road	Storage facilities	Machinery
Dasenech	No access but 3 phase electric supply is found at 70km distance	The roads are all weather no significant problem related to access	3 forage storages (2 stores the capacity of 20,000 bales and 50,000 bales capacity)	2 tractors and 2 baler machines
Dubti	Has 3-phase electricity since the farms were previously used by state farms	Asphalt and gravel road (1hr travel from Samara town)	1 store, capacity not known	None
Mile	3-phase electricity not available on farm	Asphalt and gravel road (5hr travel from Samara town)	None	None
Gawane	3-phase electricity not available on farm	Asphalt and gravel road (6hr travel from samara town)	None	None
Siti	No access but 3-phase electric supply is found at 13km distance	Gravel road and some soil	None	None
Gode	No access but 3-phase electric supply is found at 20km distance	Asphalt but some damages	None	None
Yirgalem	There is 3-phase electric supply near the potential cultivation site (1km distance) but not in the farm area	Asphalt road from Addis Ababa to Dale woreda (Yirgalem) but gravel road to farms	1940m <sup>2</sup> (On average each member/producer own 32m <sup>2</sup> store)	Feed chopper
Bishan Guracha	There is 3-phase electric supply near the site (300-meter distance)	Asphalt road	600 m <sup>2</sup> (50,000 bales)	<ul style="list-style-type: none"> <li>• Medium truck (35 quintals capacity)</li> <li>• Heavy duty tractor</li> <li>• Field vehicle (Pick-up)</li> <li>• Fodder choppers, mixers</li> </ul>
Shala	There is 3-phase electric supply near the site (3 Km distance)	Asphalt road and dry weather road	None	None
Loma	It is very far	All weather road	None	Baler (taken from Bishan Guracha)

## Institutional and political support

In all the sites visited, the key informants acknowledged government support provided for large-scale forage cultivation. The need for livestock feed reserves is a top policy agenda in Ethiopia's pastoral regions (Afar, Somali, SNNPR and Oromia). The livestock directorate provides forage extension services, including on-site training on forage agronomy and on-farm monitoring of the production process to forage producer farmers. The cooperative promotion office organizes forage producer groups into multipurpose cooperatives with the aim to produce and market forage. The office is responsible for organizing and registering cooperatives. It provides technical support in business plan preparation and auditing services for the cooperatives. Several research centers exist and provide technical support in forage production and processing. The Jinka Agricultural Research Center in south Omo shall support forage producers in the Dasenech woreda; the Afar Agricultural Research Center shall support forage producers in Afar; and the Somali Agricultural Research Center shall support forage producers in the Somali region.

## Strengths, weaknesses, opportunities, and threats (SWOT)

Expounding on commonalities and unique features of the sites, brief descriptions of their strengths, weaknesses, opportunities, and threats are given below.

### Dasenech

Category	Forage production	Forage processing/densification
Strength	<ul style="list-style-type: none"> <li>• Settlement of pastoralist around Omo river</li> <li>• Projects supporting forage production and processing</li> <li>• Flat topography and fertile soil</li> </ul>	<ul style="list-style-type: none"> <li>• Baling is practiced</li> </ul>
Weakness	<ul style="list-style-type: none"> <li>• Irrigation is dependent on government</li> <li>• Lack of interest and determination by some group members</li> <li>• High breakage of water pump generator; high fuel cost</li> </ul>	<ul style="list-style-type: none"> <li>• Baling (hay making) is fully financed by government/project except the cutting</li> <li>• Lack of mainline electric grid</li> </ul>
Opportunity	<ul style="list-style-type: none"> <li>• Existence of Omo river for irrigation</li> <li>• Long dry/sunny period providing opportunity for using solar energy</li> </ul>	<ul style="list-style-type: none"> <li>• Existence of cross-border trade with Kenya</li> </ul>
Takeaway	Improve capacity for nutritious forage production	Hay making is an option to access forage [hay] demand in other areas

### Yirgalem

Category	Forage production	Forage processing/densification
Strength	<ul style="list-style-type: none"> <li>• Dairy farmers have high interest to expand dairy</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Weakness	<ul style="list-style-type: none"> <li>• Poor production system; low soil management structure</li> <li>• Low potential for irrigated forage production</li> <li>• Poor dairy feed management</li> </ul>	<ul style="list-style-type: none"> <li>• Limited experience in forage processing</li> <li>• Traditional and low standard storage of feed</li> </ul>
Opportunity	<ul style="list-style-type: none"> <li>• There is good number of dairy cows and hence high potential for increased demand for livestock feed</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Takeaway	Improve capacity for nutritious forage production	• N/A

### Bishan Guracha-Shala

Category	Forage production	Forage processing/densification
Strength	<ul style="list-style-type: none"> <li>• Highly motivated and committed owner/manager to expand forage production</li> <li>• Experience in forage production</li> </ul>	<ul style="list-style-type: none"> <li>• Experience in hay making</li> <li>• Experience in feed marketing</li> </ul>



Category	Forage production	Forage processing/densification
	<ul style="list-style-type: none"> <li>Integration of dairy, poultry, forage production</li> <li>Availability tractor and trucks</li> </ul>	<ul style="list-style-type: none"> <li>Highly motivated and committed owner/manager to engage in forage processing.</li> <li>Own truck for transporting hay for densification/storage</li> </ul>
Weakness	<ul style="list-style-type: none"> <li>Long distance to lake Hawassa for irrigation water supply</li> <li>Need for organic and mineral fertilizers to enrich the soil</li> </ul>	<ul style="list-style-type: none"> <li>Distance between store and Shalla farm</li> <li>Long distance to electric grid at Shalla</li> </ul>
Opportunity	<ul style="list-style-type: none"> <li>Use of manure for fertilizing forage field</li> <li>Demand for feed</li> <li>Exploration of deep well for borehole development</li> <li>High support from government and stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Prevalence of feed shortage in pastoral and lowland area is creating demand for cheaper feed supply from where it exists</li> </ul>
Takeaway	Introduction of panicum grass, increase feed supply to trigger the need for densification	<ul style="list-style-type: none"> <li>Densification at Shalla seems not a possibility but production at least with rainfed system is possible to avail feed (hay)</li> <li>Start with small scale for piloting</li> </ul>

## Afar sites

### i) *Dubti*

Category	Forage production	Forage densification
Strength	<ul style="list-style-type: none"> <li>High irrigation potential; irrigation infrastructure</li> <li>RiPA is highly motivated to partner with forage producers but at initial stages of activities</li> <li>Availability of electricity</li> <li>Existence of storage facilities and access to government machineries like tractor and baler (rental)</li> <li>Ministry of lowland and irrigation maintaining damaged irrigation facility in Dubti</li> </ul>	<ul style="list-style-type: none"> <li>Government experience in hay making</li> </ul>
Weakness	<ul style="list-style-type: none"> <li>Salinity concern in Dubti forage fields</li> <li>Community's attitude regarding cultivated forage for free grazing; risk of conflict</li> <li>Lack of adapted alfalfa variety</li> </ul>	<ul style="list-style-type: none"> <li>Shortage of feed processing experience by the RiPA partners</li> </ul>
Opportunity	<ul style="list-style-type: none"> <li>Demand for feed exists though not well quantified through market studies</li> <li>High support from government</li> </ul>	<ul style="list-style-type: none"> <li>Large storage facility exists but needs further negotiations and arrangement with the government to use</li> </ul>
Takeaway	<ul style="list-style-type: none"> <li>The efforts made by RiPA should mature for drawing lessons on how to scale up forage production and move on to densifications</li> <li>S34D may provide solutions to the forage seed problem</li> </ul>	<ul style="list-style-type: none"> <li>There should be proven volume of cultivated forage to initiate densification</li> </ul>

### ii) *Mile*

Category	Forage production	Forage processing/densification
Strength	<ul style="list-style-type: none"> <li>High irrigation potential; irrigation infrastructure of abandoned state farm can be renovated for expansion of cultivated forage</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

Category	Forage production	Forage processing/densification
	<ul style="list-style-type: none"> <li>• RiPA is highly motivated to partner with forage producers and is applying cost sharing approach to build the irrigation facility</li> </ul>	
Weakness	<ul style="list-style-type: none"> <li>• Community's attitude regarding cultivated forage for free grazing; risk of conflict</li> <li>• Lack of adapted alfalfa variety</li> <li>• Lack of storage facilities</li> </ul>	<ul style="list-style-type: none"> <li>• Shortage of feed processing experience in Mile woreda</li> <li>• Lack of electricity</li> </ul>
Opportunity	<ul style="list-style-type: none"> <li>• Demand for feed exists though not well quantified through market studies</li> <li>• High support from government (forage extension)</li> </ul>	<ul style="list-style-type: none"> <li>• Large storage facility exists but needs further negotiations and arrangement with the government to use</li> </ul>
Takeaway	<ul style="list-style-type: none"> <li>• S34D may provide solutions to the forage seed problem</li> </ul>	<ul style="list-style-type: none"> <li>• The chance for densification is minimal</li> </ul>

### iii) Gewane

Category	Forage production	Forage processing/densification
Strength	<ul style="list-style-type: none"> <li>• High irrigation potential;</li> <li>• RiPA is highly motivated to partner with forage producers and is applying cost sharing approach to expand forage production</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Weakness	<ul style="list-style-type: none"> <li>• Community's attitude regarding cultivated forage for free grazing; risk of conflict</li> <li>• Lack of adapted alfalfa variety</li> <li>• Lack of storage facilities</li> <li>• Forage producer incline to vegetable production</li> </ul>	<ul style="list-style-type: none"> <li>• Shortage of feed processing experience in Mile woreda</li> <li>• Lack of electricity</li> </ul>
Opportunity	<ul style="list-style-type: none"> <li>• Demand for feed exists</li> <li>• High support from government (forage extension)</li> </ul>	<ul style="list-style-type: none"> <li>• Large storage facility exists but needs further negotiations and arrangement with the government to use</li> </ul>
Takeaway	<ul style="list-style-type: none"> <li>• This site may not be a potential for collaboration in the short run</li> </ul>	<ul style="list-style-type: none"> <li>• No chance for densification</li> </ul>

### Somali sites

Category	Forage production	Forage densification
Strength	<ul style="list-style-type: none"> <li>• High irrigation potential</li> <li>• Large land size</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Weakness	<ul style="list-style-type: none"> <li>• Low motivation for partnering for forage production</li> <li>• Low skill in forage production</li> <li>• Limited forage diversity</li> </ul>	<ul style="list-style-type: none"> <li>• No experience in forage processing</li> <li>• Limited facilities like store and electricity</li> </ul>
Opportunity	<ul style="list-style-type: none"> <li>• Demand for feed exists though not well quantified through market studies</li> <li>• High support from government</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Takeaway	<ul style="list-style-type: none"> <li>• The efforts made by RiPA should mature for drawing lessons on how to scale up forage production and pilot densification</li> </ul>	<ul style="list-style-type: none"> <li>• There should be proven volume of cultivated forage to initiate densification</li> </ul>

## SITE PRIORITIZATION FRAMEWORK

The major criteria identified for prioritizing the sites include: area available for forage cultivation, availability of sustainable, ownership, dependency on irrigation system operations, access to the electricity necessary for

densification, environmentally suitable, labor availability, political buy-in, and conflict related to forage usage. These criteria were evaluated in relative terms as shown in **Table 8**). Based on the findings, sites were grouped into high, medium, and low priority (**Table 9**).

**Table 8. Focused criteria-synthesizing across sites**

Criteria	Dasenech	Bishan Guracha/Shala	Yirgalem/Dale	Dubti/Amibara	Mile	Gode
Area for forage cultivation (ha)	54	623	131	400	3	500
Ownership	Private/group	Private	Private	Private	Private	Coop
Irrigation (availability)	Yes	Partial	No	Partial	Partial	Partial
Irrigation (sustainability)	Low	High	N/A	High	Low	High
Independent operation of irrigation facilities	Dependent	Independent	No irrigation	Independent	Independent	Independent
Access to electric power	No	Partial	Yes	Yes	No	No
Terrain	Relatively flat	Relatively flat	Steep slope	Relatively flat (but high temperature)	Relatively flat (but high temperature)	Relatively flat (but high temperature)
Labor availability	Available	Available	Seasonal	From other regions	From other regions	Available
Conflict for forage/land use	Minimal	None	None	High	High	High

**Table 9. Site prioritization based on key parameters**

Criteria	Dasenech	Bishan Guracha/Shala	Yirgalem / Dale	Dubti/Amibara	Mile	Gode
Area for forage cultivation (ha)						
Ownership						
Irrigation (availability)						
Irrigation (sustainability)						
Independent operation of irrigation facilities						
Access to electric power						
Terrain						
Labor availability						
Conflict for forage/land use						
Ranking for large scale forage	2 <sup>nd</sup>	1 <sup>st</sup>				
Ranking for green forage	1 <sup>st</sup>		2 <sup>nd</sup>			
Legend:	Highest	Medium	Low			

## PRIORITIZED SITES WITH INTERVENTION TYPE

Based on the findings presented above, it became apparent that the sites were divergent in terms of their potential for forage cultivation, processing, and use of forage feed. In fact, some sites like Yigalem, which has high potential for dairy production, lack protein-rich ingredients and a comprehensive knowledge of feed management. The landscape is hilly with undulating topography. Land size is small due to high population density. Despite existence of rivers in the area, the water is not used for irrigation due to the slope.

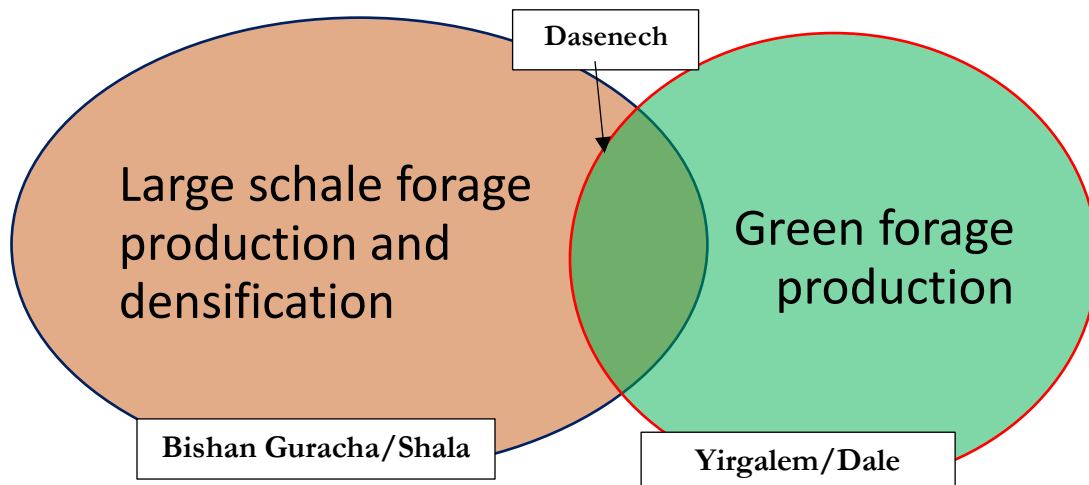
Areas like Dasenech have the potential for forage production, but the scope for densification will be low due to lack of electricity. Although a significant potential for solar power exists, tapping into such potential

requires high investment. Forage cultivation is practiced by group of agro-pastoralists recently settled along the Omo River basin. RiPA south supports the groups in forage production. The woreda government supports the groups technically as well as providing irrigation water (fuel for pumping covered by the government).

Areas like Bishan Guracha and Shala combine the potential for production and densification. Although sites in Afar have good potential, there is currently low engagement from actors regarding cultivated forages. Moreover, social conflict on forages is high. Areas like Gode are far from Addis Ababa, the capital city and Jijjiga, the regional city. Forage production is undertaken by cooperatives and currently not partnering with RiPA. Afar and Somali seem unsuitable for piloting but would serve as good locations for scaling forage production and densification, as situations evolve. Its long distance from Addis Ababa, poor infrastructure needed for forage densification, and lack of strong partners to start the piloting justifies non-selection of the location at this stage. However, as the situations evolve over time, the lessons learned through piloting in other sites can be scaled out to the Somali area.

A team of experts from CRS, the Food and Agriculture Organization (FAO), International Center for Tropical Agriculture (CIAT), and HEDBEZ also individually reviewed the findings of this study and prioritized the sites for future intervention. The expert's prioritization were consistent with the prioritization of sites as stated above. Based on this study's findings, as validated by various stakeholders, the following sites have been selected for piloting different scenarios of forage cultivation and densification (**Figure 1**):

- Bishan Guracha, and Shala – Large-scale forage cultivation and densification
- Yirgalem-Dale – Forage cultivation (rainfed)
- Dasenech – Forage cultivation and moderate levels of densification



**Figure 1. Selected sites for forage cultivation and densification under different scenarios**

### **Business propositions by sites**

- **Site – Bishan Guracha / Shalla**

- Large-scale forage cultivation
- Densification into pellets, hay, etc.
- Dairy market and regional market pull
- **Site – Dasanech**
  - Pastoral community
  - Motivated local and regional government
  - Trade corridor growth potential with Kenya
  - Use fresh forages for local needs and densified products for cross border trade (Medium-scale forage cultivation coupled with densification)
- **Site – Yirgalem / Dale**
  - Dairy pull providing a strong market opportunity
  - Fresh forage model following the opportunity witnessed in Thailand model
  - Not a strong case for densification but medium scale forage cultivation

## ANNEXES

### Annex 1: Instruments for site selection and prioritization for piloting proposed Global Feed the Future Supporting Seed Systems for Development (S34D) Activity

#### Identification

Person Interviewed:		Name of organization	
Date of Interview		Place of interview	

Note: Please fill out this questionnaire for each of the physical sites. (We understand that large scale forage cultivation may or may not be happening at present. The purpose of this instrument is to gather as much detailed information about the current sites as they exist AND any potential land that may become available in the future for large scale cultivation of forages.)

#### Location

Location of the physical site	
• Region	
• Woreda	
• Kebele	
• GPS coordinates	

#### Forage cultivation status

Do you / the community / the project grow forages currently? Yes/No. If yes, go to 1; and if not, go to 2

Questions	Responses
<b>1. If you grow forages:</b>	
1.1 Area (ha) under cultivation	
1.2 Which forages do you grow?	
1.3 If you grow more than one forages, area (ha) under each forage:	
1.4 What are the reasons for growing these forages (for example quality/robustness.)	
1.5 How much forage do you harvest per year (tons as fresh weight)	
1.6 How many harvests do you take per year?	
1.7 Quantity of forages you harvest per harvest (tons as fresh weight)	
1.8 How do you currently use forages (feeding own livestock/selling/other)?	
1.9 What is the % of forage used for own?	
1.10 If you sell forages, how much on average per month (kg as fresh):	
1.11 In which months do you sell forage?	
1.12 Do you prepare hay? Yes/No	
1.13 If you prepare hay, how much hay per year (kg as dry matter)?	
1.14 In which months do you sell hay?	
1.15 Would you like to extend forage cultivation area? Yes/No	
1.16 If yes, to how many hectares? Are those additional hectares already available? In one parcel or as fragmented? If fragmented, proximity of those pieces?	
1.17 Would you wish to cultivate other forage varieties than you are currently cultivating? Yes/No	
1.18 Do you think market is available for cultivated forages? Yes/No. If yes, in which form (fresh, hay, silage or other)	



Questions	Responses
1.19 If yes, how far away (km)?	
1.20 Do you have a place for storing hay (yes/No)	
1.20.1 If yes, how much (cubic meters)? Please describe <b>storage unit details</b> along with <b>photographs</b> . Please describe <b>how far the storage</b> is from the potential forage cultivation land.	
1.20.2 If not, how would you go about creating one?	
1.21 Do you have any experience of silage preparation? Yes/No	
1.22 If yes, of which forages? _____	
1.23 Do you have any experience of hay preparation? Yes/No	
1.24 If yes, of which forages?	
1.25 Would it be possible to hire labor required for cultivation and densification of forages?	

Proceed to No.3, below

## 2. If you/community do not grow forages

Questions	Responses
2.1 What crops (if any) are grown at present? If nothing is grown then please explain why.	
2.2 Is there potential to grow forages? Yes/No (if no, no need to proceed)	
2.3 If yes, please describe the purpose in detail?	
2.4 If selling is one of the purposes, then to whom?	
2.5 How many hectares of land is available to grow forages? - Is that all in one parcel or fragmented? - If fragmented then how far are the parcels and - What is the average size of the landholding for each of the parcels?	
2.6. Any particular reason for not growing forages so far?	
2.7 Would it be possible to hire labor required for cultivation and densification of forages?	
2.8 Do you have storage place for storing hay (as an example)? Please describe storage unit details along with photographs. Please describe how far the storage is from the potential forage cultivation land.	
2.9 If yes, how much (cubic meters):	
2.10 If not, how would you be storing forage, in case you intend to densify it as hay, block or pellets?	
2.11 Do you have any experience of silage preparation?	
2.12 If yes, of which forages?	
2.13 Do you have any experience of hay preparation?	
2.14 If yes, of which forages?	
2.15 Do you think market is available for cultivated forages? Yes/No. If yes, in which form (fresh, hay, silage or other)	
2.16 If yes, how far away (km)?	

## 3. Irrigation

Questions	Response
3.1 Do you have access to irrigation? Yes/No. - Please describe how far or close the irrigation is from the potential land of forage cultivation. - Please take pictures.	
3.2 If yes, type of irrigation (gravitational; pump; sprinkler; other) available	
3.3 Do you currently irrigate forage land? Yes/No	

- If No, please explain the opportunities you see with future cultivation of the land you identified above.	
3.4 If yes, how much of the forage land is irrigated (ha) at present? - If not, how much of the land available can be irrigated in the future. - Who are the local stakeholders that could support irrigation (names of projects etc.)?	
3.5 Do you think that sufficient water is available for irrigating the area that you would like to cultivate forages?	

#### 4. Forage production in the vicinity

Questions	Response
4.1 How many farmers in the vicinity grow forages?	
4.2 How far are those farmers located from your farm (km)?	
4.3 What is the average area in which they cultivate forages (ha)?	
4.4 Which forages are being grown by those farmers?	
4.5 What type of irrigation do they use to cultivate forages	

#### 5. Environmental conditions for forage drying

Question	Response
5.1 Months in which it rains here:	
5.2 Dry months:	
5.3 Intensity of sunlight during dry months (strong, medium, low)	
5.4 Do you see any problem in drying forages i.e., to convert to hay from the fresh forages	

#### 6. Infrastructure capacity in the area

Questions	Responses
6.1 Type of functioning machinery available (tractor, harvester, vehicle, etc.). Please add details and capacities. Attach <b>photographs</b> if possible.	
6.2 Are the machines used for forage cultivation, processing or marketing purpose (explain)	
6.3 Adequacy of labor availability for forage cultivation? (Shortage/sufficient/abundant)	
6.4 Type of labor involved in forage cultivation (Men/women/girls/boys). <b>Disaggregate by sex and youth</b>	
6.5 Adequacy of labor availability for forage processing? (Shortage/sufficient/abundant)	
6.6 Type of labor involved in forage processing (Men/women/girls/boys)	
6.7 What challenges exist regarding human capacities for forage cultivation in the area?	
6.8 What challenges exist regarding human capacities for forage processing in the area?	
6.9 What challenges exist regarding infrastructural capacities stated above?	

#### 7. Utilities

Questions	Responses
7.1 Do you have a three-phase electric supply near the potential cultivation site? Yes/No. - Please describe the distance from the potential land of forage cultivation identified above. <b>Take pictures.</b>	
7.2 If not, can you get it? Yes/No (explain the answer)	
7.3 What is the distance (meters) of the from the site to the electric power supply?	
7.4 Other challenges related to utilities	
7.6 What opportunities do you see?	

## 8. Accessibility

Questions	Responses
8.1 Distance to Addis Ababa (km); expected travel time (hours)	
8.2 Distance to regional town (km); name of town; expected travel time (hours)	
8.3 Type of road (all asphalt; partly gravel and partly asphalt; partly dry weather; all weather road). <b>Take pictures.</b>	
8.4 Any challenges with road conditions during droughts or rainy seasons or conflict?	
8.5 Any challenge with the local/community/tribal conflict?	

## 9. Projects and Institutions

Questions	Responses
9.1 Are there any projects nearby or in the site? Yes/No	
9.2 If yes, who owns the projects? Please collect the <b>contact details.</b>	
9.3 What are the purposes of the projects? (forages cultivation, seed production, agro-industries, etc. (specify)	
9.4 Where are these projects located?	
9.5 Nearby institutions (ARCs; Universities; implementing/development partners) (The leverage points).	
9.6 Are there dairy farms nearby or in the site? (Yes/No)	
9.7 If yes, how many farms?	
9.8 How big is each farm (e.g. number of dairy cows)?	
9.9 What new linkages needs to be established?	
9.10. Are there fattening farms nearby (yes/No), - If yes, how many; how far located; how big i.e. number of fattening animals that can be fattened at one time	

## 10. Demand for forage

Questions	Responses
10.1 Demand for densified feed in the area / vicinity / region	
10.2 Desire to engage in densification of forage into hay, silage, pellets, blocks (Explain)	

## 11. Political buying

Questions	Responses
11.1 What policy support for forage cultivation exist? From the local and regional governments?	
11.2 How do you assess the community members acceptance of land allocated to forage production? <b>Now and in future.</b>	
11.3 Please list the relevant stakeholders who are important to secure buying as well as, engage with to implement on the ground, should large scale land be available for forage cultivation. - Collect names, organization details, and - Contact details of the stakeholders. - If possible please chalk out a brief stakeholder mapping using the blank space below.	

*Example of stakeholder mapping (modify and edit as needed)*

Stakeholder Type	Stakeholder name/contact details	Potential engagement purposes and priority level	Expected probability of securing buying (low/medium/high)
Local government			
Zonal government			
Regional government			
Agr research institutes			
Local/regional universities			
Department of commerce			
Private sector entities			
Parastatals			
Community engagement – agro/pastoral			
Specific tribal engagement			
Other Donor funded project leverage			

**Thank you for your support and cooperation!**

## Annex 2: Data collected by site

### Anan Agro-Industry, Bishan Guracha and Loma

#### Identification

Person Interviewed:	Eskindir Yosef	Name of organization	ANAN Agro-Industry PLC
	Anan Jemal		
Date of Interview	11/03/2023	Place of interview	Anan Dairy Farm compounded, Bishan Guracha

Note: Please fill out this questionnaire for each of the physical sites. (We understand that large scale forage cultivation may or may not be happening at present. The purpose of this instrument is to gather as much detailed information about the current sites as they exist AND any potential land that may become available in the future for large scale cultivation of forages.)

#### Location

Location of the physical site	Site 1 (B. Guracha)	Site 2 (Shala)	Site 3 (Loma)
• Region	Oromia	Oromia	SNNPR
• Zone	West Arsi	West Arsi	Dawuro
• Woreda	Bishan Guracha	Shala	Loma
• Kebele	Kebele 01		Yalo
• GPS coordinates	0443418, 0784471 0443501, 0784424 0443589, 0784568 04435170784617	0434154, 0787283 0434046, 0787121 0433693, 0787471 0433703, 0787671 0433308, 0787614 0434146, 0787526 0434264, 0787466 0434185, 0787353	Not physically visited; but collected data

#### Forage cultivation status

Do you / the community / the project grow forages currently? Yes/No. If yes, go to 1; and if not, go to 2

Questions	Site 1(B. Guracha)	Site 2 (Shala)	Site 3 (Loma)
<b>1. If you grow forages:</b>			
1.26 Area (ha) under cultivation	• 1 ha	22 (not started)	600 ha

Questions	Site 1(B. Guracha)	Site 2 (Shala)	Site 3 (Loma)
1.27 Which forages do you grow?	<ul style="list-style-type: none"> <li>• Alfalfa</li> <li>• Elephant grass</li> </ul>	New, production not started	<ul style="list-style-type: none"> <li>• Local (native) grass</li> </ul>
1.28 If you grow more than one forages, area (ha) under each forage:	<ul style="list-style-type: none"> <li>• Alfalfa on 0.8 ha</li> <li>• Elephant grass on 0.2 ha</li> </ul>	-	<ul style="list-style-type: none"> <li>• 300 ha</li> </ul>
1.29 What are the reasons for growing these forages (for example quality/robustness)	<ul style="list-style-type: none"> <li>• Alfalfa has number of advantages like high nutritional value, fast growing, good for milk, suitable to the local climate, no additional fertilizer need except the biogas slurry</li> </ul>		<ul style="list-style-type: none"> <li>• The land is recently received, thus we are producing forage from local grass until we made proper preparation, development and go for other types</li> </ul>
1.30 How much forage do you harvest per year (tons as fresh weight)	<ul style="list-style-type: none"> <li>• Alfalfa production is 300 ton/ha/year</li> </ul>		<ul style="list-style-type: none"> <li>• 15,000 bales from 300 ha</li> </ul>
1.31 How many harvests do you take per year?	<ul style="list-style-type: none"> <li>• Alfalfa harvest is 14 to 16 round/year</li> <li>• Elephant grass harvest is 10 to 12 rounds/year</li> </ul>		One time
1.32 Quantity of forages you harvest per harvest (tons as fresh weight)	<ul style="list-style-type: none"> <li>•</li> </ul>		<ul style="list-style-type: none"> <li>•</li> </ul>
1.33 How do you currently use forages (feeding own livestock/selling/other)?	<ul style="list-style-type: none"> <li>• Own livestock feed</li> </ul>		<ul style="list-style-type: none"> <li>• Own livestock feed and sale</li> </ul>
1.34 What is the % of forage used for own?	<ul style="list-style-type: none"> <li>• 100%</li> </ul>		<ul style="list-style-type: none"> <li>• 27% for own livestock feed</li> </ul>
1.35 If you sell forages, how much on average per month (kg as fresh):	NA		<ul style="list-style-type: none"> <li>• 73% for sell</li> </ul>
1.36 In which months do you sell forage?	NA		<ul style="list-style-type: none"> <li>• October – June</li> </ul>
1.37 Do you prepare hay? Yes/No	No, it is fresh/green feed		<ul style="list-style-type: none"> <li>• Yes, in bale</li> </ul>
1.38 If you prepare hay, how much hay per year (kg as dry matter)?	We don't make hay		<ul style="list-style-type: none"> <li>• Last year we produced 15,000 bale gases</li> </ul>
1.39 In which months do you sell hay?			<ul style="list-style-type: none"> <li>• October – June</li> </ul>
1.40 Would you like to extend forage cultivation area? Yes/No	No	22 ha (same as 1.1 above)	<ul style="list-style-type: none"> <li>• Yes, gradually we will continue the production on 2000 ha which we already leased</li> </ul>



Questions	Site 1(B. Guracha	Site 2 (Shala)	Site 3 (Loma)
1.41If yes, to how many hectares? Are those additional hectares already available? In one parcel or as fragmented? If fragmented, proximity of those pieces?	<ul style="list-style-type: none"> <li>No, we fully utilized the available land</li> </ul>	<ul style="list-style-type: none"> <li>20 ha (2 ha for processing facility instilment)</li> </ul>	<ul style="list-style-type: none"> <li>1700 ha</li> </ul>
1.42Would you wish to cultivate other forage varieties than you are currently cultivating? Yes/No	<ul style="list-style-type: none"> <li>No</li> </ul>	<ul style="list-style-type: none"> <li>We will introduce Panicum maximum</li> </ul>	<ul style="list-style-type: none"> <li>We will introduce Panicum maximum</li> </ul>
1.43Do you think market is available for cultivated forages? Yes/No. If yes, in which form (fresh, hay, silage or other)	<ul style="list-style-type: none"> <li>We don't have surplus over own feed need</li> </ul>	<ul style="list-style-type: none"> <li>Yes; all forms</li> </ul>	<ul style="list-style-type: none"> <li>Yes; all forms</li> </ul>
1.44If yes, how far away (km)?	Ziway; Yirgalem, Arbaminch; Debreberhan, Sodo	Ziway; Yirgalem, Arbaminch; Debreberhan, Sodo	Ziway; Yirgalem, Arbaminch; Debreberhan, Sodo
1.45Do you have a place for storing hay (yes/No)	<ul style="list-style-type: none"> <li>Yes</li> </ul>	<ul style="list-style-type: none"> <li>Not yet</li> </ul>	<ul style="list-style-type: none"> <li>Not yet</li> </ul>
1.45.1 If yes, how much (cubic meters)? Please describe <b>storage unit details</b> along with <u>photographs</u> . Please describe <u>how far the storage</u> is from the potential forage cultivation land.	<ul style="list-style-type: none"> <li>600 m<sup>2</sup> (50,000 bales)</li> <li>The store is constructed by hollow blocks, well plastered have 6 m height, 20 m length and 30 m width</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
1.45.2 If not, how would you go about creating one?		<ul style="list-style-type: none"> <li>deepened on achievement of business</li> </ul>	<ul style="list-style-type: none"> <li>deepened on the achievement business</li> </ul>
1.46Do you have any experience of silage preparation? Yes/No	<ul style="list-style-type: none"> <li>Yes, using purchased maize stack (70 trucks). He also planted maize in 10ha for silage making.</li> </ul>	<ul style="list-style-type: none"> <li>No</li> </ul>	<ul style="list-style-type: none"> <li>No</li> </ul>
1.47If yes, of which forages?_____	<ul style="list-style-type: none"> <li>In last production season (September 2022) produced 50 ton silage which we are currently using; sold 40kg @15-20 Birr/kg</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
1.48Do you have any experience of hay preparation? Yes/No	<ul style="list-style-type: none"> <li>No</li> </ul>	<ul style="list-style-type: none"> <li>Not started</li> </ul>	<ul style="list-style-type: none"> <li>Yes</li> </ul>
1.49If yes, of which forages?		<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>Using local grass</li> </ul>
1.50Would it be possible to hire labor required for cultivation and densification of forages?	<ul style="list-style-type: none"> <li>Yes, no labor availability problem but attitudinal problem to engage in agriculture (dairy) related work</li> </ul>	<ul style="list-style-type: none"> <li>yes</li> </ul>	<ul style="list-style-type: none"> <li>yes</li> </ul>

Questions	Site 1(B. Guracha	Site 2 (Shala)	Site 3 (Loma)
1.51How far are the farms from HQ	<ul style="list-style-type: none"> <li>Bishan Guracha (where the dairy farm is)</li> </ul>	<ul style="list-style-type: none"> <li>12.5 km from Bishan Gurach processing unit</li> </ul>	<ul style="list-style-type: none"> <li>250 km from Bishan Gurach processing unit</li> </ul>

Proceed to No.3, below

*2. If you/community do not grow forages – This question is not applicable here:*

Questions	Responses
2.1 What crops (if any) are grown at present? If nothing is grown then please explain why.	
2.2 Is there potential to grow forages? Yes/No (if no, no need to proceed)	
2.3 If yes, please describe the purpose in detail?	
2.4 If selling is one of the purposes, then to whom?	
2.5 How many hectares of land is available to grow forages? - Is that all in one parcel or fragmented? - If fragmented then how far are the parcels and - What is the average size of the landholding for each of the parcels?	
2.6. Any particular reason for not growing forages so far?	
2.7 Would it be possible to hire labor required for cultivation and densification of forages?	
2.8 Do you have storage place for storing hay (as an example)? Please describe storage unit details along with photographs. Please describe how far the storage is from the potential forage cultivation land.	
2.9 If yes, how much (cubic meters):	
2.10 If not, how would you be storing forage, in case you intend to densify it as hay, block or pellets?	
2.11 Do you have any experience of silage preparation?	
2.12 If yes, of which forages?	
2.13 Do you have any experience of hay preparation?	
2.14 If yes, of which forages?	
2.15 Do you think market is available for cultivated forages? Yes/No. If yes, in which form (fresh, hay, silage or other)	
2.16 If yes, how far away (km)?	

*3. Irrigation*

Questions	Site 1(B. Guracha	Site 2 (Shala)	Site 3 (Loma)
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3.1 Do you have access to irrigation? Yes/No. - Please describe how far or close the irrigation is from the potential land of forage cultivation. - Please take pictures.	<ul style="list-style-type: none"> <li>• Yes, 5 hand dug wells and one shallow well (70 m deep), all are pump based</li> </ul>	<ul style="list-style-type: none"> <li>• Not yet, the possible option is ground water, (may be deep well at 500 m);</li> <li>• Hawassa lake (2.3km from the site with elevation difference of 45m; slope of 3%)</li> </ul>	<ul style="list-style-type: none"> <li>• Not yet, the possible option is ground water, (deep well)</li> </ul>
3.2 If yes, type of irrigation (gravitational; pump; sprinkler; other) available	<ul style="list-style-type: none"> <li>• Sprinkler irrigation</li> </ul>	-	-
3.3 Do you currently irrigate forage land? Yes/No - If No, please explain the opportunities you see with future cultivation of the land you identified above.	<ul style="list-style-type: none"> <li>• Yes</li> </ul>		<ul style="list-style-type: none"> <li>• No irrigation facility so far</li> </ul>
3.4 If yes, how much of the forage land is irrigated (ha) at present? - If not, how much of the land available can be irrigated in the future. - Who are the local stakeholders that could support irrigation (names of projects etc.)?	<ul style="list-style-type: none"> <li>• 1 ha</li> </ul>	<ul style="list-style-type: none"> <li>• Our intention is to install irrigation facility on 20 ha land</li> </ul>	<ul style="list-style-type: none"> <li>• We planned to irrigation facility on 20 ha</li> </ul>
3.5 Do you think that sufficient water is available for irrigating the area that you would like to cultivate forages?	<ul style="list-style-type: none"> <li>• Yes</li> </ul>	<ul style="list-style-type: none"> <li>• Not sure, it is under study</li> </ul>	<ul style="list-style-type: none"> <li>• Not sure, it is under study</li> </ul>

#### 4. Forage production in the vicinity

Questions	Site 1(B. Guracha)	Site 2 (Shala)	Site 3 (Loma)
4.1 How many farmers in the vicinity grow forages?	<ul style="list-style-type: none"> <li>• no so far</li> </ul>	<ul style="list-style-type: none"> <li>• no so far</li> </ul>	<ul style="list-style-type: none"> <li>• no so far</li> </ul>
4.2 How far are those farmers located from your farm (km)?			
4.3 What is the average area in which they cultivate forages (ha)?			
4.4 Which forages are being grown by those farmers?			
4.5 What type of irrigation do they use to cultivate forages			

#### 5. Environmental conditions for forage drying

Question	Site 1(B. Guracha)	Site 2 (Shala)	Site 3 (Loma)
5.1 Months in which it rains here:	<ul style="list-style-type: none"> <li>• June – September</li> <li>• April – May</li> </ul>	<ul style="list-style-type: none"> <li>• June – September</li> <li>• April – May</li> </ul>	<ul style="list-style-type: none"> <li>• June – September</li> <li>• April – May</li> </ul>
5.2 Dry months:	<ul style="list-style-type: none"> <li>• November – March</li> </ul>	<ul style="list-style-type: none"> <li>• November – March</li> </ul>	<ul style="list-style-type: none"> <li>• November – March</li> </ul>
5.3 Intensity of sunlight during dry months (strong, medium, low)	<ul style="list-style-type: none"> <li>• strong</li> </ul>	<ul style="list-style-type: none"> <li>• strong</li> </ul>	<ul style="list-style-type: none"> <li>• strong</li> </ul>

5.4 Do you see any problem in drying forages i.e. to convert to hay from the fresh forages	• no problem	• no problem	• no problem
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### 6. Infrastructure capacity in the area

Questions	Site 1(B. Guracha)	Site 2 (Shala)	Site 3 (Loma)
6.1 Type of functioning machinery available (tractor, harvester, vehicle, etc.). Please add details and capacities. Attach <b>photographs</b> if possible.	<ul style="list-style-type: none"> <li>• medium track (35 quintals capacity)</li> <li>• heavy duty tractor</li> <li>• field vehicle (Pick-up)</li> <li>• fodder choppers, mixers</li> <li>• simple machine maintenance and production workshop</li> </ul>	•	•
6.2 Are the machines used for forage cultivation, processing or marketing purpose (explain)	• the machines are used for forage cultivation, processing and transportation		
6.3 Adequacy of labor availability for forage cultivation? (Shortage/sufficient/abundant)	• labor is adequately available on the market	• labor is adequately available on the market	• labor is adequately available on the market
6.4 Type of labor involved in forage cultivation (Men/women/girls/boys). <b>Disaggregate by sex and youth</b>	• women and youth dominated	• women and youth dominated	• Men and youth dominated
6.5 Adequacy of labor availability for forage processing? (Shortage/sufficient/abundant)	• Sufficient	• Sufficient	• Sufficient
6.6 Type of labor involved in forage processing (Men/women/girls/boys)	• Men and youth dominated (as the work involve carrying)	• Men and youth dominated	• Men and youth dominated
6.7 What challenges exist regarding human capacities for forage cultivation in the area?	• lack of experience and attitudinal problem	• lack of experience and attitudinal problem	• lack of experience and attitudinal problem
6.8 What challenges exist regarding human capacities for forage processing in the area?	• lack of experience and attitudinal problem	• lack of experience and attitudinal problem	• lack of experience and attitudinal problem
6.9 What challenges exist regarding infrastructural capacities stated above?	• lack of technical capacity	• lack of technical capacity	• lack of technical capacity

## 7. Utilities

Questions	Site 1(B. Guracha)	Site 2 (Shala)	Site 3 (Loma)
7.1 Do you have a three-phase electric supply near the potential cultivation site? Yes/No. - Please describe the distance from the potential land of forage cultivation identified above. <b>Take pictures.</b>	<ul style="list-style-type: none"> <li>• yes, at about 300 m distance from the store</li> </ul>	<ul style="list-style-type: none"> <li>• Far (about 3 km )</li> </ul>	<ul style="list-style-type: none"> <li>• Very far</li> </ul>
7.2 If not, can you get it? Yes/No (explain the answer)	<ul style="list-style-type: none"> <li>• Yes</li> </ul>	<ul style="list-style-type: none"> <li>• not sure</li> </ul>	<ul style="list-style-type: none"> <li>• not sure</li> </ul>
7.3 What is the distance (meters) of the from the site to the electric power supply?	<ul style="list-style-type: none"> <li>• 300 m</li> </ul>		
7.4 Other challenges related to utilities	<ul style="list-style-type: none"> <li>• no place for expansion</li> </ul>	<ul style="list-style-type: none"> <li>• irrigation water sources</li> <li>• very far (&gt;3 km) three phase electricity line</li> </ul>	<ul style="list-style-type: none"> <li>• irrigation water sources</li> </ul>
7.6 What opportunities do you see?	<ul style="list-style-type: none"> <li>• located near market and milk collection sites</li> </ul>	<ul style="list-style-type: none"> <li>• relative location to big cities, Shashemene and Hawasa</li> </ul>	

## 8. Accessibility

Questions	Site 1(B. Guracha)	Site 2 (Shala)	Site 3 (Loma)
8.1 Distance to Addis Ababa (km); expected travel time (hours)	275 km	285km	
8.2 Distance to regional town (km); name of town; expected travel time (hours)	275 km	285km	
8.3 Type of road (all asphalt; partly gravel and partly asphalt; partly dry weather; all weather road). <b>Take pictures.</b>	275 km Asphalt	283 km Asphalt 2 km dry weather road	
8.4 Any challenges with road conditions during droughts or rainy seasons or conflict?	No challenge	The 2 km dry weather road may not work in rainy season	
8.5 Any challenge with the local/community/tribal conflict?	The dairy farm is situated at the middle residence area of the town (Bishan Guracha)	There was conflict between two ethnic groups (Sidama and Oromo) on the land but now demarcated under Oromia	

## 9. Projects and Institutions

Questions	Site 1(B. Guracha)	Site 2 (Shala)	Site 3 (Loma)
9.1 Are there any projects nearby or in the site? Yes/No	<ul style="list-style-type: none"> <li>• Elfora agro industry</li> <li>• 200 HHs based dairy farms</li> </ul>	<ul style="list-style-type: none"> <li>• Elfora agro industry</li> <li>• Sidama agro-industry,</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>

Questions	Site 1(B. Guracha)	Site 2 (Shala)	Site 3 (Loma)
		• Airport (Hawasa)	
9.2 If yes, who owns the projects? Please collect the <b>contact details</b> .			
9.3 What are the purposes of the projects? (forages cultivation, seed production, agro-industries, etc. (specify)	Dairy farm		
9.4 Where are these projects located?			
9.5 Nearby institutions (ARCs; Universities; implementing/development partners) (The leverage points).			
9.6 Are there dairy farms nearby or in the site? (Yes/No)	<ul style="list-style-type: none"> <li>• Elfora dairy farm</li> <li>• HHs based dairy farms</li> </ul>	• no	• no except stallholders farmers based livestock production
9.7 If yes, how many farms?	<ul style="list-style-type: none"> <li>• Elfora dairy farm (1)</li> <li>• HHs (200) based dairy farms, where each farmer has 5 to 10 cows</li> </ul>	• no	• no
9.8 How big is each farm (e.g. number of dairy cows)?	• In HH based dairy farms, each farmer has 5 to 10 cows	• no	• no
9.9 What new linkages needs to be established?	• They buy feed (baled hay) from Anan agro-industry PLC	• no	• no
9.10. Are there fattening farms nearby (yes/No), - If yes, how many; how far located; how big i.e. number of fattening animals that can be fattened at one time	• there are about 15 to 20 HHs who engaged in cattle (oxen) fattening, where each farmer fatten 5 to 10 oxen	• no	• no

### 10. Demand for forage

Questions	Site 1(B. Guracha)	Site 2 (Shala)	Site 3 (Loma)
10.1 Demand for densified feed in the area / vicinity / region	• Yes	• Yes	•
10.2 Desire to engage in densification of forage into hay, silage, pellets, blocks (Explain)	• Yes using forage produced on site 2	•	•



### 11. Political buying

Questions	Site 1 (B. Guracha)	Site 2 (Shala)	Site 3 (Loma)
11.1 What policy support for forage cultivation exist? From the local and regional governments?	<ul style="list-style-type: none"> <li>• support to gate facility like electric power</li> </ul>	land allocated through leases system	land allocated through leases system
11.2 How do you assess the community members' acceptance of land allocated to forage production? <b>Now and in future.</b>	<ul style="list-style-type: none"> <li>• no objection so far</li> </ul>	<ul style="list-style-type: none"> <li>• not sure but it is formally permitted by local government</li> </ul>	<ul style="list-style-type: none"> <li>• no objection so far</li> </ul>
11.3 Please list the relevant stakeholders who are important to secure buying as well as, engage with to implement on the ground, should large scale land be available for forage cultivation. <ul style="list-style-type: none"> <li>- Collect names, organization details, and</li> <li>- Contact details of the stakeholders.</li> <li>- If possible please chalk out a brief stakeholder mapping using the blank space below.</li> </ul>			

#### Example of stakeholder mapping (modify and edit as needed)

Stakeholder Type	Stakeholder name/contact details	Potential engagement purposes and priority level	Expected probability of securing buying (low/medium/high)
Local government	Kebele admin Woreda administration		High High
Zonal government			
Regional government	Regional investment commission		High
Agr research institutes	None		
Local/regional universities	Hawassa University	Currently no contract. But does some conservation works in Shalla area	
Department of commerce			
Private sector entities			
Parastatals			
Community engagement – agro/pastoral	Smallholder farmers and agro-pastoralists	The surrounding area is farmland and good relationship with the community is important	Medium

Specific tribal engagement			
Other Donor funded project leverage	Currently none	Formerly supported by Feed the Future Project	

## Data from Dasenech woreda

### *Identification Interview II (section 1 supplemented by Group Members)*

Person Interviewed:	Samson Esrael	Name of organization	iDE team leader
	Amare Kebede		RIPA
	Mantegaftot Yohanis		Goal Ethiopia
Date of Interview	08/03/2023	Place of interview	Jinka RIPA Office

### **Identification (Interview II – made with Coop)**

Person Interviewed:	Siri Tirfe	Name of organization	Kerech Multipurpose Farmers Cooperatives (150 members: 80 female and 70 male members)
Date of Interview	9/03/2023	Place of interview	Kerech

Note: Please fill out this questionnaire for each of the physical sites. (We understand that large scale forage cultivation may or may not be happening at present. The purpose of this instrument is to gather as much detailed information about the current sites as they exist AND any potential land that may become available in the future for large scale cultivation of forages.)

### *Location*

Location of the physical site	Interview I	Interview II
• Region	SNNPR	SNNPR
• Woreda	Dasenech (major operation area) and Nagatom (RipA operates in the two woredas)	Dasenech
• Kebele	6 forage groups (RiPA regular and crises management) in Harkole (2), Lowbet (1), Kalaway (1) Terengole (2) kebeles	Kerech. the cooperative has 150 members (80 F and 70 M), established by RLP in 2010 EC
• GPS coordinates		0170703 N, 0531678 E

Note 1: Each forage producing group provided with and operates on 4 ha (in total the 6 groups have 24 ha of land) where the groups have 27 to 34 members each. Each group member has own plot (0.12 to 0.14 ha). Out of the 24 ha land 16 ha have been used for producing grass for 5 rounds since January 2021 while the 8 ha (of 2 groups) finalized land preparation but have not yet started producing forage so far.

*Forage cultivation status*

Do you / the community / the project grow forages currently? Yes/No. If yes, go to 1; and if not, go to 2

Questions	Responses (Interview I)	Responses (Interview II)
<b>1. If you grow forages:</b>		
1.52 Area (ha) under cultivation	16 ha (another 8 ha is ready for producing forage)	<ul style="list-style-type: none"> <li>• 15 ha. Before engagement in forage production, the cooperatives were producing banana on 32.5 ha, however due to water shortage shifted to forage (Panicum) production on 15 ha.</li> </ul>
1.53 Which forages do you grow?	Panicum is majorly grown.	<ul style="list-style-type: none"> <li>• Panicum is widely grown</li> </ul>
1.54 If you grow more than one forages, area (ha) under each forage:	Rodhus and Alfalfa are under trial.	<ul style="list-style-type: none"> <li>• Few cases of Rodhus and Sudan grass</li> </ul>
1.55 What are the reasons for growing these forages (for example quality/robustness.)	<ul style="list-style-type: none"> <li>• Panicum: shorter (45) production/growing days, Very high biomass (productivity), low water requirement (moisture stress resistant, 1 to 2 irrigation per week)</li> </ul>	<ul style="list-style-type: none"> <li>• Panicum has various advantages like shorter (harvested every 30 days) production/growing days, good biomass, low water requirement and low requirement for labour</li> <li>• It is produced for seed or forage</li> </ul>
1.56 How much forage do you harvest per year (tons as fresh weight)	<ul style="list-style-type: none"> <li>• If operation goes at normal rate possibility of 6 harvest can yield approximately 1,330 bales/ha X 6 rounds X 12.5 kg/bale = 99,750 kg/ha/year = 100 ton/ha/year (dry)</li> </ul>	<ul style="list-style-type: none"> <li>• We harvest every month (if irrigation water is available) used either for own livestock feed, sell at local market and supply to GOs and NGOs who collect the grass</li> </ul>
1.57 How many harvests do you take per year?	<ul style="list-style-type: none"> <li>• The group members estimated 6 times of harvest on average per year. But it depends on water availability.</li> </ul>	<ul style="list-style-type: none"> <li>• The harvest of biomass (grass) is 5 to 6 times per year, while seed harvest is 3 to 4 times per year</li> </ul>
1.58 Quantity of forages you harvest per harvest (tons as fresh weight)	<ul style="list-style-type: none"> <li>• See section 1.5</li> </ul>	<ul style="list-style-type: none"> <li>• Last year, our cooperative sold 3,000 bales in two production season from 15 ha. But we use most of the forage for our livestock.</li> </ul>
1.59 How do you currently use forages (feeding own livestock/selling/other)?	<ul style="list-style-type: none"> <li>• Feeding own livestock, selling to institutions or projects that distribute the feed under the emergency response program and selling to local buyers. Women usually take fresh forages of Panicum and sorghum to the local market for sales. Women carry the forage on their heads and wait for buyers in the market place. A bundle of fresh forage is sold for</li> </ul>	<ul style="list-style-type: none"> <li>• Members use the produced forage for own livestock feed, retail sales on local market and baled grass sales to GOS and NGOs</li> </ul>

Questions	Responses (Interview I)	Responses (Interview II)
	about Birr 30; done every other day. Instructional buyers or projects purchased balled forage/hay.	
1.60 What is the % of forage used for own?	<ul style="list-style-type: none"> <li>As per proportional piling done with community, 35% of the produced forage is sold to institutions/projects (baled), 20% sold at local market as green forage and 45% used for own livestock feed (green forage).</li> </ul>	Most of it is used for own livestock feed. About 10% is sold green in the local market.
1.61 If you sell forages, how much on average per month (kg as fresh):	<ul style="list-style-type: none"> <li>Since 2021, we sold 5 rounds of baled hay, where a household sold 50 to 60 bales per one harvest and on average earned Birr 4,000 to 4,800 per harvest (ETB80/bale).</li> <li>In addition, each member sold about 180 bundles per year (at rate of 15 bundles per month, “we took one bundle to the market every other day”), where a bundle is sold at Birr 30. Thus, a household would earn Birr 5400 from the sales of forage.</li> </ul>	Sold in bundles by women to meet financial needs; Members cultivate own plot for most activities except the collaboration during bale making. Out of the grass seed and out of the income obtained from sales of baled hay and seed sold through cooperative, the individuals use 90% of income for own purpose and 10% provided to the cooperative for management and other purposes.
1.62 In which months do you sell forage?	<ul style="list-style-type: none"> <li>Relatively better sales occur during rainy season (June – September) as the pastoralist have better forage access from the natural rangeland for their livestock feed.</li> </ul>	Any time; if water is available, throughout the year
1.63 Do you prepare hay? Yes/No	Yes	Mostly members make bale with the support of government and NGOs, but no other type of hay production
1.64 If you prepare hay, how much hay per year (kg as dry matter)?	On average 100 ton/year, i.e., 16,660 kg (16 quintal/harvest) of hay	Last year, our cooperative sold 3,000 bales in two production season from 15 ha. But we use most of the forage for our livestock.
1.65 In which months do you sell hay?	<ul style="list-style-type: none"> <li>The producers sell at harvest time (June-Sept) to institutions, which store the hay until distributed</li> <li>Producers sold all harvests either to local market in retail modality or the baled hay to institutions including RIPA who collect grass for emergency response.</li> </ul>	
1.66 Would you like to extend forage	<ul style="list-style-type: none"> <li>Yes, RIPA established 4 new forage producing groups</li> </ul>	There is 17.5ha of land to which production can be extended; but irrigation water shortage is limiting the capacity.

Questions	Responses (Interview I)	Responses (Interview II)
cultivation area? Yes/No		
1.67 If yes, to how many hectares? Are those additional hectares already available? In one parcel or as fragmented? If fragmented, proximity of those pieces?	<ul style="list-style-type: none"> <li>• RIPA establish 4 additional groups (2 normal and 2 crises management) on 16 ha land.</li> <li>• The existing forage producing groups of RIPA operating in 4 farm clusters, 2 groups as one cluster on 8 ha, other 2 groups on other one cluster on 9 ha, while the remaining 2 groups work separately having 4 ha land each</li> <li>• The groups are within 4 km distance from the woreda town: Omorate</li> </ul>	In one parcel; adjacent to where current production is going on.
1.68 Would you wish to cultivate other forage varieties than you are currently cultivating? Yes/No	<ul style="list-style-type: none"> <li>• The project conducted adaptation trial of rodhus and alfalfa but the producers preferred Panicum due to its various advantages like high biomass (productivity), fast growing, water stress tolerance, and low management requirement.</li> </ul>	No
1.69 Do you think market is available for cultivated forages? Yes/No. If yes, in which form (fresh, hay, silage or other)	<ul style="list-style-type: none"> <li>• There are two market options, i.e., local market for retailing (mostly green forage) and baled forage/hay supplied to NGOs like RIPA and GOs, who stock the forage for emergency response purpose. In addition, the producers sell forage seed to merchants who engage in grass seed marketing. The problem with forage seed marketing is significant price reduction, from 300 birr/kg to 100 birr/kg. There seems producers look into the alternative markets do produce seed or forage.</li> </ul>	<ul style="list-style-type: none"> <li>• No market problem for the fresh (green) forage and baled grass (GO and NGOs). We have large number of animals; we need forage for our animals.</li> <li>• However, recently we faced market problem for forage seed, where the grass (Panicum) price fall from 300 birr/kg to 100 birr/kg</li> </ul>
1.70 If yes, how far away (km)?	<ul style="list-style-type: none"> <li>• The local market is woreda town (Omorate) which is about 3 to 5 km from the plots. However, the institutions who buy baled forage collect it from the farm and transport the bales to storages by the institutions transport facilities (tractor)</li> </ul>	
1.71 Do you have a place for storing hay (yes/No)	<ul style="list-style-type: none"> <li>• Yes, for example there are 3 storage in 3 kebeles of Dasenech woreda, namely Dalli Mule, Haricol and Kelewa kebeles</li> </ul>	

Questions	Responses (Interview I)	Responses (Interview II)
1.71.1 If yes, how much (cubic meters)? Please describe <b>storage unit details</b> along with <u>photographs</u> . Please describe <u>how far the storage</u> is from the potential forage cultivation land.	The average distance from production to storage site are about 1hr. The storage capacity is 50,000 bales (1 store) and 20,000 Bales each for the 2 stores Pictures of some storage facilities captured	Our cooperative has store which has 20,000 bales of hay capacity and forage seed storage, offices for the cooperative management body
1.71.2 If not, how would you go about creating one?		
1.72 Do you have any experience of silage preparation? Yes/No	No silage production practice	No
1.73 If yes, of which forages?_____	-	
1.74 Do you have any experience of hay preparation? Yes/No	<ul style="list-style-type: none"> <li>• There is baling by the government</li> <li>• The woreda support balling the harvested grass covering fuel and operation cost of the balling machine but no other form of hay production. Mostly producers sell green grass at local market and also feed the green gars to own livestock (cattle and sheep)</li> </ul>	Government was baling but not now
1.75 If yes, of which forages?	-Balling is done for panicum	Panicum
1.76 Would it be possible to hire labor required for cultivation and densification of forages?	<ul style="list-style-type: none"> <li>• The producers use own labor for the forage production and harvesting, where mostly women engage in the forage production and harvesting both for balling and fresh forage selling at local market</li> <li>• The sell (harvesting, carrying and sell) the forage at local market also done by women</li> <li>• The price for one bale of panicum was 80 birr but recently the price increased to 90 birr</li> </ul>	Yes

Proceed to No.3, below

## 2. If you/community do not grow forages: Not applicable for the site

Questions	Responses
2.1 What crops (if any) are grown at present? If nothing is grown then please explain why.	
2.2 Is there potential to grow forages? Yes/No (if no, no need to proceed)	
2.3 If yes, please describe the purpose in detail?	
2.4 If selling is one of the purposes, then to whom?	
2.5 How many hectares of land is available to grow forages? - Is that all in one parcel or fragmented? - If fragmented then how far are the parcels and - What is the average size of the landholding for each of the parcels?	
2.6. Any particular reason for not growing forages so far?	
2.7 Would it be possible to hire labor required for cultivation and densification of forages?	
2.8 Do you have storage place for storing hay (as an example)? Please describe storage unit details along with photographs. Please describe how far the storage is from the potential forage cultivation land.	There are 3 forage storages in the woreda, have the capacity of 20,000 bales each (#2 stores ) and 50,000 bales capacity
2.9 If yes, how much (cubic meters):	
2.10 If not, how would you be storing forage, in case you intend to densify it as hay, block or pellets?	
2.11 Do you have any experience of silage preparation?	
2.12 If yes, of which forages?	
2.13 Do you have any experience of hay preparation?	
2.14 If yes, of which forages?	
2.15 Do you think market is available for cultivated forages? Yes/No. If yes, in which form (fresh, hay, silage or other)	
2.16 If yes, how far away (km)?	

## 3. Irrigation

Questions	Response
3.1 Do you have access to irrigation? Yes/No. - Please describe how far or close the irrigation is from the potential land of forage cultivation. - Please take pictures.	Yes, <ul style="list-style-type: none"> <li>• The forage production clusters are located on the two sides of Omo river where the irrigation water is supplied by government funded deasil pump.</li> <li>• The irrigation is pump based where irrigation water supply cost (fuel, lubricant, operator salary, maintenance, canal management) are fully covered by government through LLRP funded by the World Bank.</li> </ul>
3.2 If yes, type of irrigation (gravitational; pump; sprinkler; other) available	<ul style="list-style-type: none"> <li>• The irrigation type is flood, where producers apply the irrigation using furrow</li> </ul>

Questions	Response
3.3 Do you currently irrigate forage land? Yes/No - If No, please explain the opportunities you see with future cultivation of the land you identified above.	<ul style="list-style-type: none"> <li>• Yes, basically all the forage production area is fully irrigated</li> <li>• However, the forage irrigation is limited by power interruption due to fuel shortage and dis-functionality of diesel electric generator which has been happening very fervently (1 to 2 times in a week). In addition, water supply from the main channel doesn't have sufficient discharge to cover additional lands.</li> </ul>
3.4 If yes, how much of the forage land is irrigated (ha) at present? - If not, how much of the land available can be irrigated in the future. - Who are the local stakeholders that could support irrigation (names of projects etc.)?	<ul style="list-style-type: none"> <li>• All forage land (24 ha) promoted by the project (RIPA) and other institutions including government are irrigated by water pumped from Omo river.</li> <li>• Pastoralist especial fund of government which covers the fuel and lubricant of electric generator, pump and electric generator operator cost.</li> <li>• RIPA purchased 2 pumps and provided to forage producers,</li> <li>• RIPA also provided training, extension service, forage seed</li> <li>• Livestock and fishery office provided training, extension service, forage seed</li> <li>• Jinca Agricultural Research Center conducts research and variety selection and in addition provides logistics and input support on land they have been conducting research and adaptation trial</li> </ul>
3.5 Do you think that sufficient water is available for irrigating the area that you would like to cultivate forages?	<ul style="list-style-type: none"> <li>• No water problem in Omo river but the main problem is capacity and functionality of the submersible water pump and electric generator which limit volume of water pumped to the canal. The available command area is very vast but the major challenge is water pumping from the river to canal.</li> </ul>

#### 4. Forage production in the vicinity

Questions	Response
4.1 How many farmers in the vicinity grow forages?	<ul style="list-style-type: none"> <li>• There are a number of producers engaged in forage production who are organized by GOs and NGOs who are producing forage on the two sides of Omo river. For example, there 6 groups having 27 to 34 members.</li> <li>• In addition, there are other 10 enterprises (groups) organized in one cooperative (multi-purpose)</li> <li>• There are also 2 forage producing cooperatives and 3 enterprises (groups) in Nagatom woreda</li> <li>• The enterprises are small groups like those organized by RiPA</li> </ul>
4.2 How far are those farmers located from your farm (km)?	<ul style="list-style-type: none"> <li>• The forage producing farms of the groups are located less than one kilometer from the river on both sides of the river (Omo) along the main and secondary canals. They are not far. They are located apprx 5-10kms away</li> </ul>
4.3 What is the average area in which they cultivate forages (ha)?	<ul style="list-style-type: none"> <li>• Each forage producer groups have 4 ha land of which each group member have 0.12 to 0.14 ha plot depending on the number of farmers in a group</li> </ul>



Questions	Response
4.4 Which forages are being grown by those farmers?	Panicum
4.5 What type of irrigation do they use to cultivate forages	<ul style="list-style-type: none"> <li>• The forage cultivation entirely done on pump based flood irrigation where the water is supplied using furrow irrigation to farms.</li> <li>• The water pump uses diesel electric generator as sources of energy for the pumps (#4).</li> <li>• Out of 4 pumps, only 2 pumps operate at time due to low capacity of the diesel electric generator</li> </ul>

### 5. Environmental conditions for forage drying

Question	Response
5.1 Months in which it rains here:	<ul style="list-style-type: none"> <li>• There are 2 rainy seasons in Dasenech woreda and the surrounding,</li> <li>• The long rainy season starts around mid-February and extends up to end of April (2.5 months) while the short rainy season is between September and mid-October (about 1.5 months long). This makes about 4 months of rain with interruption.</li> </ul>
5.2 Dry months:	<ul style="list-style-type: none"> <li>• However, in recent 10 years the duration of the rainy days showed considerable shrinkage and also become very erratic with long spill days within rainy months and both.</li> <li>• Dry months: May-August; Nov to mid Feb.</li> </ul>
5.3 Intensity of sunlight during dry months (strong, medium, low)	<ul style="list-style-type: none"> <li>• The intensity of the sun and temperature has been increasing (becoming very strong)</li> </ul>
5.4 Do you see any problem in drying forages i.e. to convert to hay from the fresh forages	<ul style="list-style-type: none"> <li>• Producers encounter grass (hay) quality deterioration as they dry the grass on ground (soil) due to termite attack</li> </ul>

### 6. Infrastructure capacity in the area

Questions	Responses
6.1 Type of functioning machinery available (tractor, harvester, vehicle, etc.). Please add details and capacities. Attach <b>photographs</b> if possible.	<ul style="list-style-type: none"> <li>• The woreda has 2 tractors to transport the baled grass, perform cultivation. The woreda also has 2 baler machines (1 of it needs maintenance)</li> <li>• The fuel, lubricant, and operator costs of the tractors and baler machine are covered by woreda and sometimes by NGOs, too.</li> </ul>
6.2 Are the machines used for forage cultivation, processing or marketing purpose (explain)	<ul style="list-style-type: none"> <li>• The tractors are used for cultivation and balled grass transportation to storages</li> <li>• Baler machine to bale the grass which will be supplied to buyers (NGOs who engaged in emergency response)</li> </ul>
6.3 Adequacy of labor availability for forage cultivation? (Shortage/sufficient/abundant)	<ul style="list-style-type: none"> <li>• No problem of labor for the producer (farmers)</li> </ul>

Questions	Responses
6.4 Type of labor involved in forage cultivation (Men/women/girls/boys). <b>Disaggregate by sex and youth</b>	<ul style="list-style-type: none"> <li>• However, the labour work on farm is highly dominated by women owing to the cultural norm</li> </ul>
6.5 Adequacy of labor availability for forage processing? (Shortage/sufficient/ abundant)	<ul style="list-style-type: none"> <li>• There is no labour availability related problem. The pastoralists have settled around forage production area</li> <li>•</li> </ul>
6.6 Type of labor involved in forage processing (Men/women/girls/boys)	<ul style="list-style-type: none"> <li>• All group members and their families work on own plot of lands, the cultivation and other farm activities are individual base than group</li> </ul>
6.7 What challenges exist regarding human capacities for forage cultivation in the area?	<ul style="list-style-type: none"> <li>• Lack of technical capacity on forage production, post-harvest handling technique problem, poor culture of money saving particularly for men as they misappropriate (drinking) income generated from the sales of baled grass, group management leaders have leadership (management) problem on the water allocation and sharing.</li> </ul>
6.8 What challenges exist regarding human capacities for forage processing in the area?	<ul style="list-style-type: none"> <li>• The balling machine and tractor should be simplified, i.e., small scale machine and manses of transport than fully depending on the heavy duty machines.</li> <li>• The forage production depended on very high external support (almost no production cost) except farm labour, this will definitely result in sustainability concern if external supports are removed.</li> </ul>
6.9 What challenges exist regarding infrastructural capacities stated above?	<ul style="list-style-type: none"> <li>• The power supply of the irrigation pump fully depends on diesel engine based electricity, thus the running cost is high and also problem of dis-functionality. Therefore, there should be options like solar and wind based pump system to reduce operation (fuel and lubricant, maintenance) costs.</li> </ul>

## 7. Utilities

Questions	Responses
7.1 Do you have a three-phase electric supply near the potential cultivation site? Yes/No. - Please describe the distance from the potential land of forage cultivation identified above. <b>Take pictures.</b>	<ul style="list-style-type: none"> <li>• No three-phase electric supply even at Dasenech woreda town (Omorate). The three-phase electric supply is found at 70km distance (at Turmi town of Hammer)</li> </ul>
7.2 If not, can you get it? Yes/No (explain the answer)	<ul style="list-style-type: none"> <li>• The power supply of Omorate town is solar field based local grid which supply power for domestic (housing) use. Three phase electric supply may not be available in nearest future.</li> </ul>
7.3 What is the distance (meters) of the from the site to the electric power supply?	<ul style="list-style-type: none"> <li>• The local grid of Omorate town is about &lt;3 km from the river</li> </ul>

Questions	Responses
7.4 Other challenges related to utilities	<ul style="list-style-type: none"> <li>• Absence of hydroelectric (three phase) power, frequent dis-functionality of diesel engine electric generator, shortage of fuel for the electric generator could considerably challenge sustainable supply of irrigation water for forage production and densification.</li> </ul>
7.6 What opportunities do you see?	<ul style="list-style-type: none"> <li>• Introduction of solar and/wind mill water pump</li> </ul>

### 8. Accessibility

Questions	Responses
8.1 Distance to Addis Ababa (km); expected travel time (hours)	875 km to Addis Ababa; two days travel
8.2 Distance to regional town (km); name of town; expected travel time (hours)	643 km to Hawassa; 1 and half days travel.
8.3 Type of road (all asphalt; partly gravel and partly asphalt; partly dry weather; all weather road). <b>Take pictures.</b>	<ul style="list-style-type: none"> <li>• The roads are mixed type, Addis Ababa to Jinka (Asphalt), Jinka to Keyafer (Asphalt), Key-Afer to Turmi (gravel=80km), Turmi to Omorate/Dasench capital (Asphalt)</li> </ul>
8.4 Any challenges with road conditions during droughts or rainy seasons or conflict?	<ul style="list-style-type: none"> <li>• As the roads are all weather no significant problem related to access</li> </ul>
8.5 Any challenge with the local/community/tribal conflict?	<ul style="list-style-type: none"> <li>• There is security concern in the area between Dasenech and Hammer communities (occurring only sometime leading to road blockage; may not lead to war)</li> </ul>

### 9. Projects and Institutions

Questions	Responses
9.1 Are there any projects nearby or in the site? Yes/No	<ul style="list-style-type: none"> <li>• Yes, there are about 42 NGO's operating in South Omo zone. But</li> </ul>
9.2 If yes, who owns the projects? Please collect the <b>contact details.</b>	<ul style="list-style-type: none"> <li>•</li> </ul>
9.3 What are the purposes of the projects? (forages cultivation, seed production, agro-industries, etc. (specify)	<ul style="list-style-type: none"> <li>• Out of those NGOs, only few work on forage multiplication like RiPA, Agri-Service Ethiopia, VSA Germany. LLRP is implemented by the government</li> </ul>
9.4 Where are these projects located?	<ul style="list-style-type: none"> <li>• Most work in Dasenech woreda</li> </ul>
9.5 Nearby institutions (ARCs; Universities; implementing/development partners) (The leverage points).	<ul style="list-style-type: none"> <li>• Jinka Agr Research Center work on promotion of forage seed multiplication, grass variety adaptation trial and selection, grass agronomic practices</li> <li>• Jinka University also started research on forage development related research</li> </ul>

Questions	Responses
9.6 Are there dairy farms nearby or in the site? (Yes/No)	• No dairy farm in Dasench woreda
9.7 If yes, how many farms?	-
9.8 How big is each farm (e.g. number of dairy cows)?	-
9.9 What new linkages needs to be established?	-
9.10. Are there fattening farms nearby (yes/No), - If yes, how many; how far located; how big i.e. number of fattening animals that can be fattened at one time	<ul style="list-style-type: none"> <li>• Yes, there are 8 livestock (goat) fattening and trading groups in Dasenech woreda.</li> <li>• Each group has 10 members (8x10 =80) out of the members 40% are females</li> </ul>

### 10. Demand for forage

Questions	Responses
10.1 Demand for densified feed in the area / vicinity / region	• Farms/pastoralists have high demand for concentrated feed particularly during feed shortage and emergency situation
10.2 Desire to engage in densification of forage into hay, silage, pellets, blocks (Explain)	• RIPA organized 2 groups (with member of 32 and 34) for concentrated feed production and marketing in 2020

### 11. Political buying

Questions	Responses
11.1 What policy support for forage cultivation exist? From the local and regional governments?	• Government has good policy and strategic actions on forage cultivation. For example LLRP program has been fully covering irrigation pumping (fuel, lubrication, operation and maintenance) costs, supporting machine (tractor and baler machine) and extension to producers
11.2 How do you assess the community member's acceptance of land allocated to forage production? <b>Now and in future.</b>	• There is no objection on the land allocated for forage production
11.3 Please list the relevant stakeholders who are important to secure buying as well as, engage with to implement on the ground, should large scale land be available for forage cultivation. - Collect names, organization details, and - Contact details of the stakeholders. - If possible please chalk out a brief stakeholder mapping using the blank space below.	• See below

*Example of stakeholder mapping (modify and edit as needed)*

<b>Stakeholder Type</b>	<b>Stakeholder name/contact details</b>	<b>Potential engagement purposes and priority level</b>	<b>Expected probability of securing buying (low/medium/high)</b>
Local government	Land administration; chaired by the Woreda Administration (Fikremarium Aymele: 0953799507)	Land allocation	High
	Woreda Agr. Office (Mesay Libene: 0919990835)	Technical support and extension service	High
	Woreda Enterprise and Industry Office	Mandate to organize groups and create job for the youth	High
	Cooperative office	Organize and register coops and provide audit service	High
Zonal government	Needed only if the land should be secured for investment. For projects benefiting the community, the woreda authorities can determine. Investment license cannot be given without securing land from the woreda authorities.		
Regional government			
Agr research institutes	Jinka Agr Research Center (Dr. Tekle Yoseph: 0916866589)	Research and technical support; selection and demonstration of technologies	High
Local/regional universities	Jinka University (newly established)		
Department of commerce	None		
Private sector entities	Eden Agri-Seed Enterprise (Getahun: 0930077382)	Buy or supply forage seed	High
Parastatals			
Community engagement – agro/pastoral	Cooperatives and group members are pastoralist	Interested to produce forage for their livestock and also sell	High
Specific tribal engagement	Not much role mentioned		
Other Donor funded project leverage	LLRP; VSA Germany		

## Dale-Yirgalem-Sidama

### Identification

Person Interviewed:	Dereje Ejano	Name of organization	Mero Dairy Farm (established I 2021)
Date of Interview	13/03/2023	Place of interview	Yirgalem tow

Note: Please fill out this questionnaire for each of the physical sites. (We understand that large scale forage cultivation may or may not be happening at present. The purpose of this instrument is to gather as much detailed information about the current sites as they exist AND any potential land that may become available in the future for large scale cultivation of forages.)

### Location

Location of the physical site			
• Region	Sidama		
• Woreda	Dale		
• Kebele	Kidist Mariam		
• GPS coordinates	0436576, 074615	0436612, 0746357	
• Elevation 1692 to 1735	0436545, 074617	0436612, 0746429	
	0436584, 0746368	0436632, 0746450	

### Forage cultivation status

Do you / the community / the project grow forages currently? Yes/No. If yes, go to 1; and if not, go to 2

Questions	Dereje	Cooperative	Enterprises
<b>1. If you grow forages:</b>	He is member of the cooperative	Has 15 members	There are 15 entireness
1.77 Area (ha) under cultivation	3.3 ha	On average each member has 2.5 ha (thus the total is 37.5 ha) but mixed farming is	On average each enterprise have 6 ha (thus all together have 90 ha) but mixed farming is practiced
1.78 Which forages do you grow?	Elephant grass (90%)	Elephant grass (70%)	Elephant grass (90%)
1.79 If you grow more than one forages, area (ha) under each forage:	Enset and banana (10%)	Enset and banana (30%)	Enset and banana (90%)
1.80 What are the reasons for growing these forages (for example quality/robustness?)	Elephant grass is most preferred due to <ul style="list-style-type: none"> <li>suitable on the soil and climate</li> </ul>		

Questions	Dereje	Cooperative	Enterprises
	<ul style="list-style-type: none"> <li>fast growing and has high biomass</li> <li>good nutrition content</li> <li>high milk yield</li> </ul>		
1.81 How much forage do you harvest per year (tons as fresh weight)	Mostly we harvest green elephant grass 4 to 5 times per year which yield 40 to 50 ton/ha/year		
1.82 How many harvests do you take per year?	4 to 5 rounds/year	4 to 5 rounds/year	4 to 5 rounds/year
1.83 Quantity of forages you harvest per harvest (tons as fresh weight)	10 ton/ha/round	10 ton/ha/round	10 ton/ha/round
1.84 How do you currently use forages (feeding own livestock/selling/other)?	70% for own cows feed 30% sell	On average 80% for owns cow feed 20% sell	Mostly (100%) for own cows feed
1.85 What is the % of forage used for own?	70%	80%	100%
1.86 If you sell forages, how much on average per month (kg as fresh):	On average 13.5 ton/year	On average 9 ton/year	-
1.87 In which months do you sell forage?	April to November (8 months)	April to November (8 months)	-
1.88 Do you prepare hay? Yes/No	Yes, but from local grass either from own land located in other kebele	Yes, but from local grass either from own land located in other kebele	Yes, but from local grass either from own land located in other kebele
1.89 If you prepare hay, how much hay per year (kg as dry matter)?	He needs 10 trucks per year out of which he harvests 2 trucks from own land located at his birth place. One truck of hay costs 8,000 birr He also spent about 400,000 birr/year for other feed (such as grain bran, brewer bran, concentrate feed)	Each member needs 11 trucks per year out of which he harvested 2 trucks from own land located at other places and purchased 9 trucks. One car hay cost 8,000 birr (total cost 72,000 birr/year) Each members also cost about 450,000 birr/year for other feed (such as grain bran, brewer bran, concentrate feed)	Each enterprise member purchase about 20 trucks (of which 18 trucks were purchased and 2 trucks were harvested from own farm in rural kebeles) per year costing 144,000 birr/year In addition each enterprises holder cost about 1,000,000 birr/year for other feed types (grain bran, brewer bran, concentrate feed)
1.90 In which months do you sell hay?	No hay sell	No hay sell	No hay sell

Questions	Dereje	Cooperative	Enterprises
1.91 Would you like to extend forage cultivation area? Yes/No	Yes, I applied for additional 10ha of land in 2014 for forage production. The government (region investment office and woreda) approved the application but not yet decided at woreda level.	2 members of our cooperative also applied for 20ha of land in 2014 for forage production. The government (region investment office) approved but not yet approved by the woreda administration.	No so far
1.92 If yes, to how many hectares? Are those additional hectares already available? In one parcel or as fragmented? If fragmented, proximity of those pieces?	10 ha The Elephant grass productions are fragmented	20 ha - 10 members produce on one cluster farm - 5 members use fragmented lands	- - 10 enterprises produce on one cluster farm - 5 enterprises use fragmented lands
1.93 Would you wish to cultivate other forage varieties than you are currently cultivating? Yes/No	Yes, if I get the expiation lad I planned to produce Desho grass and Panicum	Yes, our members also like to cultivate Desho grass	Enterprise members are also interested to produce Desho grass
1.94 Do you think market is available for cultivated forages? Yes/No. If yes, in which form (fresh, hay, silage or other)	Yes, we don't have market problem for green Elephant grass. If we also able to produce hay from other grass market will not be a problem as most transport from distant places		As enterprises have large number of dairy cows, most probably they might not engage in commercial forage production, as the need more
1.95 If yes, how far away (km)?	Most dairy and fattening farms are in the town (Yirgalem) and suburbs the market distance is nearby, 5km		
1.96 Do you have a place for storing hay (yes/No)	Yes,	Yes	Yes
1.96.1 If yes, how much (cubic meters)? Please describe <b>storage unit details</b> along with <u>photographs</u> . Please describe <u>how far the storage</u> is from the potential forage cultivation land.	182 m <sup>2</sup> (4x8 m= 32 m <sup>2</sup> and 10m x 15 m = 150 m <sup>2</sup> )	On average each member has about 32 m <sup>2</sup> storages	- 9 enterprises each has 32 m <sup>2</sup> capacity store - 6 enterprises each has capacity 150 m <sup>2</sup> store
1.96.2 If not, <b>how</b> would you go about creating one?	NA	NA	NA



Questions	Dereje	Cooperative	Enterprises
1.97 Do you have any experience of silage preparation? Yes/No	No	8 cooperative members produce silage but the remaining 7 don't	Similarly 8 enterprises produce silage but the remaining 7 don't
1.98 If yes, of which forages? _____	NA	They use maize stock, elephant grass and other grass	They use maize stock, elephant grass and other grass
1.99 Do you have any experience of hay preparation? Yes/No	Yes, He prepare 2 trucks from own harvest on land situated somewhere not at land allocated for the dairy farm and purchase 8 trucks (Isuzu quintals capacity) hay	Yes, On average each member prepare 2 trucks from own harvest on land situated somewhere not at land allocated for the dairy farm and purchase 9 trucks (Isuzu quintals capacity) hay	Yes, On average 8 enterprises produce about 10% of hay used for own consumption prom own land situated somewhere but not on land acquired for dairy farm and cover the remaining hay through purchase. However, 7 enterprises cover there hay demand fully through purchase
1.100 If yes, of which forages?	Local grass	Local grass	Local grass
1.101 Would it be possible to hire labor required for cultivation and densification of forages?	Labor availability varies across season. Labor shortage happen during coffee harvest period (October to mid-January) as the heavy work load and low payment discourage laborers to stay on dairy farm activities compered to coffee harvesting. Dairy farm owners pay 1000 to 3000 birr per month covering month round food for the employee, but this payment is smaller than the amount paid on other sectors. The dairy farmers sell milk at low price and have high feed and other related costs, as the result they are unable to pay more for the daily laborers.		

Proceed to No.3, below

*2. If you/community do not grow forages*

Questions	Responses
2.1 What crops (if any) are grown at present? If nothing is grown then please explain why.	
2.2 Is there potential to grow forages? Yes/No (if no, no need to proceed)	
2.3 If yes, please describe the purpose in detail?	
2.4 If selling is one of the purposes, then to whom?	
2.5 How many hectares of land is available to grow forages? - Is that all in one parcel or fragmented?	

Questions	Responses
- If fragmented then how far are the parcels and - What is the average size of the landholding for each of the parcels?	
2.6. Any particular reason for not growing forages so far?	
2.7 Would it be possible to hire labor required for cultivation and densification of forages?	
2.8 Do you have storage place for storing hay (as an example)? Please describe storage unit details along with photographs. Please describe how far the storage is from the potential forage cultivation land.	
2.9 If yes, how much (cubic meters):	
2.10 If not, how would you be storing forage, in case you intend to densify it as hay, block or pellets?	
2.11 Do you have any experience of silage preparation?	
2.12 If yes, of which forages?	
2.13 Do you have any experience of hay preparation?	
2.14 If yes, of which forages?	
2.15 Do you think market is available for cultivated forages? Yes/No. If yes, in which form (fresh, hay, silage or other)	
2.16 If yes, how far away (km)?	

### 3. Irrigation

Questions	Dereje	Cooperative	Enterprises
3.1 Do you have access to irrigation? Yes/No. - Please describe how far or close the irrigation is from the potential land of forage cultivation. - Please take pictures.	No	No	No
3.2 If yes, type of irrigation (gravitational; pump; sprinkler; other) available	No irrigation practice so far		
3.3 Do you currently irrigate forage land? Yes/No - If No, please explain the opportunities you see with future cultivation of the land you identified above.	No	No	No
3.4 If yes, how much of the forage land is irrigated (ha) at present? - If not, how much of the land available can be irrigated in the future. - Who are the local stakeholders that could support irrigation (names of projects etc.)?	NA	NA	NA
3.5 Do you think that sufficient water is available for irrigating the area that you would like to cultivate forages?	Yes But the topography is not suitable for most part of the forage farmland	<ul style="list-style-type: none"> <li>• Vary place to place</li> <li>• In areas where water (river) is available, topography setup</li> </ul>	<ul style="list-style-type: none"> <li>• Vary place to place</li> <li>• In areas where water (river) is available, topography setup</li> </ul>

Questions	Dereje	Cooperative	Enterprises
		challenge the water convey mechanism	challenge the water convey mechanism

#### 4. Forage production in the vicinity

Questions	Response
4.1 How many farmers in the vicinity grow forages?	About 20% HHs of Yirgalem town have dairy cows,
4.2 How far are those farmers located from your farm (km)?	The dairy cow owners live within the city and about 2 to 6 km (average 4km) in Yirgalem town and around.
4.3 What is the average area in which they cultivate forages (ha)?	Most dairy cow owners also have an average of 1 ha farmland for the forage production
4.4 Which forages are being grown by those farmers?	The major forage produced by these farmers is Elephant grass (80%), and the remaining parcel occupied by Desho and local grass, Enset, Banana
4.5 What type of irrigation do they use to cultivate forages	Almost no practice of using irrigation to produce forage

#### 5. Environmental conditions for forage drying

Question	Response
5.1 Months in which it rains here:	April to November (8 months)
5.2 Dry months:	December to March (4 months)
5.3 Intensity of sunlight during dry months (strong, medium, low)	Medium
5.4 Do you see any problem in drying forages i.e. to convert to hay from the fresh forages	Sometimes unexpected rain occurs in dry season

#### 6. Infrastructure capacity in the area

Questions	Dereje	Cooperative	Enterprises
6.1 Type of functioning machinery available (tractor, harvester, vehicle, etc.). Please add details and capacities. Attach <b>photographs</b> if possible.	<ul style="list-style-type: none"> <li>• Feed chopper</li> <li>• Animal pulled cart</li> </ul>	<ul style="list-style-type: none"> <li>• Almost all member have animal pulled cart for feed transportation</li> </ul>	<ul style="list-style-type: none"> <li>• 3 enterprises have medium size truck (Isuzu)</li> <li>• All have animal pulled carts</li> <li>• 6 enterprises have feed choppers</li> </ul>
6.2 Are the machines used for forage cultivation, processing or marketing purpose (explain)	Cart is for feed transportation and the chopper is to chop feed	Cart is for feed transportation	The carts and tracks are for feed transportation and the choppers are to chop feed

Questions	Dereje	Cooperative	Enterprises
6.3 Adequacy of labor availability for forage cultivation? (Shortage/sufficient/abundant)	Sufficient labor	Sufficient labor	Sufficient labor
6.4 Type of labor involved in forage cultivation (Men/women/girls/boys). <b>Disaggregate by sex and youth</b>	Adult and youth men dominated	Adult and youth men dominated	Adult and youth men dominated
6.5 Adequacy of labor availability for forage processing? (Shortage/sufficient/abundant)	Sufficient	Sufficient	Sufficient
6.6 Type of labor involved in forage processing (Men/women/girls/boys)	Adult men dominated	Adult men dominated	Adult men dominated
6.7 What challenges exist regarding human capacities for forage cultivation in the area?	<ul style="list-style-type: none"> <li>• Attitudinal problem to engage in agricultural (dairy farm) works</li> <li>• Skill and knowledge gap both in forage (verities and agronomy) production and dairy farming, irrigation</li> <li>• The owners and the employees have knowledge gap in forage production and dairy</li> </ul>		
6.8 What challenges exist regarding human capacities for forage processing in the area?	Skill and knowledge gap		
6.9 What challenges exist regarding infrastructural capacities stated above?	Poor dairy farm management (e.g., sanitation, animal nutrition, product and (milk management, handling, processing...). The storage facility and livestock feeding places and barn are poorly managed.		

## 7. Utilities

Questions	Responses
7.1 Do you have a three-phase electric supply near the potential cultivation site? Yes/No. - Please describe the distance from the potential land of forage cultivation identified above. <b>Take pictures.</b>	Yes, but farms are fragmented and they are located relatively at remote location as they have too far from residences. The main power line is on average about 1km distance from the plots.
7.2 If not, can you get it? Yes/No (explain the answer)	NA
7.3 What is the distance (meters) from the site to the electric power supply?	Generally most dairy farms and forage production lands are located about 1km from three phase electric greed
7.4 Other challenges related to utilities	Rugged topography, fragmented forage production farmlands, dairy farms are dispersed, mixed cropping (forage with fruits, coffee, banana and Enset).
7.6 What opportunities do you see?	Low experience and skill (no modern) on dairy farming. No tractor for forage production. Low local government (woreda, city administration) support

## 8. Accessibility

Questions	Responses
8.1 Distance to Addis Ababa (km); expected travel time (hours)	322 km
8.2 Distance to regional town (km); name of town; expected travel time (hours)	47 km (from Hawassa)
8.3 Type of road (all asphalt; partly gravel and partly asphalt; partly dry weather; all weather road). <b>Take pictures.</b>	Asphalt road from Addis Ababa and Hawassa to Dale woreda (Yirgalem) but gravel road to farms
8.4 Any challenges with road conditions during droughts or rainy seasons or conflict?	No significant problem
8.5 Any challenge with the local/community/tribal conflict?	Rugged topography, fragmented forage production farmlands, dairy farms are dispersed. No conflict as such.

## 9. Projects and Institutions

Questions	Responses
9.1 Are there any projects nearby or in the site? Yes/No	No
9.2 If yes, who owns the projects? Please collect the <b>contact details.</b>	No
9.3 What are the purposes of the projects? (forages cultivation, seed production, agro-industries, etc. (specify)	No
9.4 Where are these projects located?	NA
9.5 Nearby institutions (ARCs; Universities; implementing/development partners) (The leverage points).	Economics and Business Collage of Hawasa University is situated at Yirgalem town
9.6 Are there dairy farms nearby or in the site? (Yes/No)	No, except above mentioned types
9.7 If yes, how many farms?	i.e., 30 dairy farms of the comparative members and enterprise. In addition nearly 20% of HHs of Yirgalem town engaged in petty dairy farming who own 1 to 4 cows (improved and local). Some of them also sell milk while most of them produce for home consumption.
9.8 How big is each farm (e.g. number of dairy cows)?	The dairy farms are small and medium scale
9.9 What new linkages needs to be established?	Some NGOs like SNV, Feed the Future were supporting some dairy enterprises: technologies and input supply, some linkages
9.10. Are there fattening farms nearby (yes/No), - If yes, how many; how far located; how big i.e. number of fattening animals that can be fattened at one time	Yes, There are 10 oxen fattening farms in the town and around, they fatten 10 to 30 cattle (oxen) in one round, where they carryout 2 to 3 round fattening per year

## 10. Demand for forage

Questions	Responses
10.1 Demand for densified feed in the area / vicinity / region	No practice of densification so far

Questions	Responses
10.2 Desire to engage in densification of forage into hay, silage, pellets, blocks (Explain)	As the practice of densification and silage making are important to preserve forage for prolonged time, we are willing to engage on the practice provided we got adequate skill.

### 11. Political buying

Questions	Responses
11.1 What policy support for forage cultivation exists? From the local and regional governments?	Government (Woreda agriculture office) provide us extension support, however we are not getting adequate support to improve and expand our dairy and forage production particularly in terms of additional land which we requested from government mainly from woreda and town municipality). We applied last year (2014 EC) but no response from the woreda and town municipality although the region immediately passed our request
11.2 How do you assess the community member's acceptance of land allocated to forage production? <b>Now and in future.</b>	So far no complaint from community side, the community respect the direction and decision of government body.
11.3 Please list the relevant stakeholders who are important to secure buying as well as, engage with to implement on the ground, should large scale land be available for forage cultivation. - Collect names, organization details, and - Contact details of the stakeholders. - If possible please chalk out a brief stakeholder mapping using the blank space below.	

### Example of stakeholder mapping (modify and edit as needed)

Stakeholder Type	Stakeholder name/contact details	Potential engagement purposes and priority level	Expected probability of securing buying (low/medium/high)
Local government	Woreda administration City administration Agriculture office	Land allocation Business licensing Extension service	Medium
Zonal government	No role		
Regional government	Investment Bureau Agriculture Bureau	Investment license Technical support to woreda agr	High
Agr research institutes	None		

Stakeholder Type	Stakeholder name/contact details	Potential engagement purposes and priority level	Expected probability of securing buying (low/medium/high)
Local/regional universities	College of business exists but no linkage		
Department of commerce	None		
Private sector entities	No link as such		
Parastatals			
Community engagement – agro/pastoral	Land for investment is controlled by government; the say of the community is low		
Specific tribal engagement	No tribal issue		
Other Donor funded project leverage	None		

## RiPA North- Afar Region

### *Identification Interview*

Person Interviewed:	Abdurehman Mohammed	Name of organization	MercyCorps staff in Afar
Date of Interview	18/04/2023	Place of interview	Virtual: 0910079102

Note: Please fill out this questionnaire for each of the physical sites. (We understand that large scale forage cultivation may or may not be happening at present. The purpose of this instrument is to gather as much detailed information about the current sites as they exist AND any potential land that may become available in the future for large scale cultivation of forages.)

### *Location*

Location of the physical site	
• Region	Afar region
• Woreda	7 woredas: Gawane and Amibara (in Zone 3); Asayita, Afambo, Mile, Dubti and Chifra (in Zone 1)
• Kebele	
• GPS coordinates	

### *Forage cultivation status*

Do you / the community / the project grow forages currently? Yes/No. If yes, go to 1; and if not, go to 2

RiPA north in Afar follows market system development for forage production and feed intervention. Three private forage producers engaged recently: 1 in Dubti, 1 in Mile and 1 in 1 in Gawane. The data below are pertinent to these 3 farms partnering with RiPA. Government has also renovated about 700 ha of the former state farm in Dubti, which was abandoned due to damage. In 2020, the irrigation system was destroyed by flood; not yet made functional. The Lowland Livelihood Resilience Project (funded by the World Bank) financed forage production in 22 woredas, of which 2 are in the woredas targeted by RiPA: Amibara and Dubti. Panicum and Rhodes are planted on 50 ha in Amibara woreda (not much detail of this farm is known to the respondent).

Questions	Dubti woreda	Mile woreda	Gawane woreda
<b>1. If you grow forages:</b>			
1.102 Area (ha) under cultivation	Hamadu, Amina and Friends (Limited) (contact: 0910009720) partners with RiPA in Dubti woreda to cultivate forage on 100 ha. Forage is planted on 50 ha this year (newly started)	Mr. Haji Wiliso (contact: 0945111467) is a private investor, partnering with RiPA to cultivate forage on 3 ha. The farm is located some 15 km from the Mile Quarantine Center, which has not started functioning yet.	Mr. Abdella Mohammed (contact: 0911972932) is a private investor partnering with RiPA to cultivate forage on 10 ha (under land preparation).
1.103 Which forages do you grow?	Alfalfa, Rhodes grass and panicum	Panicum	Panicum and Sudan grass (planned)
1.104 If you grow more than one forages, area (ha) under each forage:	More land is under panicum; detail figure not available		Plan not yet realized
1.105 What are the reasons for growing these forages (for example quality/robustness.)	<ul style="list-style-type: none"> <li>• Commercial – sales to livestock traders in Dubti – expect NGOs and livestock traders to purchase hay</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Green forage for own dairy farm but in the future for sale if the cultivation expands</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Commercial - to sell forage to pastoralists and traders (no experience yet)</li> </ul>
1.106 How much forage do you harvest per year (tons as fresh weight)	<ul style="list-style-type: none"> <li>• 5 ha of panicum recently harvested. The harvested products were partly looted and yield is not known.</li> </ul>	<ul style="list-style-type: none"> <li>• Green forage harvest piece by piece. No yield estimate</li> </ul>	<ul style="list-style-type: none"> <li>• Not yet planted</li> </ul>
1.107 How many harvests do you take per year?	<ul style="list-style-type: none"> <li>• The 1<sup>st</sup> harvest started. Expected to harvest three times</li> </ul>	<ul style="list-style-type: none"> <li>• Harvested three times</li> </ul>	
1.108 Quantity of forages you harvest per harvest (tons as fresh weight)	<ul style="list-style-type: none"> <li>• Quantity yet to be estimated;</li> </ul>	<ul style="list-style-type: none"> <li>• Used as green/fresh fodder and no estimate of quantities</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>



Questions	Dubti woreda	Mile woreda	Gawane woreda
1.109 How do you currently use forages (feeding own livestock/selling/other)?	<ul style="list-style-type: none"> <li>• Commercial</li> </ul>	<ul style="list-style-type: none"> <li>• Feed own animals</li> </ul>	<ul style="list-style-type: none"> <li>• Planned to sell</li> </ul>
1.110 What is the % of forage used for own?	<ul style="list-style-type: none"> <li>• None.</li> </ul>	<ul style="list-style-type: none"> <li>• 100%</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
1.111 If you sell forages, how much on average per month (kg as fresh):	<ul style="list-style-type: none"> <li>• It is at the early stage; now harvesting in April, then expected in July and October</li> </ul>	<ul style="list-style-type: none"> <li>• April, July and October</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
1.112 In which months do you sell forage?	<ul style="list-style-type: none"> <li>• As soon as harvested and then gradually as demanded. Traders need it continuously and NGOs purchase for emergency</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
1.113 Do you prepare hay? Yes/No	Yes, the producer in Dubti prepared bale from what is being harvested on the 5 ha.	No	No
1.114 If you prepare hay, how much hay per year (kg as dry matter)?	It is in process of making		
1.115 In which months do you sell hay?	<ul style="list-style-type: none"> <li>• Since it is irrigated, baling is possible any time</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
1.116 Would you like to extend forage cultivation area? Yes/No	<ul style="list-style-type: none"> <li>• There is land potential but needs more effort to expand. Given the capacity of the company, it plans to add 50 ha and operate a total of 150 ha in the future.</li> </ul>	<ul style="list-style-type: none"> <li>• Yes, planned to increase forage area by 100 ha. There is former state farm producing banana but abandoned a long ago. The irrigation structure is good and can be made operational. The firm plans to develop other structures including storage through cost sharing arrangement with RiPA.</li> </ul>	<ul style="list-style-type: none"> <li>• No intention as the farm is more interested in vegetable production</li> </ul>
1.117 If yes, to how many hectares? Are those additional hectares already available? In one parcel or as	<ul style="list-style-type: none"> <li>• Additional 50 ha. However, only 50 ha of the secured 100 ha has been cultivated due to some damages to the irrigation system, making gravitational irrigation system difficult. Now, the firm planned</li> </ul>	<ul style="list-style-type: none"> <li>• Additional 100 ha. There is plan to build infrastructure needed to make the farm real but no action taken yet.</li> </ul>	<ul style="list-style-type: none"> <li>• No expansion envisaged for forage</li> </ul>

Questions	Dubti woreda	Mile woreda	Gawane woreda
fragmented? If fragmented, proximity of those pieces?	to renovate the irrigation system with HDP through cost sharing arrangement with RiPA.		
1.118 Would you wish to cultivate other forage varieties than you are currently cultivating? Yes/No	<ul style="list-style-type: none"> <li>Well adapted Alfalfa variety could not be found so far. Rhodes does not perform well on saline soil. The farms where forage is produced was state farm where the soil is already affected with salinity to to heavily fertilization and irrigation.</li> <li>Panicam will be the future focus forage variety in Afar</li> </ul>	<ul style="list-style-type: none"> <li>No plan to change</li> </ul>	Panicam and Sudan grass (planned)
1.119 Do you think market is available for cultivated forages? Yes/No. If yes, in which form (fresh, hay, silage or other)	<ul style="list-style-type: none"> <li>Yes, there is market. Currently, there is no sufficient forage supply. Even RiPA purchased forage (hay) from Sululta (Oromia) through its supplier for its emergency intervention. Afar is also bordering Djibouti where there is a potential for feed export.</li> <li>Hay is sold at Birr 250-300 per bale in Afar. The purchase price at Sululta is Birr 175 per bale but the transport cost is high.</li> <li>It can also supply to Eastern Oromia where there is land shortage for forage production.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
1.120 If yes, how far away (km)?	<ul style="list-style-type: none"> <li>Within Afar</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
1.121 Do you have a place for storing hay (yes/No)	<ul style="list-style-type: none"> <li>The private firms are planning to rent or get permission to use large government stores in Dubti; it is open structure for storing hay</li> </ul>	<ul style="list-style-type: none"> <li>No storage</li> </ul>	<ul style="list-style-type: none"> <li>No storage</li> </ul>
1.121.1 If yes, how much (cubic meters)? Please describe <b>storage unit details</b> along with <u>photographs</u> . Please describe <u>how far</u>	Large but actual capacity unknown	None	None

Questions	Dubti woreda	Mile woreda	Gawane woreda
the storage is from the potential forage cultivation land.			
1.121.2 If not, how would you go about creating one?		Expected to construct store through cost sharing arrangement with RiPA. But no concrete proposal yet	Expected to construct store through cost sharing arrangement with RiPA. But no concrete proposal yet
1.122 Do you have any experience of silage preparation? Yes/No	No	No	No
1.123 If yes, of which forages?__			
1.124 Do you have any experience of hay preparation? Yes/No	• Yes, in Dubti	• No	• No
1.125 If yes, of which forages?	Panicum		
1.126 Would it be possible to hire labor required for cultivation and densification of forages?	• Yes. Experienced labourar form Kombolcha (Amhara) and Raya. But also local labour supply exists.	•	•

*Note: The forage producers are in business only for 1 year partnering with RiPA north.*

**Proceed to No.3, below**

## *2. If you/community do not grow forages*

Questions	Responses
2.1 What crops (if any) are grown at present? If nothing is grown then please explain why.	Maize, cotton, sesame, and wheat
2.2 Is there potential to grow forages? Yes/No (if no, no need to proceed)	No (lack of experience; pastoral system; lack of seed and skill)
2.3 If yes, please describe the purpose in detail?	
2.4 If selling is one of the purposes, then to whom?	
2.5 How many hectares of land is available to grow forages? - Is that all in one parcel or fragmented? - If fragmented then how far are the parcels and - What is the average size of the landholding for each of the parcels?	
2.6. Any particular reason for not growing forages so far?	
2.7 Would it be possible to hire labor required for cultivation and densification of forages?	

Questions	Responses
2.8 Do you have storage place for storing hay (as an example)? Please describe storage unit details along with photographs. Please describe how far the storage is from the potential forage cultivation land.	
2.9 If yes, how much (cubic meters):	
2.10 If not, how would you be storing forage, in case you intend to densify it as hay, block or pellets?	
2.11 Do you have any experience of silage preparation?	
2.12 If yes, of which forages?	
2.13 Do you have any experience of hay preparation?	
2.14 If yes, of which forages?	
2.15 Do you think market is available for cultivated forages? Yes/No. If yes, in which form (fresh, hay, silage or other)	
2.16 If yes, how far away (km)?	

### 3. Irrigation

Questions	Dubti woreda	Mile woreda	Gawane woreda
3.1 Do you have access to irrigation? Yes/No. - Please describe how far or close the irrigation is from the potential land of forage cultivation. - Please take pictures.	<ul style="list-style-type: none"> <li>• Yes. Gravity irrigation from diverted river (Tandaho Dam in Dubti);</li> </ul>	<ul style="list-style-type: none"> <li>• Pump irrigation in Mile (from Mile River).</li> </ul>	<ul style="list-style-type: none"> <li>• Gravity irrigation, Awash river</li> </ul>
3.2 If yes, type of irrigation (gravitational; pump; sprinkler; other) available	<ul style="list-style-type: none"> <li>• Gravitational irrigation is used in Dubti.</li> </ul>	<ul style="list-style-type: none"> <li>• Pumping from Mile river in Mile</li> </ul>	<ul style="list-style-type: none"> <li>• Gravity irrigation, Awash river</li> </ul>
3.3 Do you currently irrigate forage land? Yes/No - If No, please explain the opportunities you see with future cultivation of the land you identified above.	<ul style="list-style-type: none"> <li>• Yes. The land is irrigated.</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> </ul>
3.4 If yes, how much of the forage land is irrigated (ha) at present? - If not, how much of the land available can be irrigated in the future. - Who are the local stakeholders that could support irrigation (names of projects etc.)?	<ul style="list-style-type: none"> <li>• 50 ha</li> </ul>	<ul style="list-style-type: none"> <li>• 3 ha</li> </ul>	<ul style="list-style-type: none"> <li>• 10 ha</li> </ul>
3.5 Do you think that sufficient water is available for irrigating the area that you would like to cultivate forages?	<ul style="list-style-type: none"> <li>• Yes</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> </ul>

#### 4. Forage production in the vicinity

Questions	Response (all woredas)
4.1 How many farmers in the vicinity grow forages?	• None
4.2 How far are those farmers located from your farm (km)?	•
4.3 What is the average area in which they cultivate forages (ha)?	•
4.4 Which forages are being grown by those farmers?	
4.5 What type of irrigation do they use to cultivate forages	•

#### 5. Environmental conditions for forage drying

Question	Response (applies to all woredas)
5.1 Months in which it rains here:	<ul style="list-style-type: none"> <li>• Short rain (Belg): February to April</li> <li>• Main season (Kiremt): July-September</li> </ul>
5.2 Dry months:	• Most of the days of the year is dry and sunny.
5.3 Intensity of sunlight during dry months (strong, medium, low)	• Strong
5.4 Do you see any problem in drying forages i.e. to convert to hay from the fresh forages	•

#### 6. Infrastructure capacity in the area

Questions	Dubti woreda	Mile woreda	Gawane woreda
6.1 Type of functioning machinery available (tractor, harvester, vehicle, etc.). Please add details and capacities. Attach <b>photographs</b> if possible.	<ul style="list-style-type: none"> <li>• Tractor is rented from private owners. RiPA and its partner will contribute 50% and purchase tractor and baler</li> <li>• Currently, government baler is used</li> </ul>	• Planned to use government baler in the future	• Planned to use government baler in the future
6.2 Are the machines used for forage cultivation, processing or marketing purpose (explain)	• Rented tractor is used for cultivation	Rented tractor is used for cultivation	Rented tractor is used for cultivation
6.3 Adequacy of labor availability for forage cultivation? (Shortage/sufficient/abundant)	• Sufficient	Sufficient	Sufficient
6.4 Type of labor involved in forage cultivation (Men/women/girls/boys). <b>Disaggregate by sex and youth</b>	• Men and women, mostly men	Men and women, mostly men	Men and women, mostly men
6.5 Adequacy of labor availability for forage processing? (Shortage/sufficient/ abundant)	• Sufficient labor for hay making	•	•

Questions	Dubti woreda	Mile woreda	Gawane woreda
6.6 Type of labor involved in forage processing (Men/women/girls/boys)	• Men and women, mostly men coming from highland	•	•
6.7 What challenges exist regarding human capacities for forage cultivation in the area?	• Limited skill; hot climate	Limited skill; hot climate	Limited skill; hot climate
6.8 What challenges exist regarding human capacities for forage processing in the area?	• Feed processing other than hay is unknown. Climate is challenging	•	•
6.9 What challenges exist regarding infrastructural capacities stated above?	• Access to baler depends on government decision. Tractor renting not a problem	• Tractor renting not a problem	•

### 7. Utilities

Questions	Dubti woreda	Mile woreda	Gawane woreda
7.1 Do you have a three-phase electric supply near the potential cultivation site? Yes/No. - Please describe the distance from the potential land of forage cultivation identified above. <b>Take pictures.</b>	<ul style="list-style-type: none"> <li>• The woredas have 3-phase electricity</li> <li>• No problem of electricity since the farms were used by state farms before</li> </ul>	• 3-phase electricity not available on farm	• 3-phase electricity not available on farm
7.2 If not, can you get it? Yes/No (explain the answer)	•	• Not easily	• Not easily
7.3 What is the distance (meters) of the from the site to the electric power supply?	• Within 1 km	• More than 15 km	•
7.4 Other challenges related to utilities	•	•	•
7.6 What opportunities do you see?	<ul style="list-style-type: none"> <li>• The federal ministry of low land and irrigation rehabilitated the damaged irrigation structure. This will make irrigation available for forage production on abandoned land. But the government owns the land and should manage it</li> </ul>	<ul style="list-style-type: none"> <li>• If Mile quarantine becomes functional (no one knows when), it may create</li> </ul>	•

### 8. Accessibility

Questions	Dubti woreda	Mile woreda	Gawane woreda
8.1 Distance to Addis Ababa (km); expected travel time (hours)	More than 500km; 1 days		



Questions	Dubti woreda	Mile woreda	Gawane woreda
8.2 Distance to regional town (km); name of town; expected travel time (hours)	1hr	5 hrs	6 hrs
8.3 Type of road (all asphalt; partly gravel and partly asphalt; partly dry weather; all weather road). <b>Take pictures.</b>	• Asphalt and Gravel road	Asphalt and Gravel road	Asphalt and Gravel road
8.4 Any challenges with road conditions during droughts or rainy seasons or conflict?	• It takes some hrs to enter farm if it rains	• It takes few days to enter farm if it rains; soil road in farm	• It takes few days to enter farm if it rains; soil road in farm
8.5 Any challenge with the local/community/tribal conflict?	•	•	•

### 9. Projects and Institutions

Questions	Responses (for all woredas)
9.1 Are there any projects nearby or in the site? Yes/No	• Yes
9.2 If yes, who owns the projects? Please collect the <b>contact details.</b>	• Government owned, Pastoral Resilience Project in Amibara is implementing forage production on 50ha; producing panicum and Rhodes grasses
9.3 What are the purposes of the projects? (forages cultivation, seed production, agro-industries, etc. (specify)	• For pastoralist; like emergency feed
9.4 Where are these projects located?	•
9.5 Nearby institutions (ARCs; Universities; implementing/development partners) (The leverage points).	• Center of Afar Pastoral Research Institute works on demonstration of forage spp but not collaborating with RiPA
9.6 Are there dairy farms nearby or in the site? (Yes/No)	• Yes, in Dubt; more important feed buyers are livestock traders
9.7 If yes, how many farms?	Not known. Livestock collectors and smallholder community members buy feed in smaller quantity
9.8 How big is each farm (e.g. number of dairy cows)?	No large scale dairy farm. But individuals have 1-2 cows for milking (often own consumption)
9.9 What new linkages needs to be established?	
9.10. Are there fattening farms nearby (yes/No), - If yes, how many; how far located; how big i.e. number of fattening animals that can be fattened at one time	<ul style="list-style-type: none"> <li>• There are livestock traders which aggregate sheep and goat to sell to exporters. Aggregators may collect up to 500 heads of sheep/goats in a week or 2-3 weeks depending on the supply. They keep for 10-15 days, feed the animals and sell to exporters. They need feed.</li> <li>• Aggregators have several mini-collectors with a capacity of 5-10 goats/sheep. These among the community members</li> <li>• RiPA supports three aggregators (2 cooperatives) and 1 private partner.</li> </ul>

Questions	Responses (for all woredas)
	<ul style="list-style-type: none"> <li>• Aroly Cooperative: located in Mile woreda, has 27 members (8 female and 19 men members), all traders of livestock, organized by government 5 years ago but became active last two years after they collaborated with RiPA.</li> <li>• Umer Ali and friends cooperative was established 2 years ago with 5 members (all men). It is found in Dubti woreda. One aggregator located in Chifra woreda. Each aggregator has 30-40 mini-collectors.</li> <li>• RiPA invested round Birr 200,000 per cooperative as a cost sharing to help them construct livestock holding ground, enable them collect sheep and goats for trading and training. It also linked them to livestock butchers and traders in Mojo and Addis Ababa and facilitated exposure visit to the butcheries.</li> </ul>

### 10. Demand for forage

Questions	Responses
10.1 Demand for densified feed in the area / vicinity / region	<ul style="list-style-type: none"> <li>• Not known</li> </ul>
10.2 Desire to engage in densification of forage into hay, silage, pellets, blocks (Explain)	<ul style="list-style-type: none"> <li>• Not known; if skill is built can be interesting</li> </ul>

### 11. Political buying

Questions	Responses
11.1 What policy support for forage cultivation exist? From the local and regional governments?	<ul style="list-style-type: none"> <li>• Due to increasing effect of drought, the government supports forage production.</li> </ul>
11.2 How do you assess the community member's acceptance of land allocated to forage production? <b>Now and in future.</b>	<ul style="list-style-type: none"> <li>• There is serious concern as community leaves livestock to graze the forage freely. This happens during Jan-March when the livestock mobility pattern brings large livestock number to Dubti area. The partners with RiPA now relay on permanent guarding and facing of the forage fields.</li> </ul>
11.3 Please list the relevant stakeholders who are important to secure buying as well as, engage with to implement on the ground, should large scale land be available for forage cultivation. <ul style="list-style-type: none"> <li>- Collect names, organization details, and</li> <li>- Contact details of the stakeholders.</li> <li>- If possible please chalk out a brief stakeholder mapping using the blank space below.</li> </ul>	<ul style="list-style-type: none"> <li>• Government but could not help sometimes</li> </ul>

*Example of stakeholder mapping (modify and edit as needed)*

Stakeholder Type	Stakeholder name/contact details	Potential engagement purposes and priority level	Expected probability of securing buying (low/medium/high)
Local government	Agri office; administration	Land allocation; extension service	High
Zonal government			
Regional government	Livestock production office	Provide local materials and technical support for the private sector	High
Agr research institutes	Afar Pastoral research institute	Adaption trial of forage species;	High
Local/regional universities			
Department of commerce			
Private sector entities			
Parastatals			
Community engagement – agro/pastor			
Specific tribal engagement	Community leaders	Overcoming conflict	
Other Donor funded project leverage			

**RiPA North- Somali Region**

*Identification Interview (Siti Zone)*

Person Interviewed:	Mohammed Muhammed	Name of organization	MercyCorps staff in Siti Zone, Somali
Date of Interview	15/04/2023	Place of interview	Phone call, he was in DD- Tel. 0915049970

**Identification Interview (Gode Zone):**

Person Interviewed:	Bedri Yusuf	Name of organization	MercyCorps staff in Gode Zone, Somali
Date of Interview	15/04/2023	Place of interview	Phone call, he was in Gode

Note: Please fill out this questionnaire for each of the physical sites. (We understand that large scale forage cultivation may or may not be happening at present. The purpose of this instrument is to gather as much detailed information about the current sites as they exist AND any potential land that may become available in the future for large scale cultivation of forages.)

*Location*

Location of the physical site	Siti Zone	Gode Zone
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• Region	Somali region	Somali region
• Woreda	6 woredas including Erer, Shinile, Dembel	5 woredas
• Kebele		
• GPS coordinates		

### *Forage cultivation status*

**Do you / the community / the project grow forages currently? Yes/No. If yes, go to 1; and if not, go to 2**

The data given below refer to Partners of RiPA in Siti zone and Bawako Agricultural Cooperative in Gode. The RiPA partners in Gode are not yet identified.

Questions	Responses (Siti zone)	Responses (Gode)
<b>1. If you grow forages:</b>		
1.127 Area (ha) under cultivation	32.5 ha owned by 5 farmers	• 500 ha owned by the members of the union
1.128 Which forages do you grow?	Sudan grass and panicum	• Sudan grass
1.129 If you grow more than one forages, area (ha) under each forage:	More area under Sudan grass	•
1.130 What are the reasons for growing these forages (for example quality/robustness.)	• There are 5 forage producers producing on 32.5ha. The largest farm has 15ha and the smallest has 3 ha. The largest farm uses the forage for own livestock others sell it	• Early maturing and has good nutrition value. Seed/planting material available for Sudan grass. Good yield and marketability. It also regenerates quickly.
1.131 How much forage do you harvest per year (tons as fresh weight)	• There is no good estimate of fresh weight forage. An average of 70 Bales (each 12 kg) per ha per season. Making a total of 1,645 bales per cycle of harvesting. Fresh harvest is 23% of the product.	• 400 bales per ha
1.132 How many harvests do you take per year?	Three times following the production cycle of March-May; July-August and May-June	• 3 times
1.133 Quantity of forages you harvest per harvest (tons as fresh weight)	•	• 400 bales per ha
1.134 How do you currently use forages (feeding own livestock/selling/other)?	• Mostly sold but one of the farms use for own livestock feed	• Selling and for own livestock
1.135 What is the % of forage used for own?	• 20% of the forage is used for own cattle	20-30% of production
1.136 If you sell forages, how much on average per month (kg as fresh):	• 80% is sold but there is no consistent market. If natural grass production is good, there is no	70-80% of own production

Questions	Responses (Siti zone)	Responses (Gode)
	demand for the forage; this discourages producers.	
1.137 In which months do you sell forage?	• June, Oct., April	Jan-March and July to October
1.138 Do you prepare hay? Yes/No	Yes, but done manually; not mechanized	Yes
1.139 If you prepare hay, how much hay per year (kg as dry matter)?	One farmer made hay of 210 bales from 3 ha, as an example.	300 bales in dry matter
1.140 In which months do you sell hay?	• In the months of harvest	In dry season
1.141 Would you like to extend forage cultivation area? Yes/No	• Yes	Yes
1.142 If yes, to how many hectares? Are those additional hectares already available? In one parcel or as fragmented? If fragmented, proximity of those pieces?	<ul style="list-style-type: none"> <li>• Three farmers reported to expand 155 ha (70, 50 and 35 ha, each). Due to increasing feed price coming from the highland area, local feed production is needed to reduce the effect of drought which is becoming frequent (almost every other year)</li> <li>• The farm is fragmented. The 5 farms are located in two woredas. In each woreda, the farmers are located in different kebeles. Three of the farms are located in Dembele woreda while 2 are in Erer woreda (and in two kebeles)</li> </ul>	70 ha
1.143 Would you wish to cultivate other forage varieties than you are currently cultivating? Yes/No	• Yes	Yes
1.144 Do you think market is available for cultivated forages? Yes/No. If yes, in which form (fresh, hay, silage or other)	• Yes, but not persistent. Market linkage is critically important.	• Yes for fresh forage and hay
1.145 If yes, how far away (km)?	• Dire Dawa is considered as potential since there some dairy farms	30-90 km from Gode
1.146 Do you have a place for storing hay (yes/No)	• No. kept in field until sold.	We use government facilities, stores
1.146.1 If yes, how much (cubic meters)? Please describe <b>storage unit details</b> along with <u>photographs</u> . Please describe <u>how far the storage</u> is from the potential forage cultivation land.		

Questions	Responses (Siti zone)	Responses (Gode)
1.146.2 If not, how would you go about creating one?	Not thought about it	
1.147 Do you have any experience of silage preparation? Yes/No	No	No
1.148 If yes, of which forages? _____		
1.149 Do you have any experience of hay preparation? Yes/No	• Yes, but manually	Yes
1.150 If yes, of which forages?	Sudan grass	Sudan grass
1.151 Would it be possible to hire labor required for cultivation and densification of forages?	• Yes	Yes

*Note: The forage producers are in business only for 1 year partnering with RiPA north.*

**Proceed to No.3, below**

## *2. If you/community do not grow forages*

Questions	Responses (Siti zone)	Response (Gode zone)
2.1 What crops (if any) are grown at present? If nothing is grown then please explain why.	Vegetables, fruits, sorghum	
2.2 Is there potential to grow forages? Yes/No (if no, no need to proceed)	No (lack of experience; pastoral system; lack of seed and skill)	
2.3 If yes, please describe the purpose in detail?		
2.4 If selling is one of the purposes, then to whom?		
2.5 How many hectares of land is available to grow forages? - Is that all in one parcel or fragmented? - If fragmented then how far are the parcels and - What is the average size of the landholding for each of the parcels?		
2.6. Any particular reason for not growing forages so far?		
2.7 Would it be possible to hire labor required for cultivation and densification of forages?		
2.8 Do you have storage place for storing hay (as an example)? Please describe storage unit details along with photographs. Please describe how far the storage is from the potential forage cultivation land.		
2.9 If yes, how much (cubic meters):		
2.10 If not, how would you be storing forage, in case you intend to densify it as hay, block or pellets?		

Questions	Responses (Siti zone)	Response (Gode zone)
2.11 Do you have any experience of silage preparation?		
2.12 If yes, of which forages?		
2.13 Do you have any experience of hay preparation?		
2.14 If yes, of which forages?		
2.15 Do you think market is available for cultivated forages? Yes/No. If yes, in which form (fresh, hay, silage or other)		
2.16 If yes, how far away (km)?		

### 3. Irrigation

Questions	Response (Siti zone)	Response (Gode zone)
3.1 Do you have access to irrigation? Yes/No. - Please describe how far or close the irrigation is from the potential land of forage cultivation. - Please take pictures.	• Yes. Traditional irrigation from diverted river is used.	• Yes
3.2 If yes, type of irrigation (gravitational; pump; sprinkler; other) available	• Gravitational irrigation is used. No pumping or sprinkler	• Gravitational and pumping
3.3 Do you currently irrigate forage land? Yes/No - If No, please explain the opportunities you see with future cultivation of the land you identified above.	• Yes. The land is irrigated and also used during rainy season to produce forage.	• Yes
3.4 If yes, how much of the forage land is irrigated (ha) at present? - If not, how much of the land available can be irrigated in the future. - Who are the local stakeholders that could support irrigation (names of projects etc.)?	• 32.5 ha is grown.	• 300 ha  No one supports
3.5 Do you think that sufficient water is available for irrigating the area that you would like to cultivate forages?	• Yes, it is river	• Yes, sufficient

### 4. Forage production in the vicinity

Questions	Response (Siti zone)	Response (Gode zone)
4.1 How many farmers in the vicinity grow forages?	• None	• About 1000 farmers
4.2 How far are those farmers located from your farm (km)?	•	• 5-25 km from the cooperative
4.3 What is the average area in which they cultivate forages (ha)?	•	• 1-3 ha (average 2 ha)
4.4 Which forages are being grown by those farmers?		Sudan grass and maize fodder
4.5 What type of irrigation do they use to cultivate forages	•	• Pumping and gravitational



### 5. Environmental conditions for forage drying

Question	Response (Siti zone)	Response (Gode zone)
5.1 Months in which it rains here:	• April, May, July, August, September	• Mid April-June and Mid Oct.-to Jan.
5.2 Dry months:	• Most of the days of the year is dry and sunny.	• Dec-Mid April, July to Mid Oct.
5.3 Intensity of sunlight during dry months (strong, medium, low)	• Strong	• Strong
5.4 Do you see any problem in drying forages i.e. to convert to hay from the fresh forages	•	• No

### 6. Infrastructure capacity in the area

Questions	Response (Siti zone)	Response (Gode zone)
6.1 Type of functioning machinery available (tractor, harvester, vehicle, etc.). Please add details and capacities. Attach <b>photographs</b> if possible.	•	• Rented tractor is used
6.2 Are the machines used for forage cultivation, processing or marketing purpose (explain)	•	• No machine
6.3 Adequacy of labor availability for forage cultivation? (Shortage/sufficient/abundant)	•	• Sufficient
6.4 Type of labor involved in forage cultivation (Men/women/girls/boys). <b>Disaggregate by sex and youth</b>	•	• Men and boys
6.5 Adequacy of labor availability for forage processing? (Shortage/sufficient/ abundant)	•	• Sufficient
6.6 Type of labor involved in forage processing (Men/women/girls/boys)	•	• Men and boys
6.7 What challenges exist regarding human capacities for forage cultivation in the area?	•	• Lack of machines
6.8 What challenges exist regarding human capacities for forage processing in the area?	•	• Lack of skilled labour
6.9 What challenges exist regarding infrastructural capacities stated above?	•	• Lack of machines and vehicle

### 7. Utilities

Questions	Response (Siti zone)	Response (Gode zone)
7.1 Do you have a three-phase electric supply near the potential cultivation site? Yes/No. - Please describe the distance from the potential land of forage cultivation identified above. <b>Take pictures.</b>	• The woreda towns have 3-phase electricity but the kebeles where forage is produced do not have electricity	• No 20 km away

Questions	Response (Siti zone)	Response (Gode zone)
7.2 If not, can you get it? Yes/No (explain the answer)	•	• Needs installation of electric line
7.3 What is the distance (meters) of the from the site to the electric power supply?	• 13km on average	• 20km
7.4 Other challenges related to utilities	• No supply	• No electricity and no support
7.6 What opportunities do you see?	•	• High demand for forage due to drought

### 8. Accessibility

Questions	Response (Siti zone)	Response (Gode zone)
8.1 Distance to Addis Ababa (km); expected travel time (hours)	More than 530km	800 km; 2 days travel
8.2 Distance to regional town (km); name of town; expected travel time (hours)	One day	543 km; one day travel
8.3 Type of road (all asphalt; partly gravel and partly asphalt; partly dry weather; all weather road). <b>Take pictures.</b>	• Gravel road and although soil	• Asphalt but some damages
8.4 Any challenges with road conditions during droughts or rainy seasons or conflict?	•	• Muddy road between production site and main road; poor access when it rains
8.5 Any challenge with the local/community/tribal conflict?	•	•

### 9. Projects and Institutions

Questions	Responses (Siti zone)	Responses (Gode zone)
9.1 Are there any projects nearby or in the site? Yes/No	• Not on forage production	• Yes
9.2 If yes, who owns the projects? Please collect the <b>contact details.</b>	•	• West Gode Irrigation Development Project (run by the government)
9.3 What are the purposes of the projects? (forages cultivation, seed production, agro-industry, etc. (specify)	•	• Manage the irrigation facility for agricultural production -gravity irrigation)
9.4 Where are these projects located?	•	•
9.5 Nearby institutions (ARCs; Universities; implementing/development partners) (The leverage points).	• Center of Somali Regional Research Institute	• Somali Agr Research Cennter has site in Gode; 60 km away from Gode town;
9.6 Are there dairy farms nearby or in the site? (Yes/No)	• Ye, in Dire Dawa and also few in the area	• No

Questions	Responses (Siti zone)	Responses (Gode zone)
9.7 If yes, how many farms?	Not known	
9.8 How big is each farm (e.g. number of dairy cows)?	Few farmers have 2-3 cows for milk production	
9.9 What new linkages needs to be established?		
9.10. Are there fattening farms nearby (yes/No), - If yes, how many; how far located; how big i.e. number of fattening animals that can be fattened at one time	•	• No

### 10. Demand for forage

Questions	Responses
10.1 Demand for densified feed in the area / vicinity / region	• Not known
10.2 Desire to engage in densification of forage into hay, silage, pellets, blocks (Explain)	• Not known; if skill is built can be interesting

### 11. Political buying

Questions	Responses (Siti)	Responses (Gode)
11.1 What policy support for forage cultivation exist? From the local and regional governments?	• Due to increasing effect of drought, the government supports forage production.	• Regional livestock and pastoral development bureau supports
11.2 How do you assess the community member's acceptance of land allocated to forage production? <b>Now and in future.</b>	• No problem	• It is ok
11.3 Please list the relevant stakeholders who are important to secure buying as well as, engage with to implement on the ground, should large scale land be available for forage cultivation. - Collect names, organization details, and - Contact details of the stakeholders. - If possible please chalk out a brief stakeholder mapping using the blank space below.	•	• Regional livestock and pastoral development bureau, NGOs,, Livestock traders, sometimes puntland, Somale land

### Example of stakeholder mapping (modify and edit as needed)

Stakeholder Type	Stakeholder name/contact details	Potential engagement purposes and priority level	Expected probability of securing buying (low/medium/high)
Local government	Agri office; administration	Land allocation; extension service	High
Zonal government			

<b>Stakeholder Type</b>	<b>Stakeholder name/contact details</b>	<b>Potential engagement purposes and priority level</b>	<b>Expected probability of securing buying (low/medium/high)</b>
Regional government	Livestock production office	Forage production extension	High
Agr research institutes	Somali region agricultural research institute	Adaption trial of forage species;	High
Local/regional universities			
Department of commerce			
Private sector entities			
Parastatals			
Community engagement – agro/pastoral			
Specific tribal engagement	Community leaders	Overcoming conflict	
Other Donor funded project leverage			