Gamo Gofa Zone Diagnosis and Planning Document, SNNP

Compiled by Yishak Baredo
March, 2013

Canadian International Development Agency | Agence canadienne de développement international
CGIAR | ILRI International Livestock Research Institute | IWMI International Water Management Institute | LIVES | EIAR | MoA

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GamoGofa zone diagnosis and project design

1. Introduction

The Livestock and Irrigation Value chains for Ethiopian Smallholders (LIVES) project aims at supporting the GoE's efforts to transform the smallholder subsistence agricultural sector to a more market-oriented smallholder sector to contribute to the new GTP. The project will be implemented over a 6 year period, starting April 2012 till March 2018, including a planning phase. The project shall be implemented by the International Livestock Research Institute (ILRI) and the International Water Management Institute (IWMI) in partnership with the Ethiopian Institute of Agricultural Research (EIAR), the Federal Ministry of Agriculture, Regional Bureau of Agriculture/Livestock Development Agencies and Regional Agricultural Research Institutes. The project is funded by The Canadian International Development Agency (CIDA).

The project uses a value chain framework to develop targeted commodities. Such a framework recognizes value chain actors who add value at different stages of the value chain and individuals and organizations which provide inputs/ services to the value chain actors. Key value chain actors are producers of agricultural inputs and outputs, traders and processors at village, district, regional and national level. Important service providers include the public research and extension sector which are involved in technology development, capacity development, knowledge generation and dissemination. The agricultural offices are also involved in input supply and services e.g. supply of seeds, artificial insemination, veterinary services and other agricultural crop and livestock inputs. However, community, cooperative, farmer and private sector involvement in producing inputs and providing services is emerging.

The project will carry out a range of activities in five focus areas: capacity development, knowledge management, promotion, commodity value chain development and documentation. For all activities the project will aim for a gender balanced and environmentally sustainable development.Project implementation will focus on clusters of Districts in 10 Zones, in which 4 priority livestock and irrigated fruits and vegetables will be supported in the selected districts. Gama Gofa Zone is one of the targeted Zones and this report documents the processes followed to select commodities and interventions, provides diagnostic background/baseline information on the Zone, selected Districts and selected commodity value chains. It also describes potential interventions for capacity development, knowledge management and value chain development complemented by a plan of action for implementation.

2. Study method and approaches

2.1 Selection of commodities, zones, districts and PAS

In 2010 a consultative meeting was held with SNNP regional BoA and RARI and representatives of ILRI and IWMI in Awassato select potential intervention zones and priority marketable commodities for each zone selected. In a consultative meeting the participants were offered menu of commodities so that the regional people could indicate their preference taking into account regional government's present and future market potentials, market infrastructure, and available capacity to develop the commodity.Menu of commodity options included:

- Livestock commodities:-dairy, poultry, small and large ruminants, and apiculture
- Irrigated fruits and vegetables commodities

In this consultative meeting:

- irrigated fruits and vegetables commodities,
- Livestock commodities:- large ruminants, small ruminants, honey and bee wax,

wereselected as a regional priority commodities for support from LIVES project and also based on commodities selected,GamoGofa, and Sidamazone wereselected as potential zones for intervention. Consideringpossible changes that could take place since 2010,the regional sector office representatives were revisited in 2012to review and reconfirm zones and commodity selection done in 2010.However, the regional sector office representatives reconfirmed the earlier zone and commodities selection.

The two zones were also given an opportunity to review commodities selected by the region and to identify cluster of districts which fit to agro-ecological and socio-economic requirement of the selected commodities and also to select potential PAs in each district. To this end expert consultation meeting in GamoGofa zone was held with regional representatives and PIP team (Annex 1). The zonal experts chaired by vice head of office of agriculture reviewed commodities proposed by the region and omitted honey and bee wax because of it underdeveloped status and added poultry as a new commodity. The experts' team also listed 7 potential districts and ranked each district for its potential to develop the selected commodities using zonal commodity ranking matrix (Table 1).

Table 1: District commodity ranking matrix

No	Potential districts	Beaf	Chicken	Small ruminants	Fruits &veget	Total
1	ArbaminchZuria	3	2	3	3	11 (1)
2	Mirab Abaya	3	2	2	2	9 (2)
3	Chencha	1	2	3	2	8 (3)
4	Bonke	2	2	3	1	8 (4)
5	DembaGofa	2	2	1	2	7
6	UbaDebreTsehaye	3	1	2	1	7
7	Kucha	2	2	1	1	6

Based on commodity ranking matrix three districts (ArbaminchZuria, Mirab Abaya and Chencha)were identified as cluster districts for intervention by LIVES project.However, through further discussion, Chencha was dropped because of too much NGOs functioning in the district and Bonke was selected as one of the cluster districts.

The selected districts were also given an opportunity to review the commodities and most specifically select potential PAs for intervention. Thus, in each district consultative team chaired by the respective wored office of agriculture reviewed the proposed commodities and selected potential PAs using PAs selection matrix (Annex 2).

2.2 Base line data collection

2.2.1 Project Implementation Plan (PIP) data collection

Project Implementation Plan data collection focused on identifying cluster districts and basic information for each district. The PIP data included identifying beneficiary HHs for each commodity in

each target PA, mapping of major value chain actors such as inputs/services providers, processing and marketing individuals and/or institutions and consumers as well.In the three cluster districts 49 PAs with the farming HH accounting 28534 HHs (26200 male and 2334 female) wereidentified as having a potential for the four major commodities. The farming HH engagement in irrigated fruits and vegetables is highest (9411mhh and 995fhh) compared to all other commodities. Female headed HHs are engaged more in fruits and vegetables production than any other commodities followed bypoultry production(Table 2).

Table 2. Beneficiary HHs

	PA name	PA pop (HH) Total			Beef		Chicken		Small ruminants		Fruits and vegetables (irrigated)	
		M HH	F HH	Total	MHH	FHH	M HH	F HH	M HH	F HH	M HH	F HH
1	Mirab Abaya	6277	810	7087	305	7	226	37	363	49	3197	398
2	Arbaminchzuria	11275	1252	12527	6723	643	5036	823	4077	328	5659	574
3	Bonke	8648	272	8920	754	17	726	26	390	12	555	23
	GamoGofa zone	26200	2334	28534	7782	667	5988	886	4830	389	9411	995

Source: WoredaOffice of Agriculture

For each cluster districts major actors along the priority commodities value chain were also assessed. The assessment result highlights that inputs supply is dominantly handled by public sectors and the role of private sector is quite low. And also quite critical services like AI, veterinary services, etc are largely operated by the public sector (Annex 3).

2.2.2. Base line data

Base line data collection started after Project Implementation Plan was completed. And its ultimate objective was to draw benchmark for result based monitoring and evaluation and impact assessment. The data collection was based on the selected five priority commodity combinations of cluster districts and a random sampling was used to select representative PAs. Thus, out of the 49 potential PAs in the three cluster districts,12 PAs with representative commodity combination were randomly selected for base line data collection (Table 3).A team of experts (Livestock and Irrigated crops) from GamoGofa zone and from the respective sample districts were engaged in base line data collection. Focus group composed of at least 12 people representing PA leadership, sub PAs representatives, women and youth representatives' were our main source of base line data collection. And this was triangulated with data from key informants of at least 5 to 6 people and secondary data from each district office of agriculture (Annex 4). The data collection mainly focused on selected commodities production, productivity, marketing, revenue generated and actors along each commodity value chain taking into consideration gender disaggregation.

Table 3. Commodity combinations and sample PAs for cluster districts

No	Districts	Commodity combinations	Name of Sample PA
1	ArbaminchZuria	BPI	GentaNeti
2	ArbaminchZuria	BPSI	ChanoDorga
3	ArbaminchZuria	BPSI	ZigitiBokole
4	Bonke	BPS	Ketele
5	Bonke	BPS	DemilePuso
6	Bonke	BSI	Bula
7	Bonke	PS	Gezeso
8	Bonke	PSI	Chosa
9	Mirab Abaya	BPS	Para Gosa
10	Mirab Abaya	BPSI	WankeWajifo
11	Mirab Abaya	I	Mole
12	Mirab Abaya	PI	Omolante

Key. D=Dairy, B=Beef, S=Small ruminants, P=Poultry, I=irrigated fruits and vegetables

2.2 Consultations on intervention options

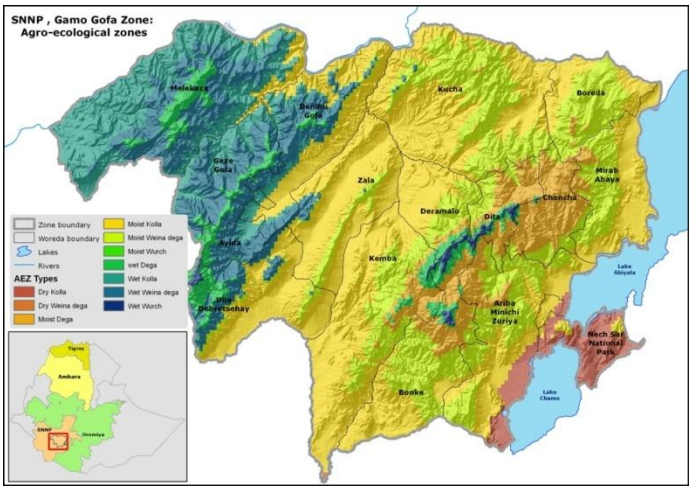
Actors at district, zone, regional and federal level were consulted on commodity based intervention options along the value chain. The strategy used to consult actors was a two to three days work shop organized at federal level and also at zone level. The federal level workshop accommodated both public and private actors functioning mostly at federal and regional level. On the other hand a workshop organized at target zone level accommodated both public and private sector actors directly involved on input output marketing and service provision mostly at district and zone level. In both consultative meetings participants were briefed on genesis of LIVES, intervention options derived from PIP and base line survey and given an opportunity to review the draft options in depth, and to come up with their own additions, amendments and concerns as well and also setting vision per commodity through commodity based group discussion were carried out. Moreover, workshop participants prioritized interventions for the first year of the project giving due emphasis to inputs and services which could contribute more for the rest of five years project operation time.

3.Description of GamoGofa zone

3.1GamoGofa zone

GamoGofa zone is located at 505 km south of Addis Ababa and 275 km south west of Awassa. The total area of the zone is estimated to be 12581.4 square kilometer and consists 15 woredas. The total population of the zone is estimated about 1,597,767 (CSA, 2007) with averagw population density of 80 inhabitants per kilometer square. It lies at an altitude ranging between 746 to 3478 meters above sea level, with average temperature ranging between 10°C and 25°C and the average annual rainfall is above 900 mm. The topography of the zone is characterizes with undulating feature that favors for the existence of different climatic zones in the area ranging from dry low land to wet worch mid altitude (Fig 3). The south western periphery of the three cluster districts is dominantly moist lowland followed by moist mid altitude.

Fig 3. Agro-ecology of GamoGofa zone



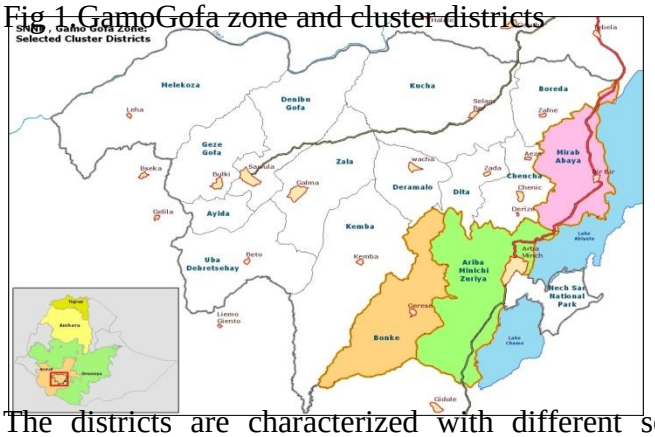
3.2 Zonal staff

In GamoGofa zone sectors engaged in delivering technical backstopping to the districts include Office of Agriculture, Marketing and Cooperatives, Women Children and youth office and many other non government organizations. The government office technical personnel detail is given in (Annex 4.) Educational level of the zone technical staff varies from diploma to MSc in different agricultural and social disciplines. There is only one MSc. level staff in Marketing and Cooperative Office and all others are first degree graduates. However, in comparison with number of districts to be covered and magnitude of professional demand, educational level and staff number at zone level seems to be is quite low.

3.3Cluster districts

The three districts (Mirab Abaya, ArbaminchZuria and Bonke) selected for LIVES intervention are located in the south western periphery of the zone (fig 1).

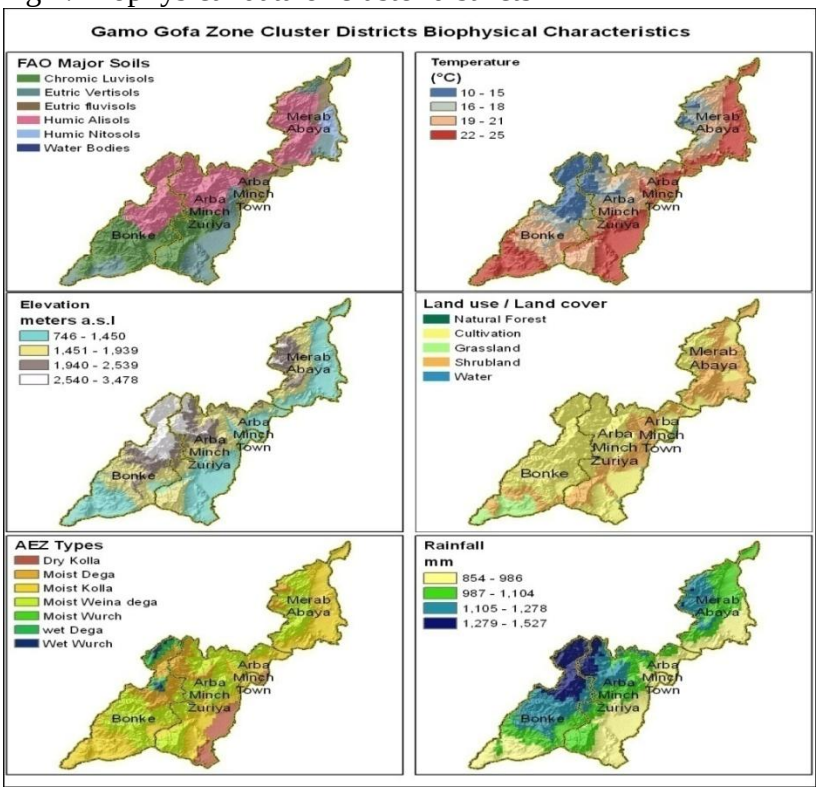
Fig 1.GamoGofa zone and cluster districts



The districts are characterized with different soil types ranging from dominant humicAlisol to cromicLuvisols. The southern west part of the three districts is dominantly eutricvertisols where irrigated banana, mango and avocado dominate. All the cluster districts have highest temperature ranging between 22 to 25 degree centigrade along the rift vally lakes Abaya and Chamo. Rainfall

amount in this districts also varies between 854mm in southern parts of the districts to 1527mm in the northwestern parts of the cluster districts (Fig 2).

Fig 2. Biophysical data of cluster districts



Rain fed agriculture is more dominant in the cluster districts (71704 ha) compared to irrigated crops whichis only 5022.5 ha in total. Among the cattle population local dairy cow accounts the highest (140,2660) followed by oxen and improved cows which is 80,738 and 323 respectively.

Table 4.Land use land cover of cluster districts

	Unit	Bonke	A/minchZuria	Mirab Abaya	Total
Rainfedcrops	**Ha**	**35525**	**18374**	**17805.5**	71704.5
Irrigated crops	**Ha**	**513**	**1533.5**	**2976**	5022.5
Grazing pasture	**Ha**	**9367**	**22734**	**38342**	70443
Forest and woodlot	**Ha**	**28456**	**NA**	**12775**	41231
Improved cow	**No**	0	323	0	323
Local dairy cows	No	64912	61327	14027	140266
Oxen	No	42897	26933	10908	80738
Sheep	No	141472	28962	4335	174769
Goats	No	1104553	25465	16266	1146284
Poultry	No	94365	32792	20065	147222

Source: LIVES survey 2012.

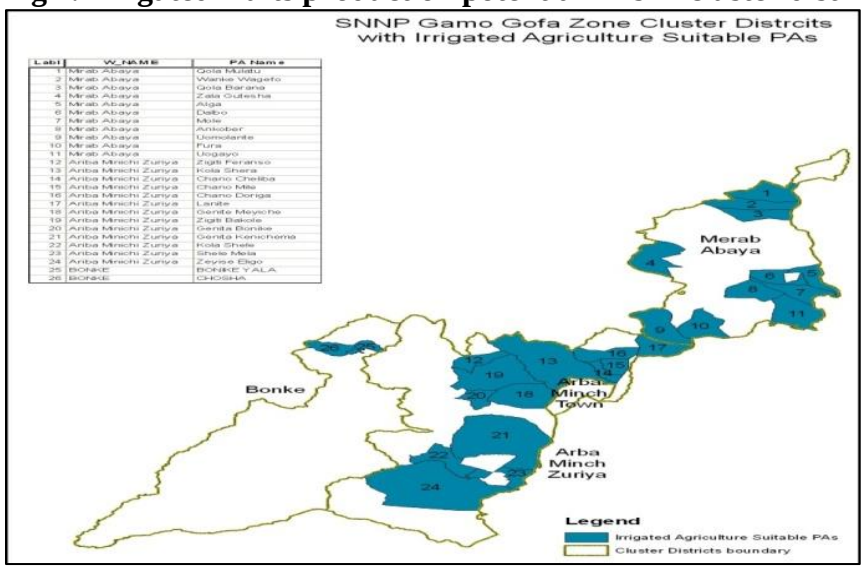
4. Commodity description

4.1 Irrigated fruits (banana, mango, avocado, papaya, apple)

4.1.1 Production

The dominant irrigated fruit crops produced by GamoGofa zone farmers include banana, mango, avocado, papaya and also apple is currently getting momentum in moist highland parts of cluster districts. And total numbers of 29 PAs are selected as potential areas for irrigated fruits agriculture in general (Fig 4)

Fig 4. Irrigated fruits production potential PAs in cluster districts



Source: LIVES survey 2012.

Among the fruit crops banana is produced by the highest number of HHs in the cluster districts (6902 mhh and 914fhh) followed by mango, avocado, papaya and apple (Table 4). The survey result also highlights that almost all the farmers (100%) are engaged in production of these fruit.

Table 5. Major irrigated fruit commodities production in the three cluster districts

NO	Descriptions	Banana		Mango		Avocado		Papaya		Apple	
		M	F	M	F	M	F	M	F	M	F
1	HH involved in production	6902	914	6605	881	1989	94	1178	76	368	18
2	No of threes owned by	5,658,263	532,411	51950	8040	5438	798	15,986	2501	11600	369
3	Average productivity q/ha	231	231	126	126	148	148	200	200	35	35

Source: LIVES baseline survey 2012.

Fruits plot size for each HH varies depending in the location and fruit types. In the moist low land part of the cluster districts where semi-commercial banana is practiced, a HH can have from 0.13 hectare to two hectares. Fruits like mango and avocado are counted on a number of trees per HH and on average each HH has 6 to 7 mango trees and 4 to 5 avocado trees. The already established mango and avocado

fruit trees are all local varieties with no specific name and unknown agronomic practice requirements. On the other hand, established banana varieties and its agronomic requirements are well known since it's established and managed accordingly. Since 2008, the zone started introducing different fruit varieties of avocado, mango, apple and others both grafted and non-grafted (Table 6) and according to the experts report Dwarf Cavendishbanana variety dominates the banana plantation.

Table 6. Different fruit varieties introduced in GamoGofa zone

		Varieties introduced		
No	**Banana**	**Apple**	**Mango**	**Avocado**
1	Dwarf Cavendish	Anna	Tomyatkins	Hass
2	Giant Cavendish	Golden delicious	Kent	Etinger
3	Mediam Ambo	Red delicious	Apple mango	Furte
4	Grand nail	Crispin	Local	
5	Williams	Local		
6	Local (with different names)			

Source: Zone Office of Agriculture

Since recently, apple production is given much attention both by the public sector and NGOs thus awareness among farmers on apple varieties, nursery management, agronomic practices etc. is much ahead than other fruit crops. This could be attributed to substantial income which farmers are generating from sell of seedlings (50bir/seedling) and apple fruits (25bir/kg and above)at farm gate. Established fruit trees (specifically mango and avocado) receive no proper management due to lack of skill and knowledge among farmers. In addition focus group members reported that theft is very critical when fruit trees are away from residence and for this reason many farmers abandoned fruit trees away from residence. Agronomic practices like pruning; training, proper spacing or maintaining plant population, etc are not widely observed on the field. Some avocado and mango trees are extremely tall that harvesting and other management practices are becoming hard for many farmers specially women farmersand old trees rejuvenation through top grafting and other techniques is not widely used.

4.1.2Irrigation of fruit trees and its management

GamoGofa zone has a total irrigable area accounting 74,045 ha out of which 24,101 ha (33%) is under irrigation currently (Zone report 2012). There are about 40 irrigation schemes in GamoGofa zone and these 40 schemeshave command area of 24281ha. Out f the total command area 14853ha or 61% is in use while 39% is not in use and more than 16,825 HH are driving their livelihood from irrigated agriculture. The LIVES target districts possess12 schemes with command area of about of 12,100 ha which is more or less 50% of the total irrigated area in GamoGofa zone and all modern irrigation structures are located in moist lowland along rift valley lakes. An irrigated land holding per HH varies from 0.15 ha to 1.32 ha (Table 7). Focus group farmers reported that dominant irrigated fruit is banana while other fruit types like mango, avocado, papaya are irrigated during their establishment period only.

Table 7. Irrigation schemes located in LIVES cluster districts

District	PA	Command	On	Beneficiaries	Average

		area/Ha	use/Ha		holdings/HH
A/Zuria	Weze	1250	820	NA	NA
A/Zuria	Kola Shele	6000	1370	NA	NA
A/Zuria	ChanoChalbe	450	300	1970	0.15
A/Zuria	Shara	500	476	671	0.71
A/Zuria	Kola Shele	1200	1359	1027	1.32
A/Zuria	Wezeka	300	300	600	0.50
A/Zuria	Chano Mile	900	730	1989	0.37
A/Zuria	Elgo	400	400	800	0.50
M/Abay		300	300	1200	0.25
M/Abay	Shafe	100	100	0	NA
M/Abay	Doshaye	100	100	0	NA
M/Abay	Rays	600	600	0	NA
Total		**12100**	**6855**	**8257**	

Source: Computed from SNNPR 2012 irrigation schemes inventory

There are also numbers of other unregistered small scale irrigation plots using water from different sources. Major water sources of the zone include big rivers, small streams and springs, artificial dams, hand dug well while springs diversion, and hand dug wells are common in highland parts of the cluster districts. Deep borehole is not common in the zone. Different water lifting mechanism are introduced in the zone which included

- Motorized pumps (of different capacity ranging from 2Hp to 4Hpand of different brand)
- Rope and Washer pump
- Treadle pump.
- Manual using buckets

However, motorized pump use is expanding rapidly.For insistence in 2011 MirabAbay and Arbaminchzuria have distributed 138 and 159 water pumps respectively through credit and this does not include pumps distributed through NGOs and also pumps bought by individual. Despite its significant water resource loss, flood irrigation is massively used and farmers are more interested by flood irrigation because of its less cost and easy operation. Water application mechanisms like drip irrigation, sprinklers, etc are not practiced by farmer but the technology is there in some public nurseries and demonstration plots for demonstrating the technology and some seedlings production. Marketing and Cooperative office explained that there is wide opportunityin the zone to access pumps through credit wherefarmers in a group of four can borrow many adequate to purchase a pump and to cover initial running cost from OMF. Some focus group members reported that both purchase and operation cost of pumps scares many farmers while those who can afford complained about lack of pump supplier nearby. Pumps are usually owned by group or individuals and pump renting is not exercised in the area. However, some expert complain that most of the pumps distributed are abandoned or underutilized for number of reasons such as reluctance of farmers to cover running cost, etc. This needs further assessment on the status of utilization and underlying causes for less utilization.

Farmers skill and knowledge on crops water requirement at different growth stage is low resulting unnecessary water loss in one hand and shortage to farmers located next. And conflicts resulting from

inequitable water resource use are very common in areas where irrigation is used intensively. Water users associations, a decision making body for equitable waters resource utilization and its institutional set up are not strong enough to address this conflict. Some experts also report that some of the irrigation schemes are stretched beyond the designed capacity resulting in water scarcity which again aggravates the conflict. Farmers who use some irrigation schemes are also complaining about frequent change of river course that have abandoned them and lack of support to address the challenge.

4.1.3Irrigated fruit input/service delivery system

Inputs such as improved seeds, seedlings, fertilizers, agro-chemicals, and machineries like pumps, sprayers, etc are critical in irrigated fruits production. Currently a farmer to farmer planting material exchange through cash is very common. Banana suckers' selling by individual farmers along the road side is widely practices. Apple grafted seedling production and selling by individual farmers in the high land part is very effective in addressing apple farmers need. Avocado and mango seeds are sold every year to different regions to be used as root stock. Public nurseries operating far away from many farmers plot also deliver limited improved seedling and other planting materials for avocado, mango etc but the supply is erratic for reasons such as logistics and running cost. Kalehiwot church aid operating in Bonke is working on supply of improved apple seedlings to limited number of farmers

Pumps and sprayers supply and maintenance is not yet developed. Few private workshops located in Arbaminch and in some small village towns are engaged in pump maintenance but are inefficient and also far away for most of fruit farmers. Cooperatives and unions are engaged in supplying inputs like fertilizer, sprayers but due to some financial and management problems, the inputs supply and other service from primary cooperatives and unions is irregular and unsustainable.

4.1.4 Processing and marketing of fruits

Anefficient and gainful products marketing is key element for product boosting using improved technologies and practices and farmers can only be convinced to invest when they can generate more income. Though efforts in improving production and productivity of these fruit crops is limited still fruit farmers depend on sell of the product for their cash need and the annual income generated from sell of these fruit crops is quite substantial (Table 8). Almost all the farmers (100%) producing these fruit crops are also engaged in selling to meet their cash need and the annual revenue generated from banana and mango in the cluster districts accounts about ETB 185,563,386.00 and 12548300.00 respectively. Even though apple has very low annual production, the revenue generated from its sell is significant and this is mainly due to its better selling price compared to other fruit crops

Table 8. Marketing of major fruit crops and annual revenue generated in cluster districts

No	Indicators	Banana		Mango		Avocado		Papaya		Apple	
		M	F	M	F	M	F	M	F	M	F
1	Total volume produced qt/year	1,010,650	114,913	31780	4774	4785	739	9425	272	3480	109
2	Proportion sold	55	55	87	76	99	96	99	98	100	100
3	Proportion of HH selling	100	100	100	100	100	62	100	100	100	
4	Average price birr/qt	300	300	400	400	475	475	200	200	1500	1500
5	Annual revenue generated	167,386,640	18,176,746	11,091,775	1,456,525	2,247,047	337,918	1,877,750	53,467	5,220,000	163,125

Source: LIVES survey 2012

Some value addition practices like processing and packing fruit products which could uplift income to farmers are not widely practiced in the zone. So far, only few organizations are engaged in processing and in assisting marketing of fruit products.Banana product in Arbaminch is becoming an export commodity and recently some organizations like Bioversityinternational have initiated mobile packing sites for Arbaminch area farmers unions. The same organization has also created market linkage for GamoGofa banana product to Saudi Arabia in 2012 and more than 135 ton of banana exported. Farmers unions are also playing significant role in marketing of banana. One Village One Product (OVOP) a Japanase NGO has also started processing banana leaves and false stem to papers in ArbaminchZuria in small quantity. ECOPIA, a local NGO is also engaged in processing and canning of avocado, mango and apple as demonstration with limited women groups in Arbaminch district.

Among fruit crops produced in AGamoGofa zone, banana has relatively sustainable market while other fruit crops suffer severe lack of market during peak harvest. Many farmers complain about unworthy fruit price during pick harvest for mango, avocado and papaya.Fruit products are perishable which needs maximum care during harvesting, transporting, storing. So far, lack of preserving techniques has significantly affected GamoGofafarmers bargaining power because they cannot wait with their product any longer and the only option is to surrender and collect any offer before they loss their total harvest.

Local preservation techniques like coffee seed preservation practice implemented in Dale, Sidimacould bedemonstrated for fruits preservation for some time. This is a practice where traditional tukul houses with grass roofing done by knowledgeable local people is serving as cold chain to preserve coffee seeds for longer period of time and could be exercised for fruits also. Product grading alone can add value to the product and also income to farmers but it is not given due attention and farmers resist grading due to uniform price offer by fruit buyers. Different fruits could easily be processed and consumed by local people. To this end avocado breakfast on the road side widely practiced in Arbaminch, Awassa and other cites could be upgraded with due consideration of clients. It is an area where women could be engaged and also home agents could contribute in introducing different simple processing techniques.
Quite large volume of avocado and mango (more than 100 trucks of 10 tons) fruits are transported to major region every year to be used as root stock but its sell is haphazard generating less benefit to producers. The fruits can be graded and packed so that better price could be fetched due to value addition. GamoGafa farmers are practicing dominantly individual marketing which is retarding bargain power of a farmer because of low volume of product and lack of access to market information.

4.1.5Linkage in irrigated fruit value chain

Fruits production, processing and marketing is becoming an import business where different actors at different locations should be linked for efficient and cost effective business.In this regard, fruit producers in GamoGofa zone have started good linkages with some public sectors like woreda Marketing and Coop office for market information and this has yielded good result such as market linkage created between Mirab Abaya district fruit farmers and fruit processers in Upper Awash and banana exporters in Addis. Farmers union in this district also played important role in bulking, and storing the product for easy access to buyers. However, to be more effective such linkages should be expanded to all other public and private actors. The linkage should be extended to producers and public service providers like research station, certifying and regulatory section so that services like scion supply, inspection, certification and regulatory actions could be handled in a sustainable way. These opportunities and options are not effectively function in the zone. Apart from facilitating marketing

process, efficient linkage with various actors will increase farmers income by reducing transactions and related costs.

4.1.6Gender intervention/ Strategies

Women play a great role in providing support for the labor force and assist in planting, weeding, harvesting, transporting and threshing fruit production. Overall, in fruits production both men and women share the responsibility of producing fruit crops often equally. However, decision making and use of benefits is more of male dominated than female. In the past opportunities like access to capacity building, skill development, etc is more of male biased. Some of the operations like harvesting tall unmanageable trees may not be convenient for female farmers. Female farmers can contribute more in fruits production and also be benefited provided that such challenges are addressed .

4.1.7 Environmental assessment

Some of the intervention geared towards fruits production may have positive or negative impact on the surround environment including human health and this has to be thought of earlier and mitigation arrangements should be at place. The LIVES project has perceived some of the possible impacts of fruits production intervention on human health, environment and this included salinity because of excessive irrigation, agrochemical impact on human health, vector disease like malaria incidence in ponds, canals, etc.

4.2 Irrigated vegetables (onion, tomato, hot pepper, potato, garlic, etc)

4.2.1 Production

Different types of leafy, root, tuber, bulb andfruit vegetables are grown in the cluster districts bothunder rain fed and irrigated conditions. Irrigated onion, tomato, pepper, etc are grown both in the moist lowland part of the cluster districts that stretch along the rift valley lakes and in the highland parts of the cluster districts. The total households engaged in production of these vegetables crops in the three cluster districts account 3662hh (3423mhh,239fhh).

Table 9. Irrigated vegetable production in cluster districts

NO	Descriptions	Onion		Tomato		Pepper		Garlic		cabbage	
		M	F	M	F	M	F	M	F	M	F
1	HH involved	827	58	363	47	471	47	870	36	892	51
2	Area (ha)	59	3	34	21	41	8	73	4	138	3
3	Average productivity qt/ha	140	140	107	107	97	97	106	106	97	97
5	Volume produced qt	8602	515	3886	383	363	23	9788	489	13146	313

Source: LIVES base line survey 2012

These vegetables are intensively cultivatedwith market focus and major sources for irrigation varies with locations. Vegetables like Irish potato and sweet potato are cultivated mostly under seasonal rain fed agriculture occupying larger area of land but dominantly produced for home consumption with less market focus. Focus group members reported that more than 80 percent of the total sweet potato and 60 percent of Irish potato production is for home consumption. Land allocated by individual HH for vegetables like onion, garlic, cabbage, particularly in the high land part could only be estimated or measured on square meters rather than a hectare. Access to quality seed sources is limited and vegetable farmers use any available seeds to produce vegetables.

Overall production and productivity of irrigated vegetable crops is low and this is attributed to number of factors such as lack of skill and knowledge, from farmers and front line staff, less access to improves technologies and practices, limited access to quality inputs and services delivery and lack of sustainable vegetables processing and marketing systems.

4.2.2On farm Irrigation/agronomy

Source of irrigation water for vegetables varies depending on the location of farmers. Those farmers located in moist lowland agro-ecology dominantly use irrigation schemes constructed by different organizations and those in moist high land part depend on traditional small stream diversion, hand dug wells, and artificial ponds.Both diesel and petrol pumps are becoming very popular among vegetable farmers. However, farmers start using pump before any orientation is given to them on proper pump operation and precautions and thus due to lack of proper handling such as greasing and timely service, failure of the pumps is reported to be very common. In addition, farmers lack knowledge and skill on timing and volume of irrigation water required for a specific cropand understanding crop-water relations and managing water application accordingly is a challenge. Some focus group members reported that many farmers are abandoning vegetable production because of various diseases.This is mainly due to the prevalence of several viral and bacterial diseases accompanied by absence of effective control measures. Less access to agrochemicals, lack of skill and knowledge on disease management are worsening the situation. Also, because of market demand vegetable farmers are opted to grow the same vegetable on one plot from year to year thus effectuating disease and pests cycle

4.2.3Irrigated vegetables inputs/services delivery systems

One cannot speak of cultivating vegetables under irrigation without appropriate pest and disease control mechanism.Vegetable farmers are getting fertilizer, vegetable seeds and pesticides from four sources:
i) multipurpose village shops who have no knowledge about, ii) occasionally from woreda offices of agriculture,iii) Unions and iv) unknown sources (illegal markets) smuggled from Kenya. High price of specially pesticides in legal market pushes farmers to illegal market which is usually tied with poor quality. Dominant vegetables seeds known by farmers for onion, is Bombe red and for other vegetables varieties with different names from different countries can be found in the open markets and small village shops. However, pesticides and fungicides which are very critical for vegetable production are not easily available anyway. Pumps are supplied by government with much subsidized price (6000 ETB for 3 hp diesel pump) and this has held back private pump suppliers. Moreover,farmers reported that governmentpumps supply strategy is not sustainable. Vegetable seeds and seedlings production both by public and private is not a common practice in the cluster districts.

4.2.4Vegetables processing and marketing

All vegetable farmers are engaged in selling of vegetables they produce and for some vegetable proportion sold ismore than 95 % of the total product. Particularly for vegetables like onion, tomato, paper and garlic, market demand and market access beyond the zone is main factor contributing to selling higher proportion of the total product. However, local cabbage has the lowest proportion sold compared to other vegetables under consideration and this is attributed to significant home consumption and also its market demand which is limited to local village markets only. Vegetable farmers in the three cluster districts generate highest revenue from sell of Garlic which is equivalent to ETB 6,508,688 per annum followed by onion with annual revenues of ETB 5,396,538 (Table 10

Table 10. Marketing of vegetables from the three cluster districts

NO	Descriptions	Onion		Tomato		Pepper		Garlic		Cabbage	
		M	F	M	F	M	F	M	F	M	F
1	**Total volume produced qt/year**	8602	515	3886	383	363	23	9788	489	13146	313
2	**Proportion sold**	55 ??	55 ??	75 ??	55 ??	59 ??	38 ??	95	95	52	52
3	**Proportion of HH selling**	94	100	100	100	27	38	100	100	100	100
4	**Average price birr/qt**	730	730	600	600	1933	1933	700	700	250	250
5	**Annual revenue generated**	5,396,538	3,25238	2125193	192,270	685,941	41,612	6,508688	3,25434	3,103,159	70144

Source: LIVES survey 2012

Vegetable marketing is dominated by retailers who are stationed in their gulit and directly buy from farmersand these retailers directly sell to consumers. Bulkers or whole sellers are not common in vegetable marketing and this could be due to perishable nature of the vegetables products or small scale of total produce. Women are the leading role players in vegetable marketing. Means of transport for most vegetables is animal or human back pack and some vegetable farmers use donkey drawn carts when the village market is near to vegetable farm and this is causing a significant post harvest loses

Vegetables products certification and branding is not a common practice in the zone in general. Farmers are not fetching the price they deserve for vegetable product because of poor infrastructure and lack of appropriate storage facilities at farm level. ECOPIA isthe only local NGO engaged in demonstrating processing and canning of hot pepper for export in Arbaminchzuria with few female farmers but its success is not yet known. Other value addition through processing or packing and branding does not exist in the zone

4.2.5 Linkage among vegetable value chain actors

Linkages between vegetable producer farmers and public sectors offices like crop, livestock, irrigation, marketing and coop, is strong as far as capacity building and technical backstopping is considered. However, in case of inputs supply such as agrochemicals and improved vegetable seeds, the public sector involvement is minimum or not existing.Some of the non government organizations like Kalehiwot, Vita, World Vision Ethiopia have strong linkage with vegetable producer farmers in the area of inputs supply, capacity building, knowledge management such as experience sharing tour. Primary cooperatives and unions does have much linkage with producer farmers because non of the cooperatives are engaged in marketing or inputs supply for vegetables. Vegetable collectors and whole sealers are not common in the area may be because of short shelf life of vegetables but the relationship of farmers with retailers is strong. Even though, rural microfinance is functioning in the zone none of the farmers dare to take loan for vegetable production because of unreliable vegetable production pattern. Until middle of this year, no research center was functioning in GomaGofa and technical assistance was rendered from Areka and Awass research centers. However, as of July 2012 a research center is established in Arbaminch which will take the responsibility of researchable problems and technical backstopping. Linkage of farmers with Arbaminch University is strong because the university has community service unit focusing on problems arising from the community and do action research. Farmers have strong linkage with input suppliers (legal and illegal) because these are the only source of agrochemicals and improved seeds for vegetable farmers.

4.2.6 Gender intervention/strategy

Women role in vegetable production is immense specifically at home stead garden. They also have significant role in land preparation, seedling transferring, weeding, planting and harvesting in larger scale irrigated vegetable production. Income from vegetables is managed by women when it is a small home garden, but larger scale vegetables production like tomato selling is controlled by male farmers. However, decision making power of women is low at home and in communal organization. Strategy to empower women through engaging in income generating activities, in decision making positions and increasing access of women to capacity building and services would increase women decision making power

4.2.7 Environmental assessment

Some intervention of LIVE project like use of different agrochemicals, excessive use of ground water for irrigation etc. could result some negative impact and such issues should be addressed as early as possible.

4.3 Fodder (Alfafa, Napier, Silage, etc)

4.3.1 Production

In GamoGofazone farmers inhabiting in mid to high land areas allocate small piece of land on periphery of their holding either forstall-feeding or for tethering while farmers living in lowland area have relatively better land holdings and thus dominantly practice free grazing

However, in both agro-ecologies feed and feeding is becoming a critical constraint faced by livestock farmmers in GamoGofa. This is mainly due to continuous land fragmentation as the result of population pressure followed by depletion and extinction of some indigenous grass and fodder species due to overgrazing. And much less care is given to developing and maintaining animal feed sources.For the last number of decade woreda office of agriculture has been trying to improve farmers' access to adequate fodder to feed their animals. This includes distribution of forage seeds, seedlings, cuttings, splits, etc. collected from different sources directly to individual farmers. Multiplication of seeds and other planting materials was carried on demonstrate plots, FTcs and model farmers field established almost in each district in GamoGofa zone. Forage types distribute include cuttings of elephant grass, seeds of Rhodes, disodium, sesbania, lucenia, and legumes like cowpea, lablab, pegian pea, etc.

However, Few innovative farmers practice planting fodder in the periphery of their farming plots which could not yield enough to feed the stock owned by individuals and also some produce forage seed for selling and for human consumption. But majority of farmers are not still convinced in the importance of fodder and its production for their livestock. Moreover, office of agriculture complains that lack of parent stock for major fodder species is a challenge stressing that productivity of the old parent material have significantly decline. Over all, experts complain that the forage seed multiplication and distribution strategy could not take off as expected due to number of reasons such as unreliable seed supply, farmers less enthusiasm in either producing their own fodder plot or for sell.

Some research reports highlight that research attention has been devoted to feed problems and solutions and optimal feeding practices but there has been relatively little systematic consideration of the constraints smallholders face, the feeding strategies and coping mechanisms they use, and the ways scientific knowledge and indigenous technical knowledge can be combined to help the farmers improve livestock productivity and livelihoods. Thus fodder and forage improvement intervention in these two locations in GamoGofa zone with different feeding practice should be dealt with different approach .

In some agro-ecology animal feed are abundant during wet season and mostly wasted because farmers are not aware of preserving using different techniques. In addition, some farmers feed the fodder grasses to their cattle before any seed is set particularly in feed stress year also contributing to fodder planting materials shortage.

On farm Irrigation Agronomy

Fodder production through irrigation is a new practice where fodder biomass could significantly be increased per unit area. However this needs better on-farm agronomic practices such as irrigation water management, ideal planting time and maintaining fodder density, disease and pest control

Integrated inputs/ service supply intervention

In general supply of inputs and serves for production of irrigated fodder is scarce in most areas. Specifically sustainable fodder and forage seed multiplication and distribution system is non existing and needs due attention in the project interventions.

Processing/ marketing

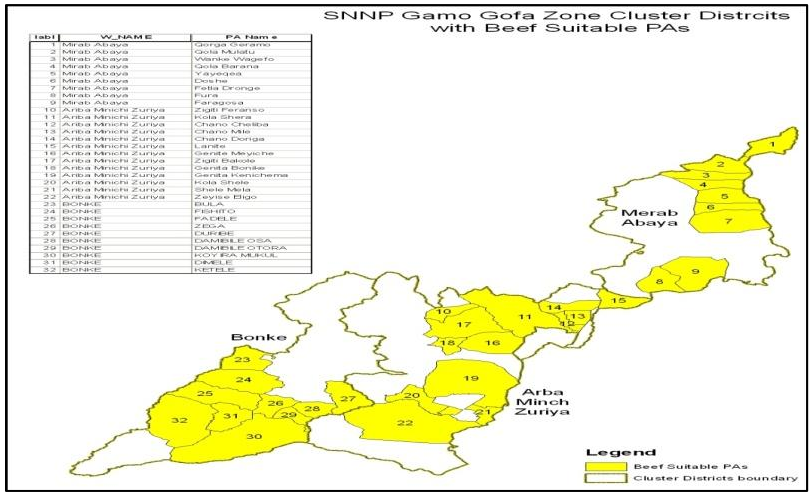
Forage and fodder seeds are not processed among rural community and marketing of forage and fodder seed is carried out in big town mostly by multipurpose shop owners with little or no knowledge about it. This has resulted in mishandling and failure in germination.

4.4 Beef production value chain

4.4.1 Production

Beef cattle fattening was very traditional in the zone. In a recent development in the zone, all the important livestock schemes are being converted to high value commodities with considerable market demand particularly for protein, hide and skin source both in local and export markets and ultimately higher income for farmers. In the three cluster districts more than 32 PAs are considered as potential areas for beef (Fig 2).

Fig. 5 Beef production potential PAs in three cluster districts



Source: LIVES base line survey 2012

In the cluster districts, 21228 mhh and 1488 fhh are engaged in male animals husbandry and these farming households own more than 42588 male animals of different category. Moreover, 6932 hhs (6692 mhh, 240 fhh) are engaged in improved beef production or fattening and these farmers produce more than 16824 fattened ox for market every year (Table 11).

Table 11 .Beef production in the three cluster districts

NO	Descriptions	M	F	Total
1	HH owning male animals	21,228	1,488	22616
2	No of male animals owned	40,028	2,560	42588
3	No HH engaged in improved beef production	6692	240	6932
4	No male animals under improved beef production	16524	300	16824

Source: LIVES base line survey 2012

Cattle are sold for beef at different stages. Bulls are sold for beef at the age of three or more with no special care. Ox could also be sold for beef once the farmers finish plowing the land and this happens when a HH faces some social problem or the ox is not active enough for plowing. Moreover, traditionally farmers keep on using ox as draught force and when the farm activity ends they take care of ox for few months and offer to the local market specifically during national holidays. However, it is constrained by number of factors such as limited knowledge of farmers in improved fattening practice, poorly performing local breed, etc.

4.4.2On-farm fodder production

In GamoGof zone particularly in the lowland part, free grazing is widely practiced which needs larger area to maintain few livestock herd. In long rainy season feed (grasses roughage as well as crop residue) are abundant in the zone butpreserving it for feed scarce part of the year is not common. Few farmers practice fodder production mostly elephant grass planted in the periphery of their farm plots or as hedges but quite inadequate to feed livestock owned by individualHH. Some leguminous like cow pea are produces by farmers but used as food for a family. Also some other farmers produce grass and leguminous forage species commonly for the purpose of selling forage seeds because of the attractive forage seed price. Some farmers in the high land area feed their fattening animals with sweet potato while those in low land feed cooked maize whenever there is no food stress in the area. Use of industrial product or any other protein source or concentrate is not common. Cut and carry system which can generate maximizing biomass per unit area through adopting better management practice is not yet developed in the zone. Animal feed is mostly roughage with no protein supplement in form of concentrate or leguminous forage feed sources thus much extending fattening period.

4.4.3Input/service delivery system

In GamoGofa public sector is the sole distributer of Vet drugs, AI and different vaccine with highly subsidized price while small drug venders located in Arbaminch and Geresetowns are not functioning effectively because farmers prefer to buy from government clinics. Other inputs like concentrate, wheat bran, both macro and micro mineral blocks, forage seeds,etcsupply is occasionally done by private traders in a small quantity. In Mirab Abaya one wheat flour trader explained that he brings only two quintals of wheat bran occasionally and complained that selling even this two quintals of wheat bran may take him two months or even more some times. Overall, the supply of these feed sources is quite low dominantly because of under developed demand.

4.4.4Processing/marketing

Out of 22616 HHs (21228mhh, 1488fhh) engaged in male animalshusbandry in GamoGofa zone, more than 75% of HHs sell one or two male animals ready for meat per year.And also more than 6692 mhh and 240fhhs are engaged in improved beef production which is totally for market purposes. The revenue generated from sell of both male animals and improved beef account about ETB 107,145,502 and 127,231,502 respectively indicating that the commodity is an important livelihood source for the GamoGofa community.

Table 12. Marketing of male animals and improved beef in the 3 cluster district

NO	Descriptions	M	F	Total
1	HH owning male animals	21,228	1,488	22616
2	No of male animals owned	40,028	2,560	42588
	Proportion of HH selling male animals	75	75	
	Proportion of male animals sold	53	46	
3	No HH engaged in improved beef production	6692	240	6932
4	No male animals under improved beef production	16524	300	16824
	Revenue generated from seal of male animals	101,466,752	5,678,750	107,145,502
5	Revenue generated from sell of improved beef	124,962,752	2,268,750	127,231,502

Soyrce: Lives survey 2012

Although its traditional in nature and less favoringfarmers community, beef marketing is well organized in villages, PAs, district towns, zonal towns and also beyond. Middle men or collectors move within the village and negotiate with individual farmers on farm get price and either connect them to collectors or buy by themselves. Also farmers can directly sell in village markets but still brokers play significant role between farmers and consumers or mostly butchers. Usually collectors does not have enough capita individually and thus two or three collectors pull out their money and send one truck of fattened oxen to zone, region or to Addis. Some butchers also buy oxen directly from farmers in market days. In rural areas fattening is mostly geared towards national holiday'smarkets some timescausing excess supply and consequently lower price to farmers**.**Meat processing is not developed but occasionally meat processing plant located in Wondo genet come and buy fattened and un fattened ox from district towns. Public sector is responsible for meat inspection and hygiene. However, the inspection is not adequately facilitated with skilled staff and equipments.

4.4.5Linkages in the large ruminants beef value chain

Linkage among major actors is key factor to improve beef production and there by farmers income and thus the following interventions are envisaged

- Initiating and facilitating platform for discussion among actors to design common goal and strategy to achieve common goal in beef production, marketing, processing, inputs supply, etc
- Developing linkage with regional animal feed processors like Lecha in Hadya and Alto in Sidam and other private feed processors
- Developing linkages with livestock market information for timely market information

4.4.6Gender intervention strategies

Traditionally, fattening is meant for male but in reality nothing can impede women participation and this has been demonstrated in number of occasions and IPMS experience in number of PLWS and this can be cited asevidence.

4.4.7 Environment assess

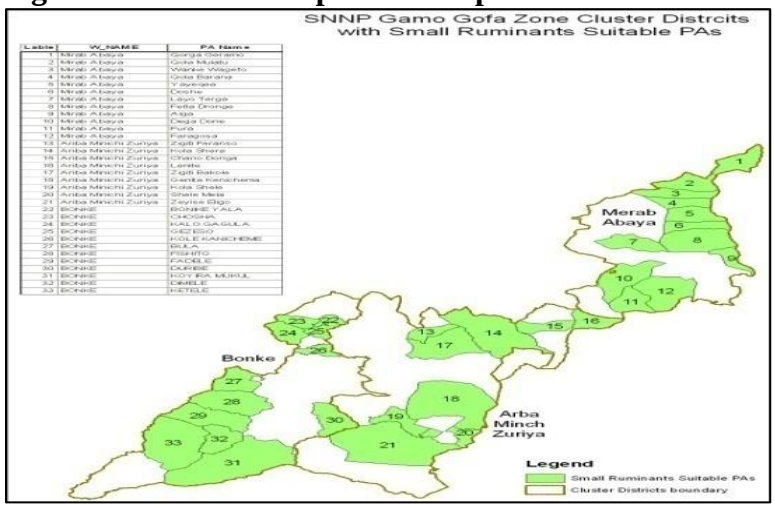
The impact of various fattening related interventions could have negative or positive influence on the environment and thus a strategy should be devised to alleviate the problem if any and scale out some unexpected spillover positive outcomes.

4.5Meat production from sheep and goats

4.5.1 Production.

Sheep and goats husbandry is a very common traditional practice and farmers usually exercise short stall feeding/tethering in the village. The small ruminants' density and distribution in the three cluster districts is shown in Fig 6.A total of 29 PAs are considered as potential for both sheep and goats production in GamoGofa zone. However, sheep population density is more in the moist midland and higland of the cluster districts.

Fig 6.Small ruminants production potential PAs in three cluster districts



Source: LIVES base line survey 2012

In the three cluster districts the total male and female household engaged in sheep and goats production account about 7208 and 10685 respectively and the total number of sheep and goats owned by this farmers account 32673 and 43368 respectively (Table 13).

Table 13. Small ruminants production and fattening in the 3 cluster district

		Sheep			Goats		
NO	Descriptions	M	F	Total	M	F	Total
1	HH owning small ruminants	6802	406	7208	10002	683	10685
	No of small ruminants owned	30556	2117	32673	40233	3135	43368
4	HH engaged in fattening	1431	158	1589	3229	261	3490
5	No of Animals fattened	3477	451	3928	7202	351	7553
6							

Source: LIVES survey 2012

And also a total number of HHs engaged in sheep and goats fattening account about 1589 and 3490 respectively. Small ruminants in GamoGofa zone are all local breeds. However, new breeds like Bonga breed are being demonstrated in some of the cluster districts by KaleHiwlt Church aid organization in Bonke. And also World Vision Ethiopia has introduced Bonga Breed to Mirab Abaya but all did not expand significantly and need further assessment for scaling out. Government has also introduced different sheep and goats breeds such Dorper and Bore from south Africa and distributed to few model farmers in the zone outside cluster districts.Experts in the zone also explain that there are unique local sheep breeds in neighboring Camba districts which so far not explored. No local breed selection and improvement using different techniques has been exercised in the zone.

4.5.2Housing, Feeding. Health care

In GamoGofa zone housing, feeding and medical care are some of the major challenges in sheep and goats production. Number of sheep and goats are kept packed down in a small area with human beings over night and released during day time for free grazing or tethered the whole day to avoid invasion of neighboring crop area. Free grazing is very common in lowland part where land holdings per HH are relatively better while tethering is dominant in PAs located in highland areas. Feeding industrial products or concentrate protein source to sheep and goats is not common. However, some farmers feed leftover from family dish, boiled maize with salt, etc whenever they need body weight gain in short period of time and this is usually done for national holydays or religious holydays markets. Coverage of Viet service by the public sector is so limited due to skilled manpower,drugs, and operation cost limitations. Farmers reported that they use deworming tablets and other Viet drugs from nearby Viet drugs vender shops or from office of agriculture but farmers much prefer public sector service because of its much subsidized price. There are some private feed suppliers in some of the districts and they reported that they do not want to expand because of very less demand.

4.5.3On farm fodder production

Fodder and forage production for the purpose of feeding their animals is not widely practiced by farmers.Few farmers engaged in forage and fodder production give priority to seed selling rather than feeding their animals mainly because of better price per kg of forage seeds. However few farmers practice fodder production such as elephant grass in the periphery of their plots and feed their animals. Various crop residues like maize, sorghum, various fruits specifically banana and others is abundant in the lowland parts and abundant grass is available in the rainy and wasted due to lack of skill and knowledge.

4.5.4Inputs/servicesdelivery system

Farmer to farmer Lambs supply either for production or fattening is a common practice in the zone. However, the supply is inadequate when need arises for increased number of lambs for different purposes. Larger propitiation of Viet drugs supply is done by public sector and very few drug venders are also engaged some districtsbut with less capacity to deliver the services. Animal health care service is dominantly done by public sector using the limited number and less skill staff available. Other inputs such industrial products or concentrate source supply is done neither by the public sector nor by the private sector and traders communicated in many of the village towns reported that there is no demand for inputs.Credit for small ruminants is widely offered by OMF mainly with group collateral. Focus group members reported that death of sheep and goats is very common and lack of security system either from organized finance institutions or community based insurance service is most damaging the

livelihood of farmers. Diagnosis ofvariousdiseases is much delayed or totally not done due to lack of diagnostic kits and skilled manpower near to the farmers.

4.5.5Processing and marketing

GamoGofa farmers depend largely on sell of small ruminants for minor family expenses. However, proportion of female headed HH selling both sheep and goats is higher than male headed households indicating that female headed HH depend more on small ruminants for their cash needs.

Table 14. Small ruminants marketing and processing in the 3 cluster district

		Sheep			Goats		
NO	Descriptions	M	F	Total	M	F	Total
1	HH owning small ruminants	6802	406	7208	10002	683	10685
	No of small ruminants owned	30556	2117	32673	40233	3135	43368
	Proportion of HH selling small ruminants	83	88	-	84	96	-
	Proportion of small ruminants sold	52	69	-	54	51	-
4	HH engaged in fattening	1431	158	1589	3229	261	3490
5	No of Animals fattened	3477	451	3928	7202	351	7553
6	Revenue generated from small ruminants	8,287,473	758,713	9,046,186	11,563,246	843,920	12,407,166
	Revenue generated from fattened small ruminants	2,894,482	391,903	3,286,385	4759827	318295	5078122

Source: LIVES Survey 2012

Furthermore, the revenue generated from sell of both un-fattened and fattened sheep and goats is quite substantial for GamoGofa farmers accounting annual income of ETB 9,046,186 and 12, 407,166 for un-fattened sheep and goats respectively (Table 14). Small ruminants processing is not practiced in the zone. However, some abattoirs located in Addis and Mojo occasionally come and collect sheep/goats from the zone. Small ruminants marketing among farmers is a very common practice where in each village market specific area is assigned for small ruminants selling and buying. Usually collectors or assemblers buy sheep from farmers and either retail it in larger market or supply to bigger traders in bigger markets. Selling of small ruminants is done individually which usually results in low price for farmers because of the involvement of number of middle men. Slaughtering small ruminants in butchers and selling is a recent phenomenon usually taking place in bigger town and cities but no more practiced in village towns. However, inspection for meat quality and safety is not in place because the small animals are slaughtered mostly outside the slaughtering houses.

4.5.6Linkages in small ruminants value chain

So far the linkage created among major actors is limited. In GamoGofa situation good linkage exists between farmers and village level collectors and/or assemblers who collect small ruminants from farmers house or small village markets and they themselves retail in bigger markets or supply to some bigger traders. Despite some limitations public sector veterinary service and drugs supply has strong linkage with sheep producer farmers. Apart from these all other linkages with different actors in small ruminants value chain is so weak or non existing in almost all of the cluster districts.

4.5.7 Gender intervention/strategies

Small ruminants husbandry is traditionally meant for female and much can be done for women empowerment through facilitating more involvement of women in capacity building and access to services such as credit and extension service.

4.5.8Environmental assessment

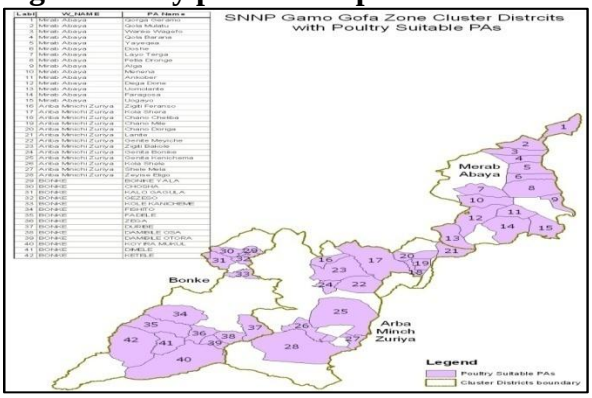
Improved small ruminants production with increased stock could have negative or positive impact to the environment in which the enterprise is functioning and this demands envisaging measures appropriate to mitigate the impact

4.6Poultry egg/meat

4.6.1 Production:

In cluster districts more than 37 PAs are identified as more potential for poultry production (Fig. 7).The survey conducted by LIVES project shows that out of 22403 HHs (1624fhh) involved in poultry production, more than 99.8% HHs are engaged in selling either live chicken or egg to meet their family financial need

Fig 7. Poultry production potential PAs in cluster districts



Source: LIVES 2012 survey

And more than 99 percent of the total poultry population in surveyed districts is local chicken while improved poultry breed account only 1 percent showing that poultry production in the zone is dominantly relying on indigenous breed (Table 15). Focus group members reported that local breed chicken have five times of brooding period and about four times of egg laying time and in each egg laying time at least 15 to 18 eggs are expected making the total annual production not more than 60 to 72 eggs. More over number of chicks per house hold is significantly low indicating that it is not business oriented to generate sizeable income.

Table 15. Poultry production(meat/egg) in the 3 cluster district

		Local		
NO	Descriptions	M	F	Total
1	HH owning local chicken	20779	1624	22403

2	No of local chicken owned	112,214	7200	119414
3	HH engaged improved chicken	326	74	400
4	No of improved chicken owned	1291	134	1425
5	No of eggs produced	5,891,214	361,283	6252497

Source: LIVES survey 2012

The local breeds are known for their low yield, disease resistance and low inputs requirement. Wide research activities were undertaken to upgrade the productivity of local breed but until today, no convincing results were not recorded in comparison with exotic chicken. Office of agriculture has been doing much effort to improve productivity and production of poultry and this includes effort to improve management aspect of local chicken and introduction of exotic breed.According to the zonal OoA 2010 report, major actions taken by the zone to improve poultry production include:

- Feeding and health care improvement extension
- Crossing local with improved
- Growing day old chicken
- Hatching/brooding fertile eggs by local chicken
- Distributing layer and three months old improved chicken

However, the exercises are constrained by number of factors such as limited supply inputs including of improved breed, drugs, feed, etc and also lack of skilled and knowledge both from farmers and front line staff side. Very recently day old chicks distribution was resumed with introduction of hay-box technology and few farmers in some the districts in GamoGofa zone started the practice by producing their own hay-box but many of the districts have in their new year plan. Prior training was conducted to experts and farmers on hay-box production skill. However, survival and productivity of these exotic chicken distributed to farmers is not assessed in depth. In any case this is an area to boost poultry production both for egg and meat.

4.6.2Housing, feeding health care

Local breed poultry farmers traditionally give very less attention to housing, feeding, and health care. Culturally chicken are housed with family mainly to protect them from wild life attack and theft during night time only and during day time they are left for scavenging. Improved house construction for exotic breed using locally available materials was introduced since long time ago but it did not take off. Local breed survive only on scavenging and no farmer bothersabout poultry feed. Focus group members reported that health care is taken only when the chicks are sick which in most case is too let to recover. Vaccine service is reported to be erratic because of inconsistent vaccine drugs supply in district veterinary service office and for some other logistics reasons such as transport.

4.6.3Poultry inputs /servicesdelivery system

Improved breed supply (day old chicks, pullets, fertile eggs) is done by the public sector and other inputs like Viet drugs and vaccines are also supplied by public sector. There are few private Viet drug venders in some of the cluster districts and in zonal capital but their function is limited.Improved feed use for poultry is not practiced by most of the farmers and consequently its supply is none existing because of limited or no demand. Also other inputs like feeding and watering trough, small scale hatchery are not easily available.

4.6.4Processing and marketing

Live chicks and egg marketing is a very important cash income source specially for women who need small amount of money weekly or daily to cover minor daily needs of a family. Almost all households (99.7) sell one or more chicken annually and 79% of the total eggs produced is directly sold to marketand the average price of an egg is ETB 1.7 (Table16). Focus group members reported that the remaining 21% of egg is either used to replace the stock or consumed at home. Table 16. Marketing of poultry (Meat &eggs)

Table 17. Marketing of poultry (meat & egg) in the 3 cluster district

		Local chicken			Improved		
NO	Descriptions	M	F	Total	M	F	Total
1	HH owning chicken	20779	1624	22403	326	74	400
2	No of chicken owned	112214	7200	119414	60	53	113
3	Proportion of HH selling chicken %	99.8	99.9	99.7	69	80	149
4	Proportion of chicken sold	60	60	120	35	88	123
5	Average price of a chicken	61	61	122	88	88	176
	Average price of egg ETB Birr/egg	1.7	1.7	-	1.7	1.7	
	Revenue generated from sell of chicken	4,050,790	228,999	4,279,789	29,582	4,226	33,808
6	Total eggs produced	4,680,530	282,999	4,963,529	NA	NA	NA
7	Proportion of eggs sold	79	78	157	NA	NA	NA
8	Revenue generated from sell of eggs	6,365,520	311,438.64	6676959	NA	NA	NA

Source: Lives survey 2012

And marketing of poultry (egg/meat) in the zone is developed in traditional way. There are collectors who collect eggs and chicks from farmers' house and do retail business by their own or sell to other retailers. In addition, in village market days, chicks and eggs buyers sit on main get to the market and collect chicken or egg or farmers can sell in the center assigned for poultry.Chicks market from the zone could extend only to Soddo during national holydays and religious festivals otherwise much is consumed by the zone inhabitants.Poultry farmers and traders as well face significant egg losses due to mishandling. Poultry marketing is usually done by individual farmers living much transaction there by reducing much benefit farmers could fetch by selling directly to consumers or big traders.

4.6.5Linkages in the poultry value chainactors

- Developing linkages among actors through initiating actors plat form will assist in setting common goal and strategy for poultry development.
-

4.6.6 Gender interventions

Traditionally poultry is the domain of female farmers in GamoGofa. Usually small expenses of a family is covered by most housewives from the income generated either through sell of eggs of chicks. However, the income is so small because of less productivity of local breed, poor management, and also

lack of skill and knowledge from female farmers side. Less access of female farmers to various services like credit, extension service, skill development, market information, etc are some of the issues to be address to enhance female farmers income from poultry.

4.6.7 Environment assessment/intervention

Poultry development in (peri-) urban areas may result in zoonotic diseases – this will be addressed through awareness creation by extension staff and also poultry development in urban areas can also result in unpleasant smells. This could be minimized by appropriate site selection. Towns should designate appropriate sites for developing this commodity and others. Again synergies can be created between poultry and dairy development by using poultry waste as a source of dairy animal feed.

5. Knowledge management

At PA level there are demonstration plots some with forage and fodder seed, seedlings, cuttings for demonstration and sometimes to be distributed to farmers. In some FTCs there are also physical soil conservation demonstrations such as contour bands with tie-ridges, etc. and the bands are established with some forage grass like vetivar grass or elephant grasses. Occasionally farmers to farmers experience sharing tours are facilitated by district and/or at DA level whenever there are good lessons to be shared with. Improved vegetable production technique and different fruit seedlings production demonstration (grafted, non grafted, potted and bare rooted) is also carried out in some of the FTCs. Model farmers are used as resource person in some of the trainings and workshops to demonstrate their own experience and train others. These are good practices in the area of knowledge management. However, most of the exercises are inconsistent in nature because of operation budget constraint, frequent staff turnover, lack of ownership and defined strategy, less skill and knowledge of frontline staff.

6. Capacity development

Different organizations both public and private are engaged in capacity development in the cluster districts (Table 11). Office of agriculture at district level annually planes and facilitates different trainings for front line staff on new practices but usually few of its plans are executed due to financial and some management challenges. Some trainings are initiated by the region or the zone and DAs extend the training to model farmers.

Table 11. Government office engages in capacity development

No	Government offices	Location	Area of capacity building
1	Office of agriculture	District/zone/region	Livestock, fruits and vegetables
2	Marketing and cooperatives	District/zone/region	Cooperative organizing, market linkage, business development plan
3	Womens affairs Office	District/zone/region	Livestock, fruits and vegetables,
4	Youth Affairs office	District/zone/region	Livestock, fruits and vegetables
5	FM rural radio	District/zone/region	Vegetables
6	Omo MF	District/zone/region	Business management
7	Irrigation scheme development unit	District/zone/region	Irrigation schemes management

Source: LIVES base line survey 2012

There are also numbers of projects and programs within the government office which are engaged in capacity build and knowledge sharing (Table 12).

Table 12. Government projects and programs engaged in capacity buildings

No	Projects/Programs	Location	Area of capacity building
1	HAB	District/zone/region	Livestock, fruits and vegetables
2	PSNP	District/zone/region	Livestock, fruits, vegetables
3	PSNP+	District/zone/region	Livestock
4	Small scale irrigation development project	District/zone/region	Irrigated crops

Source: LIVES base line survey 2012

Numbers of NGOs are also engaged in Capacity development (Table 13). For almost all the NGOs engaged in capacity building the resource person are from district, zone or regional office of agriculture.

Table13. NGOs engaged in capacity building

No	NGOs	Location	Area of capacity building
1	Worled vision	Mirab Abaya	Livestock, fruits and vegetables
2	Kalehiwot	Bonke	Livestock, fruits, vegetables
3	Mekaneyesus	Bonke	Livestock
4	Katholic mission	Arbaminch	Livestock
5	Vita	Bonke	Vegetables
6	OVOP	Arbaminch	Frits value addition
7	ECOPIA	Arbaminch	Vegetable and fruits value addition

Source: LIVES base line survey 2012

However, both public and private capacity building initiatives are fragmented and do not consider commodity value chain. And the agricultural staffs are less capacitated in adult education, value chain oriented extension principles and also lack commodity focused in-depth technical skill and knowledge which should be considered in depth during LIVES project phase.

7. Extension service

Since1995E.C a new extension approach named Participatory Demonstration and Training Extension system (PADTES) was placed in to action at national level. Its objectives are mainly focused on agro ecology and market oriented based technology dissemination and extension services. Considering the geographical diversity of the region and adaptability of new technology both in terms of agro climate and socio economy PADTES was considered as regional extension approach too. Bureau of agriculture and Marketing and Cooperatives have a structure from region up to thedevelopment centers to give effective extension service to the rural community. Moreover, at each PA level a farmers training center (FTC) was established and three development agents (crop development, animal husbandry, natural resource development) and one Marketing & Coop agent for every 3 PAs are assigned. These extension agents conduct training on different modules and give extension services to the farmers/pastoralists.

The survey conducted by LIVES in 2012 also highlights that each of the three districts have significant staffing at grass root level which can contribute to the implementation of value chain commodity development (Annex 5). However, technology transfer and information flow is still top down. For number of reasons front line staffs and SMS depend on zonal or regional office. Commodity value chain development approach skill development among the front line staff and SMS is necessary.

8 Vision and intervention options

8.1 Tropical fruits value chain (Avocado, mango, banana, apple)

8.1.1 Vision statement

To increase income and livelihood of men and women producers and increase foreign exchange earnings, project partners aim to increase total sales revenue of fruit production with 50%. This will be achieved through increased domestic sales of apples, mango, avocado and domestic and international sales of banana. Increased sales will in turn be the result of developing/strengthening domestic and international market linkages, improved production through improved/increased use of available irrigation water by individual users and farmers in irrigation schemes, improved agronomic practices and introduction of improved varieties with the help of different nursery models.

8.1.2 Fruits production intervention

- Assessing the existing fruit varieties and its performance and coming up with possible measures to upgrade the production and productivity of old fruit trees should be given priority.
- Assessing the different fruits planting materials generation, multiplication and distribution system and coming up with inbuilt sustainable multiplication and distribution strategy
- Introducing more productive new varieties appropriate for each agro-ecology
- New export suitable banana varieties tissue culture introduced by Bioversity International could be one area to focus.
- Top working: pruning training, grafting etc.
- Disease and pests which affect production and quality of the product are common and measures both biological and chemical should be given priority.
- More specialized NGOs like Kalehiwot in apple production, should be linked in the fruits production improvement intervention.

8.1.2.1 Year 1 Intervention options

- **Assessing the existing fruit varieties and its performance and coming up with possible measures to upgrade the production and productivity of old fruit trees should be given priority.**
- **Assessing the different fruits planting materials generation, multiplication and distribution system and coming up with inbuilt sustainable multiplication and distribution strategy**
- **Introducing more productive new varieties appropriate for each agro-ecology (mango, avocado, papaya, apple)**

❖

8.1.3Potential area for intervention in irrigation of fruit crops

- ❖ Skill and knowledge development among fruit farmers on
  - Pumps operation,
  - Efficient water utilization for different crops depending on crop water requirements at different growth stages.
- ❖ Assessing on how efficiently the pumps in farmers hand are used and the outcome of the study will lead us what strategy to pick such as introducing pump renting, or facilitating access to new pump purchase.
- ❖ Assessing of the existing irrigation structures current performance against its design, etc
- ❖ Initiating new/strengthen the existing water users associations and capacitating them in equitable water resource management skill, group leadership skill is very essential,
- ❖ Reviewing the existing WUA bylaws through participatory approach.
- ❖ Introducing more efficient water application technologies, like drip irrigation and sprinkler irrigation could be some of the option for intervention

8.1.3.1Year 1 Intervention

- ❖ **Assessing the existing irrigation structures current performance against its design, etc and coming up with recommendations**
- ❖ **Assessing on how efficiently the pumps in farmers hand are used**
- ❖ **Skill and knowledge development among fruit farmers on**
  - **Pumps operation,**
  - **Efficient water utilization for different crops depending on crop water requirements at different growth stages.**

8.1.4 Potential area for interventions in irrigated fruits input/service system

- ❖ Promote farmers/private planting material producers and strengthen
- ❖ Promote mother trees establishment in each seedling producer farmer/private entrepreneur field (avocado, mango, apple, etc)
- ❖ Assess pump use status in the cluster districts in general
- ❖ Initiate/strengthen inspection, certification and regulatory body for planting materials multiplication and distribution
- ❖ Promote pump renting strategy with in the community
- ❖ Initiate private pump supplier with spare parts shop
- ❖ Develop private pump maintenance and training on pumps operation
- ❖ Conduct skill training both for cooperatives and private traders on inputs stocking, handling and sustainable inputs/ services delivery

8.1.4.1 Year 1 Interventions

- ❖ **Promote farmers/private planting material producers and strengthen**
- ❖ **Promote mother trees establishment in each seedling producer farmer/private entrepreneur field (avocado, mango, apple, etc)**
- ❖ **Introducing pump renting, or facilitating access to new pump purchase**
- ❖ **Train farmers on different brand of pumps, sprayers and other water lifting machines operation skill**

-

8.1.5 Area of intervention for fruits processing and marketing

- **Assessing potential markets for fruits specifically mango, avocado, papaya**
- Assessing and introduce both local modern and fruits preserving, storage, packing transporting techniques
- Training farmers in fruits preserving techniques
- Assessing fruits processing/ canning exercises by ECOPIA and others and devising a strategy to scale out if it is worthy
- Assess the existing fruits residue processing (banana steam and leaves to paper) by OVOP and devising a strategy if it is worthy
- Introduce fruits product grading, leveling and certifying with GamoGofa Brand
- Promoting use of banana leftover for livestock fattening
- Train farmers, private fruits traders, cooperatives in fruits grading and leveling technique
- Strengthen inspection and certification section
- Promote collective group marketing technique

8.1.5.1 Year 1 Intervention

- **Assessing and introduce both local modern and fruits preserving, storage, packing transporting techniques**
- **Training farmers in fruits preserving techniques**
- **Assessing fruits processing/ canning exercises by ECOPIA and others and devising a strategy to scale out if it is worthy**

8.1.6 Area of intervention for linkages in irrigated fruit value chain

- Facilitate formation of platform for dominant actors in the irrigated fruits value chain
- Initiating linkage between fruit farmers and marketing groups such as wholesealersand retailers at district level
- Initiate linkage with private and public sectors seedling producers with private/public service providers for provision of planting materials, inspection and certificate

8.1.6.1Year 1 Intervention

- Assessing potential markets for fruits specifically mango, avocado, papaya
- **Link with traders, special programs, project for better market linkage**
- **Initiating linkage between fruit farmers and marketing groups such as wholesealers and retailers at district level**
- **Initiate linkage with private and public sectors seedling producers with private/public service providers for provision of planting materials, inspection and certificate**

8.1.7Gender Intervention

- Engage female farmers in fruit seeds, seedling, cuttings production
- Facilitate participation female farmers in value addition like juice processing
- Promote one to one male-female ration in capacity building, skill development
- Introduce women friendly technologies such as dwarf or grafted fruit varieties

- Increase female farmers access to information through distributing pamphlets, brochuers prepared in local language in female gathering places (coffee ceremony, female butter ikub, local butter market places, etc)

8.1.7.1 Year 1 Intervention

- **Engage female farmers in fruit seeds, seedling, cuttings production**
- **Facilitate participation of female farmers in value addition like juice processing**

8.1.8Area of intervention for environment

- Awareness creation on use of agrochemicals and its impact on human health through workshops
- Introducing and promoting integrated pest management to minimize agrochemical impact on human health
- Promoting use of fruit crop leftover for dairy and fattening program
- Assessing continually irrigated areas for soil salinity

8.1.9 Capacity building/Knowledge management for irrigated fruits value chain

- Training fruit farmers and frontline staff in better management of the old and newly introduced varieties
- Training farmers in preliminary pumps operation,
- Training farmers and front line staff in efficient water utilization for different crops depending on crop water requirements at different growth stages.
- Training private/youth/women in pump/sprayers maintenance system
- Conduct skill training both for cooperatives and private traders on inputs stocking, handling and sustainable inputs/ services delivery
- Train farmers, private fruits traders, cooperatives in fruits grading and leveling technique
- Training farmers in fruits preserving techniques
- Facilitate formation of platform for dominant actors in the irrigated fruits value chain
- Facilitate participation of female farmers in value addition like juice processing
- Training female farmers in fruits processing techniques
- Awareness creation on use of agrochemicals and its impact on human health through workshops
- Facilitating experience sharing tour to advanced fruit farmers, processing units, marketing institutions, etc
- Awareness creation on malaria and other vector disease spread due to poor sanitation in ponds, canals, etc and initiating collective action to maintain the sanitation of ponds and canals
-

8.2 Vegetables value chain

ain (Tomato, cabbage, leaf cabbage, garlic, leaf onion, onion, potato, pepper)

8.2.1 Vision

To increase gross sale revenues of vegetables by 50% for male and female farmers through increases in the area of irrigated vegetable production and productivity increases. Increases in production and productivity will result from improved supply of water in schemes, improved on-farm water use efficiency, improved agronomic practices, including use of high yielding varieties through development of specialized (female) vegetable seed producers and linkages with input suppliers. Increased on farm prices, resulting in increased sales revenues, will be obtained through scheduling of production and making better marketing arrangements

8.2. 2 Area of production intervention for vegetables

- Demonstrating over all improved agronomic practices
- Assess the existing seed supply source and its reliability for quality and sustainability
- Introduce certified and/treated seeds and other input and services delivery system

8.2.2.1 Year I intervention

- Training farmers and front line staff in vegetables production techniques
- Facilitating experience sharing tour for model farmers and front line staff to advanced vegetable production farmers

8.2.3 On farm irrigation/agronomy intervention

- Thus, farmers should have basic knowledge on vegetable crops – water relationship. To this end a manual should be produced in local language and be distributed to farmers so that each farmer can have a guide on volume of water required for each plant and at what time it should be applied.

8.2.3.1 Year I intervention

- Training farmers in pumps and sprayers operation and primary service like greasing is essential
- Farmers and front line staff should be trained on different disease and pest control measures both biological and chemical methods,
- Introducing better transporting and storing, packing facilities like traditional cooling houses and transporting equipments

8.2.4 Area of intervention for vegetable inputs/ services supply

- Facilitate access to credit for women, youth, private for seed or seedlings production
- Assess the knowledge, skill and resource capacity of the existing private maintenance shops and do capacity building
- Assess farmers present machines maintenance practice and capitalize on it for better services
- Engage and capacitating cooperatives, unions and private vegetable inputs suppliers in inputs supply and also in stacking fast moving items

8.2.4.1 Year I intervention

- Engage and capacitating cooperatives, unions and private vegetable inputs suppliers in inputs supply and also in stacking fast moving items
- Promoting private/farmers groups vegetable seeds and seedling production approach
- Capacitating private/farmers and frontline staff them with skill, knowledge and
- Facilitate access to credit for women, youth, private for seed or seedlings production

- Assess farmers present machines maintenance practice and capitalize on it for better services
-

8.2.5 Area of intervention for vegetables processing and marketing

- Promote collective marketing will develop capacity for vegetable producers to establish common storing and cooling facilities and also bargaining power for better price
- Introduce vegetable processing practices
- Developing grading and certifying capacity and promoting Gamo Gofa brand for vegetables produced in GamoGofa could upgrade marketing ability and better income as well.
- Introducing better transporting facilities will reduce losses related to poor transporting
- Review ECOPIA experience and scaling out if it sounds feasible
- According to some reports vegetable post harvest loss accounts about 30% in Ethiopia in general and this has to be addressed through introducing better transporting and storing facilities like traditional cooling houses and transporting equipments

8.2.5.1 Year I intervention

- Introducing better transporting, packing, storing facilities
- Introduce vegetable processing practices

8.2.6 Area of intervention for linkages among actors for vegetables

- Facilitate formation of platform for dominant actors in the irrigated fruits value chain and initiate them to design common vision and strategy to develop vegetable production and marketing
- Initiating linkage between vegetable farmers and marketing groups such as wholesalers in Addis and other big cities for sustainable market
- Linking banana fruit traders with vegetable producers could be another area to assess
- Initiate linkage with private and public sectors seedling producers with private/public service providers for provision of planting materials, inspection and certification

8.2.6.1 Year I intervention

- Initiating linkage between vegetable farmers and marketing groups such as wholesalers in Addis and other big cities for sustainable market
- Initiate linkage with private and public sectors seedling producers with private/public service providers for provision of planting materials, inspection and certification

8.2.7 Area of intervention for gender

- Promote one to one male-female ration in capacity building, skill development, knoeledge management like experience sharing tour.
- Engage landless female farmers in vegetable seeds and seedling production
- Increase female farmers access to information through distributing pamphlets, brochuers prepared in local language in female gathering places (coffee ceremony, female butter ikub, local butter market places, etc)
- Facilitate participation of female farmers in value addition like juice processing

8.2.7.1 Year I intervention

- Engage female farmers in vegetable seeds and seedling production
- Facilitate participation of female farmers in value addition like juice processing

8.2.8 Area of intervention the impact of irrigated vegetable production on environment

- Awareness creation on use of agrochemicals and its impact on human health through workshops
- Introducing and promoting integrated pest management to minimize agrochemical impact on human health
- Promoting use of fruit crop leftover for dairy and fattening program
- Assessing continually irrigated areas for soil salinity
- Awareness creation on malaria and other vector disease spread due to poor sanitation in ponds, canals, etc and initiating collective action to maintain the sanitation of ponds and canals

8.2.8.1 Year I intervention

- Awareness creation on use of agrochemicals and its impact on human health through workshops
- Introducing and promoting integrated pest management to minimize agrochemical impact on human health

8.2.9. Capacity building and knowledge management for irrigated vegetables value chain

- Training farmers and front line staff in irrigated vegetables production techniques
- Facilitating experience sharing tour for model farmers and front line staff to advanced vegetable production farmers, processing plants and marketing centers
- Training farmers in different disease and pest control techniques
- Training private/public seeds, seedlings, other planting materials and agro chemical suppliers in production and handling techniques (quality seed production, grading, importance of certification, proper storage,etc)
- Awareness creation on value of group marketing and its management skill through workshop
- Formation of vegetable producers platform
- Training female farmers in vegetable processing practices to increase shelf life etc.
- Training seeds and agrochemicals suppliers on the value of supplying certified and or treated vegetables seeds its storing practices and also link them with suppliers in zones and regions and facilitate access to credit for seeds and chemicals supply if needed.
- Promoting private/farmers groups vegetable seeds and seedling production approach and capacitating them with skill, knowledge
- Training farmers in pumps and sprayers operation and primary service like greasing is essential
- Farmers and front line staff should be trained on different disease and pest control measures both biological and chemical methods, crop rotation for the purpose of disease and pests control and replenishing soil fertility.

8.3 Irrigated fodder production

8.3.1 Vision

To introduce fodder production in irrigated fields/schemes for livestock commodity development using permanent perennials varieties (grasses and legumes) or annual rotational varieties to improve soil fertility and/or as part of an Integrated Pest Management Strategy (IPM). Market demand for such fodder will be created by linking producers with dairy and fatteners

8.3.2 Production interventions

- Awareness development among farmers on the importance of irrigated forage and fodder production
- Watershed management area currently implemented in almost all the districts could be a good potential for forage and fodder development in individual or communal holdings
- Improving communal grazing plots with the introduction of better yielding grass species
- Area enclosure will increase feed availability
- Introducing rotational grazing and
- Introducing cut and carry system

8.3.3. Fodder inputs supply system intervention

- Assessing the current situation and developing sustainable seed supply system
- Initiating and engaging private/farmers group in producing forage and fodder seeds. This need some strategy such as giving guarantee to buy the seeds after production because producers fear lack of buyer when produced in large volume
- Promoting feed preserving and storing techniques on crop residue and abundant grass available in long rainy season has to be given attention.
- Promoting leguminous forage and fodder production on individual holdings

8.3.4. Fodder production linkages

- Linking fodder seed producers with institutions which produce forage seed (EIAR, ILRI, etc.)
- Linking fodder seed producer farmers with fodder and forage seed traders

8.3.5. Capacity building and knowledge management for irrigated fodder

- Develop awareness among farmers and entrepreneurs through workshops
- Training farmers and private sectors in fodder production

8.4 Beef production value chain

8.4.1 Vision:

To increase annual revenues from beef production by 15 -25 % through increased number of fattened animals/farmer, involving more male and female farmers in fattening their own male animals through supplementary feeding and improved animal health care and service provision.. This will be supported by increased production of fodder and supply of animals to be fattened through linkages with animal

supply markets. Increased sales value (prices) of animals will furthermore be obtained through improved market linkages with potential buyers

.

8.4.2 Area of beef production intervention

- Developing community based disease control strategy
- Scheduling vaccination and drug supply
- Diagnostic survey for prevailing diseases
- Introducing better management in feeding, housing and health care for local breed
- Introducing concentrate or other protein source to accelerate fattening period
- Some genetic improvement with AI for dairy beef

8.4.2.1 Year I intervention

- Introducing better management in feeding, housing and health care for local breed
- Training farmers in improved beef management practice
- Developing community based disease control strategy
- Scheduling vaccination and drug supply
- Diagnostic survey for prevailing diseases and developing action plan

8.4.3 Intervention area for on-farm fodder production

- Fodder crops multiplication in banana farms
- Watershed management area currently implemented in almost all the districts could be a good potential for forage and fodder development in individual or communal holdings.
- Promoting feed preserving and storing techniques on crop residue and abundant grass available in long rainy season has to be given attention.
- Leguminous forage and fodder production on individual holdings could improve protein source part of livestock feed and also could generate income by selling.
- Focus also should be given to improving communal grazing plots with the introduction of better yielding grass species, and also area enclosure will increase feed availability
- introducing rotational grazing and cut and carry system should also be focus area for on-farm fodder production

8.4.3.1 Year I intervention

- **Seeds, seedlings production in private plots, FTCs**
- **Fodder crops multiplication in banana farms**
- **improving communal grazing plots with the introduction of better yielding grass species, and also area enclosure and developing management system**
- **Developing communal grazing area management practice**

8.4.4. Area of intervention for inputs/services

- Private/ farmers Forage and fodder seed multiplication and distribution.
- Services like hormone assisted mass insemination with mobile team, sex fixer and AI are very sensitive and time bound operations but public sector with multiple objectives and responsibilities may not be capable of doing effectively. Thus such sensitive activities should be shared with focus groups or enterprises who have skill and resource capacity while public sector undertakes close monitoring inspection and regulatory section.

- Animal health care service and AI cant be covered by few trained public sector staff and thus Community Animal Health Workers (CAHW) and community AI technicians should be trained and equipped with necessary materials such as rapid diagnostic kits.
- Privatization of Viet service and AI is most important for better result in livestock improvement.
- Introducing communal management systems for grazing area development

8.4.4.1 Year I intervention

- **Developing private/ farmers forage and fodder seed multiplication and distribution.**
- **Initiating mass insemination and facilitating necessary inputs supply for mass insemination**

8.4.5 Area of intervention for marketing and processing.

- Collective marketing which may connect them directly with consumers could increase income from sell.
- Also farmers should be advised on the importance of holiday and staggered fattening so that imbalance in supply and demand and the resulting lower price could be minimized.
- Poor meat quality and sanitation observed in all levels of butcheries and slaughtering house could be improved through training more meat inspection experts and equipping them with some inspection materials.
- Training should also be rendered to butcher houses in meat handling and selling house sanitation.
- Market information sharing mechanism using different methods like distributing timely market information focused leaflets in local language in public gathering places, like Idir, Ikub, DeboJige, FTC notice board, etc.
- Initiating entrepreneurs to engage in meat processing so that fattened oxen could be absorbed with out market challenge to farmers

8.4.5.1 Year I intervention

- **Promoting collective marketing and linking them with buyers**
- **Scheduling fattening for holydays and or staggered fattening**
- **Assessing and promoting contractual fattening**
- Market information sharing mechanism using different methods like distributing timely market information focused leaflets in local language in public gathering places

8.4.6 Linkages in the large ruminants beef value chain

- Initiating and facilitating platform for discussion among actors to design common goal and strategy to achieve common goal in beef production, marketing, processing, inputs supply, etc
- Developing linkage with regional animal feed processors like Lecha in Hadya and Alto in Sidam and other private feed processors
- Developing linkages with livestock market information for timely market information

8.4.6.1 Year I intervention

- Initiating linkage between farmers and marketing groups such as wholesalers in Addis and other big cities for sustainable market and better price
- Initiating and facilitating platform for discussion among actors to design common goal and strategy

8.4.7 Area intervention on gender strategies

- Increase female farmers' access to fattening skill by engaging more female farmers in skill training,
- Experience sharing tour etc.,
- Inputs supply development,
- Introducing technologies such as mechanized chopper, etc.

8.4.7.1 Year I intervention

- Increase female farmers' access to fattening skill by engaging more female farmers in skill training,
- Experience sharing tour etc.,

8.4.8 Intervention strategies on environmental effect

- Use of crop residues as a source of feed could have a negative effect on soil structure/fertility and should be compensated through the use of manure, crop rotation or other fertility enhancing practices

- Grazing area development can have a positive effect on apiculture development through increased biodiversity and availability of flowers (bee forage)
- Zero grazing is promoted; hence land degradation due to trampling will be minimized
- If live animals are also sold intensively, genetic erosion may occur – awareness will be raised during annual review meetings on livestock commodities.
- During slaughtering, zoonotic diseases might occur but, this potential danger will be studied
- Fruit waste (especially banana) can be used as a source of feed for fattening

8.4.9 Capacity building and knowledge management for beef value chain

- Training farmers and front line staff in improved beef production (housing, feeding, health care, etc)
- Training community animal health worksrs (CAHW)
- Training butcher houses owners and beef traders in meat handling and selling house sanitation, better live animals transporting importance and value
- Identifying and developing market information sharing techniques
-

8.5 Meat production from sheep and goats

8.5.1 Vision

To increase sales value of shoat production by 80% through increased number of fattened animals/famer; involving more male and female farmers in fattening their shoats. This development will

be supported by reducing animal mortality through use of vaccines, better animal health services, increased production of feed and introduction of community breeding systems aimed at improving breed performance. Increased sales value of animals will furthermore be obtained through increased prices resulting from market linkages with potential buyers

8.5.2 Area of intervention for production of improved small ruminants

- Conducting wider scale participatory local breed selection /(community based ram selection)
- Assessing potential of local breeds listed by the region for their better performance and scaling out their distribution
  - Adilo sheep local breed
  - Guji-Woito local goats breed
- Crossing local with better performing other breeds
  - Bonga/ Horo

8.5.2.1 Year I intervention

- **Conducting wider scale participatory local breed selection /(community based ram selection)**
- **Training farmers and front line staff in improved shoat management**

8.5.3 Area of intervention for improved small ruminants housing feed health care…

- Internal and external parasite control
- Introducing standard housing practice for sheep and goats production,
- Promoting concentrate use for improved fattening,
- Initiating more private sector involvement in Viet service, drugs and concentrate supply.

8.5 3.1 Year I intervention

- Internal and external parasite control
- Introducing standard housing practice for sheep and goats production,
- Promoting concentrate use for improved fattening,

8.5.4 Intervention area for fodder improvement

- Promoting private farmers production of forage and fodder
- Introducing different crop residue treatments such as urea treatment, mineral block urea molasses treatment
- Introducing various feed treating preserving techniques
- Assessing and introducing better utilization techniques of fodder feed

8.5.4.1 Year I intervention

- **Promoting private farmers production of forage and fodder**
- **Introducing different crop residue treatments such as urea and chopping**

8.5.5 Area of intervention for inputs and services

- Introducing lambs rearing group specifically women and synchronizing with fattening group
- Introducing Community Based Livestock insurance to minimize accidental death of accidental death/loss

- Assessing private sector input/service suppliers capacity, skill and limitations and capacitating them
- Strengthening private/farmers forage and fodder seed multiplying and distribution strategy

8.5.5.1 Year I intervention

- **Introducing lambs rearing groups specifically women and synchronizing with fattening group**
- **Strengthening private/farmers forage and fodder seed multiplying and distribution strategy**
- **Assessing private sector input/service suppliers (feed, drugs) capacity, skill and limitations and capacitating them**
- **Promoting use of additional feed concentrate for fattening**

8.5.6 Area of intervention for processing and marketing

- Promoting contractual fattening
- Initiating collective marketing for better price through reducing much operation in between
- Promoting small ruminants slaughtering in registered butchers for monitoring health and sanitation

8.5.6.1 Year I intervention

- **Promoting contractual fattening**
- **Initiating collective marketing for better price through reducing much transaction in between**

8.5.7 Area of intervention for linkage

- To make Viet drugs supply sustainable and easily assessable for local venders and thereby for farmers linkage among local venders and suppliers at zonal, regional and federal agro-dealership network level is essential
- Linking small ruminants collective marketing group with large traders like export abattoir could guarantee market and reasonable price
- Initiating and facilitating small ruminants value chain actors platform to set up common vision and development strategy will assist in addressing number of challenges collectively.
- Initiating small scale commercial small ruminants producers both for fattening and reproduction and strengthening their linkage with OMF and other legal lending institutions
- Strengthening market information access for small ruminants products through linking them to Ethiopian livestock market information system for market options
- Strengthening linkage among public sectors actors working for common goal (women's affairs office, livestock process owner and Marketing and cooperative department) for better success

8.5.7.1 Year I intervention

- **Strengthen linkage among local venders and suppliers at zonal, regional and federal agro-dealership, food processors network level**
- **strengthening fattening group linkage with OMF and other legal lending institutions**

8.5.8 Area of intervention for gender

- Engage female farmers group in shoat fattening
- Facilitate their access to credit

- Increased female farmers for capacity building through female farmers focused target selection
- Improving female farmers access to market information using different strategies such as distributing market information in women dominated gathering places like better ikub, buter market, coffee morning
- Increasing number of female in decision making positions like in cooperatives, private input supply services etc.
- Fattening ram selection, buying and selling of both fattened and unattended sheep and goats is still in the hands of male farmers and this is the area to focus for empowering women. Thus training female farmers in ram selection and experience in bargaining while selling and buying is necessary

8.5.8.1 Year I intervention

- Engage female farmers group in shoat fattening
- Facilitate female farmers access to credit
- Increased female farmers for capacity building through female farmers focused target selection

8.5.9 Area of intervention on environmental impacts

- Possible land degradation impact due to free grazing could be avoided or minimized through developing cut and carry system
- Soil fertility losses due to use of crop residue for feed could be minimized through introducing crop rotation, use of manure,
- Improving grazing land for small ruminants could result regeneration of different flora which could initiate apiculture

8.5.10 Capacity building/Knowledge management

- Training farmers and front line staff in improved shoat management
- Training experts in meat inspection
- Practical training for farmers on ram selection for local breed improvement
- Training female farmers in fattening ram selection, buying and selling of both fattened and unattended sheep and goats
- Capacity building for meat inspection section and private sectors engaged in slaughtering of small ruminants
- Skill upgrading for assistant veterinarians assigned in PAs to focus for intervention
- Strengthening public sector staff skill and knowledge through short term trainings, workshops
- Supplying diagnostic tools and training staff in its use
- Training CAHW

8.6 Poultry egg/meat

8.6.1 Vision

To increase egg and meat production/sales value by 30 to 60% in rural areas through reducing chick mortality through community based health workers, vaccinators using a cluster/group approach. This will be furthermore supported by improved feeding and housing and selection of best performing male and female chickens.

To introduce egg and meat production/sales revenue in (peri-)urban areas by establishing semi commercial medium scale production farms 50 - 400 birds using exotic breeds, through development of specialized pullet producers and linkages with suppliers of quality feed and health services.

Increased sales value in both systems will also result from improved on-farm prices resulting from better marketing arrangements/linkages

8.6.2 Area of production intervention/rural and urban

- Assess day old chicks producing institutions status
- Initiate market oriented production practice (increased number per household)
- Conducting selection among the GamoGofa zone local breed for meat and management improvement for local breed
- Introduction of Bovan Brown for egg and Rose for meat for commercial small scale
- Assessing and introducing poultry feed from locally available ingredients

8.6.2.1 Year I intervention

- Conduct local chicks selection
- Assessing and exercising poultry feed preparation from locally available ingredients
- Introduce improved housing practice

8.6.3 Area of intervention for improved poultry housing feeding and health care…

- Developing awareness among farmers on the importance of improved housing both for local and improved breeds and introducing different poultry housing designs
- Demonstrate improved feeding and housing practice
- Initiating private entrepreneurs for Viet service

8.6.3.1 Year I intervention

- **Training farmers on improved housing, feeding and health care**
- **Introducing local feed formulation from locally available elements**

8.6.4 Intervention area for inputs supply

- Introduce small scale hatchery to produce day old chicks in large number
- Device a strategy to avail vaccination drugs on time including cold chain supply for district office of agriculture
- Farmers and traders skill in eggs inspection should be strengthened for quality egg marketing
- Assess day old chicks producing institutions status and strengthen them
- Develop pullet production group
- Assessing sustainable day old chicks supply system and strengthening it
- Initiate group or individual day old raring tem for pullet production
-

8.6.4.1 Year I intervention

- Assessing and introducing poultry feed from locally available ingredients
- **Initiate group or individual day old raring tem for pullet production**
- **Establish private hatchery**
- **Device a strategy to avail vaccination drugs on time including cold chain supply for district office of agriculture**

8.6.5 Area of intervention processing and marketing

- Initiating and facilitating formation of collective poultry marketing and linking to consumers or big traders
- Effort should be made to improve chicks and eggs handling and storing and transporting
- Meat quality/ safety assurance through strengthening inspection unit in livestock section

8.6.5.1 Year I intervention

- Initiating and facilitating collective poultry marketing and linking to consumers or big traders

8.6.6 Gender interventions/ strategies

- Poultry production is traditionally the domain of women and hence women can be targeted for commercial as well rural poultry development
- Increased involvement of women (in male and female headed H H) can be obtained through capacity development/knowledge management and increased access to inputs and new information sources
- Production of pullets can successfully be introduced for women groups and individuals
- Increased involvement of women in cooperative structures to supply inputs and process market outputs

8.6.6.1 Year I intervention

- Engaging women in pullet production
- Training women in day old chicks management and vaccination

8.6.7 Environment assessment/intervention

- Poultry development in (peri-) urban areas may result in zoonotic diseases – this will be addressed through awareness creation by extension staff
- Poultry development in urban areas can also result in unpleasant smells. This could be minimized by appropriate site selection. Towns should designate appropriate sites for developing this commodity and others
- Synergies can be created between poultry and dairy development by using poultry waste as a source of dairy animal feed.

8.6.8. Capacity building/knowledge management

- Training farmers in improved poultry production practice
- Train CAHW and equip them
- Train female farmers in day old chicks rearing/pullet production
- Training farmers in vaccination for various diseases
- Organizing experience sharing tour for model farmers to advanced poultry farms

- Train farmers in improved poultry production
- Train farmers in improved poultry production
- Training CAHW for major vaccination and other health care /rural and urban
- Training poultry farmers on improved poultry management in general
- Initiate private entrepreneurs in hatchery running and conduct hatchery management skill training for the private individuals or enterprises.

9. Capacity building/knowledge management for technical staff

9.1 Extension staff

- In-service trainings on (commodity value chain concept, market oriented extension approach, more technical issues like day old chicks management, etc)
- MSc and BSc depending on the need

9.2 Community managers

- Training on group leadership skill
- Managing group owned resources (irrigation schemes, grazing areas, etc.)
- Financial management of community owned resources
- Equitable use of communal resources
- Gender and community resource management
- Input supply and output marketing skills
- Importance of linkages

9.4 Knowledge centers

- Drafting KC and Model FTC management strategy and monitoring tools
- Refurbishing and facilitating knowledge centers
- Equipping KCs and model FTCs

Annex 1. GamoGofa zone consultative team Members

No	Name	Department/position
1	AtoMatewosBunde	Vice Head/ZoA
2	AtoBurukZewde	Livestock process owner
3	AtoAhimedReta	Irrigation process owner
4	AtoMelesmena	Coffee and Tea Pro. owner

5	AtoBafaBalcha	NR process owner
6	AtoGeze Getachew	Planning process owner
7	AtoYayaDalbo	Agri. inputs process owner
8	Ato Daniel Adane	Land use process owner
9	W/rt Aster Geremewu	Livestock expert
10	AtoTeshale Getachew	Irrigation expert

Annex 2. Recommendation domain areas (Peasant Association) for selected zonal commodities

1 ArbaminchZuria

	Region/Zone	Beef /live animals	Chicken meat/eggs	Small ruminant	Fruit and veget	Total
1	Lante	1	1	1	1	
2	ChanoDaroga	1	1	1	1	
3	Chano mile	1	1	0	1	
4	ChanoChalba	1	1	0	1	
5	Shara	1	1	1	1	
6	GantaKenchema	1	1	1	1	
7	SheleMella	1	1	1	1	
8	Kola Shele	1	1	1	1	
9	Elgo	1	1	1	1	
10	GantaMeche	1	1	0	1	
11	GantaBonke	1	1	0	1	
12	ZigitiBakole	1	1	1	1	
13	ZigitiPerasn	1	1	1	1	

2 Mirab Abaya

S/n	PA name	Beef/ live animal	SR meat/live animals	Chicken meat & egg	Fruit and vegetable
1	OmoLante	0	0	1	1
2	Fara	1	1	0	1
3	FaraGosa	1	1	1	0
4	Ankober	0	0	1	1
5	Agayehu	0	0	1	1
6	Mole	0	0	0	1
7	Alge	0	1	1	1
8	Dlili	0	0	0	1
9	Fetele	1	1	1	0

10	Desho	1	1	1	0
11	Yayike	1	1	1	0
12	Kola barena	1	1	1	1
13	WankeWaja	1	1	1	1
14	Kola Mulatu	1	1	1	1
15	Korga	1	1	1	0

3. Bonke

s/n	Region/Zone	Beef /live animals	Chicken meat/eggs	Small ruminants sheep	Fruits/ Vegetables
1	DembileOtora	1	1	0	1
2	DembileOsa	1	1	0	1
3	Koshele	0	0	1	1
4	DhemilePuse	1	1	1	0
5	Ketele	1	1	1	0
6	Pudele	1	1	1	0
7	Phishto	1	1	1	0
8	Zaga	1	1	0	0
9	Koiramukula	1	1	1	0
10	Durbe	1	1	1	0
11	Chosha	0	1	1	1
12	Yela	0	1	1	1
13	Gezeso	0	1	1	0
14	KaloGagula	0	1	1	0
15	Ole Knachame	0	1	1	0
16	Bula	1	0	1	1

NB Level each PA by indicating 0= Not potential, 1= Potential

Annex 3.Lists of potential value chain actors and service providers

No	Activities	Commodities				
		Beef/meat & live animals	Milk	Small ruminants/ meat and live	Chicken/meat & eggs	Irrigated fruits And vegetables
1	Knowledge and capacity building	-BOA -Marketing & Coop bureau -Women Children and Youth Affairs Bureau -HABP FM	-BOA -Marketing & Coop bureau -Women Children and Youth Affairs Bureau -HABP FM	BOA -Marketing & Coop bureau -Women Children and Youth Affairs Bureau -HABP FM	BOA -Marketing & Coop bureau -Women Children and Youth Affairs Bureau -HABP FM	BOA -Marketing & Coop bureau -Women Children and Youth Affairs Bureau -HABP FM
2	Provisions of improved animal genetic resource	-BOA -SARI -Private farms	-BOA -SARI -Primate farms	-BOA -SARI -Private farms	-BOA -SARI -Private farms	-

3	Animal feed suppliers	-Kaudie concentrate feed retailers -Lecha Union -SidamElto Union -BoA (forage seed)	-Kaudie concentrate feed retailers -Lecha Union -SidamElto Union -BoA (forage seed)	-Kaudie concentrate feed retailers -Lecha Union -SidamElto Union -BoA (forage seed)	-Kaudie concentrate feed retailers -Lecha Union -SidamElto Union -BoA (forage seed)	-
4	Vet. service and drugs	-BoA -Private drugs and equip. suppliers	-BoA -Private drugs and equip. suppliers	-BoA -Private drugs and equip. suppliers	-BoA -Private drugs and equip. suppliers	
5.	Supply of irrigation inputs and services	-	-	-	-	-BoA -Rural technology centers, -Private traders

No	Activities	Commodities			
		Beef/meat & live animals	Milk	Small ruminants/ meat and live	Chicken/meat and live
6	Supply of agrochemicals and fertilizers	-	-	-	-
7	Supply of seed, seedlings, & grafted materials	-	-	-	-
8	**Crop spraying ser.**	-	-	-	-
8	Storage facility	-	-	-	
9	Technical and Advisory	-BoA -Marketing & Coop	-BoA -Marketing &	-BoA -Marketing &	-BoA -Marketing & Coop

	services	bureau	Coop bureau	Coop bureau	bureau
10	Providers of financial service	-OMF	OMF	OMF	OMF
11	Market information	-Marketing & Coop bureau	-Marketing & Coop bureau	-Marketing & Coop bureau	-Marketing & Coop bureau

No	Activities	Commodities				
		Beef/meat & live animals	Milk	Small ruminants/ meat and live	Chicken/meat and live	Irrigated fruits And vegetables
12	Output Producers		-Private dairy farms	-	-	-
13	Product processing	-ELFORA processing plant	-Almi milk collection and processing	-	-	-
14	Output Marketing	-Big traders	-Big traders	-Big traders	-Big traders	-Big traders

15	Product consumers	-Urban Dwellers -Universities & higher learning inst -Restaurants big hotels	-Urban dwellers -Restaurants, hotels	-Urban dwellers -Restaurants, hotels	-Urban dwellers -Restaurants, hotels	-Urban dwellers -Restaurants, hotels -Higher learning institutions
17	Research Centers	-SARI -Hawassa University -Animal Health laboratories	-SARI -Hawassa University -Animal Health laboratories	-SARI -Hawassa University -Animal Health laboratories	-SARI -Hawassa University -Annimal Health laboratories	-SARI -Hawassa University -Plant health Laboratory -Soil Laboratory
18	Gender	-BoA -Women, Children and Youth bureau -Marketing and coop. bureau	-BoA -Women, Children and Youth bureau -Marketing and coop. bureau	-BoA -Women, Children and Youth bureau -Marketing and coop. bureau	-BoA -Women, Children and Youth bureau -Marketing and coop. bureau	-BoA -Women, Children and Youth bureau -Marketing and coop. bureau

Annex 4. Regional value chain actors' description

No	Name	Location	Main role	Geographical coverage	Capacity for collaboration	Oppoortunity for collaboration	commodity for intervention	Limitation for colaboration
1	BoA	Hawassa	-Inputs supply, Regulatory ,Services,ToT, gender mainstreaming, monitoring and evaluation	The whole region	Staff, Inputs supply, structure to grass root level	Staff, inputs supply, structure to grass root level	beef, Dairy, small Ruminants, poultry, Irrigated crops	skill on focused value chain, means of transport, over loaded staff, fast staff turn over.
2	Marketing and coop. bureau	Hawassa	Organizing Coop, Market information, market linkage, TOT, Regulatory, Licencing ,monitoring and evaluation	The whole region	Staff, Market linkage	Staff, market information	beef, Dairy, small Ruminants, poultry, Irrigated crops	skill on focused value chain, means of transport, over loaded staff, fast staff turn over.
3	HABP	Hawassa	TOT on business planning and value chain, facilitating hh asset building	79 food insecure Districts in the region	Staff, Value chain skill	Staff, Value chain skill	beef, Dairy, small Ruminants, poultry, Irrigated crops	Knowledge management, too many decission making stake holders
4	Womens, Children & Youth affairs bureau	Hawassa	Empowering women, children and youth in socioeconomic development	The whole region	Staff,	facilitating acces to grass root women and youth organizations	beef, Dairy, small Ruminants, poultry, Irrigated crops	Skill in value chain approach
5	FM	Hawassa	Broadcasting agriculture and gender related news	The whole region	Media technology and staff	Promotion and popularization of technologies, new practices	beef, Dairy, small Ruminants, poultry	Basic concept on agriculture and agri value chain
6	Unions	Hawassa	Inputs supply, output market and linkage,	The whole region	Input supply skill	input supply	beef, Dairy, small Ruminants, poultry, Irrigated crops	Business and financial management skill

7	Flour mills	Hawassa	Producing by-products as raw material for animal feed	The whole region	Source of byproduct	byproduct supply	beef, Dairy, small Ruminants, poultry,	Limited product type, low quantity,
8	Traders	Hwassa	inputs supply, market linkage, price setting informally, quality setting	The whole region	Input supply	input supply	beef, Dairy, small Ruminants, poultry, Irrigated crops	Modern marketing techniques
9	Omo-microfinance	Hwassa	ToT on business management, Credit provision, business monitoring and evaluation	The whole region	Capital for credit	Credit provision	beef, Dairy, small Ruminants, poultry, Irrigated crops	skill on value chain
10	Research institution	HHawassa	Conduct research, introducing new technologies, advisory service	The whole region	Research approach, staff, facilities	Action research	beef, Dairy, small Ruminants, poultry, irrigated crops	Fast Staff turnover
11	Laboratories (plant protection, soil, animal health)	Hawassa	Assessment, collection of samples, diagnoss and recommendation for constraints pertinent to crops, soil and animal health	The whole region	Facility like laboratories	Facility and staff	beef, Dairy, small Ruminants, poultry. Irrigated crops	Facilities, means of transport
12	Universities and ATVETs	Hawassa, Arbaminch, Soddo	Teaching, Research, training, outreach programs	The whole region	Staff, skill,	MSc. BSc. training, action research, TOT training	beef, Dairy, small Ruminants, poultry. Irrigated crops	More of academic focused
13	Irrigation schemsad minstration	Hawassa	Irrigation scheme study, design and construction/ contracting, monitoring and evaluation	The whole region	staff, facility	Staff, facility	Irrigated crops	Community based irrigation skill
12	ELFORA	Wondo Genet	Products processing and packing plant	The whole region	-	-	-	-

Annex 5. List of focus groups and key informants for GamoGofa Zone

No	District name	PA name	Name of participants	Sex	Role		
					Focus group	Key informant	DA
1	Mirab Abaya	Para Gosa	Matwosmartkos	M		x	x
2			EndaleWodajo	M	x		x
3			Belachewkasa	M		x	
4			BezabhiBanja	M		x	
5			DichaChelo	M		x	
6			Gudisa Seta	M	x		
7			ZemedkunZase	M	x		
8			Mesay Nigatu	F	x		
9			ArakeChake	F	x		
10			GedameDobo	F	x		
11			AmarechDongo	M	x		
12			Yisehak Goncho	M	x		
13			DichaCholo	M	x		
14			Gudisa Seta	F	x		
15			MeselechGeta	M	x		
		Mole		Sex	Focus group	Key informant	DA
1			OsaAnjulo	M	x		
2			GeseseWolde	M	x		
3			ErmiasFola	M	x		
4			ErmiasHile	M	x		
5			Matwos Mara	M	x		
6			Markos Mega	M		x	
7			AskaleAragew	F		x	
8			Melese Mena	M		x	
9			OufyisaHardido	M		x	
10			OukaSankura	M		x	
11			EliloDoke	M		x	
12			GemejoGebo	M		x	
13			DamaHerano	M		x	
14			BeklerBalango	M			x

15			**Abraham Chama**	M			**x**
				Sex	**Focus group**	**Key informant**	**DA**
1	**Mirab Abaya**	**WankeWajifo**	MeridTucho	M		**x**	
2			Kebede Fanta	M		**x**	
3			ChamasaChare	M		**x**	
4			MuluManake	M	**x**		
5			Tomas Toga	M	x		
6			WoizeDangro	F	x		
7			AskeAno	M	x		
8			DenekeShito	M	x		
9			AntishAnale	M	x		
10			Kifle Chicko	M	x		
11			Kebede Doje	M	x		
12			DenbleWae	F	x		
13			DawitBalcha	M	**x**		
14			BahiluJarsa	M			**x**
15			WogeneWalo	M			**x**
		OmoLante					
1			**AschankiBuguro**	M		X	**x**
2			**AlaroAyza**	M		**x**	
3			**Meles Kara**	M		**x**	
4			**MadeboWana**	M		**x**	
5			**Birhanu Bubo**	M	**x**		
6			**Tesfaye Shanks**	M	**x**		
7			**Nigist Tsegaye**	F	**x**		
8			**Tesfaye Genbero**	M	**x**		
9			**Esrael Tesema**	M	**x**		
10			**MilkiasGebo**	M	**x**		
11			**DawitBuko**	M	**x**		
12			**Bogale Bocho**	M	**x**		
				Sex	**Focus group**	**Key informant**	**DA**
1	**ArbaminchZur**	**GantaMeti**	**ManayeKiro**			**X**	**X**
2			**Sana Taze**			**X**	
3			**KasahunBirze**			**X**	
4			**Sake Sana**			**X**	
5			**Bogale Bulo**		**X**		
6			**BartaBelaye**		**X**		

7			TajeroOsa		X		
8			Bata Shanko		X		
9			GetahunAshto		X		
10			SatanaTiro		X		
11			AdiyoSekoru		X		
12			KegankeKeta		X		
		ZigetiBekole		Sex	Focus group	Key informant	DA
1			SelemonAsefa		X		x
2			AjireAdamu		x		
3			DamotaDake		x		
4			DawitDita		x		
5			AbebeAno		x		
6			GoshaGoncha		x		
7			Matewos		x		
8			TizazuWondimagen		x		
9			AbayneshTefera	x	x		
10			SintuTadese	x	x		
11			HarasHantalo		x		
12			WabaraWaja		x		
13			OrsaAweke		x		
14			CholeTonjo		x		
15			MerseMada		x		
16			AdimasuAreta			x	
17			Halo Handso			x	
18			TorchaEshete			x	
19			KobaDejene			x	
20			AnoAnka			x	
21			YoleYoyile			x	
				Sex	Focus group	Key informant	DA
1	ArbaminchZuriya	ChanoDorga	Getenesh Simon	X	X		X
2			Aste Adaro		X		
3			SisayDego		X		
4			Habtamu Anjulo		X		
5			Girma Sorsa		X		
6			Samuel Wanja		X		
7			Haile Anbase		X		
8			Elias Gotera		X		

9			**GebreGesa**		**X**		
10			**Alemayehu Borago**		**X**		
11			**Lemlem Oche**	x	**X**		
12			**AbayenishWorku**			**X**	
13			**WonjalaWaresho**			**X**	
14			**GereboGalgale**			**X**	
15			**EsayasAmbarko**			**X**	
16			**Bayu Bale**			**X**	
				Sex	**Focus group**	**Key informant**	**DA**
1	**Bonke**	**ketele**	**Alemayehu Yohanes**	M	**x**		**x**
2			**BahiruBahile**	M	**x**		**x**
3			**AtnafuAske**	M	**x**		
4			**Esatuhabte**	M	**x**		
5			**Abraham koyra**	M	**x**		
6			**AdisuHabte**	M	**x**		
7			**BesteneBayile**	M	**x**		
8			**TakeleDawit**	M	**x**		
9			**SelemonAreso**	M	**x**		
10			**FeteneMenesha**	M	**x**		
11			**BizuneshShifawu**	F	**x**		
12			**BeyenechBayele**	F	**x**		
13			**MahidarMesene**	F	**x**		
14			**BirhanuBulgo**	M		**X**	
15			**YohansTifawu**	M		**x**	
16			**Keuyo Rosa**	M		**x**	
17			**DawitShibiru**	M		**x**	
18			**Badege Bekele**	M		**x**	
19			**Tariku Kukaro**	M		**x**	
				Sex	**Focus group**	**Key informant**	**DA**
1	**Bonke**	**Dimale**	**Tigist Fida**	**x**			**x**
2			**Beteche Bekele**	**x**		**x**	
3			**GetahunShama**	**x**		**x**	
4			**SileshMelka**	**x**		**x**	
5			**GetahunGirma**	**x**		**x**	
6			**AbebeAtnafu**	**x**		**x**	
7			**TadeseTache**	**x**		**x**	
8			**ChelkoLasha**	**x**		**x**	
9			**GezahagnZema**	**x**	**x**		

10			Tesfaye Gebre	x	x		
11			LegeseBeyene	x	x		
12			TemelesMenza	x	x		
13			List Leta	x	x		
14			AbreashZege	x	x		
15			AmsalAdmasu	x	x		
16			Amenu Kebede	x	x		
17			DanelWorkela	x	x		
18			AtnafuYimer	x	x		
19			NegaErmias	x	x		
20			GezahagnYimer	x	x		
21			SilaseShano	x	x		
				Sex	Focus group	Key informant	DA
1	Bonke	Bula	KokebWondimu		X		X
2			Melkamu Belay		X		X
3			ShibeshiHina		X		
4			GanchoreKadura		X		
5			MehariMolijo		X		
6			Ale Talbe		X		
7			Tokash Tomas		X		
8			AdmasuKapite		X		
9			AtileElere		X		
10			DertaDagnachew		X		
11			AbayenshSherumaye	x	X		
12			MaheAntacha			X	
13			GanzabeGaro			X	
14			KeteAbera			X	
15			GorfuGomera			X	
			AyeleAsfawu			X	
			ChurukaChulo			X	
				Sex	Focus group	Key informant	DA
1	Bonke	Gezeso	GidaGinbare		X		X
2			Etagen Bogale	X	X		X
3			AmsaluArmado		X		
4			TeferiGanchulo		X		
5			HantoaHalala		X		
6			DukasoDoke		X		

7			WorkuWonbera		X		
8			Ore Bako		X		
9			HylemaHabte		X		
10			Tirunge	X	X		
11			WorkuHalala			X	
12			MatewosMaka			X	
13			AkaluHanto			X	
14			ArbaKochle			X	
15			AdhaAshro			X	
16			AbuzaMarcha			X	
17			Kafaro			X	
18			Yilma Kono			X	
				Sex	Focus group	Key informant	DA
	Bonke	Chosha	AmsaluHiele		x		x
1			GazachewEsyas		x	x	x
2			SamulGoda		x		
3			Teshalehaile		x		
4			Kebede kakawuel		x		
5			Demise Damo		x		
6			KeresoGarsho		x		
7			ArmedaGuro		x		
8			DemekeShalo		x		
9			SamulDereje		x		
10			BarudaBobe		x		
11			GirnGiya		x		
12			AdaneAsefa			x	
13			GetahunKidane			x	
14			MilketeDingro	x		x	
15			Kebede Kefiso			x	
16			AynoDola			x	
17			ShifnoDukarso			x	
18			Birhane Ego	x		x	
19			Sago sabara			x	
20			Kebdekantura			x	
21			Borena Bone			x	
22			GezahagnGamo			x	

Annex 6. Human resource in GamuGofa zone

No	District	Department	PhD		MSc.		BSc.		Diploma		Certificate	
			M	F	M	F	M	F	M	F	M	F
1	GamoGofa zone	Crop production	0	0	5	2	0	0	0	0	0	0
		Llivestock	0	0	4	2	0	0	1	0	0	0
		Irrigation scheme	0	0	2	2	0	0	0	0	0	0
		Women and children	0	0	4	1	0	0	1	1	0	0
		Marketing &Cop	0	0	8	0	0	0	0	0	0	0
2	Bonke	Crop production	0	0	0	0	4	1	58	4	0	0
		Llivestock	0	0	0	0	3	1	61	4	0	0
		Irrigation scheme	0	0	0	0	2	1	2	1	0	0
		Women and children	0	0	0	0	3	1	3	2	0	0
		Marketing &Cop	0	0	0	0	4	1	5	3	0	0
3	Mirab Abaya	Crop production	0	0	0	0	0	2	36	7	0	0
		Llivestock	0	0	0	0	2	0	36	7	0	0
		Irrigation scheme	0	0	0	0	1	0	3	1	0	0
		Women and children	0	0	0	0	3	1	1	3	0	0
		Marketing &Cop	0	0	0	0	4	1	4	0	0	0
4	ArbaminzhZuria	Crop production	0	0	0	0	5	0	42	10	0	0
		Llivestock	0	0	0	0	3	1	46	10	1	0
		Irrigation scheme	0	0	0	0	2	1	1	2	0	0
		Women and children	0	0	0	0	2	1	2	1	0	0
		Marketing &Cop	0	0	0	0	8	1	5	3	0	0