4.16 SOCIO-ECONOMIC SCENARIO

The plant and quarry sites are located within the Sululta Wereda and the buffer zone covers a total of five administrative Weredas from two zonal administrations, namely, Sululta, Mullo, Yaya Gulele and Wichale from North Shoa zone and Adaberga from West Shoa zone (Refer **Fig. 4.35**). Within these Weredas there are twenty-eight Peasant Associations (PAs).

Although the Weredas consist of both urban and rural sections, the core zone (plant and mining sites) and the buffer zone (area within 10 km radius of plant and mining sites) are located in the rural settings of these Weredas. Therefore, the study focuses mainly on the associated rural parts of the Weredas.

4.16.1 STUDY OBJECTIVES

Basic demographic and socio-economic information on population and settlements that would be affected by the construction and operation of the proposed project have been gathered by a primary survey. The study area has been divided into core and buffer (within 10 km radius from center of plan and mining areas) zones.

4.16.2 METHODOLOGY

A combination of various methods, techniques and materials were used in this study, which aims to determine the socio-economic profile of the proposed project. Methods and materials used in this study include the following:

4.16.2.1 Review of Literature and Maps

Various statistical and analytical reports published by Central Statistical Authority were extensively used to determine the socio-economic and demographic profile of population and settlements in the project area. Furthermore, topographic maps (Ethiopian Mapping Agency [EMA] 1984 and CSA 1994) were also used to identify and delineate villages, resources and facilities that are located within the core and buffer areas of the proposed cement plant scheme.

4.16.2.2 Quantitative Level Survey

The quantitative survey has been carried out at Wereda, PA and Household level. The collection of baseline data from this focused groups had the following objectives:

- To collect statistical information on the socio-economic conditions and livelihoods bases of the households found within their respective administrations
- To identify and locate historical, religious, cultural and other important sites located around the immediate surroundings of the project area
- To identify current and planned public and private investments taking place within the project core and buffer areas
- As stakeholders, to make the local communities and their leaders aware about the proposed project
- To assess the response, expectations, fear and propose corrective measures for the negative impacts.

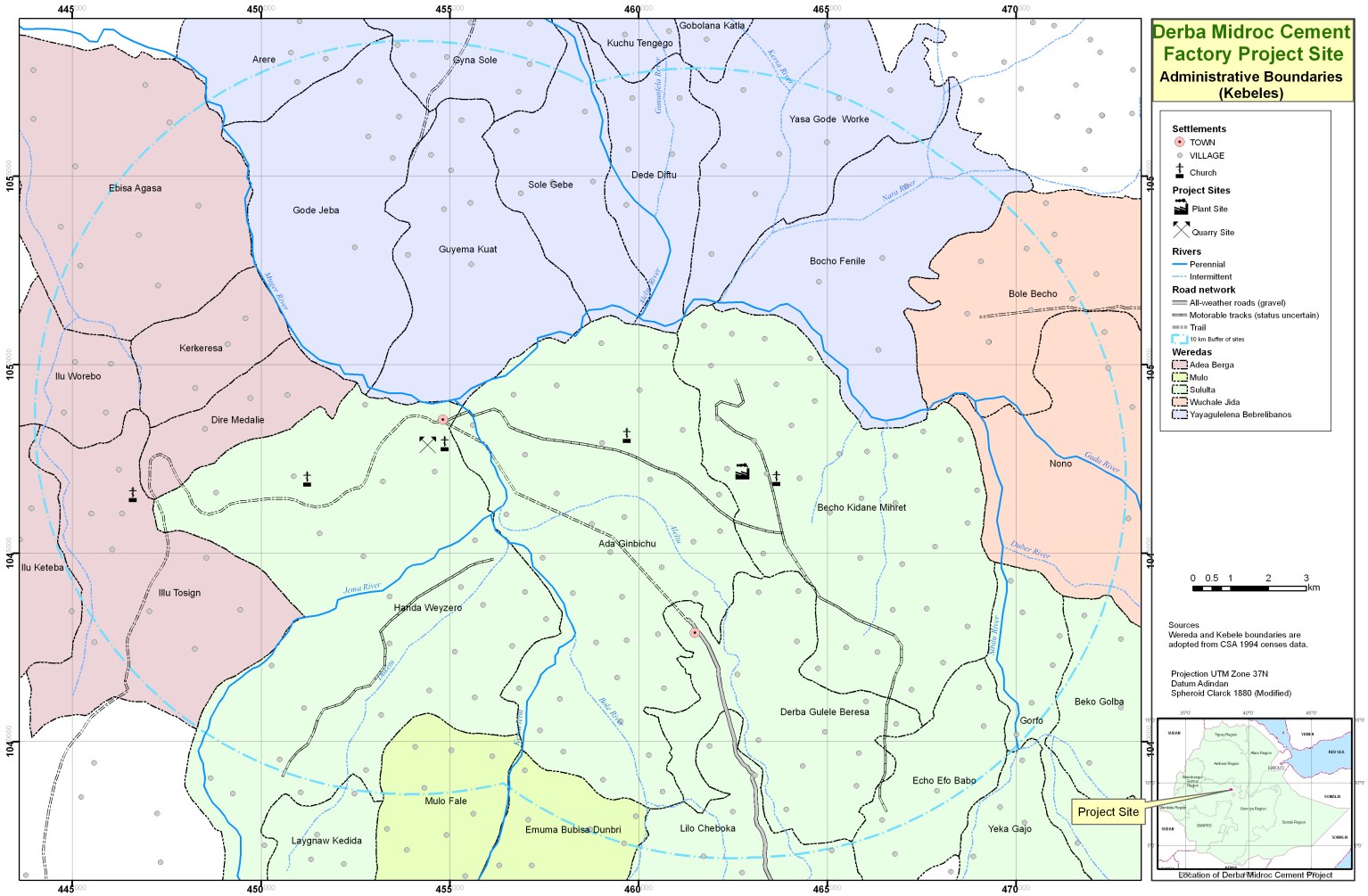

Fig. 4.35 : Administrative boundaries (Kebeles) in the Study Area

4.16.2.3 Quantitative Wereda Level Survey

All the five Weredas affected by the potential impacts of the project were surveyed by a structured set of questionnaires (Questionnaire is enclosed as **Annex 4.9**). The Wereda administrative bodies are the immediate and the primary responsible governmental bodies for any development activities taking place within their administrative boundaries. The participation of these governmental administrative bodies from the initial baseline survey through the construction and operation phases of the project benefits both the project affected communities and the project developer.

4.16.2.4 Quantitative PA Level Survey

All twenty-eight administration offices of the Peasant Associations (PAs) located within the potential impact zones of the project were surveyed through a structured set of questionnaires (Questionnaire is enclosed **Annex 4.10**).

4.16.2.5 Quantitative Household Level Survey

A quantitative survey was conducted using a structured set of Questionnaires (See **Annex 4.11)** on a statistically representative stratified random sample of about 1,000 households. The information was collected by random selection of households from various locations and topographical set up from the core and buffer areas.

4.16.2.6 Qualitative Survey: Key Informant Interviews and Discussion

In order to assess knowledge, perception and attitude of the communities about the proposed project and its potential impacts, several meetings, interviews and discussion were held with a number of community leaders and representatives of various offices. Moreover, discussions were held with local officials to assess official response and examine prospects and challenges for various mitigation strategies.

4.17 SOCIO-ECONOMIC PROFILE OF THE WEREDAS

4.17.1 DEMOGRAPHIC CHARACTERISTICS

4.17.1.1 Population and Settlement

The population in the year 2007 within the five Weredas is estimated to be about 435,829 living in 76,562 families of which 50.1% were males and 49.9% were females. The estimated household size for the Weredas is 5.7 persons per family. Within the Weredas, household size ranges from 4.6 in Wuchale to 9.0 persons per family in Mulo Wereda.

The population is predominantly rural based with nearly 91.9% living in rural areas. The urban population is estimated to be only about 8.9%.

The average population density for the whole Weredas is 103.4 persons/ km^2 against a national population density of 50 persons/ km^2. Within the Weredas, population density ranges from 91.3 persons/ km^2 in Wuchale to 110.3 persons/ km^2 in Ada Berga Wereda.

4.17.1.2 Ethnic Composition

According to the Wereda survey results, population of the project area is almost entirely of the Oromo ethnic group (97.2%) and Oromiffa is the major, if not the sole, language spoken in the area. Perhaps due to very low level of urbanization along with its

concomitants and predominantly agrarian nature of the local economy, among others, social intermingling of the population with other ethnic groups is very limited in the project area.

There are no known ethnic minorities that might require special protection effort by the proposed project.

4.17.1.3 Religion

Inhabitants of the proposed project area are predominantly followers of the Orthodox Christian religion (95.3%). Followers of the Muslim religion are only 2.6% and traditional believers are only 2.1% of the total population of the project area.

Traditionally, most of the houses in the project area were round-shaped wooden houses plastered with mud and roofs covered with grass. A recent development in the housing pattern in the project area is that farmers have moved away from construction of houses with thatched roofs to corrugated iron sheets perhaps due to rise in income and to save grass for livestock fodder.

4.17.2 EDUCATION

4.17.2.1 General

In the global poverty alleviation attempt education has become one major area of development intervention. As part of the Millennium Development Goals (MDG), by 2015 children everywhere will be able to complete a full course of primary schooling. Besides, under the MDG programme, gender disparity in primary and secondary education is expected to be eliminated.

The Government of Ethiopia has given due emphasis to the education sector with the introduction of new policy, strategy and sector program. Since 1994, after the new policy was enacted, the Government is pursuing a policy of regional decentralisation based on identified priorities. The policy is mainly geared towards re-addressing the problems of access, equity, quality and relevance of the entire education and training activities within the country.

The general situation in the project area indicates that most parts lack basic social infrastructure like education services. Inadequate access to schooling is a major socio-economic problem of the area.

4.17.2.2 Literacy Rate

The average literacy rate for the total population above the age of 10 years is very low (less than 31%) and this figure is 42% for urban and 30% for rural population. The literacy rate within the buffer area ranges from 22% to 60%. Yaya Gulele Wereda has a better education coverage compared to other Weredas, which have a very poor coverage level.

There is gender discrimination in education. About 33% of male and less than 28% of female population is reported to be literate.

4.17.2.3 Education Facilities

Under the newly adopted education policy, the entire education system is classified as basic, general, higher and specialised education in formal and non-formal education.

There are a total of 95 schools, 838 teachers and 43,915 students in the study area. Most of the schools are first and second cycle schools. At the project area level, student/ teacher

ratio is 52. The country level student/ teacher ratios are 60 and 46 for primary and secondary level education respectively.

In reference to the nation wide ratio, most Weredas in the project area have achieved a better student/ teacher ratio.

From the assessment of the school facilities in the project areas the following problems were observed:

- Though educational facilities are being expanded still they seem inadequate to cater to the needs of the growing student population within reasonable access distance, especially post primary schools.
- Insufficient class rooms
- Most of the existing schools are poorly equipped and lack adequate materials like desks, learning materials etc. Besides, absence of facilities like drinking water and toilets is common in several of these schools.
- Lack of budget for maintenance and proper handling of day to day activities
- Though there is an encouraging trend to enroll girls in schools, there is still gender imbalance between enrolment levels of boys and girls
- Due to poor access to services, there is a scarcity of good teachers, especially in post primary schools around the quarry site.

4.17.3 PUBLIC SERVICES AND INFRASTRUCTURES

4.17.3.1 Roads

In general, the road network in the project area is very poor. Apart from some dry and link roads to the main towns, most of the areas are inaccessible. The main Addis – Debremarkos highway is one trunk road leading to and passing through the Sululta and Wichale Weredas. This is an asphalt road of 73 km length. Currently, there are a total of 585 km of roads (i.e. 321 km of dry weather road, 191 km of all weather road and 73 km of asphalt road).

The lack of an adequate transport network of all–weather roads and scattered settlements have left a majority of the people in and around the project area isolated. This has been an obstacle in the development of the area. Lack of access to basic domestic needs, social services and economic facilities has imposed unreliable transport burden and wastage of time, which could be otherwise used to productive activities.

4.17.3.2 Type of Institutions

On the basis of the estimates made on the data obtained from some Weredas, there are 37 Farmers' Service Cooperatives and five Farmers' Producer Cooperatives in the Weredas.

4.17.4 ECONOMIC ACTIVITIES

As in most parts of rural Ethiopia, subsistence agriculture with production of crops, cereals, pulses, oil seeds, fruit, vegetables and livestock characterizes the economic activities of the Weredas. Off-farm income generation and employment options are extremely limited primarily due to limited skills, experience, educational background, and small market.

95.7% of the economically active population of more than 10 years of age relies on mixed farming as their major source of employment and income. About 0.1% of the population is

employed as daily labourers while 1.9% are reported to have earned some level of income through trading. Other sources of income options contribute the remaining percentage.

4.17.4.1 Agriculture

Ethiopia is a predominantly agrarian country and the majority of the population is engaged in agriculture contributing a substantial amount to the gross domestic product and export revenues. In general in Ethiopia, agriculture is characterised by a high fragmentation of land holdings, low productivity and traditional system of production. The Weredas in this project area are agricultural crop producers dominated by annual crops of mainly cereals, pulses, oilseeds, and spices.

4.17.4.2 Agricultural Systems

The agricultural land in the five Weredas of the study area is mainly cultivated by means of traditional rainfed subsistence farming. The average farmland holding per household in the Weredas is about 1.9 ha. The total land utilization in the area by the type of crops grown in the area is given in **Table 4.32.**

No	Major crops	Agricultural Lands of the Weredas (ha)					Total
		Sululta	Wichale	Yaya Gulele	Mullo	Adaberga	
1	Cereals	35,183	22,585	24,644	12,889	38,608	133,909
2	Pulses	5,406	7,724	5,589	3,200	2,610	24,529
3	Oil Seeds	991	1,521	413	1,086	1,660	5,671
4	Spices	94	-	61	-	-	155
5	Vegetables	369	-	474	1,119	469	2,432
	Utilized	42,044	31,830	31,181	18,294	43,347	166,696
	Unallocated		6,929	1,327		1,920	10,176
	Excess	3,335			1,398		4,733
	Total Farm Lands	38,709	38,759	32,508	16,896	45,267	172,139

Table 4.32 : Wereda wise Area covered by Agricultural Crops in the Project Area

4.17.4.3 Agricultural Crops Production

The agricultural production in the Weredas is dominated by cereals and pulses while spices, oil seeds and vegetables are available in relatively small quantities. Various cereals, namely, teff, maize, sorghum, wheat, barley, millets and oats are grown in the area. The production of crops also includes chickpeas, haricot beans, peas, beans, lentil and vetch. With regard to the production of oilseeds, sesame, nug, linseed, sunflower and rapeseeds are grown on a limited scale. The cultivation of spices (mainly Pepper) is also done on a small scale.

Vegetables are grown for local consumption. Potato, cabbage, onion and garlic are grown in the area.

The estimated annual volume of crop production amounts to 2,192,943 qt and the summary of the estimated volume of crop production is presented in the **Table 4.33**.

Sn	Major Crops	Production (qt)					Total
		Sululta	Wichale	Yaya Gulele	Mulo	Adaberga	
1	Cereals	407,437	168,713	330,902	177,514	746,217	1,830,783
2	Pulses	45,941	49,976	62,452	57	40,415	198,841
3	Oil Seeds	7,081	8,367	1,642	15	16,363	33,468
4	Spices	4,500	-	2,781	-	-	7,281
5	Vegetables	34,033	-	23,259	22,852	42,427	122,570
	Total	**498,992**	**227,056**	**421,036**	**200,438**	**845,422**	**2,192,943**

Table 4.33 : Wereda wise Volume of Crop Production

4.17.4.4 Crop Productivity and Price

Peasants in the project area grow more than 28 types of crops of which cereals and pulse account for the majority. All of the five Weredas do not necessarily produce the same types of crops. The common crops grown in all Weredas are teff, which is a staple food crop of the area and for most of the population of the country, wheat and barley. The production of spices, pulses, oil seeds and vegetables is limited.

The price of agricultural products fluctuates over different months of a year. Peasants dispose many of the crops immediately after harvesting to meet their financial requirements and prices are lower at these post harvesting periods. The prices then increase and show significant increment from month to month. The prices furnished here relate to the average marketing price prevailing within the current time period. **Table 4.34** presents the yield and price level of the various types of crops grown in the five Weredas.

Sn	Major Crops	Sululta		Wichale		Yaya Gulele		Mulo		Adaberga		Average	
		Productivity (Q/ha.)	Unit Price (Birr)	Productivity (Q/ha.)	Unit Price (Birr)	Productivity (Q/ha.)	Unit Price (Birr)	Productivity (Q/ha.)	Unit Price (Birr)	Productivity (Q/ha.)	Unit Price (Birr)	Productivity (Q/ha.)	Unit Price (Birr)
1	Teff	8.0	450.0	5.2	450.0	10.5	450.0	9.7	450.0	7.7	480.0	8.2	456.0
2	Maize	15.4	260.0			21.2	260.0	0.5	260.0	33.0	180.0	14.0	192.0
3	Sorghum	15.2	350.0	6.4	350.0	18.9	350.0	10.6	350.0	14.7	190.0	13.2	318.0
4	Wheat	12.0	330.0	7.7	330.0	12.4	330.0	6.0	330.0	28.3	280.0	13.3	320.0
5	Barley	21.9	316.0	11.5	316.0	12.3	316.0	21.9	316.0	27.9	250.0	19.1	302.8
6	Millet	8.0	300.0									1.6	60.0
7	Oats	8.0	250.0	6.8	250.0			0.8	250.0			3.1	150.0
8	Chickpeas	16.2	440.0	11.0	-	13.5	440.0	0.6	440.0	8.7	600.0	10.0	384.0
9	Haricot Bean	8.0	390.0			12.0	390.0					4.0	156.0
10	Peas	8.0	390.0			12.0	390.0	0.1	390.0	8.7	400.0	5.8	314.0
11	Bean	8.0	363.0	4.9	-	10.6	363.0	0.0	363.0	17.5	400.0	8.2	297.8
12	Lentil	12.0	500.0	8.0	-	6.0	500.0	0.0	500.0	8.7	600.0	6.9	420.0
13	Vetch	8.0	290.0	6.4	-	11.6	290.0	0.1	290.0	10.4	320.0	7.3	238.0
14	Sesame	5.5	700.0			4.0	700.0					1.9	280.0
15	Nug	7.0	540.0	3.8	540.0	4.0	540.0	1.0	540.0	10.4	700.0	5.2	572.0
16	Linseed	7.0	536.0	5.6	536.0	4.0	536.0	0.0	536.0	8.7	650.0	5.1	558.8
17	Sunflower	5.0	600.0			3.5	600.0					1.7	240.0
18	Rape Seed	14.0	600.0			4.0	400.0			10.4	500.0	5.7	300.0
19	Red Pepper					37.2	1,176.5					7.4	235.3
20	Bessobila	48.5	13.3			9.0	3.0					11.5	3.3
21	Green Pepper	47.5	80.0			66.8	3.0					22.9	16.6

Sn	Major Crops	Sululta		Wichale		Yaya Gulele		Mulo		Adaberga		Average	
		Productivity (Q/ha.)	Unit Price (Birr)	Productivity (Q/ha.)	Unit Price (Birr)	Productivity (Q/ha.)	Unit Price (Birr)	Productivity (Q/ha.)	Unit Price (Birr)	Productivity (Q/ha.)	Unit Price (Birr)	Productivity (Q/ha.)	Unit Price (Birr)
22	Others					82.1	3.0					16.4	0.6
23	Sweet potato					43.3	-			25.0	116.0	13.7	23.2
24	Potato	88.2	167.3			29.1	-	100.0	167.3	120.0	7.0	67.5	68.3
23	Cabbage	136.1	70.0			59.3	-	0.9	70.0	127.5	188.6	64.8	65.7
26	Onion	77.6	35.0					-		71.1	225.3	29.7	52.1
27	Garlic					26.7	-	198.5	1,273.5	45.0	70.0	54.0	268.7

Table 4.34 : Estimated Crop Productivity and Unit Price

The annual estimated value of agricultural crops is Birr 672,595,326 with a significant contribution (86.6%) coming from cereals and pulses. **Table 4.35** depicts the value of the agricultural produces.

Sn	Major Crops	Value (Birr)					Total (Birr)
		Sululta	Wichale	Yaya Gulele	Mulo	Adaberga	
1	Cereals	132,158,772	59,665,414	121,364,890	58,511,025	210,551,120	582,251,221
2	Pulses	17,705,520	-	22,539,598	22,055	16,334,400	56,601,573
3	Oil Seeds	3,857,168	4,485,708	889,448	8,064	10,828,350	20,068,738
4	Spices	288,020	-	1,950,437	-	-	2,238,457
5	Vegetables	4,670,633	-	-	5,062,135	1,702,570	11,435,337
	Total	158,680,113	64,151,122	146,744,373	63,603,278	239,416,440	672,595,326

Table 4.35 : Value of the Crops

4.17.4.5 Agro-Forestry

Fruit orchards are limited in the area. Bananas, oranges, papayas, coffee, chat, apples and inset are grown on a relatively small scale.

As in most of the country, eucalyptus is grown on a large scale and is highly preferred due its fast maturing and multipurpose economical benefits. There are around 8,875,000 eucalyptus trees in these Weredas and people generate substantial economic benefits from them.

4.17.5 CONSTRAINTS IN CROP PRODUCTION

Various interrelated reasons are identified to be the causes of low productivity of crops in the area. The various constraints in crop production include.

- Insufficient land holdings
- Lack of improved farm implements
- Insufficient and uneven distribution of rainfall
- Inaccessible surface and ground water irrigation
- Lack of agro-chemicals and fertilizer
- Lack of improved seeds
- Weak agricultural extension services
- Loss of soil fertility
- Crop diseases and insects
- Weed infestation
- Lack of improved seed practices

4.18 LIVESTOCK

4.18.1 LIVESTOCK POPULATION

The main livestock populations found in the five Weredas are cattle, sheep, goats, poultry and equines. The largest type of livestock population consists of oxen, cows, bulls and calves and their presence is vital for undertaking agricultural activities.

Table 4.36 presents the type and number of livestock population of the Weredas. As presented in Table 2.5 among the five Weredas of the project area the highest livestock holding per family (5.0) is found in Wuchale Wereda and the lowest (2.3) is in Adaberga Wereda. The average livestock holding per family is 3.4.

Sn	Livestock	Sululta	Wichale	Yaya Gulele	Adaberga	Mulo	Total
1	Cattle (Oxen, Cows, Bulls, Calves)	180,566	135,092	75,262	116,331	66,852	574,103
2	Sheep	82,130	132,032	48,014	39,702	66,517	368,395
3	Goats	15,070	2,234	15,065	19,145	2,739	54,253
4	Equines (Horse, Donkey, Mule)	37,030	36,729	9,102	27,020	8,114	117,995
5	Poultry (Mainly Chicken)	77,230	149,401	28,458	63,175	45,901	364,165
	Total	**392,026**	**455,488**	**175,901**	**265,373**	**190,123**	**1,478,911**

Table 4.36 : Livestock Population of the Weredas

The predominant varieties of livestock belong to the indigenous type but lately exogenous varieties are also being introduced. Livestock are raised as an important part of the mixed farming system in the Weredas. Cattle as a dominant livestock group are kept primarily for the production of draft oxen, replacement stock and milk. Sheep and goats are kept as source of cash income and sometimes for meat during holidays and festivals. Other products obtained from livestock include dung used for fuel, skin and hides.

The common characteristic of the indigenous cattle is their low productivity. It takes about 4-5 years for calves to reach maturity with calving intervals of 1.5-2 years. Milk production does not exceed about 1.5 lt/day/cow and average maturity live weight is about 250 kg/head. Sheep and goats have smaller live weight ranging between 25-40 kg/head. Average kidding rate is about 1.5/year, and reproduction rate for sheep does not exceed 1/year.

4.18.1.1 Livestock Feed

Livestock in the five Weredas entirely depend on grazing and browsing in low crop areas and crop residues. Grazing sources and their condition ranges from fair to good. There is no seasonal migration of livestock in the five Weredas of the two Zones.

Based on the current available livestock population and the grazing land the average carrying capacity of the land for the five Weredas indicates that there is relatively higher number of livestock population as compared to the grazing land at present. One possible reason for the large number of livestock especially that of cattle in these Weredas could be directly associated with mixed crop livestock farming system whereby large numbers of cattle/oxen are used for crop cultivation. Greater cultivation of cropland, which necessitated the use of more cattle/oxen for draft power, has been a common feature. This has been because of increase in human settlement over the last few years.

4.18.1.2 Livestock Diseases

The prevalence of livestock diseases is a serious concern in the area of study. The major livestock diseases in terms of economic importance are internal parasites, external parasites and infectious diseases.

At present, taking the livestock resources into account, the animal health services rendered in the five Weredas are not adequate. In general, veterinary personnel and facilities are inadequate for the livestock population that requires these health services.

4.18.1.3 Livestock Marketing

Livestock and livestock products are marketed in small sized open markets where buyers and sellers bargain on specific items. Animals are usually taken to the market when farmers have surplus to their requirement or when they are in need of cash for home expenditure, such as purchase of agricultural inputs, consumer goods as well as payment of taxes. In addition, farmers, also sell livestock either when prices are attractive or during severe drought and animal disease outbreaks in order to avert and minimize their risk.

4.18.1.4 Constraints to Livestock Raising

The major constraints to livestock in the area include inadequate feed, poor genetic make-up, animal health and diseases, lack of adequate health services, lack of market infrastructure, increased population pressure, lack of finance, and shortage of trained manpower.

4.18.2 APICULTURAL PRODUCTION AND INCOME

Apiculture, i.e., bee keeping is also being practiced in the study area on a small scale. Existence of such off farm activities assists the population in generating additional annual income. The methods of production include both the traditional and the modern system and bee keeping has a good prospect for growth in the future. Honey consumption and the associated price are increasing with time especially in the urban centres of the Wereda and other places. This demand arises from the multipurpose usage of the product including the manufacture of a local drink called Tej. The apicultural production and income is given in **Table 4.37**.

Sn	Description	Quantity and Income of Honey Production					
		Quantity in kg			Income in Birr		
		Urban	Rural	Total	Urban	Rural	Total
I	**Apiculture production**	595	23,035	23,630	10,710	345,525	356,235
1	Number of Local Beehives	560	11,410	11,970	10,080	171,150	181,230
2	Number of Unimproved Beehives	35	11,625	11,660	630	174,375	175,005
II	**Average Apiculture Products**	3,000	37,460	40,460	54,000	561,900	615,900
1	Honey in Kg	2,800	37,110	39,910	50,400	556,650	607,050
2	Wax in Kg	200	350	550	3,600	5,250	8,850
	Total	3,595	60,495	64,090	64,710	907,425	972,135

Table 4.37 : Quantity and Income from Apiculture Production

4.19 SOCIO-ECONOMIC SCENARIO OF THE STUDY AREA

4.19.1 BACKGROUND

The population, settlements, social service facilities and infrastructure in the twenty eight PAs falling within the study area of 10 km around the proposed project site and villages of the five Weredas will be partially affected by the realization of the proposed project.

The household level socio-economic baseline survey of the project area has been conducted during August 2007 through random sampling. The overall sample size is 956 households and this represents over 7% of the households in the buffer area. Larger sample size is taken from the quarry, plant and access road sites whereas the sample size is lower in the other places relatively distant from these core areas. The 85.5% of the surveyed household heads are male and the remaining 14.5% are female. The age category of the surveyed household heads ranges from the minimum of 15 to over 65 years and 90% of the surveyed household heads are economically active (having less than 65 years of age).

The findings of the primary survey are presented below.

4.19.2 DEMOGRAPHIC CHARACTERISTICS

4.19.2.1 Population

The total population within the buffer area f 10 km radius around the plant and mining sites is estimated to be about 76,228 of which 49.6% were males and 50.4% were females in the year 2007.

The average family size of 5.5 persons per household for the surveyed households is considerably higher than the national average and slightly smaller than the Wereda average. The details of the population are given in **Annex 4.16.**

The average population density for the buffer area is 153.7 persons/km^2 against the Wereda and national population density of 103.4 and 50 persons/km^2 respectively. Within the buffer area, population density ranges from 31.6 persons/km^2 in Becho Kidane Mihiret to 818.6 persons/km^2 in Kerkercha PA (Refer **Fig. 4.36**).

A total number of 52 births and 23 deaths occurred during the previous year. The corresponding birth, mortality and natural growth rate thus amounts to 5.44%, 2.41% and 3.03% respectively. At the current growth rate, secondary impact zone/ buffer area's population is expected to reach from 76,228 in 2007 to more than 155,000 by the year 2025.

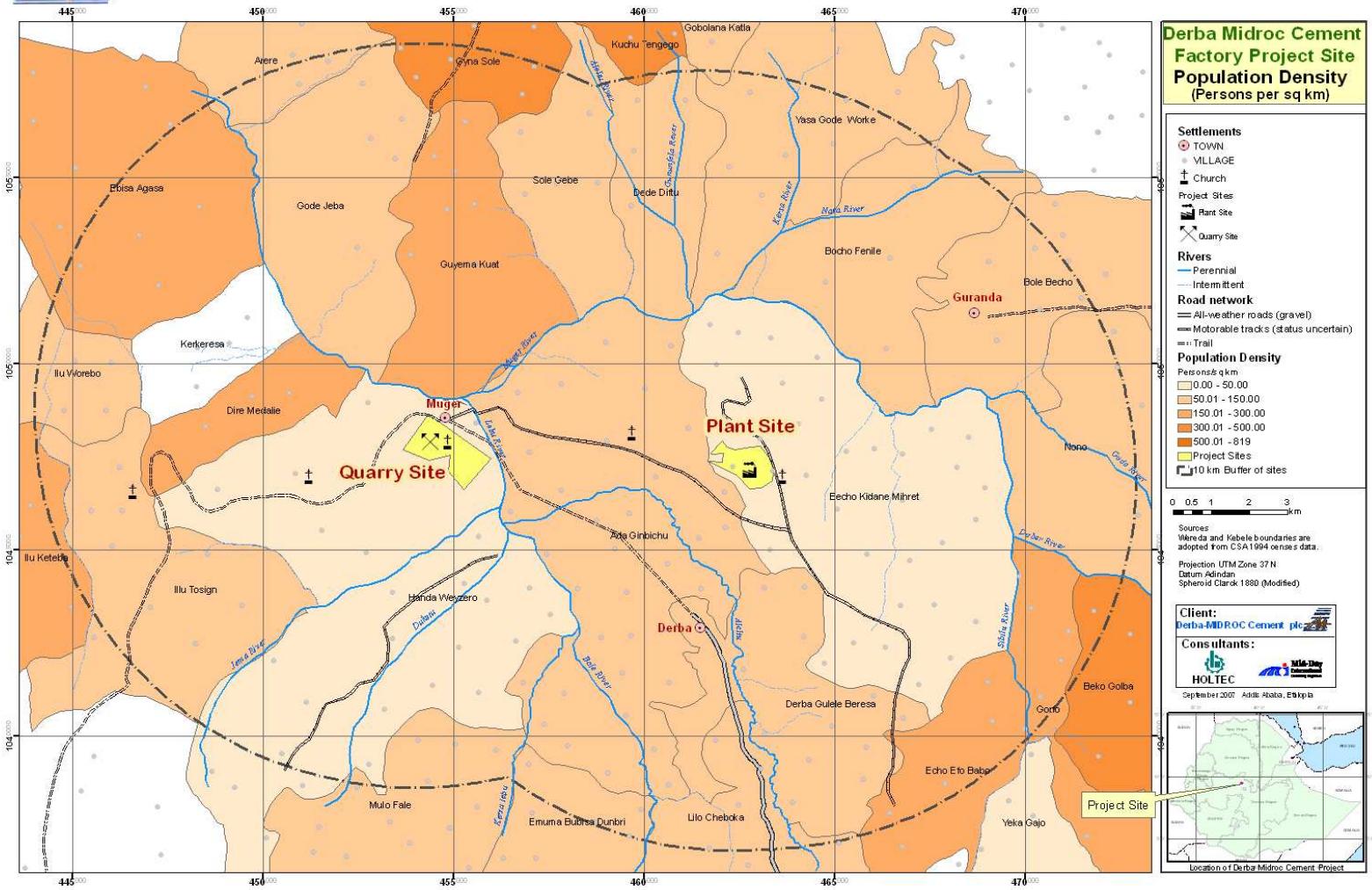

Fig. 4.36 : Population Density of the Study Area

Sn	Wereda	PA	Population Number			HHH Number			Average Family Size	Population density (Pop /km^2)
			Male	Female	Total	Male	Female	Total		
	Sululta		63,149	64,103	127,252	14,057	2,365	16,422	7.7	101.9
1		Becho Kidane Mehret	804	872	1,676	269	18	287	5.8	31.59
2		Handa Weizero	891	1,611	2,502	514	235	749	3.3	33.62
3		Ada Ginbichu	1,318	1,520	2,838	576	556	1,132	2.7	54.87
4		Gorfo	1,453	866	2,319	350	65	415	5.6	223.57
5		Beku Golba	1,268	1,468	2,736	104	56	160	14.2	435.33
6		Lilo Chebeka	1,392	1,424	2,816	370	97	467	6.0	92.88
7		Derba Gulele Beresa	1,825	2,065	3,890	1,161	107	1,268	3.1	147.46
8		Eko Efo Babo	524	430	954	287	253	540	2.1	258.78
		TOTAL	9475	10256	19731	3631	1387	5018	3.9	
	Mulo Wereda		17,761	18,021	35,782	3,178	783	3,961	9.0	101.9
9		Amuma Bebisa Dunburi	1,038	1,214	2,252	286	48	334	7.0	185.44
10		Mulo Fale	800	600	1,400	169	30	199	5.2	196.96
			1838	1814	3652	455	78	533	6.9	
	Wichale		47,740	43,486	91,226	16,474	3,174	19,648	4.6	91.3
11		Bole Becho	1,370	1,375	2,745	580	155	735	3.7	100.26
12		Becho Faneli	1,360	1,400	2,760	410	110	520	5.3	91.33
13		Nono	1,690	1,570	3,260	617	128	745	4.4	56.50
		TOTAL	4420	4345	8765	1607	393	2000	4.4	
	Yaya Gulele		32,967	34,377	67,344	11,224	1,797	13,021	5.2	113.4
14		Arere	529	771	1,300	204	55	259	5.0	92.79
15		Gobolana katila	119	121	240	40	8	48	4.9	500.00
16		Goda Jaba	1,005	905	1,910	317	63	380	5.0	63.43
17		Gyna Sole	3,592	3,338	6,930	437	30	467	14.8	362.64
18		Kuchuna Tengego	983	947	1,930	284	39	323	5.8	305.18
19		Guyamana Kuwat	3,324	2,436	5,760	556	556	1,112	5.2	223.60
20		Sole Gibe	817	573	1,390	242	36	278	5.0	86.01
21		Dede Diftu	987	842	1,829	248	172	420	4.4	122.92
22		Yasa Gode Wereke	1,207	1,105	2,312	457	60	517	4.5	76.86
		TOTAL	12563	11038	23601	2785	1019	3804	6.2	
	Adea berga		56,755	57,470	114,225	19,999	3,511	23,510	4.9	110.3
23		Kerkerecha	2,031	1,830	3,861	390	30	420	15.3	818.57
24		Elu Keteba	1,910	3,570	5,480	399	40	439	12.5	289.03
25		Elu Tosigne	1,699	1,679	3,378	405	118	523	6.5	107.68
26		Dire Medale	130	125	255	40	8	48	4.8	210.70
27		Elu Werebo	746	588	1,334	187	23	210	6.4	113.15
28		Debisa Agasa	2,992	3,179	6,171	853	82	935	6.6	152.03
		TOTAL	9508	10971	20479	2274	301	2575	8.0	
		TOTAL OF ALL PAs	37,804	38,424	76,228	10,752	3,178	13,930	5.6	153.7
TOTAL OF ALL WEREDAS			18,372	17,457	435,829	64,932	1,630	76,562	5.7	

Table 4.38 : Population, Family size & Density of the Study Area by PAs & Weredas

4.19.2.2 Marital Status

95.9% of the household heads were married and the remaining 1.4 and 0.8% were single and widowed respectively. Marriage in the study area could be considered stable with reported divorce cases being less than 1.9%.

Male household heads is the dominants the households by about 77.2% while female headed households constituted only 22.8%. Male to female ratio is nearly 1:1 for the whole buffer area.

4.19.2.3 Religion

Residents of the project area are predominantly followers of the Orthodox Christian Religion (99.9) and only 0.1% are followers of Islam.

4.19.2.4 Ethnicity

According to surveyed results, population of the buffer area is almost entirely of the Oromo ethnic group (97.3%) and Oromiffa is the major, if not the sole, language spoken in the area. The remaining 2.7% of the total households belong to Amhara ethnic group. None of the Project Affected Persons belong to ethnic minority groups.

4.19.3 EDUCATIONAL STATUS OF THE POPULATION

According to findings of the survey results, overall literacy rate is very low for the surveyed population. 67.3% of the total population was illiterate and only the remaining 32.7% were literate. Of this, less than a quarter of the population had formal education of which the majority was only at the primary level.

Literacy rates were also disproportionate between sexes. For instance, while 69.4% of females were illiterate, the figure was 65.2% for males. This figure is very low compared to the Wereda average. Literacy rates were consistently higher for men than women throughout all levels of education.

4.19.4 HOUSING AND SETTLEMENT

On the basis of the sample survey result, there are an estimated 15,081 residential main houses that belong to the 13,930 household heads. The majority of surveyed household heads own only one main house and the remaining household heads have got more than a single main house (1.1 houses per household).

An estimated 32.7% of the households surveyed had a separate guesthouse. The presence of separate houses for kitchen and cattle shed purposes is one indicator of better sanitation practices. In addition to this, people have got houses for other unspecified purposes.

View of the houses in Adero village

4.19.4.1 Housing Conditions

Traditionally, most of the housings in rural areas are 'tukuls' and temporary shelters/structures made of twigs, rugs, mud and roofs covered with grass. A recent development in the housing pattern in the project area is that farmers have moved away from construction of houses with thatched roofs to corrugated iron sheets perhaps due to rise in income. Most of the houses are without partitioned rooms and poorly constructed windows for ventilation and daylight. They are often smoke-filled and dark inside and with earth floors.

There are over 5 persons living in such one-roomed, smoke-filled, earth-floored and unventilated tukuls and shelter-like structures. These unhealthy dwelling houses are favourable environment for the transmission of communicable diseases like pulmonary tuberculosis, ARI, louse-borne diseases (typhus and relapsing fever), skin infections, etc.

4.19.5 AGRICULTURE

4.19.5.1 Average Landholding

Further analyses of the survey results revealed that land is a scarce resource in the project area and accordingly, a total of 956 households had 2418.7 ha of farmland. This translates into an average of 2.58 ha per household.

Both landlessness and inequality in landholding is still a serious problem in the project area. For instance, the size of the maximum landholdings reaches 24.5 ha of farming land whereas the minimum being only 0.125 ha. While the land-poor 36.5% of the households owned only 15.0% and the land-rich 36.6% of the households owned nearly 63.7% of the total farmland available (see **Table 4.39**).

The majority of landless people gain access to land through some internal arrangements including leasing, share-cropping and other land sharing arrangements at family level. In response to the growing problem of landlessness, parents allot small plots of land from their scarce resource, to their children.

Landholding (hectares)	Households		Total Landholding	
	Number	Percent	Hectares	Percent
Landless	2	0.002		
<= 1	116	12.3	76.1	2.6
1.1 to 2.0	231	24.2	359.8	12.4
2.1 to 3.0	257	26.9	621.6	21.4
3.1 & More	350	36.6	1853.6	63.7
Total	**956**	**100.0**	**2811.1**	**100.0**

Table 4.39 : Size of Landholding among the Surveyed Households

4.19.5.2 Agricultural System

Agriculture (crop production and livestock rearing) is the sole economic opportunity available to farmers in the project area. Despite some efforts launched recently to introduce improved agriculture, agricultural techniques adopted in the study area were by and large traditional rainfed subsistence farming.

The land use in the buffer area is dominated by the production of annual crops and followed by grazing land. The proportion of land used for agro-forestry, is comparatively very small. Exact land utilisation pattern as collected from the surveyed households is presented in **Table 4.40** and is believed to give a comparable picture for the rest of the project area.

Land Use	Total (ha)	Average
Farming	2418.7	2.58
Grazing	913.8	1.14
Residential	337.4	0.39
Tree	0.58	0.58
Others	11.33	0.6

Table 4.40 : Land Use Pattern in the Buffer Area (in ha)

The total area of land utilized for the production of crops is estimated to be 74,228 ha of land exceeding the estimated 55,732 ha of farmland by 18,556 ha or by 133%. The possible reason for this increment is that people use the same area of land more than once during the two different production seasons in a give year. It is also possible that people owning land along rivers could produce more than once using river waters. With respect to crop production, people grow almost sixteen types of crops dominated by cereals.

The average farmland holding of about 2.58 ha per household and is greater than the 1.9 ha per household average for the total Weredas. The major crops of the buffer zones are as shown in **Table 4.41**. The main crops in the buffer areas are cereals in crop rotation after two or three cereal cultivation periods. The amount of cereal crops is about 87.6% of the area occupied by the individual farms.

Sampled Village	Teff	Maize	Sorghum	Wheat	Barley	Oats	Chickpeas	Bean	Nug	Garlic	Others	Total
Becho Dibdbe	1.29	0.03	0.15	0.35	0.01	0.03	0.16	0.2	0.05	0.03	0.01	2.3
Botoro	1.00	0.24	1.26	0.21			0.01					2.7
Gimbchu	1.13	0.50	1.00	-								2.7
Average	1.09	0.35	1.03	0.12		0.0	0.02	0.02	0.01			2.6
% of crop utilization	41.4	13.3	38.9	4.5		0.1	0.7	0.7	0.2	0.1		100.0

Table 4.41 : Areas under Major Crops in the Buffer Area (ha)

The average yield of crops is given in **Annex 4.14.** The average selling price of crops is given in **Annex 4.15.**

4.19.5.3 Agro-forestry Practices

There are different kinds of perennial trees (banana, orange, mango, coffee, chat and eucalyptus) under the ownership of the surveyed households and eucalyptus tree is the dominant tree species. However, the estimated volume of production and associated level of income from tree production per surveyed households is only 1,948 birr/ year. The

estimated volume of production and associated level of income from tree production is estimated and presented in **Table 4.42.**

Sn	Type of Trees	Number of Trees	Production		Income in Birr
			Unit of Measurement	Quantity	
1	Banana	137,508	kg	112,241	396,670
2	Mandarin	102	kg	-	2,186
3	Orange	12,152	kg	25,198	61,479
4	Papaya	131	kg	1,137	4,153
5	Avocado	175	kg	58	583
6	Mango	146	kg	4,080	5,391
7	Coffee	27,641	kg	22,925	395,344
8	Chat	1,661	Zurba	3,497	30,672
9	Eucalyptus	9,137,118	Nr	1,427,796	7,619,233
	Total	**9,316,635**		**1,596,932**	**8,515,711**

Table 4.42 : Estimated Number of Trees and Income

On the basis of the survey result, there are several constraints facing tree production within the buffer area and these include:

- Shortage or absence of improved seedling variety and nursery.
- Landslides and cracking caused by difficult topography.
- Attack from worms, ants, fire ants and other insects. In such places, the area is marginally appropriate for Eucalyptus trees only.
- Most of the land area is rocky and not suitable for tree planting
- Scarcity of land.
- The awareness of the people towards the importance of tree plantations is very low at large.

4.19.5.4 Constraints to Crop Production

It was also reported that the sector's productivity has been in a steady downward spiral for decades now. According to some farmers, the problem of agricultural productivity in the area is so severe that produce of the majority of the farmers (80%) is inadequate to support their families throughout the year.

The majority of farmers in the surveyed households perceived the following as the most pressing agricultural problem in the buffer area.

- Shortage of finance for the purchase of farming inputs, lack of improved agricultural inputs and these include seeds, fertilizers (UREA and DAP), insecticides and miscellaneous inputs. The reasons accountable for this limitation are mainly higher purchase price as well as transportation cost.
- Human labour is used in crop production and most of it comes from family members. During the seasonal peaks, they generally help one another on a non-cash basis while in the mean time seek hired labour. However, shortage of labour is acute especially for the elders and women headed households. Major use of the unskilled labour is accounted for by land preparation, weeding, harvesting and post harvesting operations.
- Use of traditional farming methods- The predominant technology used by farmers is the traditional plough drawn by pair of oxen. The farmers use the bullock power mainly for

land preparation and threshing. The topography and the non-availability of modern technology limit the growth of crop production in the area. Besides this, there is shortage of oxen in the area. Due to land scarcity the land is farmed without leaving the land fallow in between and this has led to loss of soil fertility.

- Crop attack from monkeys, apes, rats and other wild animals are the other dominating factors affecting agricultural crop production.
- The topography is rugged and hilly and is not appropriate for ploughing using oxen. In such places, people dig the land using hoes, which is less productive.
- Shortage of oxen in the area.
- Prevalence of frequent worm attacks, various types of weeds, crop diseases, insects and pests.

Among other things, shortage of farmland, compounded by loss of soil fertility, erratic rainfall and inadequate supply of inputs are major problems that have been consistently eroding farmers' coping capacity and made them so vulnerable. The level of poverty and associated vulnerability in the study area is such that even smallest shocks can cause considerable damage to people's livelihoods. Therefore, in order to avoid undesirable and potentially impoverishing impacts of its realization, it is very important for the proposed project to make conscious efforts (over and above simple 'compensation for lost assets') aimed at building asset-bases for and capacities of the affected population.

4.19.6 LIVESTOCK

Livestock, which serves as source of energy, food and income and means of transport, occupies a central location in the local economic life of the people in the project area. With suitable agro-ecology that provides adequate pasture and water, for farmers in the project area, life without livestock is inconceivable.

Livestock is composed of cattle, sheep, goats, equines, poultry and beehives. The livestock population within the project area is 210,807 and is shown in **Table 4.43**. As shown in the table, among the different livestock species of the project area, cattle rank first (76,479) followed by sheep and goats (60,059), poultry (31,896) and equines (28,006) population. However, the number of beehives (14,367) is relatively smaller in the area.

Wereda Location of the Buffer Area	Cattle (Oxen, Cows, Bulls, Cows)	Equines (Horses, Donkeys, Mules)	Sheep and goat	Poultry (mainly Chicken)	Beehives	Grand Total
Adaberga	8,816	1,588	6,899	4,867	8,072	30,242
Mullo	7,825	1,282	7,329	4,532	1,399	22,367
Sululta	37,516	21,070	31,973	14,323	3,453	108,335
Wichale	6,499	1,384	3,934	2,084	408	14,309
Yaya Gulele	15,824	2,681	9,923	6,091	1,035	35,554
Total	76,479	28,006	60,059	31,896	14,367	210,807

Table 4.43 : Number of Domestic Animals

Among the surveyed households disparity in ownership of livestock is remarkable. On an average, the surveyed households owned 5.6 cattle, 2.0 equines and 4.4 sheep and goat. Based on the survey results the estimated livestock holding per family is 11.8, which ranges between 3.5 (at Elu Werabo PA) and 29.2 (Mulo Fale PA). Ownership of poultry and beehives was not significant.

The overall livestock density of the project area is 298.6 cattle/ km^2. The highest livestock concentration is observed in Dire Medale (854.9 cattle/ km^2) with the least in Elu Werebo (62.3 cattle/ km^2).

There are many factors that limit the quantity and quality production of domestic animals in the area and the respondents have reported the following constraints:

The major constraints for livestock development in the area include inadequate feed, poor genetic make-up, animal health and diseases, low standard management, lack of market infrastructure, increased population pressure, lack of finance, drought and shortage of trained manpower. On the other hand, the resource base, previous project experience, market outlet etc. are potential aspects that could be exploited for the benefit of livestock development.

The majority of the surveyed households perceived the following as the most pressing livestock problems:

- Shortage of animal feed and grazing land.
- The grazing area is located far from the residential houses requiring more travel time.
- There are various types of cattle diseases such as Aba-Gorba and Abasenga, sheep and goat fox, foot-mouth that result mostly in their deaths. The cattle do not get immediate medical treatment due to the shortage of veterinary clinics. There are also various types of worms (Leach, Mice, Black leg, Anthrax and bacterial diseases) that suck their blood as well as flies that attack the cattle.
- Lack of improved variety of cattle and also lack of awareness towards the importance of modern cattle raising system.
- Shortage of drinking water.
- Difficult topography and lack of access to potential grazing lands has caused frequent deaths and injuries to cattle. Inaccessibility of the grazing land i.e. roads get frequently damaged by floods prohibiting easy access to cattle.
- Frequent attack by wild animals.

4.19.7 EMPLOYMENT AND SKILL

4.19.7.1 Primary Occupation

Mixed agriculture (crop production and livestock rearing) is the sole source of employment, and hence, livelihood in the project area. Results of the survey clearly confirmed that not only 98.5% of the heads of households interviewed were farmers, but also 92.5% of them had neither the experience nor the opportunity to work and earn a living outside agriculture. Agriculture is the only source of employment and livelihood and it plays a pivotal role in the local economy.

There are limited types of economic activities taking place by the households. The identified primary occupations of the people include farming, factory employment in the Mugher cement factory, guards and trading activity. The majority of the households comprising of over 98.5% are engaged in the primary occupation of farming whereas the remaining 1.5% are involved in factory employment, guards and trading.

4.19.7.2 Secondary Occupation

An estimated 7.5% of the households have got supplementary activity like carpentry, daily labour, guarding, priest, trading, tailoring, etc. other than their primary occupation. These

are a source of additional income to the people. The implementation of the project can also bring more type of economic activities to the people located near the project area.

4.19.7.2 Division of Works

Due to the fact that the population is mainly agricultural based, the division of labour relates to the types of activities of the rural communities. Various types of economic activities are performed by family members at different levels of magnitude. All of these activities involve the participation of male and female population of the household heads, children and hired people and is done with all the groups of society.

Ploughing and seed sowing are largely performed by male population with marginal assistance received from child and female labour. In particular, females cover only about 0.5% of the labour requirements of these activities. The types of activities in which all types of the available labour of the family are involved are land preparation, crop harvesting, hoeing/ weeding, threshing/ shelling crops, fodder collection, marketing of agricultural products and conducting of trading activities of any kind. Caring of children, food preparations, marketing of household items, milking of animals and cleaning of livestock sheds are largely the responsibility of the females. In all types of the activities, child labour has an important place.

4.19.8 Type of Human Feed and Annual Consumption Level

People in the area like the rest of the country depend mainly on agricultural products for their daily meal. The level of consumption depends on the interaction of the family size and the economic status of the particular family. However, the average consumption level was computed and estimated from the collected sample size. The result shows that the annual per capita consumption level amounts to about 2.5 quintals of crops, one poultry, one sheep or goat, 3 kg of beef, one kg of butter, 5 litre of milk, 1.4 kg of cheese, 3.9 kg of vegetables and 1.3 kg of fruits. The listed types of food consumption contain balanced nutritional contents.

The people were also interviewed whether they are food deficit or not. Accordingly, the majority of the respondents (68%) experience food shortages and the remaining 32% stated that they don't have food shortages.

4.19.9 Annual Household Income

The major source of employment and income in the project area is mixed farming, i.e. crop production and livestock. However, apart from the heads of the households who are often the breadwinners of the family, other family members also contribute to family income through employment in farming and off-farm activities.

The most important income accounting for over 90% originates from agricultural and related activities mainly from the production of crops and vegetables, perennial crops, domestic animals and its products, agro-forestry products and renting of farming lands. The remaining activities i.e. trading, employment, handicrafts and others represent the remaining income of the people. On the bases of the survey result, the annual per capita income of the people is computed as Birr 12,450.84 (refer **Table 4.44**).

Income Source	Average Annual Per capita Income (Birr/HHH)	%
Crop (Grain and Vegetables)	8,696.75	69.8
Perennial crops	611.32	4.9
Animals	1163.04	9.3

Income Source	Average Annual Per capita Income (Birr/HHH)	%
Animal products/ by products	556.18	4.5
Agro-forestry products (including firewood charcoal)	241.44	1.9
Land Rent/ leasing	56.47	0.5
Petty trading	230.28	1.8
Governmental permanent employment of family members	123.87	1.0
Labor of family members	157.17	1.3
Handicraft/ trade by family members	80.95	0.7
Family Trading Activity	198.16	1.6
Financial support by family members & relatives	21.10	0.2
Pension	10.22	0.1
Others	303.90	2.4
Total	**12,450.84**	100.0

Table 4.44 : Annual Income

The annual minimum and maximum incomes of the households in each PA are given in **Annex 4.12 & 4.13** respectively.

4.19.10 ANNUAL HOUSEHOLD EXPENDITURE

The structure of household expenditure reflects the subsistence level of the rural economy. The consumption line of expenditures consist of about 62.3% of home consumption, 2.6% of farm inputs, 0.6% of taxes, social and cultural and about 12.9% of other expenses. Moreover, the average saving rate of the community is estimated to represent 9.5% and medical expenses account for only 5.1% of the annual income (refer **Table 4.45**).

Consumption Items	Total Per capita Annual Consumption (Birr /HH)	%
Consumables	4,999.70	40.2
Medical care	636.42	5.1
Education	456.42	3.7
Clothing	863.54	6.9
House maintenance/ building	583.94	4.7
Energy	57.57	0.5
Water	15.13	0.1
Transport	143.49	1.2
Farm tools	104.75	0.8
Farm inputs	320.43	2.6
Hiring labor	154.07	1.2
Land Rent	155.65	1.3
Food for livestock	220.13	1.8
Animal Health	57.58	0.5
Purchase of Animals	389.16	3.1
Taxes	82.48	0.7

Consumption Items	Total Per capita Annual Consumption (Birr /HH)	%
Debt Repayment	159.79	1.3
Saving	1187.72	9.5
Social/ Religious Ceremonies	258.82	2.1
Others	1604.04	12.9
Total	**12,450.84**	100.0

Table 4.45 : Annual Consumption and Saving

4.20 SOCIO-ECONOMIC CHARACTERISTICS OF THE CORE AREA

4.20.1 BACKGROUND

In the previous section global demographic profile of population of the project area based on the Wereda level survey results was presented. As the information from the survey was available only at higher level and it does not also cover key areas of interest, it was found necessary to conduct fresh and thorough survey that is focused on population and settlements that would be affected by the proposed project. Thus, a quantitative household survey was conducted on a carefully selected stratified random sample of 244 households from the project affected villages.

This section describes the social and demographic characteristics of the would-be affected population in more detail.

4.20.2 DEMOGRAPHIC CHARACTERISTICS OF THE HOUSEHOLDS

4.20.2.1 Population

The Plant and Quarry sites are located close to Becho Dibdibe and Gimbchu villages within Becho Kidane Mehret and Handa Weizero PAs respectively (see **Fig. 4.35**).

Results of the household survey showed that there were a total of 2,027 people living in the 619 households surveyed. Females constitute 62.4% of the total population. Out of the total 244 heads of households interviewed only 12.3% were female-headed households. Proportion of female-headed households here is considerably higher compared to 2.1% average for the Weredas as a whole.

Average family size of 5.3 persons per household for the survey households is slightly lower than the average of 5.7 persons per family for rural households in the Weredas.

Sn	Project Component	PA	Affected Village	Population			Household Heads		
				Male	Female	Total	Male	Female	Total
1	Plant Site	Becho Kidane Mehret	Dibdibe	88	90	178	21	2	23
2	Quarry Site	Handa Weizero	Botero	290	272	562	81	18	99
3	Access Road	Ada Gimbchu	Gimbchu	257	308	565	112	10	122
Total				635	670	1,305	214	30	244

Table 4.46 : Population of the Project Area

4.20.2.2 Marital Status

98% of the households surveyed were married and the remaining 0.8% and 1.2% were divorced and widowed respectively.

4.20.2.3 Religion

Residents of the project area are predominantly followers of the Orthodox Christian Religion (98.4%).

4.20.2.3 Ethnicity

According to surveyed results, population of the project affected area is almost entirely of the Oromo ethnic group (97.5%) and Oromiffa is the major, if not the sole, language spoken in the area. The remaining 2.5% of the total households belong to Amhara ethnic group. None of the Project Affected Persons belong to ethnic minority groups.

4.20.2.4 Education

According to findings of the survey results, the overall literacy rate is very low for the surveyed population and 81.5% of the people were illiterate and only 18.5% were literate. Of this, less than a quarter of the population had formal education of which the majority was only at primary level.

Literacy rates were also disproportionate between sexes. For instance, while 88.5% of females were illiterate, the figure was 69.8% for males. This figure is very low compared to the Wereda average. Literacy rates were consistently higher for men than women throughout all levels of education.

4.20.2.5 Housing and Settlement

On the basis of the sample survey result, there are an estimated 2,007 residential main houses that belong to the 619 household heads. The majority of surveyed household heads own only one main house and the remaining household heads have more than a single main house.

The people usually construct separate house entirely reserved for the guests coming from distant places. These people could be relatives, friends or having any type of relationship. An estimated 20% of the households had separate guesthouses. The presence of separate houses for kitchen and cattle shed purposes is one indicator of better sanitation practices. In addition to this, people have got houses for other unspecified purposes.

Traditionally, most of the houses in the project area were round-shaped wooden houses plastered with mud and roofs covered with grass. A recent development in the housing pattern in the project area is that farmers have moved away from construction of houses with thatched roofs to corrugated iron sheets perhaps due to rise in income.

4.20.3 AGRICULTURE

4.20.3.1 Average Landholding

Further analyses of the survey results revealed that land is very scarce resource in the project area. According to the survey results, a total of 244 households had 680.1ha (refer **Table 4.47**) of farmland. This translates into an average of 2.8ha per household. However,

this figure does not include landless farmers and those households who share their land with their family members. The majority of landless people gain access to land through some internal arrangements including leasing, share-cropping and other land sharing arrangements at family level. In response to the growing problem of landlessness, parents had allotted small plots of land from their scarce resource, to their children. Both landlessness and inequality in landholding is still a serious problem in the project area. For instance, while the land-poor 21.7% of the households owned only 15% and the land-rich 43.9% of the households owned nearly 62.3% of the total farmland available.

Landholding (ha)	Households		Total Landholding	
	Number	%	Hectares	%
Landless				
<= 1	15	6.1	7.0	1.0
1.1 to 2.0	38	15.6	55.3	8.1
2.1 to 3.0	84	34.4	194.3	28.6
3.1 & More	107	43.9	423.6	62.3
Total	**244**		**680.1**	

Table 4.47 : Size of Landholding among the Surveyed Households

4.20.3.2 Agriculture System

The land use in the core area is dominated by the production of annual crops and followed by grazing. The proportion of land used for agro-forestry, is comparatively very small. Exact land utilisation pattern as collected from the surveyed households is presented in **Table 4.48** and is believed to give a comparable picture for the rest of the Project Area.

Sub PA	Farming (ha)	Grazing (ha)	Residential (ha)	Tree & Others (ha)	Total (ha)
Becho Dibdbe	2.2	0.5	0.3	0.1	2.5
Botoro	2.5	0.5	0.2	0.0	2.7
Gimbchu	2.6	0.7	0.0	0.3	2.9
%	2.5	0.6	0.1	0.2	2.8

Table 4.48 : Land Use Pattern in the Core Area

The project area is mainly cultivated by means of traditional rainfed subsistence farming. The average farmland holding of about 2.5 ha per household and it is higher than the Weredas (1.9 ha). The major crops of the core area are as shown in **Table 4.49**. The main crops in the core areas are cereals in crop rotation after two or three cereal cultivation periods. The amount of perennial crops is about 98.2% of the area occupied by the individual farms.

Sampled Village	Teff (ha)	Maize (ha)	Sorghum (ha)	Wheat (ha)	Barley (ha)	Oats (ha)	Chickpeas (ha)	Bean (ha)	Nug (ha)	Garlic (ha)	Others (ha)	Total (ha)
Becho Dibdbe	1.29	0.03	0.15	0.35	0.01	0.03	0.16	0.2	0.05	0.03	0.01	2.3
Botoro	1.00	0.24	1.26	0.21			0.01					2.7
Gimbchu	1.13	0.50	1.00	-								2.7
Average	1.09	0.35	1.03	0.12		0.0	0.02	0.02	0.01			2.6
% of crop utilization	41.4	13.3	38.9	4.5		0.1	0.7	0.7	0.2	0.1		100.0

Table 4.49 : Areas under Major Crops in the Core Area

It goes without saying that agriculture (crop production and livestock rearing) is the sole economic opportunity available to farmers in the project area. Despite some efforts launched recently to introduce irrigation, agricultural techniques adopted in the study area were by and large traditional.

The majority of farmers in the surveyed households perceived shortage of farmland as one of the most pressing agricultural problem in the proposed project area. Among other things, shortage of farmland, compounded by loss of soil fertility, erratic rainfall and inadequate supply of inputs are major problems that have been consistently eroding farmers' coping capacity and made them so vulnerable. The level of poverty and associated vulnerability in the study area is such that even smallest disturbances can cause considerable damage to people's livelihoods. Therefore, the proposed project could help in building up asset base in the area to address the prevalent problems of:

- Shortage of finance for the purchase of farming inputs, absence of improved inputs and these include seeds, fertilizers (UREA and DAP), insecticides and miscellaneous inputs. The reasons accountable for this limitation is mainly higher purchase price as well as transportation cost.
- Shortage of labour- Human labour is used in crop production. Most of the labour comes from family. However, during the seasonal peaks, they temporarily help one another generally on a non-cash basis while in the mean time seek hired labour. Shortage of labour is acute especially for elder and women headed households provided that there is an active family member in it. Major use of the unskilled labour is accounted for by land preparation, weeding, harvesting and post harvesting operations.
- Use of traditional farming methods- The predominant technology used by farmers is the traditional plough drawn by a pair of oxen. The farmers use the bullock power mainly for land preparation and threshing. The topography and the non-availability of modern technology limit the growth of crop production in the area. Besides this, there is shortage of oxen in the area. Due to land scarcity the land is farmed without any gap to leave the land fallow and this leads to loss of soil fertility.
- Crop attack from monkeys, apes, rats and other wild animals are the other dominating factors affecting agricultural crop production.

4.20.3.3 Agro-forestry Practices

There are different kinds of perennial trees (banana, orange, mango, coffee, chat and eucalyptus trees) under the ownership of the surveyed households and eucalyptus tree is

the dominant tree species. However, the estimated volume of production and associated level of income from tree production per surveyed households is only 178 Birr/ year.

On the basis of the survey results, there are constraints facing agro-forestry practices and these include scarcity of land and shortage or absence of improved seedling variety and nursery.

4.20.4 LIVESTOCK

Livestock, which serves as source of energy, food and income and means of transport, occupies an important place in the local economic life of the people in the project area. With suitable agro-ecology that provides adequate pasture and water for farmers in the project area, life without livestock is inconceivable. As discussed above, among the surveyed households farming techniques are traditional and disparity in ownership of livestock is remarkable. On the average, the surveyed households owned 5.6 cattle, 1.0 equines and 4.5 sheep and goats. Based on the survey results the estimated livestock holding per family is 11.2. Ownership of poultry and beehives was not significant.

4.20.5 TYPE OF HUMAN FEED AND ANNUAL CONSUMPTION LEVEL

People in the core zone like the rest of the country depend mainly on agricultural products for their daily meal. The level of consumption depends on the interaction of the family size and the economic status of the particular family. However, the average consumption level was computed and estimated from the collected sample size level. The result shows that the annual per capita consumption level amounts to about 2 quintals of crops, one poultry, one sheep and goat, 7 kg of beef, 1.8 kg of butter, 6 litre of milk, 2.3 kg of cheese, 12 kg of vegetables and 5 kg of fruits. The listed types of food consumption contain balanced nutritional contents. The people were interviewed whether they have food deficiency or not. Accordingly, the majority of the responses amounting to 61% responded that they experience food shortages and the rest 39% stated that they don't have food shortages.

4.20.6 DIVISION OF WORKS

Due to the fact that the population is mainly agricultural based, the division of labour relates to the types of activities of the rural communities. All of the activities involve the participation of the male and female population of the household heads, children and hired people.

Ploughing and seed sowing are largely performed by the male population with marginal assistance received from child and female labour. In particular, females covers only about 0.5% of the labour requirements of these activities. The types of activities that involve participation from all of the available members of the family are land preparation, crop harvesting, hoeing/ weeding, threshing/ shelling crops, fodder collection, marketing of agricultural products and conducting of trading activities of any kind. Caring of children, food preparations, marketing of household items, milking of animals and cleaning of livestock sheds are largely the responsibility of the female. In all types of the activities, child labour input has a great place of importance.

4.20.7 ANNUAL HOUSEHOLD INCOME

The major source of employment and income in the project area is mixed farming, i.e. crop production and livestock. However, apart from the heads of the households who are often the breadwinners of the family, other family members also contribute to family income through employment in farming and off-farm activities.

The most important part of income accounting to over 88.5% originates from agricultural and related activities mainly from the production of crops and vegetables, perennial crops, domestic animals and its products, agro-forestry products and renting of farming lands. The remaining activities, i.e., trading, employment, handicrafts and others account for the remaining income of the people. On the bases of the survey result, the annual per capita income of the people is computed as Birr 10,287.62. (Refer **Table 4.50**).

Income Source	Average Annual Per capita Income (Birr/HH)	%
Crops (Grain & Vegetables)	8,093.32	78.7
Perennial crops	177.72	1.7
Animals	649.28	6.3
Animal products/ by products	184.96	1.8
Agro-forestry products (including firewood charcoal)	325.36	3.2
Land Rent/ leasing	4.57	0.4
Petty trading	33.32	0.3
Governmental permanent employment of family members	0.38	0.0
Labor of family members	75.34	0.7
Handicraft/ trade of family members	17.70	0.2
Family Trading Activity	1.89	0.0
Financial support by family members and relatives	1.23	0.0
Pension		
Others	686.54	6.7

HH : Household

Table 4.50 : Annual Income

4.20.8 ANNUAL HOUSEHOLD EXPENDITURE

Structure of household expenditure reflects the subsistence level of the rural economy. The consumption line of expenditures consist of about 50.5% of home consumption, 1.8% of farm inputs, 0.6% of taxes, social and cultural expenses and about 2.8% of other expenses. Moreover, the average saving rate of the community is estimated to represent 7.6% and medical expenses account to only 3.6% of the annual income (refer **Table 4.51**).

Consumption Items	Total Per capita Annual Consumption (Birr /HH)	%
Consumables	5,190.58	50.5
Medical care	370.89	3.6
Education	75.06	0.7
Clothing	959.43	9.3
House maintenance/ building	796.97	7.7
Energy	53.35	0.5
Water	13.96	0.1

Consumption Items	Total Per capita Annual Consumption (Birr /HH)	%
Transport	68.52	0.7
Farm tools	92.24	0.9
Farm inputs	189.96	1.8
Hiring labor	146.50	1.4
Land Rent	69.84	0.7
Food livestock	111.89	1.1
Animal Health	21.06	0.2
Buying Animals	465.76	4.5
Taxes	59.42	0.6
Debt Repayment	236.50	2.3
Saving	777.33	7.6
Social/ Religious Ceremonies	300.62	2.9
Others	287.74	2.8
Total	**10,287.62**	100.0

HH : Household

Table 4.51 : Annual Consumption and Savings

4.21 POVERTY PROFILE OF THE STUDY AREA

4.21.1 INCOME/ CONSUMPTION DIMENSION OF POVERTY

4.21.1.1 Consumption/ Expenditure

The results of the household survey reveal that the per capita consumption expenditure of the household and the population in the project area is estimated to be Birr 9214.37 and Birr 1722.77 respectively. According to the 2002 Development and Poverty Profile of Ethiopia the real per capita consumption expenditure of North and West Shoa zone, the area where the project is located, amounts to Birr 1087.2. The figure revealed by the primary survey is higher than the figure recorded for North and West Shoa Zones. This may partly be attributed to the time gap and price used in the calculation of the data.

In accordance with the 2002 Development and Poverty Profile of Ethiopia, the proportion of people in absolute poverty is about 31.7% in North and West Shoa Zones. From this it can be inferred that a substantial portion of the households in the study area live in absolute poverty. This is by far better than the National and Oromiya region absolute poverty figures (39.9%and 44.2%).

As indicated by the survey a significant portion of the expenditure in incurred on food. Food expenditure on average accounted for 56.4% of the household budget. The other expenses make up 43.6% of the household budget. Within non-food category, clothing and house maintenance accounted for greater share of total expenditure (10.5 and 8.7%). Medical care and education budget contributed 4.0 and 0.8 % of the total household budget respectively.

4.21.1.2 Income

The major source of employment and income in the project area is mixed farming, i.e. crop production and livestock. However, apart from the heads of the households who are often

the breadwinners of the family, other family members also contribute to family income through employment in farming and off-farm activities.

The most important income accounting to over 88.5% originates from agricultural and related activities mainly from the production of cereals and vegetables, perennial crops, domestic animals and its products, agro-forestry products and renting of farming lands. The remaining activities, i.e., trading, employment, handicrafts and others represent the remaining income of the people. On the bases of the survey result, the annual per capita income of the house hold and population is computed to be Birr 10,287.62 and 1923.4 respectively.

4.21.2 NON-INCOME/ CONSUMPTION DIMENSION OF POVERTY

4.21.2.1 Education Level

According to findings of the socio-economic survey results, overall literacy rate in the project area is very low, about 81.5% of the surveyed household heads are illiterate whereas the remaining 18.5% are literate. Of this, less than a quarter of the household heads had formal education of which the majority was only till primary level.

Literacy rates are also disproportionate between sexes. For instance, while 88.5% of females are illiterate, the figure is 69.8% for males. This figure is very low compared to the Wereda average (31%). Literacy rates are consistently higher for men than women throughout all levels of education.

Of the total household heads in the project area, 3.5%, 4.0%, 7.6%, and 1.5% and1.5% have attained Lower Primary (1-4), Primary (5-8), and Secondary (9-10), Technical school and above grade 10 level education respectively.

4.21.2.2 Demography

Females constitute 51.3% of the total population. Out of the total surveyed household heads (244) only 12.3% were female-headed households.

Average family size of the project area is about 5.3. This is classified as larger family size, which mostly indicates the character of a poor family. About 98% of the households surveyed were married and the remaining 0.8% and 1.2% were divorced and widowed respectively.

4.21.2.3 Farm Assets

The main source of livelihood in the project area is agriculture. Under such circumstances, therefore, land ownership in the project area becomes an important determinant of welfare.

According to the survey results, the total interviewed households had 680.1ha of farmland. An average size of land of the surveyed household is found to be 2.8 ha. The majority, nearly 90.9% of the surveyed household own more than 2 ha of land.

The entire surveyed households in the project area own land. In general the size of individual land holding of the farmer in the study area is better than the region and country. This implies that the farmers in the study area are likely to have better welfare status.

Another important input in the agricultural production in the Ethiopian context is the availability of traction power. This is mainly done with the use of oxen in the country. Thus, a household owning oxen would be in a better position in cultivating the land. The results of the socio-economic survey indicate, on an average the surveyed households own 5.6

cattle. Majority of the surveyed households, i.e., about 95% the farmers in the project area own cattle.

4.21.2.4 Housing and Sanitation

Status of shelter is one of the indicators of well being of society. The average number of rooms per household in the study area is 1.2. This is very low for an average family size of 5.3 people per household.

The sanitation situation of the area is very poor. An overwhelming majority (97.5%) of the surveyed households in the study area use open fields while only the remaining 2.5% use dry pit latrines.

4.22 PUBLIC HEALTH IN THE STUDY AREA

A detailed Public Health survey has been carried out in the project area during the period Aug-Sept 07 to assess the existing health situation within the various Weredas in and around the project area.

4.22.1 METHODOLOGY

The following study methods were utilised.

Literature Review: Before the study relevant documents, official reports, etc. were reviewed. In addition, documents related to National policies and strategies, annual reports of the Ministry of Health (MoH), etc. were also assessed and reviewed thoroughly.

Questionnaires: Prior to the launching of this study, a questionnaire was designed to collect data at the Wereda-level governmental offices, particularly from Wereda Health Offices and individual health facilities.

4.22.2 PREVAILING HEALTH SITUATION IN THE PROJECT AREA

TEN TOP DISEASES AND ENDEMIC DISEASES

In general, the health status of the community especially children below five years and pregnant women can be described as poor. Due to deficient sanitation, and crowded and low cost housing, communicable diseases are prevalent in the project area (both rural and urban). The situation is related, either directly or indirectly, to a lack of adequate and safe drinking water and sanitation, low living standards and poor nutrition.

Prevalent communicable diseases in the project areas, as diagnosed by the existing different health facilities, mainly hospitals and health centres, are as follows.

- Upper acute respiratory tract infections (URTI)
- Intestinal parasites (all types)
- Diarrhoea (all types), including bacillary dysentery (bloody diarrhoea)
- Typhoid fever
- Infection of the skin and subcutaneous tissue
- HIV/ AIDS

These diseases are not only among the top-ten diseases diagnosed in the health facilities, but most of them are also the leading causes of hospital admissions and hospital deaths.

The ten top diseases reported by the health institutions in the five Weredas are presented in **Table 4.52**. However, the prevalence of the disease differs from one Wereda to the other**.**

Adaberga Wereda			
	Type of Diseases	**No.**	**%**
1	Pneumonia	1020	17.3
2	URTI / Other Respiratory Infection	1001	17.0
3	Skin and subcutaneous tissue infection	869	14.7
4	Intestinal Parasites	632	10.1
5	Gastric	561	9.5
6	Injuries due to fights	539	9.0
7	Typhoid	513	8.7
8	EPTB	448	7.9
9	UTI	308	5.2

Wuchale Wereda			
	Type of Diseases	**No.**	**%**
1	Pneumonia	4655	35.7
2	Diarrhea	1794	13.7
3	Intestinal Parasites	1357	10.4
4	Rheumatism	1044	8.0
5	Infection Wound	900	7.0
6	Gastric	898	6.9
7	Tonsillitis	680	5.2
8	Injuries	636	4.9
9	Eye Diseases	612	4.7
10	Anemia	464	3.5

Mulo Wereda			
1	Injuries due to fights	806	27.2
2	URTI/ other Respiratory Infection	783	26.5
3	Diarrhea	369	12.5
4	Intestinal parasites	228	7.7
5	Eye Disease	171	5.8
6	Gastric	165	5.6
	Type of Diseases	**No.**	**%**
7	Tonsillitis	147	5.0
8	Rheumatic Pain	112	3.8
9	Tooth disease	95	3.2
10	Common cold	80	2.7

Yaya Gullele Wereda			
1	URTI and other Respiratory Infection	792	24.8
2	Injuries due to fights	484	15.1
3	Intestinal Parasites	457	14.3
4	Diarrhea	408	12.8
5	Gastric	343	10.7
6	Tooth disease	274	8.6
	Type of Diseases	**No.**	**%**
7	Arthritis	259	8.1
8	Skin and subcutaneous tissue Infection	178	5.6

Sululta Wereda			
1	Pneumonia	2007	24.0
2	URTI/ other Respiratory Infection	1531	18.3
3	Gastric	1531	18.3
4	Intestinal Parasite	617	7.4
5	Bacillary Dysentery (CDD)	521	6.2
6	Conjunctivitis	467	5.6
7	Anaemia	467	5.6
8	Skin and subcutaneous tissue infection	426	5.1
9	Tonsillitis	451	5.0

Adaberga Wereda				Wuchale Wereda			
	Type of Diseases	No.	%		Type of Diseases	No.	%
10	Rheumatism	397	4.5				

Source: Wereda Health Office of each Wereda

Table 4.52 : Ten Top Diseases Diagnosed in the Five Weredas in the Study Area

4.22.1.1 HIV/ AIDS

HIV/ AIDS is one of the fastest growing diseases in Ethiopia. The number of persons living with HIV/ AIDS in the country (Ethiopia) and Oromiya region is estimated to be 1,320,000 and 318,000 respectively in the year 2005. ("AIDS in Ethiopia", Sixth Report Fact sheets). The same sources indicate that the prevalence rate of HIV/ AIDS stood at 3.5 and 2.4% in the country and Oromiya region respectively.

The available information also shows the prevalence of the disease in the five Weredas of the project area. However, the blood test result figures may not be representative and can show only the overall picture of the project area because these figures represent only those patients who visited the Health Centre and some volunteers. The blood test results obtained from the project area are presented in **Table 4.53**.

Sn	Wereda	Total Blood Samples Examined in 2006	Positive Results	
			No.	%
1	Ada Berga	753	245	33.0
2	Mulu	368	5	1.4
3	Yaya Gulele	596	18	3.0
4	Sululta		2,035	

Source: Wereda Health Offices

Table 4.53 : Prevalence of HIV/ AIDS & Results of Blood Tests in the Study Area

The Weredas in the project area are carrying out the following activities to control and prevent the spread of STDs particularly HIV/ AIDS:

- Provision of education and creating awareness
- Early Diagnosis and Treatment of STD
- Condom distribution
- Provision of VCT services

4.22.1.2 Malaria

Due to the elevation of the area, malaria is not a major health problem in the project area and not reported around the plant site (on the plateau). 44% of the Peasant Associations located within the 10 km radius are identified as malaria free area.

However, in the Muger valley malaria is a threat to the population farming and residing in the area. In year 2006 about 621 malaria cases were identified in Yaya Gulele Wereda and few additional cases were also reported from Ada Berga Wereda.

4.22.1.3 Malnutrition

Food insecurity and malnutrition are chronic health problems in the project area. Malnutrition weakens resistance to infection and makes recovery from infection more difficult. Malnutrition afflicts the poorest sections of the community and children who are especially at risk. Malnutrition related diseases, (such as Kwashiorkor, Marasmus, vitamin A and mineral deficiencies) are one of the major continuing health problems in Ethiopia. Extensive studies conducted by the Ethiopian Nutrition Institute (ENI) found underweight

rates between 40-60% of children <5 years of age. The MoH statistical report shows that malnutrition is one of the ten leading national health problems and is the seventh leading cause of hospital deaths.

Malnutrition together with poor environmental health conditions (poor water quality and inadequate sanitation) further exacerbates the already poor health conditions within the population, pre-disposing the population to a range of serious epidemic diseases such as typhus, relapsing fever and other house-borne diseases.

4.22.1.4 Diseases of Women and Children

The survey attempted to assess the common diseases related to women and children prevalent in the area. The most common diseases affecting the women (age 15-49 years) include the following:

- STDs and HIV/ AIDS
- Malnutrition
- Intestinal parasites
- Anaemia (due to iron deficiency)
- Diseases associated with complication of pregnancy and child delivery
- Pneumonia
- Urinary tract Infection (UTI)

The most common diseases affecting children (< 5 years of age) include the following:

- Measles
- Pert sis (Whooping cough)
- Diarrhea
- Malnutrition (Kwashiorkor, Marasmus, etc)
- Intestinal parasites (e.g. Amoebiasis, Giardiasis, Ascriasis, Hookworm, etc)
- Pneumonia
- Eye diseases
- Tonsillitis

4.22.1.5 Harmful Practices of the Communities

The findings of the survey revealed the existence of harmful practices in the project area, which is mainly attributed to the lack of awareness and wrong belief of the people. Some of these harmful practices prevalent in the project area are:

- Cauterization of body (with very hot metal rod/ knife), incising the skin and letting out blood as a treatment for pyrexia, headache, chest pain, etc
- Scrubbing of tonsils and tonsillectomy for children when they develop diarrhoea
- Uvuloectomy, i.e., cutting of the uvulae of children as a treatment for fever and, diarrhoea
- Rape and pre-marital sexual practices
- Early marriage and abduction
- Massage of pregnant women
- Using local medicine and tattooing
- Extramarital sex and unsafe sexual practices
- Female circumcision and genital mutilation

4.22.1.6 Problem of Health Services in the Study Area

The results of the survey identified and outlined the major constraints prevailing in the health facilities of the project areas. These include:

- Shortage, high attrition rate and uneven distribution of health professionals (in quality and quantity).
- Shortage / lack of buildings and rooms for medical procedures (e.g. laboratory and X-ray rooms, drug stores, offices, etc.).
- Shortage of drugs, equipment, laboratory reagents and chemicals, X-ray films and other medical supplies.
- Lack of adequate budget for drugs.
- Lack/ shortage of Vehicles/ Ambulance

4.23 EXISTING HEALTH FACILITIES AND PROFESSIONALS

4.23.1 HEALTH SERVICES

The Health Bureau is responsible for providing health care in the region and operates a comprehensive health care network within the limits of the available resources. In addition to the Health Bureau, some NGOs and Other Governmental Agencies (OGAs) are involved in the Region.

The general policy of the Ministry of Health proposes the following basic health services to be installed in each Zone in order to allow minimum health services to be provided to the population.

- Central referral hospital
- Regional hospitals
- Rural hospitals
- Health care centres

The health professionals working in different health facilities of the project area are mandated to carry out routinely preventive, curative and rehabilitative health services to the community they are assigned to serve according to the information gathered from the Wereda Health Offices. These services comprise all of the following specific types of health care for the community:

1. **Medical Services:** For outpatients and inpatients, medical and physical examination, diagnosis and treatment of the diagnosed ailments, Advice/ therapy, etc.
2. **Family Health Services:** The family health services include antenatal and postnatal care for the women during their pregnancies and deliveries, Family planning services, which include advice and convincing the couples and administration of different contraceptive methods and treatment of sick children (under 5 years of age) and child growth monitoring services.
3. **Expanded Programme for Immunisation (EPI)**
4. **Laboratory Diagnostic and Radiography (X-ray)**
5. **Communicable Diseases Prevention and Control Services**: Treatment and control measures of diseases such as HIV/ AIDS /STDs, tuberculosis, leprosy, trachoma (prevention of blindness).
6. **Information, Education and Communication (IEC):** The services are rendered regularly to create community awareness on the prevention and control of diseases,

childcare and child nutrition, personal and domestic hygiene and Sanitation, family planning, etc. Malaria and Other Vector-Borne Diseases Control Services

7. **Environmental Health and Sanitation Services:** In these services, communities are given health education and training, demonstration on the construction and proper use of pit latrines, ventilated-improved-pit (VIP) latrines, proper disposal of refuse, protection of springs for safe water supply with community participation in the protection work, and inspection of public eating and drinking establishments, like hotels, bars, tea-shops, abattoirs, meat-shops, etc. The workers in such establishments are also given medical examination for any infectious and communicable disease; and those found to have the disease are treated immediately.

Besides the above listed activities, the health professionals in the Wereda provide health education in relation to HIV/ AIDS, STDs, communicable diseases, environmental, sanitation, personal hygiene and family health in school and prisons. They also give some other health program/activities related to TT vaccination program in school.

Pills, injections and condoms are commonly promoted contraceptive methods in the health units of the project area. The contraceptive prevalence rate for Yaya Gulele, Mulu, and Sululta Wereda estimated to be 17%, 40.4%, and 26% respectively.

4.23.2 HEALTH FACILITIES

Currently available health facilities in the project areas are depicted in **Table 4.54**. As shown, there is no hospital in all of the five-surveyed Weredas. The result of the survey indicates that 6 Health Centres, 20 clinics, 27 health posts, 19 pharmacies and 5 drug stores exist in the five Weredas of the study area.

Description	Wereda in the project area					Total
	Ada Berga	Wuchale	Mulu	Yaya Gullele	Sululta	
Health Facilities: Population	**126,832**	**95,756**	**39,417**	**75,464**	**140,694**	**478,163**
Health Centre	2	1	1	1	1	6
-Health Station (Clinic)(Govt. & NGO) -Private Clinic	2 6	2 3	- 1	2 2	2	8 12
Health Post	5	3	5	2	12	27
-Pharmacy (Govt) -Pharmacy (Private)	1 6	1 2	- -	- -	1 8	2 16
-Drug Stores (Shops) (Govt) -Drug Store (Private)	1 -	- 1	1	1 -	1	4 1
Ratios						
Population to Health Centre Ratio (Target: 1 Health Centre to serve 25,000)	63416	95756	39417	75464	140694	79693
Population to Health post Ratio (Target: 1 Health Post to serve 5,000 people)	25366	31919	7883	37732	11725	17709
Health Service Coverage Ratio	**100%**	**52.2%**	**24.1%**	**63%**	**68%**	

Source: Wereda Health Office and primary survey

Table 4.54 : Existing Health Facilities in Weredas within the Study Area

According to the information obtained from Wereda offices, the total population that is served by these existing health facilities and drug-outlets in the five Weredas is estimated to be 478,163. The result of the ratios of population to health centre is indicated in **Table 4.55**. The available health facilities are far below the standards stipulated by the Ministry of Health (MOH). This shows that the health facilities in the project area are poor.

In terms of health facilities, Sululta and Ada Berga Wereda have relatively better health service than the other Weredas in the study area and Mulu Wereda registered the lowest health service coverage.

4.23.3 HEALTH PROFESSIONALS

The total number of currently available health professionals and the ratios of population to health professional in the five Weredas of the project area are given in **Table 4.55** below. The number of health facilities and workers is unevenly distributed among the Weredas in the project area. For instance, the Sululta Wereda has relatively larger number of health workers and facilities than the other Weredas.

Except the Ada Berga Wereda, all the other Weredas in the project area have no physicians (Medical Doctor). As indicated in the table the ratios of population to doctor, nurses and sanitarians in the five Weredas of the study area is also far less than the standard set by the Ministry of Health (MOH). This figure indicates the serious shortage of health workers in the project area. This implies that much remains to be done to attain the standard set by the MOH.

Description	Zones in the project area					
	Ada Berga	Wuchale	Mulu	Yaya Gullele	Sululta	Total
Population	126,832	95,756	39,417	75,464	140,694	478,163
Health Facilities:						
Physicians (all types)	1	-				1
Health Officers	1	1		1	1	4
Nurses (all types)	13	11	5	8	17	54
Sanitarians	1	1	1	1	2	6
Lab. Technicians						
Pharmacists Technicians	2	1	1	2	2	8
Health Assistants	6	2	2	2	6	18
Community Health Workers	85		18			103
Health Extension program workers	26	19	7	16	26	94
Ratios						
Population to Doctor Ratio (Target: 1 Doctor to serve 10,000 population)	63,416	95,756	39,417	75,464	140,694	95,633
Population to Nurse Ratio (Target: 1 Nurse to serve 5,000 Population)	9,756	8,705	7,833	9,433	8,276	8,854
Population to Sanitarian Ratio	126,832	95,756	39,417	75,464	70,347	79,693

***Source**: Wereda Health Office (2007) and Own calculation*
***Note**: The calculated result of population to Doctor Ratio include Health officers*

Table 4.55: Currently Available Health Professionals in the Study Area

4.23.4 PROPOSED HEALTH FACILITIES

The Weredas in the project area have planned to build various health facilities so as to improve health coverage and the quality of health service in the project area. As depicted in **Table 4.56** a total of 14 different types of health facilities will be constructed within the next five years. It is expected that these health facilities will serve an estimated 317,776 people living in and around the project area. This will significantly improve the health coverage and quality of health services in the project area.

Sn	Wereda	Type of Health Facility			
		Health Centre	Upgrade Clinic to Health Centre	Upgrade Health Centre to Hospital	Health Post
		No.	No.	No.	No.
1	Yaya Gulele	1			1
2	Wuchale	1	1		2
3	Mulu				2
4	Sululuta	1		1	4
	Total	3	1	1	9

Table 4.56 : Health Facilities Planned in the next 2-5 years in the Study Area