

PASTORAL COMMUNITY DEVELOPMENT PROJECT

BASELINE SURVEY OF 55 WEREDAS OF PCDP PHASE II

FINAL MAIN REPORT

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HAILU EJARA KENE (CONSULTANT)

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ACRONYMS AND ABBREVIATIONS

ADEXPEBD	Adjusted expenditure
adINCOME	Adjusted Income
AHW	Animal Health Workers
AWGR	All Weather Gravel Road
BoARD	Bureau of Agriculture and Rural Development
BoE	Bureau of Education
BoFED	Bureau of Finance and Economic Development
BoH	Bureau of Health
BR	Browsing Animals
CSA	Central Statistics Agency
DPPC/DPPA	Disaster prevention and Preparedness Agency
EAP	Economically Active Population
DVM	Doctor of Veterinary Medicine
GER	Gross enrolment rate
GFR	General Fertility Rate
GR	Grazing Animals
HA	Health Assistant
HC	Health center
HEW	Human health Worker
HF	Health facility (health center, clinics, health posts)
HO	Health officer
HP	Health Post
HP/HC	Health Center/health Post
IDA	International Development Association
IER	Income Expenditure Ratio
IFAD	International Fund for Agricultural Development
LA	Lab Technician
LIU	Livelihood Integration Unit
MoARD	Ministry of Agriculture and Rural Development
MoFA	Ministry of Federal Affairs
MoWR	Ministry of water Resources
NER	Net enrolment rate
NFW	Non-functional Water points
Old Age	Population with > 64 years of age
PARDB	Pastoral Agriculture and Rural Development Bureau
PCDP	pastoral Community Development Project
Pop	Population
PSAP/SAP	Primary School Age Population
RAGW/RAG	Reproductive Age group Women
SCR	student class room ratio
SNNPR	Southern Nations, Nationalities and Peoples Region
STR	Student teachers ratio
THC	Theoretical health service coverage
TLU	Tropical Livestock unit

U5C	Under five Children
VA	Vet Assistant
VF	Veterinary Facility (vet clinic, vet post
VLU	Veterinary Livestock Unit
WFP	World Food Programme
Young Age	Population under 15 years of Age

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Executive Summary

The 55 pastoral areas of PCDP II, in this report, includes weredas in Somali (21 weredas), Afar (14 weredas), Oromia (14 weredas) and SNNPR (six weredas). These weredas are arid and semi arid lowlands often suffer from frequent drought, shortage of water and forage for animals, poor access to basic services and access to adequate transport and road networks. The total area of the weredas is estimated at 233 thousand square kilo meters with an average density of 19 people per square kilo meters. Of the total area of these weredas, 90 percent are arid and semi arid agro-climatic zone with altitude below 1500 meters above sea level. Average rainfall is estimated to below 700 mm per annum. It is also estimated that only five percent of the area have tree cover. They are also characterized by flat topography of an average slope of 2.8 percent

In 2007, the population of the weredas was projected at 4.4 million of which 17 percent were urban and 83 percent were rural population. Male female ratio (sex ratio) was also 112 percent. Of the total population the Somali region accounted for 54 percent, Oromia 26 percent, Afar for 15 percent and the remaining five percent for SNNPR. The annual population growth is estimated at 2.7 percent per annum with a doubling period of 26 years. By year 2033, the population of the weredas is estimated to reach about 8.8 million with a crude population density of 38 people per square kilo meters.

Pastoral and agro-pastoral way of life is dominant with few sedentary crop farmers. In 2007, there were about 600 thousand households in these weredas of which about 49 percent were pastoralists, 33 agro pastoral, and 19 percent were sedentary farmers. The population is dependent on livestock and opportunistic farming of limited crops both of which are extremely subsistence. Non-pastoral activities are very limited due to persistence of pastoral livelihood systems, low investment opportunities and low level of urbanization.

Livestock production therefore subsist almost eight in every 10 households in the lowlands. In 2007, the weredas estimated to have about 19.4 million heads (10 million TLU) of livestock resources of which 24 percent were cattle, 60 percent shoats, and 13.1 percent camel. A typical household in these weredas have an average 20 TLU of animals and 3.72 animals per capita with significant variation between wealth groups and livelihoods. Despite huge livestock resources in the lowlands, only few animals were marketed. The average commercial off take of livestock in these weredas was only 7.9 percent. The majority of off take went to mortality, predation and raiding. Household consumption was also estimated at 2.9 percent. Diseases are rampant and kill considerable number of animals every year. Anthrax, reinderpest, pasteurolosis, pox, pneumonia and others are the major epidemic and endemic diseases. Parasites such as ticks also affect a number of livestock populations in these lowlands. The average animal mortality rate was therefore estimated at 29 percent per annum. Despite significant animal epidemiology veterinary services are not well developed. In 2007, only 181 vet clinics and posts were serving 10 million veterinary livestock units. They were poorly equipped and staffed to adequately serve the growing population of livestock resources in the lowlands. Distribution and pattern of vet facilities in these areas are also inadequate. A vet facility in the lowlands serves about 2459 km² and 109468 VLU. Furthermore, these veterinary facilities have only 579 veterinary personnel (excluding Somali and SNNPR) of which the majority was animal health workers and vet technicians. The ratio of animals to DVM and vet assistant was 128863 and 35631 VLU respectively. Therefore roughly veterinary service coverage of physical infrastructure and vet personnel was 38 and 102 percent. If the data of SNNPR and Somali included to the health coverage of the vet personnel the overall coverage will decline significantly below the stated figures.

Crop production is expanding in the lowlands with government intervention and pauperization of the pastoral livelihoods. Data on the size of land under crop production is however lacking to analyze the extent of expansion and growth. But data from WFP indicated that crop production is increasing by an average of 11.3 percent per annum between 1995 and 2007 with considerable growth in pastoral livelihood dominant weredas of Afar and Somali region. Crop production is however, a risky business in all lowlands due to poor soil fertility, critical soil moisture stress,

frequent drought, pests and diseases. Irrigated crop farming is not well developed except in very few river valleys hosting few sedentary farm households. Despite increasing trends, annual production can only feed less than a quarter of a population in these weredas with an average per capita production growth of 6.1 percent per year.

Due to subsistence nature of the pastoral and agro-pastoral household economy, annual cash income is low and unsustainable. In 2007 the average income of a household in the lowlands was estimated at only 4820 birr of which 76.3 percent was generated from live animal and animal product sales. The rest 24 percent was obtained from crop sales, transfers and gifts, sales of fire wood and charcoal, mining, petty trade and others. Daily labor wage accounted only for 10 percent of the total cash income of the households. Most of the household cash expenditure is also on basic necessities. The same source indicated that average cash expenditure of a household was 4277 birr of which 36 percent was for basic necessities such as staple food and clothing. Food expenditure accounted for 47 percent of total basic household cash expenditure. Income expenditure ratio was also 115 percent with saving potential of only 15 percent. Yet there is significant variation between weredas and wealth groups for which this ratio is none or negative.

The majority of the food needs of the households also come from livestock resources. About 28.1 percent of the food source of the households was from animal products. The largest food of the households (41.1 %) however came from purchases for all wealth categories. Food aid and transfers accounted for more than 10 percent of the food needs, with the largest proportion in weredas with the highest poverty incidence and repeated shocks. Poverty level was also significant in all weredas. Qualitative studies and projected estimates showed that of the total population in the 55 weredas about 38 percent were either very poor or poor. The middle income and the relatively wealthy households accounted for 39 and 22 percent of the population. These wealth groups vary considerably in income, number of livestock and asset owned and access to food sources and opportunities. The income of the wealthy group was 14 times more than the very poor, 2.7 times the income of the poor and 1.5 times more than the income of the middle income households. This variation is also significant between pastoral and agro-pastoral households.

Vector and, water born and other poverty and sanitation related diseases pose significant effect on livelihoods and the wellbeing of the population. Health service delivery systems are inadequate and incompatible with the growing needs and circumstances of the lowlands. As the result, the majority of the population in the lowlands depends either on traditional healing practices or none at all. Malaria affects considerable proportion of the population with debilitating effect on the productivity of human labor, mortality and morbidity. According to WFP about 76 percent of the pastoral lowlands of the 55 weredas are malarious varying from 82 percent in Oromia to 61 percent of the total surface area of the pastoral weredas of Somali region. The number of health facilities is inadequate and the distribution is not consistent with the area, population density and special needs of the lowlands. In 2007 there were only 389 health facilities of which 49 were health centers, 64 were clinics and 276 were health posts. Hence a typical health facility in the lowlands serves over 785 km² of area, and over 120000 human populations. The number of health staff in the same year was also two physicians, 273 nurses and 81 sanitary and lab technicians, 56 health assistants and 515 human health workers. Excluding Somali region, the average availability of any type of health staff per health facility was only 3.6. Considering high level professionals, a ratio of health centers to physician was more than 19 to 1. Average number of nurses and health assistants was only 0.9 and 0.2 per health facility. Therefore, physician population ratio was about 1.04 million, while health assistants and nurse ratio was 37101 and 7610 population respectively. Yet, the theoretical service coverage of health service was 74 percent.

The number of primary schools was also 1120. About 34 percent of these schools (378 schools) were found in Oromia and 31 percent (348 schools) in Somali pastoral weredas. These schools have about 4544 class rooms (sections), on average only four class rooms per school. There were also about 6313 teachers in these schools. The number of students per teacher (STR) was on average 49 for all primary schools varying from 54 students in Somali to 35 students in SNNPR.

Over crowding is the common problem in the majority of the lowlands, about 57 percent ranging from 44 percent in Oromia to 115 percent in Somali pastoral weredas. SNNPR have however adequate classrooms for the existing

enrolments. Enrolment rate in general is low. It was estimated that GER for the 55 weredas was 31 percent with the highest GER in pastoral areas of Oromia (48 percent) and the lowest in Somali region (only 24%). Excluding Somali region net enrolment was only 28 percent in 2007.

Water shortage is critical socio-economic problem in all areas. The number of safe drinking water is inadequate and ill distributed in vast landmass of the lowlands. In 2007 there were 1134 different water supply points (modern) in the 55 weredas most of which were shallow and hand dug wells. Of these water supply points only 84 percent were functioning. Of these functioning water points the majority are of poor quality due to concentration of salts and other impurities. Thus in the lowlands one functional water point serves 246 km² of area, 4669 human and 10616 TLU of livestock population. The yield of almost all water supply points is extremely low. Due to non-functionality, impurity and mal distribution of water points as well as inadequate number, the theoretical service coverage of the water points as a whole was only 24.5 percent varying from 27 in Afar to 17 percent in Somali pastoral weredas.

The 55 pastoral and agro-pastoral weredas have also served by 551 kms of asphalt, 3785 kms of all weather gravel roads, and 7154 kms of community roads with a road density of 35 meter per 100 km² and 1.5 meters per capita. The majority of the lowlands have no access at all. Estimates show that only 34 percent of the landmass of the lowlands has access to all weather roads within the radius of 10 kms (WFP, 2004). In general a km of road serves about 96 km² in these weredas.

In summary the pastoral areas are marginal in terms of access to basic services, and vulnerable to various shocks. Poverty incidence is significantly high increasing from year to year with environmental degradation, human and animal population growth, increasing shocks and asset deletion. Though much have been done so far to improve the livelihoods in the lowlands, considerable attentions are still needed to improve access to basic services and improving production capacities in the lowlands. This report touches only few aspects of pastoral lowlands but have significant contribution in identifying problems of the existing services in the lowlands. There are a number of baseline surveys and studies conducted in these areas for the last 20 years. More recent studies and surveys are of livelihood assessment of DPPA and Save the Children UK, Farm Africa and PCDP. Readers are advised to refer to these studies and assessments for details particularly on seasons, natural resources and local food supply, risks and coping strategies. In general however, with out much analysis and research the pastoral areas are in need of development priority in all sectors particularly livestock production, human resources development, capacity building and strengthening coping abilities of the population as well as linking the lowland economy with the markets

I. INTRODUCTION

The PCDP has started functioning in 30 pastoral and agro-pastoral weredas of four regions Somali, Oromia, Afar and SNNPR in 2003. The first phase of the project extended over the period of five years (2003-2008). Consistent with its objective, PCDP has contributed substantial inputs to improve the livelihoods and well beings of the pastoral and agro-pastoral communities. Some of its major achievements are construction of water supply points, human and animal health posts, community access roads and other infrastructure that have low cost and easily maintained by the community and local governments. Above all PCDP boasts of inculcating participatory community development approaches where communities have much say on interventions that positively affect their lives. Institutional empowerment was other component of the project which has some effect on the efficiency of local institutions. The risk management component, which have substantial financial share and believed to contribute to the vulnerability reduction and strengthening coping abilities was not effective for various reasons. In general with these achievements, PCDP phase one was terminated on April 2008

The phase two of the project will soon commence with minor changes in approach and component of the project. However in phase two of the project, the project interventions and support will extend to about 57 weredas of the four regions. These weredas include 21 weredas of Somali, 14 weredas of Oromia, six weredas of SNNPR and 14 weredas of Afar regional states. In general in phase two more than half a million households and over four populations and over half a million pastoral and agro-pastoral households are expected to benefit from integrated programme of the PCDP. A five year phase will expected to commence in 2009 and extends to the end of 2013.

This baseline indicator and report is aimed at establishing a benchmark against which the outcomes of the intervention of the project will be measured at any given point during the project implementation period. In addition to this objective the report is fundamental to explore the current development situations of the target weredas. The report is therefore extensive and includes all major rural development sectors in the weredas. The report heavily relies on quantitative secondary data collected and organized by federal and regional institutions. This is consistent with the terms of reference and the agreement entered on May 23 2008 between the client and the consultant.

The data organization of the report has two sections. Section one is an analyzed basic quantitative indicators covering almost all major sectors including population vital indicators, agriculture (livestock and crop production), road access indicators, health, vet services, education and water supply and finally poverty and food security indicators. Though not exhaustive some environmental indicators are also added. Section two is a raw data and processed indicators annexed to the end of the report.

The main report on the other hand is organized in seven chapters including this introductory part of the report. The methodology and approach to collect secondary data from the regions and federal institutions as well as the preparation of the report is assessed in chapter two. In chapter three a brief discussion of the background of the project weredas and the PCDP is made. The demographic characteristics with basic indicators are briefly discussed in chapter four. The livelihood of the pastoral and agro pastoral population is mainly dependent on transhumant and traditional livestock production. Opportunistic crop production also forms significant component of the family income and currently increasing with pauperization of

pastoralist through repeated natural and man made shocks. Sedentary farming is also practiced though its magnitude is limited to few pocket areas of the weredas. Besides, these major components of livelihoods non-farm activities also comprises significant share of income and employment. Though livestock are means of wealth accumulation and backbone of pastoral economy, the growth of markets, poverty and vulnerability in the lowlands generally increased the need for money and a wide range of transactions. Cash income determined the status and well being of pastoralists though it is dependent on the number and type of assets of the household owned in a particular year and season. Much of household expenditure of the pastoralists is expenditure made on staples and other basic necessities. The general aspect of income and expenditure of rural pastoral households is explored in chapter five of the report. Distinct to pastoral and agro pastoral lowlands are low access to education, human and animal health services, low access to water supply, and poor access to transport and road networks. The low access to these fundamental economic and social services contributed to growth of vulnerability and poverty as well as transformation of livelihoods in the lowlands. This will be detailed in chapter seven of the report. Typical to pastoral and agro-pastoral lowland, inefficient and incapacitated institutions add the burden of vulnerability and poverty and lack of access to sustainable development. Most of the formal institutions suffer from ill equipped manpower, funds and poor working conditions and incentives. Traditional institutions played a major role in stabilizing and administering the social and economic welfare of the population. These institutions are still dynamic in these areas and above all play roles in management of common property resources, community mobilization, conflict solving, peace and security. However, the institutional and vulnerability aspect of these weredas was not incorporated in the report due to critical shortage of reliable data. Finally, the report is concluded by Chapter seven.

II. APPROACHES AND DATA COLLECTION METHODOLOGY

2.1 Approaches and Methods

Secondary data collection methods have been employed to prepare this report. A number of government and non-governmental organization at federal and regional level have been contacted. Several data bases, annual reports and particularly data collected by regions for allocation of annual capital budget have been explored and used. Manuals, guidelines, statistical bulletins, studies and surveys of other institutions particularly that of CSA, World Food Programme (vulnerability Analysis and Mapping unit data base), Save the Children UK livelihood survey of 2004 and 2005, assessments of Livelihood Integration Unit of the USAID/DPPC, PCDP survey of 2005 (of 22 weredas), and others were assessed for pertinent data that fit into the objective of this report and data collection endeavor.

In general the following institutions are sources of data

1. DPPA livelihood integration unit livelihood assessment of SNNPR pastoral areas, food supply prospects and prices on SNNPR
2. World Food Programme vulnerability indices and data collected for all weredas of the country on water supply, per capita food production, road density, agro-ecological zones and area for Somali and Afar regions. WFP data is fundamental to most of the variables included in the report.
3. CSA most of the data from this institutions is aggregated at zonal level and have little contribution for this report. Besides, its coverage is limited to few pastoral areas. However demographic information are projected from the 1994 population and Housing census of CSA.
4. Federal pastoral community development project for livelihood studies and baseline survey of the former weredas and implementation manuals
5. Federal cooperative agency, Rural Financial Intermediation Project. for Saving and credit associations in intervention weredas
6. Regional Bureaus of Finance and Economic Development (BoFED) for most of the information including agriculture and livestock, support services, economic and social infrastructure and statistical abstracts
7. Regional Agriculture and Rural Development Bureaus, Health and Education Bureaus, Water Mineral and Energy Resources Development, regional cooperative agencies, Rural Road Authorities, and others. Most of the data from these institutions are inconsistent and unreliable. However, the data were used to fill some missing gap.
8. Save the Children UK for prices and livelihood studies. The data from this institution is core to this report particularly data related to wealth, income and expenditure, and food sources

2.2. Scope of the Secondary Data

The main objective of this baseline data collection and report is to establish basic indicators against which the outcome of PCDP interventions will be measured and to create adequate databases and information on the situation of the 55 weredas. Therefore, the report is multi-sectoral and includes almost all sectors of the pastoral economy. The main focus was however made on the components of PCDP five years programme which is also integrated multi-sectoral rural development programme. Hence the report and data covers at least four major broad areas

1. The physical environment with very limited indicators due to shortage of secondary data at woreda level. These indicators includes geographic areas, administrative kebeles, locations, topography and climate as well as agro-ecological zones of the 55 weredas
2. Demographic dynamics including population number for 2007 by gender and residence, age structure, and vital demographic indicators. Projection to 2030 is also included to show trends of population growth and the need for more investment and development interventions in these weredas.
3. Livelihood systems including broad categories of livelihood means supporting the lives of pastoral and agro-pastoral population in all weredas. These broad categories include, crop production over the last 10 years (crude estimates), per capita production, livestock production (number and type, mortality and off take rates, veterinary facilities and coverage), income generating activities (including petty trade, and others), cash income (, saving and credit, magnitude, sources and inequality), cash expenditure (categories and sources), food availability and sources, wealth characterization and poverty, and
4. Infrastructure availability and access including health services (facilities and coverage, human resources) primary education (schools, GER and NER, Teachers and sections and associated vital indicators), water supply (type and situation, coverage, demand and supply), road (type and length, coverage), extension services (personnel and population with access).

The data is collected, analyzed and annexed for each 55 weredas.

2.3. Limitation and Constraints of the Secondary Data

Though most of the necessary data were collected, only limited number of data was used in this report. Most of the data from different institutions on the same subject vary widely. Exaggerations and under estimations are common problem of all data sources. As a result, some of the aggregated data, for example averages, were not used in this report unless they have raw data. Most of the data from World Food Programme (though vital for this work) were not used due to extreme aggregation and lack of raw data from which indicators were calculated. On the other hand, most of the available data on livelihoods (including production, income and expenditure, wealth and poverty, food security and etc) employed qualitative survey methods which are inappropriate for quantitative secondary data analysis. However, excessive weighting, aggregation and regression models were used to arrive at the proximate quantitative information. Data from livelihood integration unit and Save the Children UK has such limitations. Furthermore, data was generally not available at wereda level. Most of the federal and regional government institutions aggregate their data either on the regional, federal and/or zonal levels. These data have limited applications to fulfill the objective of wereda level data needs. Most of the regional institutions particularly the health, road and water supply as well as the regional BoARD and pastoral institutions suffer from these deficiencies. In addition, limitation of data is critical on the newly added and recently separated weredas in Oromia, Somali and SNNPR. For wereda which lacks data for one or more indicators, regression model is fitted and data were extrapolated to fill the missing gaps. For separated weredas, number of kebeles and population densities was used to disaggregate data into meaningful proportions¹.

¹ Separated weredas are weredas which are split into more than one administrative weredas either from the same former wereda or relocated from other regions and weredas.

Some vital data are also lacking particularly infrastructure and service coverage, drop out rates, water supply point yields and road length and net works, basic morbidity data, family planning and other related curative and preventive health care services. Such indicators believed to have been obtained through comprehensive sample surveys and qualitative data collection techniques at household and wereda level. Information on saving and credit associations, and income generating schemes are inadequate. Most of the institutions do not record default rates, income growth of the beneficiaries, and associated vital statistics. Most of the data available in these institutions dwell on type and number of institutions, number of beneficiaries, aggregate capital, and related information which were inadequate to draw sufficient baseline outcome indicators. Furthermore, except limited number of institutions the data collection methods and approach is unknown. Therefore most of the data obtained from regional institutions (excluding regional education bureaus) were from annual reports and plans which lack both temporal and spatial dimensions. As much as possible however data from annual statistical abstracts of the institutions, published statistical information, studies and survey data were used to prepare this report

Except for education and road, data on SNNPR are for 2006. For Somali region, a number of information is lacking particularly on health staff statistics, gender disaggregated enrolment rate, veterinary personnel, etc. There are also a number of problems related to timing of data collection and availability of regional responsible staff due to extended meetings and field work. Institution and comprehensive environmental data of the all weredas are also inadequate. Institutional data particularly on human resources (except for Afar) region is lacking. Shortage of environmental data is also critical excluding those indicators extracted from WFP data sources (topography, rainfall, agro-ecology and tree cover). Despite such short comings, the report is rich in refined data and information consistent with the components of PCDP.

2.4. Data Gap Filling Methods

Some of the recently separated weredas and those added to PCDP in phase II have inadequate data². Most of the weredas were not included in the surveys of the livelihood studies of save the children UK or other institutions.. Other weredas also lack consistent and reliable data and information. This required organizing the same data from different institutions for different weredas. For most of weredas which lack information at all and recently separated weredas, a number of data gaps observed. Thus the lack of consistent data for most of the weredas required to employ different extrapolation and data gap filling methods. Some of the methodologies used in this secondary data survey are presented below.

A. Simple and Multiple Ordinary Least Square Regressions

This method was widely used to fill data gap in income, expenditure and livestock number estimations for weredas with no previous base studies and those which have no data at all. The estimation is fitted to the equation after testing its relationships with the estimated variable. The output of the estimation is checked against weredas with similar livelihoods using averages and other pertinent statistical methods.

The formula of the simple regression analysis is as follows

$Y_i = a + bX$, where Y is the estimated variable, b the slope and X the estimator (the independent variable).

² The weredas were separated since 2005. These weredas include Mi'o (from former Dire), Chinaksen, Hudet, Hargele, Nyangatom, Dasenech, Girja, Guradhamole (Somali and Oromia), Mi'eso(Somali and Oromia), Gola oda (Somali and Oromia).

The multiple regression analysis on the other hand assumes more than one independent variable;

$Y_i = a + b_1X_1 + b_2X_2 + b_3X_3 + b_iX_i$, where a constant, b_1, \dots, b_i are slopes and x_1, x_2, x_i are independent variables and y is the dependent or the estimated variable

The equation is used to estimate household income and expenditure for about 10 weredas in all regions. The income and expenditure of the households for about 42 weredas is estimated from livelihood survey of save the children UK. The data was collected using qualitative methods and livelihood approaches which need more weighting and averaging exercises to organize into administrative locations as well as to aggregate the data into more useful units. After converting these data, estimates were made for the missing gaps (weredas) by analyzing the data of the existing weredas.

According to the analysis, the household income and expenditure is a function of the number of livestock (TLU/capita) family labor (percent of economically active population in the family) then the estimated and adjusted income will have the following mathematical equation

Income= $1428.453 + (61.479 \cdot EAP) + (29.588 \cdot TLU/HH)$, where EAP is proportion of economically active population.

Similarly the household expenditure is estimated in two steps

a. $ADEXPEBD = 1913.378 + (9.414 \cdot TLU)$, where ADEXPEBD is adjusted expenditure, TLU tropical livestock unit

b. $ADEXPEBD = (220.443 \cdot FS) + (0.797 \cdot AdINCOME)$, where FS is family size and adINCOME is adjusted income

B. Weighted Average

This method is used to estimate household income and expenditure, food sources, and wealth categories. The method is used to bring all qualitative data together so that they have meaningful definitions and used readily for the intended purposes. The weighted household expenditure, income and food sources are also two steps exercise.

First: weight the income and expenditure as well as the food sources of the households by wealth categories

Second: weight figures developed in step one above by livelihood weights. The formula will be the following

Step 1: weighting by wealth category

Adjusted income= $(PVP \cdot IN/EXP \text{ of VP}) + (PP \cdot IN/EXP \text{ of P}) + (PMI \cdot IN/EXP \text{ of MI}) + (PBO \cdot IN/EXP \text{ of Bo})$

Where PVP, PP, PMI and PBO are percent or proportion of very poor, poor, middle income and better off households in the studied community, and VP, P, MI, Bo are very poor, poor, middle income and better off as well as IN/EXP is income or expenditure. This variable and formula was also used for weighting food sources of the studied weredas.

Step 2: Weighting By Livelihood

The figures calculated in step I were further recalculated to adjust for livelihood proportions as follows

$ADINC/EXP = Wt_p * INC_p + Wt_{L_{ap}} * INC_{ap}$, where Wt_p and $Wt_{L_{ap}}$ are weights for pastoral and agro pastoral households, INC_p and INC_{ap} are adjusted income of pastoral and agro- pastoral households respectively. Weighted wealth categories were also calculated using the same procedure.

C. RATIOS: ratios are used to estimate and disaggregate the population into weredas or sub weredas from estimated regional, zonal or wereda population. The population projection for all 55 weredas is made based on ratio methods as follows

$$Y_{Wt} = PW_b / PR_b * PR_t$$

Where Y_{Wt} is estimated population of the wereda for year t, PW_b base population of wereda t (for example 1994) , PR_b base population of the region (eg 1994) and PR_t estimated population of the region for year t

D. GROWTH RATES: this method is also used for estimation and adjusting some data. The geometric growth rate is used in this report.

$$G_t = G_o (1+r)^t$$

2.5. Data Analysis

The collected and adjusted secondary data are analyzed using regressions, correlations and other descriptive methods such as median and mean. Percentage distributions, ratios and others were used to aggregate data into meaningful components. As much as possible dis-aggregation of secondary data into categories such as regions, new and former weredas, pastoral and agro-pastoral weredas, and in few areas gender are used as dis-aggregation units.

Spread sheet, SPSS and MS-word processing software are used for analysis of the refined data. Finally, the data is interpreted and presented in bi-variate and multi-variate tables, graphs and figures.

The data collection was accomplished between May 23 and June 25 2008 in two rounds. The first round was collection of data from federal institutions including agencies, ministries, UN organizations, NGOs, and Oromia sector Bureaus. The data collection at this level was completed on June 1, 2008. The second step include collection of data from the regional sector bureaus of Somali, Afar and SNNPR The data collection at regional level extended for 20 days from June 5, to June 25 2008.

III. BACKGROUND TO PCDP AND PCDP INTERVENTION AREAS

3.1. Background to PCDP

Most of the lowlands of Ethiopia are inhabited by pastoral and agro-pastoral population³ who are heavily depended on livestock production. These areas cover more than two third of the landmass of the country and characterized by low access to economic and social infrastructure. The areas are also known for low and erratic rainfall of less than three months in a year. Despite many critical socio-economic and environmental variations that distinguish the lowland pastoral areas from the highlands, the dominance of pastoral and agro-pastoral livelihood systems with opportunistic farming are typical to the lowlands.

Above all the lowlands are vulnerable to many natural risks and man made calamities. Due to increasing population, devastating droughts and other natural shocks, many of life supporting systems in these areas are under continuous disruption. Pauperization in the lowlands is dynamic with deteriorating income, coping abilities and resilience of livelihoods. Declining number of livestock through emergency sales, and mortality has a direct impact on the survival of pastoral livelihoods. Drought kills as many animals with either shortage or fluctuation of rainfall from season to season. Increasing frequencies and depth of drought in these areas enhanced the dynamism of its impacts than in any part of the highlands which have easy capacity for resilience. For pastoral population who lost their cattle it might need more than three years to restock animals. Asset loss is also common and each year the pastoral lowlands comprise the largest proportion of drought affected population in need of humanitarian support.

For many years, the pastoral lowlands are devoid of meaningful access to infrastructure particularly roads that link these areas to the highlands and central market areas of the country. Within the lowlands accessibility through out the year is at stake and market and transaction of goods and services is difficult. Lack of access to markets also contributed to the vulnerability of the lowlands. Health and education infrastructure is not well developed and as a result morbidity is at the highest proportion. Literacy is less than 15 percent and the majority of school age children have no access to primary education. Water supply for both human and livestock consumption is the main constraint to development and improvement of livelihoods. Shortage of rains, typical characteristics of the environment, environmental degradation and population growth (both human and animal population) exacerbated shortage of sustainable water supply. The pastoral areas have a huge natural resources yet underdeveloped and unable to support livelihoods of its population.

Environmental degradation particularly over grazing, bush encroachment, deforestation, and in some areas soil erosion and salinization are threatening. Bush encroachment mainly caused by heavy overgrazing, lack of rotational grazing (mal distribution of water points), and increasing drought and in some areas control of seasonal bush burning is critical problem in many lowland weredas. Currently bush encroachment occupies the largest proportion of the Borena and Afar rangelands and a growing threat in the Somali lowlands.

³ According to the working definition of PCDP, pastoralism is said to exist when livestock production subsisting on natural vegetation, covers more than 50 percent of the livelihood needs of the population. On the other hand agro-pastoralism exists when the population depends (temporarily or permanently) on crop production and livestock covers less than 50 percent of the income of the households.

In view of these multi-dimensional socio-economic problems in the lowland pastoral areas, much efforts have not been in the last 50 years. Vulnerability to natural shocks is increasing though many human and animal lives could be saved than before. Drought still hampers livelihoods and kills many animals further increasing deterioration of assets and accelerating the pace of poverty.

The pastoral community development project, among many rural development programmes, was formulated to intervene in pastoral lowlands to reduce vulnerability, improve development opportunities and access to basic services, empowering pastoral communities as well as strengthening capacities of institutions active in pastoral lowlands.

Pastoral community development project was signed between the IDA (World Bank), IFAD and the government of Ethiopia in 2003 with the following major goals.

1. Improve livelihoods of pastoral and agro-pastoral areas through integrated and participatory rural development approach (including crop and livestock improvement, basic infrastructure; health, education, water supply, access roads, and other community projects)
2. Reduce vulnerability and exposure to major risks through improving the resilience and coping capacities of the population and livelihoods. This component also include traditional risk management and early warning systems and focus on development of sustainable resources that reduce exposure to root causes of major risks such as developing sustainable water supply points, and range management, as well as improved contingency planning.
3. Integrating other income generating activities that support main livelihood strategies and improve income, employment and reduce poverty and exposure to risks of the pastoral population. Income generating schemes that mainly focus on local resources, expertise, are fundamentally created by the choice of the community through free credits and loans forwarded by the project.
4. Above all developing participatory community driven development approach to the area to empower the community, improve sustainability, and human resource capacities in the lowlands, are the centerpiece of PCDP intervention principles. Institutionalization of this system was core to the PCDP intervention in the first phase of the project.
5. Research and study is part and parcel of the objective and component of the project to identify major livelihood gaps, major policies and strategies for the lowlands, and resource potentials of these areas. This component supports the sustainable development and smooth implementation of the project and helps to improve outcomes and impact of the project intervention.

The first phase of the project extended over the period of five years (2003-2008) with a total cost of 60 million USD contributed by the IDA, the IFAD, the federal government of Ethiopia, the regional states and the community. In the first phase, the project able to cover 30 weredas (later 32 weredas due to the separation of some weredas in to two) in Afar, Somali, Oromia and SNNPR. In total these weredas comprise over three million population. The project claimed to benefit almost one third of the communities (kebeles) in these weredas. Many water supply points (the majority birkas and ponds), animal and human health posts, a number of access roads, income generating schemes, capacity building activities (government institutions mainly local government and community), were accomplished.

The first phase of the project was completed in April 2008. Similar to the first phase, the second phase of the project will extend over the period of five years (2008-2013) with more or less similar component, donor contributions and project activities and intervention modalities. However there are some major changes in the institutionalization of some components of the project (particularly income generating schemes), assumptions of stakeholders duties and responsibilities, and linkages between stakeholders and institutions directly involving in the development of lowland pastoral areas of the country.

Three components are assumed in the second phase including

1. Sustainable livelihood enhancement: this component is planned and implemented by the community through close support of the mobile support teams to develop community action plans which later on budgeted and translated into action. The sustainable livelihood enhancement include two sub components
 - a. Community investment fund: the sub component includes funds for the construction, expansion and rehabilitation of primary schools, animal and human health posts and facilities, potable water supply points, small scale irrigation, access and feeder roads, and natural resources management
 - b. Rural livelihoods program: This sub-component will support the establishment of rural savings and credit cooperatives in beneficiary communities at *wereda* and regional level and the capacity-building of associated support services, and other actors, with appropriate modifications to respond to pastoral social and economic environments and characteristics. Support for establishing Pastoral Rural Savings and Credit Cooperative (RUSACCO) will be extended to both members of income generating grant beneficiary groups established under PCDP I and other members of the respective communities as well as to interested new groups in selected weredas (PCDP, 2008:12).
2. Pastoral Risk Management: this component is aimed at reducing vulnerability to risks and disasters in the lowlands and building coping capacities and improving resilience through harnessing local knowledge and experience and improving risk assessment and support strategies. The component has the following sub components
 - a. Pastoral early warning and response program. Collection of reliable early warning information, disseminating early warning results, accurate projection of onset of disasters and risks and building capacities to materialize these activities is the major objective of the sub component. It will be accomplished by the early warning and response department of the MoARD due to its extended structure from the kebele to the federal level. It also includes the preparation of contingency plans that could be implemented during disaster periods to save the assets and welfare of the population.
 - b. Disaster preparedness Investment fund: DPIP is the second sub-component of PRM that will identify community and *wereda* needs for long-term disaster preparedness and mitigation. The implementation of this sub-component follows identification of major disaster causes at *Wereda* level and preparation of long-term strategic investment plans that will be aggregated at regional level and integrated into a long term regional disaster preparedness strategy and prioritized investment plan. The Regional Pastoral Development Bureaus/Commissions with their respective *wereda* offices will own and coordinate the planning and implementation process with the technical and financial support of PCDP. These investments will include, inter alia (PCDP, 2008:15)

- ❖ Rural feeder roads,
- ❖ Improved water supply through the construction and rehabilitation of boreholes with distribution systems,
- ❖ Integrated watershed management,
- ❖ Micro dams/water harvesting systems
- ❖ Fodder banks,
- ❖ Flood control measures and
- ❖ Rangeland improvement.

3. Participatory learning and knowledge management

This includes pastoral areas research and strengthening networking, and developing methods for demand driven and participatory development approaches.

Financing modalities are also similar to PCDP I, though resources of some components will be channeled to other institutions which are more responsible and pertinent to accomplish with better efficiency. The total cost of the PCDFP II is also estimated at 110 Million USD financed by the IDA, the IFAD, the Federal government, regional states and the community.

Including the 30 first phase weredas, phase II PCDP intervention weredas extended to 57 weredas⁴. Of these weredas, 21 weredas are in Somali region, 14 each in Oromia and Afar region and the remaining six weredas are of Southern Nations, Nationalities and People region. These areas are estimated to account for over 4.4 million populations who are pastoralists and agro-pastoralists dependent mainly on livestock production. This makes the PCDP coverage areas to double both in terms of population and geographical areas. The details of the pastoral areas could be referred from the subsequent chapters of the report.

⁴ Though different documents indicated the PCDP II weredas as 57, only 55 weredas are covered in this survey.

3.2. Background to PCDP II Weredas

This survey, as briefly stated above, covers for 55 weredas located in Somali (21 weredas), Oromia (14 weredas), Afar (14 weredas) and SNNPR (six weredas). These weredas accounted for the vast proportion of the lowlands both in terms of area and population numbers. They are mainly inhabited by pastoralists who mainly dependent on subsistence production of livestock and agro-pastoralists subsisting on both opportunistic crop production and livestock husbandry. The weredas are characterized by high vulnerability (mainly to drought), erratic and unpredictable rainfall, arid and semi arid climate, low population density (but rapidly growing population). Typical to these areas, low access to infrastructure, substantial level of morbidity, illiteracy, low access to water supply and sanitation facilities, low income, high food insecurity and poverty, asset loss, and under developed market infrastructure. Livelihoods are subsistence and monetization is recently developing. Level of urbanization is less than 17 percent with little linkages with pastoral hinterlands.

The total area of these weredas is estimated at 233 thousand square kilo meters. Pastoral weredas of Somali region accounted for over 42 percent of the total area of all PCDP II weredas. Oromia and Afar accounted for 47 percent and six weredas of SNNPR for the remaining 11 percent of the area (CSA, 2007, WFP, 2008). The new weredas accounted for more than 36.1 percent of the total areas while the PCDP I weredas for the remaining 63.9 percent of the total area. Though data is not reliable the 55 weredas have 1378 administrative kebeles⁵ with average area of about 169 km² (more than 21 times larger than most of the highland kebeles). Over half of these kebeles are assumed to be agro-pastoral and the remaining half pastoral kebeles. Refer Table 1.

Table 1: No. of Weredas, kebeles and Area of Intervention Weredas

Indicators	Region				Woreda Type		
	Oromia	Somali	Afar	SNNPR	Former	New	Total
Total Kebeles	354	729	161	134	1040	338	1378
PCDP I kebeles ⁶	94	218	74	39	425	0	425
area(km ²)	81016	100041.6	27564.2	24369.7	148742.8	84248.78	232991.5
No. of Weredas	14	21	14	6	32	23	55
Area/woreda (km ²)	5786.8	4763.9	1968.871	4061.617	4648.211	3662.99	4236.21
Area/kebele (km ²)	228.9	137.2	171.2062	181.8634	143.0219	249.2567	169.0795

Source: WFP, CSA, regional BoFEDs, 2008

The majority of the weredas have an arid and semi arid agro-ecological zone with warm to hot climate. According to the data from World Food Program, below half percent of the surface area of the weredas experience an arid climate (berha) with mean annual rainfall of less than 600 mm and altitude of less than 500 masl. The temperature in these areas usually estimated at an average of above 35 degree Celsius. Almost 0.1 percent of the surface area of the new PCDP weredas falls within this agro-climatic zone. The arid agro-climatic zone mainly inhabited by pastoral population who mainly rear camel and goats and subsists on seasonal mobility with their animals. Crop production is rare irrespective of the volume and

⁵ Data for 8 weredas of Somali region (Debewein, Degahabour, Erer, Ferfer, Gura dhamole, Hargele, Hudet, and Mustahil) are not available.

⁶ This data is unreliable. Source Federal project coordination unit, PCDP

duration of rainfall in any one season. Seasonal mobility is common characteristics to cope up with critical water shortages and declining forage and browsing resources. Population density is extremely sparse and vegetation types are arid and semi arid bush and shrubs. Vegetation cover is rare and barren lands dominate this agro-ecology particularly at lower altitudes.

The semi arid climate (dry to wet kola) accounted for almost 90 percent with an average annual temperature of 30-35°C and rainfall of less than 900 mm per annum. The majority of the semi arid climate has relatively better vegetation cover, more or less reliable but inadequate rainfall, low population density, and rich livestock resources mainly goat and camels. Crop production is experienced in few areas either using seasonal rains or small scale traditional and modern irrigation systems. Millet and sorghum are major crops but with low yield due to unpredictable rains. Yet, livestock production is dominant life supporting production system. The area is inhabited by pastoral population with more or less temporary settlement. Almost 94 percent of the Somali and 97 percent of the Afar weredas fall within semi arid agro-climatic zones. About 87 percent of the area of the intervention weredas of Oromia have semi arid agro-climatic zone. While in SNNPR weredas this agro-climatic zone accounted for only less than 72 percent of the total areas of the weredas. It is also observed that 85.5 percent of the surface area of the new and 92 percent of the former weredas surface areas falls in this agro-climatic zone.

The third agro-climatic zone dominant in the lowland pastoral areas is the dry weina dega with annual rainfall of less than 1000 mm and a temperature of more than 20°C. This agro-ecology is dominant in Oromia and SNNPR rangelands. It covers in general about 8.1 percent of the total areas of the weredas. The ecology is inhabited mainly by agro-pastoralists, subsisting on crop production, relatively high proportion of sedentary agricultural population mainly producing cereals (maize, sorghum) and at the same time rear animals (cattle, sheep and goat as well as equines). 8.4 Percent of the total areas of the new weredas is weina dega agro-ecological zone. This agro-ecological zone has three major sub ecological zone: dry, moist and wet weina dega (mid altitudes). The dry weina dega accounted for almost two third of the weina dega zone and mainly dominant in the rangelands of southern nations, nationalities and peoples region. In Somali and Afar sub agro-ecology covers almost all proportion of the total areas the main agro-ecological zone. The moist weina dega zone is found in Oromia and SNNPR pastoral weredas. This sub agro-ecology constitutes 35 percent of the area of weina dega zone (the main agro-ecology) and covers 54 percent of Oromia and two third SNNPR weina dega zones. The wet weina dega zone accounted for only 1.1 percent and dominant in SNNPR pastoral weredas. Though livestock production is still play a major role in the livelihoods of the majority of the population, crop production is the main economic activity and source of food and income. Rainfall is relatively reliable, temperature is mild and the environment is hospitable to sedentary population. High population density and environmental degradation are common characteristics of the wet and moist weina dega sub agro-ecological zone.

The fourth major agro-ecological zone in the pastoral weredas is the highlands with altitude above 1500 masl and cool temperature of less than 20°C. Rainfall is more or less stable though there is significant fluctuation from season to season. Crop production is the main livelihood system for the majority of the households. Major crops are wheat, barley, maize and pulses. This agro-ecology accounted for about 2.2 percent of the total areas of the weredas. Less than half percent of the Oromia, 20 percent of SNNPR weredas surface area have highland agro-ecology. However in Somali and Afar regions it accounted for only 0.04 and 0.28 percent respectively. Of the total areas of the new weredas 5.9 percent is highland agro-ecology compared to 0.04 percent for the former weredas.

For details refer Table 2.

In general, of the total areas of the weredas over 90 percent are lowlands with altitude below 1500 meters above sea level, and less than one percent arid lowland below 500 masl. Highlands above 2300 masl accounted only for two percent of the area and mid altitude zones between 1500-2300 masl only to 2.2 percent of the total area. About 94 percent of the area of the new weredas falls under an altitude of less than 1500 masl.

Though all types of topographic features are found in the lowlands, the majority of the PCDP weredas have flat topography with dominant plains often used for grazing and browsing purposes. Recent estimates indicated that the average slopes of all 55 weredas are less than 2.8 percent. For the majority of the weredas in Somali and Afar regions the slope is on average about 1.75 and 3.35 percent. Similarly for Oromia and SNNPR the average slope is 3.69 and 3.18 percent respectively. In general almost two third of the pastoral weredas have a slope of below three percent, 22 percent between three and five and the rest 12 percent above five percent. The maximum slope is only 8.9 percent.(WFP,2008). Had it been adequate and prolonged rainfall, the largest proportion of the lowlands would have been water logged and suffer from excessive salinity, and large proportion of marshy areas.

The majority of these low-lying flat plains are devoid of sustainable water resources often watered by few major trans-boundary rivers such as Wabe Shebelle, Awash and Genale, Dawa and Omo. The largest proportion of the area of the pastoral areas is watered either from seasonal run offs and/or perennial traditional ground water sources. The vast plains are covered by bush trees usually used for grazing and browsing. Around the major river valleys and banks riverine land use system is common where families are agro-pastorals who dominantly use irrigated production of horticultural crops, maize and sorghum. This land use type is common in Somali region particularly in Kelafo, Gode, Chereti, Dolo Ado and Fik and Filtu. The average elevation of the weredas ranges between 869 masl. Over half of the weredas have an altitude of less than 800 masl. In general 20 percent of the weredas have an average elevation of less than 500, and slightly more than 58 percent have an average elevation of more than 800 masl (WFP, 2008). Except for Oromia region (1227 masl on average) weredas in Somali, Afar and SNNPR have an altitude of less than 800 meters.

The forces of environmental degradation are working rapidly against the livelihoods and wellbeing of the physical environment and the human population who have survived for centuries in harmony. Increasing population pressure, overgrazing local and global climatic changes and variability are major causes. Deforestation is rapid and most of the pastoral rangelands of Somali and Afar are rapidly deteriorating. Most of these lands lost their vegetation cover which once has a dense bushes and tree covers sustaining livestock and human population through out the year. Declining rainfall volume and seasonality have aggravated the potential loss of capacities of vegetation cover to revive. Over grazing due to livestock densities and human population further crippled the natural system of self replenishment of the environment. The result was bush encroachment, loss of bio-diversity of the rangelands, and a rapid change of micro- climate. Declining asset positions and general poverty lead most of the former pastoral households to pursue crop production as an alternative livelihood means. Encroachment to bush lands for crop production is now common irrespective of the suitability of the agro-climate and land use of the lowlands. Soil erosion is common in most areas. Losses of vegetation cover also lead to removal of top soil by wind in dry season which is the major cause of soils in the lowlands.

Currently, only five percent of the area of the weredas is estimated to have tree cover. Over 42 percent of the weredas have tree cover of less than two percent. Only one third of the weredas is estimated to have

tree cover above five percent. In pastoral areas of Afar and Somali the proportion of area under tree cover is estimated only to 2.4 and 1.4 percent. Oromia and SNNPR pastoral areas have however better tree cover estimated on average at 11.4 and 9.3 percent of the total areas of the weredas in these regions. In Somali almost 95 percent of the weredas have a tree cover of less than five percent and in Afar almost all weredas have a tree cover of less than five percent of their area. The proportion of weredas having under five percent tree cover for Oromia and SNNPR is however accounted for one in 10 and one in three weredas respectively (WFP, 2008). Though many factors contributed to loss of tree cover, livestock population and human population densities are the two most important determinants of loss of trees. These two factors contributed to about a quarter of the total loss of tree cover and have linear inverse relationship with the percentage of tree cover of a particular wereda. The regression analysis showed that for every growth of human and livestock density by 10 units per km², tree cover declines by about one percent (though not statistically significant)⁷. Therefore, the larger the density of human and livestock population, the lower is the area under tree cover. Survival on the production and transaction of charcoal and firewood rather assumed to contribute to the largest part of tree loss and environmental degradation, yet there is no adequate data to substantiate the argument. However, with increasing poverty in the lowlands, loss of assets and livestock over the last 30 years, exploitation of tree cover as a means of survival and alternative income source is expanding in all pastoral lowlands. Rough estimates showed that sale of charcoal and fuel wood accounted for almost 20 percent of the total cash income of the households.

Typical characteristics of the lowland areas are inadequate rainfall and its erratic nature. The lowlands have in general inadequate rainfall and mostly suffer from frequent drought and its consequences. According to the WFP (2004), the average annual rainfall in these weredas is slightly above 510 mm. Almost 50 percent of the target weredas have got an annual average rainfall of less than 538 mm. Of the total weredas slightly over one third has a mean annual rainfall of less than 400 mm. Areas enjoying above 750 mm accounted only for 15 percent of the total weredas. The Afar region enjoys an average of 426 mm while Somali region 431 mm. Average annual rainfall in Oromia is 749 mm and that of SNNPR is 500 mm per annum. Almost two third of Afar weredas, half of the weredas of the Somali region, half of weredas of SNNPR have mean annual rainfall of below 500 mm. Almost all pastoral weredas of Oromia region obtain more than 600 mm per annum. Though varying from place to place the pastoral weredas have two main rainy seasons. The largest area of the lowlands enjoys rainfall in the months of March to the end of May where the highlands enjoy small rains for cultivation of crops. The rainfall in this season determines the availability of forage for animals, supply of milk and milk products for human consumption and the continuation of normal livelihoods in the coming months. Changes in the volume and season of the rains in this period will result in critical shortage of food and forage for animals, and in some areas in migration of the people. The problem is critical in most of the inaccessible lowlands where support and institutional disaster mitigation and early warning systems are weak or non existent. In areas where crop production is part of the economic activities, shortage of rainfall in this season also has serious impact on food security and income of the households. The second major rainy season extends from June to September. This period has in general low precipitation. But it plays the major role in sustaining livelihoods particularly for forage production and productivity of animals. In general the Somali and Afar lowlands have the smallest and shortest rainy season.

Other sources of data (WFP, 2008) also indicated that only one and half months on average have a monthly rainfall of more than 100 mm. Half of the total weredas have less than one month with greater than 100 mm rainfall. Over a quarter of the weredas however enjoy a half month with more than 100 mm

⁷ The multiple regression model fitted for estimation take the form $Y_t = 6.666 - 0.014HD - 0.01AD +/_6.7346$

rainfall. Weredas with more than three months more than 100 mm rains accounted only for 13 percent of the total surveyed weredas. Almost all weredas of Afar and 95 percent of weredas of Somali region have less than two months with more than 100 mm rainfall. The percentage for Oromia and SNNPR on the other hand is 21 and 50 percent respectively. For details refer to table 2 and annex 1 and 2..

Table 2: Agro-ecological and Physical Characteristics of Target pastoral weredas

Indicator	Variable	Region				Wereda		Total
		Oromia	Somali	Afar	SNNPR	Former	New	
Elevation (masl)-weredas	<500	-	33.3	14.3	33.3	18.8	21.7	20.0
	500-800	-	28.6	35.7	16.7	31.3	8.7	21.8
	>800	100	38.1	50.0	50.0	50.0	69.6	58.2
Slope (%)-weredas	<3%	42.9	85.7	64.3	50.0	75.0	52.2	65.5
	3-5%	35.7	14.3	21.4	16.7	18.8	26.1	21.8
	>5%	21.4		14.3	33.3	6.3	21.7	12.7
Rainfall >100 mm(month)	< 3	64.3	100.0	100.0	66.7	100.0	69.6	87.3
	3-5	35.7	-	-	16.7	-	26.1	10.9
	>5	-	-	-	16.7	-	4.3	1.8
Mean Rainfall (mm)	mm	748.8	431.3	426.7	496.0	514.0	523.5	518.0
Tree cover	%	11.4	1.4	2.4	9.3	3.3	7.5	5.1
highland	%	0.1	0.0	0.3	20.0	0.0	5.9	2.2
Weina dega	%	12.3	6.2	3.0	8.1	8.0	8.4	8.2
lowland	%	87.5	93.7	96.6	71.9	91.9	85.5	89.6
Bereha	%	0.1	0.0	0.1	0.1	0.1	0.1	0.1
Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: World Food Program, VAM, 2008.

IV. DEMOGRAPHIC CHARACTERISTICS

4.1. Population Number and Growth Rate

The population of the pastoral lowlands is fast growing mainly due to migrations. According to the extrapolated data from CSA projections, the total population of the pastoral lowlands⁸ is about 4.5 million by the end of 2007. Of the total estimated population about 53 percent were males and 47 percent were females with a sex ratio of about 1.12⁹. In the last 15 years the population of the target pastoral lowlands increased by more than 41 percent, at an annual growth rate of about 2.7 percent. The proportion of urban population is however low and in the same year it was estimated at about 17 percent. Even though population growth is fast both in rural and urban areas, there is only slight growth variation between the two. However the rural population growth rate is only 81 percent of the urban population growth rate.

Furthermore, of the total population of the weredas in 2007, about 83 percent live in rural and 16.5 percent in urban areas. According to projections made from the CSA 1994 Population and Housing Census both rural and urban population grew by 40 percent between 1994 and 2007. Other things being constant, both the rural and urban population is expected to double after 26 years and by the end of 2033 the total rural population of the 55 weredas will be almost 7.3 million. In the same period, the urban population will reach

⁸ These are the lowland areas inhabited by the pastoral and agro-pastoral population below and altitude of 1500 masl. The word is used to denote that there are also weredas which are sedentary farming population such as Maji in the southern region.

⁹ Sex ratio is the ratio of males to female population.

1.6 million. In general the total population of all weredas by 2033 will be 8.8 million with average density of about 38 persons per km².

Of the total population in the target weredas, Somali region accounted for about 53.5 percent of the 55 weredas. Afar region accounted for only 15 percent of the population. Oromia and SNNPR accounted for 26 and 4.9 percent of the population in 2007. The urban population accounted for 16.5 percent. Of the total urban population, weredas in Somali and Oromia constituted over 91 percent. On the other hand the highest population growth in the lowlands is still observed in SNNPR and Oromia pastoral weredas. Over the last 14 years the population of these regions grew by 47 percent. In Somali and Afar weredas the population in the same period grew by 38 and 33 percent respectively. Assuming, the marginality and fragile environment as well as the limited actual resources of the lowlands current population growth is considered to be high and rapid. It is also expected that net migration is the single most important contributor to fast population growth than the natural fertility of the population.

Table 3 : Estimated Rural and Urban Population of the Weredas ('000), 2007

Description	Region				
	Oromia	Somali	Afar	SNNPR	Total
Total Population	1182.052	2402.799	680.149	219.398	4484.398
Male	601.808	1277.943	382.496	111.387	2373.634
Female	580.243	1124.854	297.651	108.012	2110.76
Rural Population	1022.308	1886.048	631.149	204.148	3743.653
Male	519.337	1007.239	354.4	103.493	1984.469
Female	502.974	878.811	276.75	100.655	1759.19
Urban Population	159.744	516.751	49	15.25	740.745
Male	82.471	270.704	28.096	7.894	389.165
Female	77.269	246.043	20.901	7.357	351.57

Source: Projected from CSA Population and Housing census 1994.

4.2. Age Distribution of the Population

Like in the highlands the population of pastoral lowlands is dominated by young age population. Over 49 percent of the population in 2007 was under the age of 15 years. Of the young age population (below 15 years), 27.5 percent were children below the age of five years. Women in reproductive age group comprises of about 46.2 percent of the total female population in all weredas. These groups are the sources of all natural fertility in the population and in need of focused services in terms of family planning, post and ante natal care, nutritional and adequate health care services. Economically active (the main sources of labor force in rural lowlands) accounted for about 49.5 percent of the population. The old age group accounted for the rest 1.9 percent of the population. Therefore, the dependency ratio is estimated at about 102 percent. Only 12 weredas have a dependency ratio of less than 100 percent and the rest 43 weredas have dependency ratio of more than 100 percent. Pastoral weredas of Somali region, on average have the highest dependency ratio (110%) On the other hand Afar and SNNPR have the lowest dependency ratio.

Table 4: Estimated population by vital age group ('000)

Age	Region				
	Oromia	Somali	Afar	SNNPR	Total
15-49 Female (urban and rural)	257.12	507.569	145.137	55.465	965.291
15-49 Female(Rural)	216.824	391.284	132.918	48.35	789.376
15-64 (urban and rural)	569.533	1162.969	351.239	119.118	2202.859
Male	282.943	603.067	191.596	58.746	1136.352
Female	286.591	559.899	159.643	60.37	1066.503
15-64 (rural)	478.741	899.421	321.721	105.841	1805.724
Male	236.464	467.963	175.131	53.501	933.059
Female	242.278	431.453	146.592	52.34	872.663
5-14 (Urban and Rural)	399.888	884.711	240.1	68.515	1593.214
5-14(rural)	357.178	708.049	226.661	64.56	1356.448
<5 (urban and rural)	181.87	318.256	76.295	26.933	603.354
< 5 (rural)	161.442	250.953	70.906	25.115	508.416
<15 (urban and rural)	581.76	1202.96	316.39	95.45	2196.56
<15(rural)	518.62	959.01	297.56	89.68	1864.86
> 64 (urban and rural)	30.76	36.88	12.5	4.82	84.96
>64 (Rural)	24.93	27.62	11.87	8.63	73.04

Source: Projected from CSA 1994 Population and Housing census.

The economically active population (age 15-64 years) accounted for 49.5 percent of the population. The distribution of economically active population did not significantly vary between regions and weredas. About 54 percent of the population of SNNPR pastoral weredas, 52 percent of Afar, and 48 percent of the population of the pastoral weredas of Somali and Oromia are economically active.

The rural active labor force on the other hand is 48.7 percent of the respective population. Most of these active population are engaged either on pastoral or agro-pastoral activities. Most of this labor force (active labor) engaged in pastoralism and agro-pastoralism. Only few of the households are employed in the service or non-pastoral activities. These group of population includes the ex pastoralists who join non-pastoral labor forces due to pauperization and internal conflict, the residents in urban and peri-urban areas consisting of most of the young age groups. The regional and wereda distribution of the age pattern of the population is presented in table 4- and annex 4.

In general the age pattern of the population in the 55 weredas is the manifestation of high fertility rates and characteristics of the fast growing population. Though data on fertility and mortality rates are not available at wereda level, the age distribution of the population indicated that fertility rate is more than mortality rates. As indicated in table below, the general fertility rate is 625 (i.e. more than six children per women) varying from region to region. Lowest fertility rate (GFR 496 children) is observed in SNNPR. Oromia has the highest general fertility (722 children per 1000). Afar and Somali has total fertility of 552 and 646 per 1000 reproductive age group women. Of the 55 weredas, 12 weredas have an average fertility rate of less than 500, and 30 weredas have a general fertility rate of more than 600 children per 1000 reproductive age women. General Fertility is also more than the total Fertility rate for all weredas. General fertility rate in rural areas in general is three percent more than the total general fertility for both urban and rural areas (642 per 1000) varying from 753 in Oromia to 448 in SNNPR. Refer table 5 below.

4.3. Household Heads and Family Size

There were about 611531 household heads in the 55 weredas in 2007. Of the total heads, 75.7 percent were males and 24.3 percent were female headed households. Furthermore, Somali accounted for about 39 percent of the households, Oromia 35, Afar 19 and SNNPR seven percent of the total households. In general, a typical wereda have on average 11112 household heads (8411 male and 2700 female headed households). Though data is unreliable pastoral households who depended on the livestock production accounted for 49 percent of the rural households, and 33 percent are agro-pastoral households who depend on crop and livestock production. Sedentary crop farmers accounted only for 18.6 percent of the households. Urban households mainly depend on petty trade of goods and services, catering, sales and distribution of manufactured goods, etc

The other demographic indicator is family size. Family size in general is a function of population growth, marriage and religious affiliation, social and cultural characteristics of the population, education and access to modern family planning services. The lack of access to these services, the dominance of Islam, and early marriage usually characterize the lowland pastoral areas which often resulted in the large family size. The calculated average family size in all weredas is about 7.62. Pastoral weredas of Somali region have the largest family size (about 10.4 members per family) and SNNPR weredas the lowest (five persons per family). Weredas of Oromia and Afar have an average family size of six. About 11 weredas have on average small size (less than five members per household), 19 weredas medium family size, and 25 weredas have large family size (more than seven members per family). Over 95 percent of weredas in Afar region have large family size where as in SNNPR none of the weredas have large family size.

4.4. Population density

Low population density is the main characteristics of the pastoral lowlands. The average population density for all 55 weredas was 19 people per km² with substantial variation between different regions. Pastoral weredas of SNNPR have the lowest crude population density (nine persons/km²); Somali pastoral weredas on the other hand have relatively high density of 34 persons per km². Oromia and Afar has a population density of 14 and 12 persons/km² respectively. The population density is highly correlated with aridity, altitude, volume of rainfall, and the proportion of pastoral and agro pastoral households.

Table 5: Number of Households, GFR, Density and Dependency ratio of the Weredas, 2007

Indicator	Region				
	Oromia	Somali	Afar	SNNPR	Total
Number of Households	213289	237523	116565	44153	611530
Sedentary	10971	91743	4791	5230	112734
Agro-pastorals	110337	36050	35405	18709	200502
Pastorals	91982	109730	76368	20214	298294
Female Heads	43393	45957	48124	11071	148545
Density (person/km ²)	14.5	23.4	24.7	9.0	19.0
Dependency ratio (urban and rural)	109.8	110.0	94.6	84.8	103.3
Dependency ratio (rural)	115.2	111.6	95.9	96.1	106.8
General Fertility Rate (urban and rural)	722.3	646.0	551.6	496.0	625.0
General Fertility Rate (rural)	753.7	653.7	551.8	547.6	641.6
Family Size	6.3	10.4	5.9	5.0	7.6

Source: Projected from CSA Population and Housing Census, 1994 and Regional BoFEDs.

4.5. Population Migration and Pastoral Movements

Data is inadequate on the actual population migration of the pastoral and agro-pastoral areas. But internal migration is a demographic dynamics which need no figure to substantiate the seasonal migration in the lowlands. The pastoral areas are vulnerable to various shocks which induce seasonal and internal migration within and beyond their boundaries. Shortage of water and grazing land and seasonal availability of these resources are the main determinants of seasonal migrations. Seasonal migration in search of water and forage for animals follows the rainfall regime and extends over a wide geographic areas and prolonged seasons. In most of the lowlands particularly those adjacent to international boundaries migration to as far as the main land Somali, Kenya and Djibouti is common particularly in prolonged drought periods which will have significant mortality effect on the livestock and human population. In most areas seasonal migration extends over the period of three to six months. Internal seasonal migration (within the boundaries of the weredas or within the larger pastoral lowlands), is common particularly where pastoral population is dominant. This type of migration constitutes for the over whelming majority of all migrations in the lowlands. Migration in almost all areas starts in the mid of dry season and extends until the onset of the main or small rainy seasons. This migration will include part or whole livestock and family members depending on the type of livelihoods, the length and depth of the drought. In normal to poor rains, only adult males and strong animals will migrate to areas that can support livestock for sometimes in the year. This type of movement is calculated and in group than sporadic family based migrations. Females and young children as well as milking cows, small ruminants, and weak animals are left behind often in fixed to temporary settlement areas. In agro-pastoral dominant lowlands, seasonal migrations are limited to nearest vicinity and only part of the livestock and family members are migrating. The dominance of crop production and fixed settlements, the small herd size limited agro-pastoral seasonal movements in these areas.

Such type of movements is the major causes of conflict between different ethnic and clan groups. During migrations, resources are shared among different ethnic groups either through negotiation with host community or by force and violence. However, in most the rangelands, this type of resource sharing is

dictated and managed by traditional institutions established to manage common resources and to solve conflict. Such institutions are efficient where resource sharing is between the same ethnic groups or clan of the same lineage. Common understanding and traditional bylaws are very active and manage most of the conflicts arising within the groups. Conflicts are however rampant between different ethnic groups where traditional common resource management and bylaws to mitigate conflicts are no more effective and efficient. These conflicts are very common between the Oromo and Somali, Somali and Afar, pastoralists. For details of the type and destination of pastoral and agro-pastoral movements readers are advised to refer to Livelihood surveys of Save the Children UK and PCDP baseline survey of the weredas in 2005.

V. LIVELIHOOD SYSTEMS¹⁰

The lowland areas are of diverse ethnic groups, environment and climatic condition which shape livelihoods and coping strategies. Shocks are fundamental and leading causes for the variation of livelihood systems in the lowlands. The arid climate, the changing weather conditions and lack of water and infrastructure are also contributing to livelihood variations and adaptive strategies. Considering these natural conditions, the population in the lowlands dwells on the production of livestock that thrives best to hostile environment for crop production and modern household economy. Thus unlike in the highlands, livelihoods and adaptive strategies are limited to very few economic activities. Three major livelihood systems are dominant in lowland pastoral areas, excluding urban economic activities: Pastoralism is a way of life where livestock production is dominant and a major source of employment, income and food as well as wellbeing of the population. Pastoral adaptive strategies to the environmental shocks include production of large number of livestock that adapt to the environment, production system and production constraints. Transhumant migrations or seasonal migration in search of water and forage for animals are fundamental to the sustainability and survival of pastoral livelihood system. Mobility is the major distinguishing characteristics from other forms of livelihood systems in the lowlands. Pastoral production system is limited by extremely changing weather condition, shortage of forage and water, market and market infrastructure, inadequate access to veterinary and human health services, declining areas of the rangeland (population growth, crop production and bush encroachment). The production system is often subsistence and relies mainly on its own production. Few surpluses are marketed mainly when drought is a serious threat to the survival of animals and human population. This livelihood system subsists 49 percent of the total rural population in the lowlands. Pastoralism is dominant livelihood system in Somali and Afar lowlands. In these regions pastoral livelihood system accommodate about 46 and 66 percent of the total population. In Oromia and SNNPR they account for 41 and 46 percent of the respective population. Of the total surveyed weredas, 31 weredas have a population of more than 50 percent dependent on pastoral livelihood system.

Agro-pastoral production system is the second economy subsisting the majority of the population pastoral lowlands. This production system is a recent introduction to the lowlands due to migrations, drought, forced and induced transformation of the pastoral system through pauperization, development policies and strategies. Agro-pastoralism, unlike pastoral livelihoods depends on both production of crops and livestock both for the market and own production. Since most of agro pastoral livelihood is transformations of pastoralism due to poverty and inadequate restocking, it is subsistence. Crop production is opportunistic and located around river valleys, moist and wet weina dega and highland agro-climatic zones of pastoral areas. Crops barely survive in the lowlands. Poor soil fertility, critical moisture stress, lack of inputs, lack of

¹⁰ Livelihood system is a broader concept. It includes a wide range of assets (financial, human, natural, physical, and social), policies and strategies, process and outcomes. The definition used in this report is simply related to the way people live and earn their income. Thus livelihood in this report is related to economic activities.

experience and knowledge, weak extension and support services, lack of access to irrigation all are major limiting factors. However agro-pastoralism is a rapidly increasing subsistence enterprise in all lowlands with considerable conflict with environmental sustainability and rangeland management. Though crop production is increasing in these areas, livestock production still subsist the majority of the population. Livestock production is subsistence but it is the main source of income and food. Agro-pastoralism depends on the production of cattle, sheep and goat, equines and poultry. The number of the livestock is however by much less than pastoral production system.

This livelihood system accounted for two third of the population in the 55 target weredas ranging from 15.2 percent in Somali rangelands to slightly above 52 percent in Oromia. Agro-pastoralism subsists 15 percent and 30 percent of the population in 35 weredas of Somali and Afar regions. Of weredas covered in this report 48 weredas have agro-pastoral communities in varying proportions. Only seven weredas have no pastoral population at all.

Sedentary farming is the third livelihood system. This only hosts less than 10 percent of the population and dominant in the major river valleys of Genale, Wabe Shebelle and Awash. Dolo Ado, part of Kelafo, Gode, Jijiga and Kebri beyah, Fentale and Chinaksen are some pastoral areas having some sedentary farming system.

Sedentary farming subsists 18.6 percent of the weredas and dominant in Somali, SNNPR, and Argoba wereda of Afar region. In four weredas, sedentary crop farming subsists less than a quarter of their population while in five weredas it is dominant source of income and food for more than 70 percent of the population.

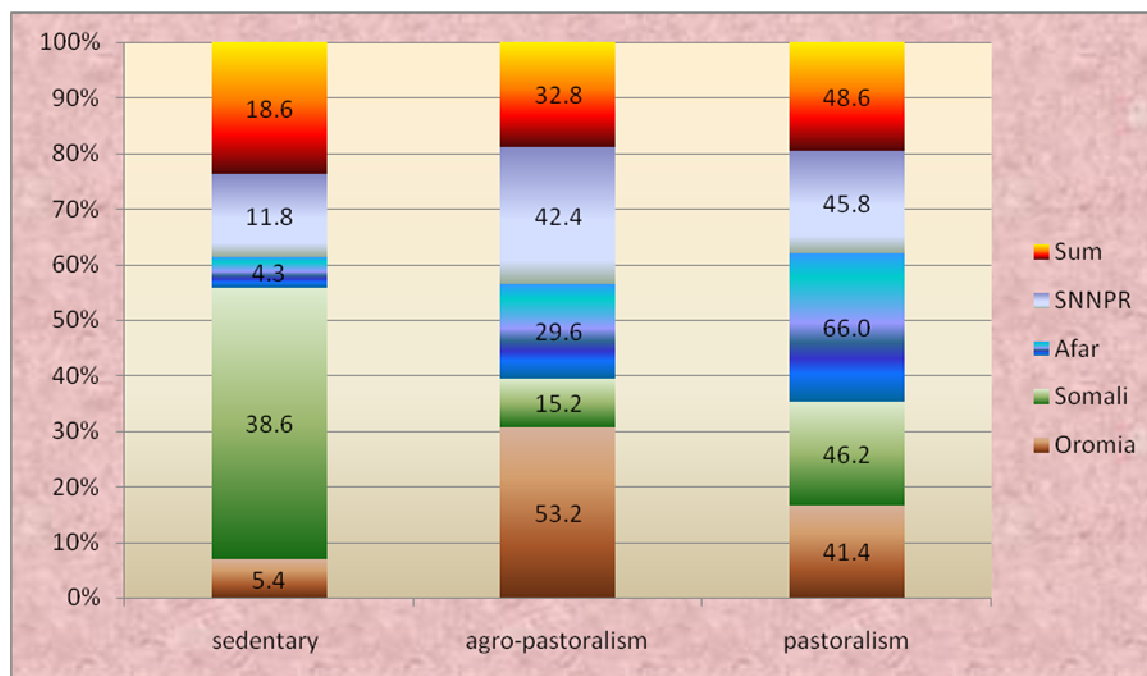


Figure 1: percentage share of major Livelihood Systems

5.1. Livestock Production

The lowlands of Ethiopia are rich in livestock population. Over two third of the population in these weredas subsists on production of different livestock species. Livestock are the main sources of income and employment, wealth and food. Unlike in the highlands the pastoral lowlands have accommodated the largest animal population per capita.

5.1.1. Number and Pattern

Yet livestock production is traditional and subsistence. Commercial production of livestock for markets, production of milk and meat are very limited and off takes as a result is small compared to the number of livestock in these areas. Consistent with the natural environment of the lowlands, a wide variety of livestock are produced by pastoral and agro-pastoral households. Cattle, sheep and goats, and camels are main animals reared by the pastoralists inhabiting the arid and semi arid lowlands. In the moist and dry mid altitudes almost all livestock species (except camels) are produced and integrated with opportunistic crop production.

The 55 weredas of PCDP II have about 19.4 million heads of livestock or 10 million tropical livestock units¹¹. Of there total heads of animals about 24 percent are cattle, 60 percent are sheep and goats and 2.5 percent are equines. Camel population accounted for about 13 percent of the total animal population in these weredas.

Cattle are mainly kept in large numbers for milk production, cash income and food. The number of these animals determines the status of the household in the community, security against natural calamities and above all they are sources of wealth and household wellbeing. Unlike in the highlands cattle population in the lowlands are dominated by female animals consistent with the need for milk production objective of the households. In agro-pastoral communities cattle are also reared for traction power. Most of the cattle breeds in the lowlands are local breeds but have relatively better production potentials and yields than highland breeds. Production and yield of animals however in general are low and subsistence. The major animal breeds in the lowlands are the Borana cattle (of the Borena, Laga Hida and Mada Walabu), the Kereyou cattle, Afar cattle and the Ogden cattle breeds. The Borena cattle breeds are assumed more productive relative to other cattle breeds in the lowlands of Ethiopia. Accurate estimates of production potentials of different cattle breeds in the lowlands were however not well documented.

¹¹ Tropical Livestock Unit (TLU) is an animal with a live weight of 250 kg. it is used to measure forage demand and supply. The standard used in this report is as follows: cattle 0.75, shoats 0.25, equines 0.80 and camel 1.25 TLU

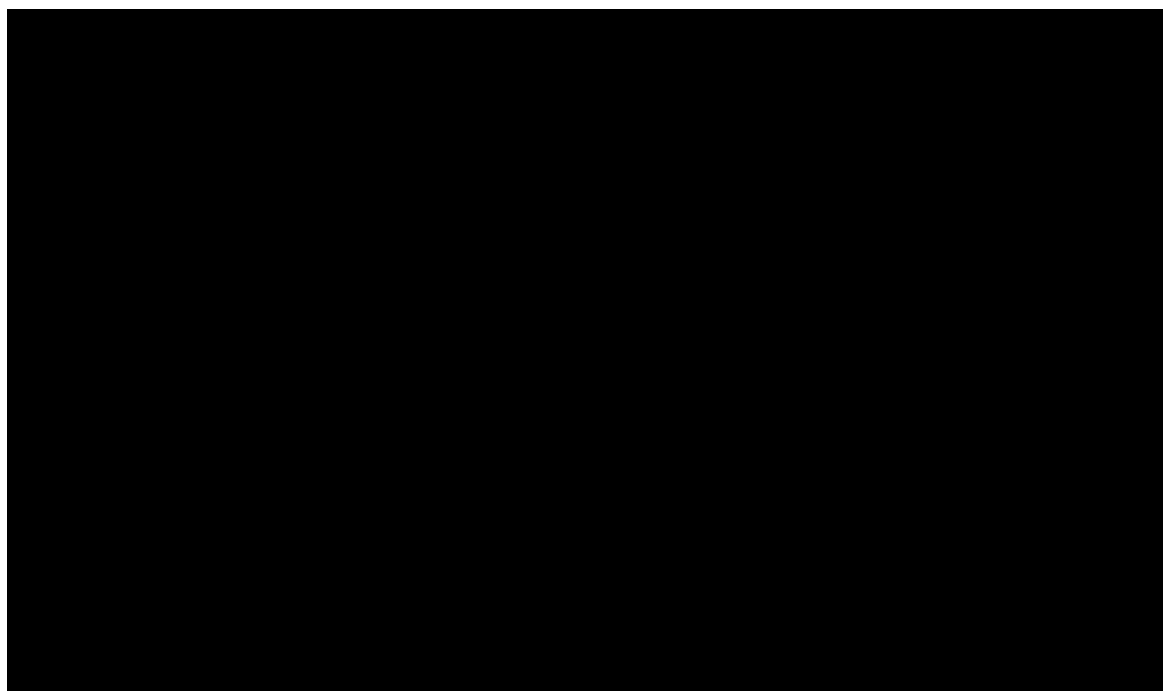


Figure 2: Livestock population (in heads)

Cattle production is the dominant source of cash income, food and wealth for both pastoral and agro-pastoral population. Except in sedentary farming areas the main objective of cattle production (mainly in arid and semi arid climate) milk production.

Of the total cattle population in the 55 weredas Oromia accounted for over 42 percent, Somali and Afar 23 and 21 percent of the total cattle population. SNNPR accounted for 12 percent of the cattle population. Furthermore, cattle accounted for the largest livestock population in Oromia region than other regions. In the region cattle constitute 47 percent (in heads) of the livestock population of the pastoral lowlands followed by SNNPR 41 percent. Furthermore the new PCDP weredas accounted for 49 percent of the total cattle population while the remaining 51 percent was the share of the former weredas. However the new weredas have an average of more than 1.3 times more cattle population per wereda than the former weredas of PCDP.

Table 6: Estimated Number of Livestock Population (in heads and TLU), 2007

	Region				wereda type		
	Oromia	Somali	Afar	SNNPR	former	new	Total
Cattle	2004575	1118697	1021574	582784	2429732	2297898	4727630
Shoat	1703907	6298159	2885843	775236	7719821	3943324	11663145
equines	240694	128573	73999	51044	317261	177049	494310
camel	351094	1761887	435049	281	1722191	826120	2548311
Total Heads	4300270	9307316	4416465	1409345	12189005	7244391	19433396
Cattle	1503433	839022	766182	437090	1822301	1723426	3545727
Shoat	425979	1574539	721464	193810	1929958	985834	2915792
Equines	192557	102860	59200	40834	253810	141641	395451
camel	438870	2202359	543813	352	2152742	1032652	3185394
Total TLU	2560839	4718780	2090659	672086	6158811	3883553	10042364

Source: Regional BoFEDs, 2008

The number of cattle in a particular season is highly correlated with the wealth status of the households and mainly determined by the availability of forage and water. Population pressure and encroachment of crop lands in the vast rangelands, currently threatened the availability of forage for animal production. With increasing frequency of drought in recent years the number of animals owned by the household is declining from time to time. Currently an average household in the surveyed weredas owned 19.5 TLU per household or 3.7 TLU per capita. The pastoral households have the largest animals per capita than the agro-pastoralists who have other alternative employment opportunities. Similarly cattle ownership per capita is larger in the new weredas. These weredas have almost twice as many animals per capita than the former weredas of PCDP. Almost two third of the weredas have an average cattle holding of less than three TLU/capita, 84 percent less than five and 98 percent less than 10 TLU/capita. The highest per capita cattle ownership is observed in Somali and Afar region (5 and 3.5 TLU) while Oromia and SNNR exhibit about 2.4 and 3 TLU/capita. The number of cattle is also highly correlated with elevation (altitude) and the amount of rainfall. As elevation and rainfall increases the number of cattle population also increases mainly due to relatively abundant water and forage resources. Accordingly, as elevation increases from less than 500 to more than 800 masl the proportion of cattle in these areas increases from 16 to 67 percent of the total livestock population.

Sheep and goat are the second largest component of animal population in the lowlands. They best thrive in drought periods than cattle or equine population. They are the main source of cash income and meat for pastoral and agro pastoral households. In some lowlands, goats are reared for production of milk mainly for household consumption. Sheep and goat accounted for about 60 percent of livestock heads in the weredas. Per capita ownership is also high and on average a household owned about 5.8 TLU or 23 heads of sheep and goats. In about 73 percent of the weredas, shoats accounted for more than one third of the total livestock population. Per capita holding of these animals is also high in Afar and Somali. In these regions per capita ownership of sheep and goats is about 6.4 and 4.6 heads.. Similarly 11 percent of the surveyed weredas have more than 10 heads of sheep and goat per household. Ownership of these animals also varies between different wealth categories. The better off, owned more sheep and goats compared to the poor and the middle income households. In the lowlands of Somali and Afar this variation is significant. In these regions the wealthy households owned on average more than 30 heads of shoats compared to less than 10 heads of animals by the poor households. Shoaat population in general is substantially large in the Afar and Somali lowlands. The two regions accounted for 79 percent of the shoaat population in the 55 weredas (54 and 25% respectively). Oromia accounted for 15 and SNNPR only seven percent of shoaat population. Furthermore, the ratio of shoats to cattle population is on average five ranging from merely one in Oromia to eight in Afar pastoral weredas.

Equines in the lowlands are rare. Only few households in limited weredas rear these animals. In general however, there were 494310 heads (395451 TLU) of equine population in the weredas, mainly dominated by donkeys. An average household have 0.81 heads of these animals. Oromia and Afar are leading in the number of equine population (49 and 26% respectively). Somali accounted only for 15 percent of the population while SNNPR 10 percent. Equines contribute significant role in transportation of goods and services next to camels.

Camels are dominant among all animals in most of the weredas. Of all surveyed weredas, camels are reared in 52 of the weredas. According to the estimates there were 2.5 million heads of camels (3.2 million TLU). Camel population accounted for 13.1 percent of the livestock heads. Somali accounted for 69.1 percent of the population. Afar and SNNPR accounted for the remaining 31 percent of camel population

(17 and 14 percent respectively). Ownership per household is about 5.57 heads for all weredas with substantial variations among regions. Camel holding per capita in Somali region is 9.4 and 4.6 in Afar region. Most of the Oromo pastoralists rear cattle and as a result an average household owned only 2.1 heads of camels. Camels are the major source of food, means of transport, and cash income. They thrive and reproduce best in arid and semi arid climate. They are best browsers and adapt to arid climate where water and fodder are the major limiting factors for livestock production. Camel milk production is a sustainable food and cash source for the majority of pastoral population in the Oromia and Somali regions. Camels are mainly reared by the pastoralists than agro-pastoralists.

Table 7: Vital Indicators of Livestock Production of PCDP II Weredas

Indicators	Region				woreda type		
	Oromia	Somali	Afar	SNNPR	former	new	Total
TLU/HH	12.47	25.44	19.38	15.48	20.28	18.40	19.51
TLU/Capita	2.42	4.98	3.45	3.00	2.65	5.21	3.72
Density (TLU/KM ²)	59.31	100.07	104.92	31.62	93.24	69.86	83.46
shoats/ capita (in heads)	8.15	33.37	25.04	18.36	26.50	18.29	23.16
shoats/household TLU	2.04	8.34	6.26	4.59	6.63	4.57	5.79
equines/household(heads)	1.03	0.74	0.57	1.09	0.83	0.79	0.81
camel/ household (heads)	2.10	9.39	4.57	0.01	6.29	4.36	5.57
camel to other animal ratio	0.20	0.80	0.55	0.00	0.59	0.36	0.49
shoat cattle ratio (heads)	0.90	5.94	8.00	1.43	5.71	3.26	4.69

Source: Calculated from Regional BoFEDs data

5.1.2 Animal Off take

Livestock production is traditional and subsistence. Commercial production for milk and meat is limited and in most areas non-existent. Animal feed and water shortages, poor market infrastructure, poor access to livestock extension services, poor veterinary infrastructure and high mortality rates are the most limiting factors for commercialization of livestock in the lowlands. Frequent drought also contributed to the adaptation of traditional subsistence livestock production in these areas.

Therefore off take rate is low for almost all types of animals. The average off take rate of animals was estimated at 50 percent including predation, mortality, household consumption, marketing and raids. Commercial gross off take is only estimated at 9.3 percent. Commercial off take ranges between 2.4 and 19 percent¹².

Commercial off take in general is a function of the number of animals owned, weather condition, and epidemiology and food security situation in a particular season. In good rainy seasons commercial off take is low while in bad season commercial off take increases. In general the calculated commercial off take rate of all weredas is estimated at about 7.9 percent. Commercial off take is the highest for Somali and Afar estimated at an average of 8.2 and 8.0 percent. In SNNPR and Oromia gross commercial off take is relatively low (7.9 and 7.6 respectively). The highest off take rate comes from the arid climatic zone with

¹² This information is calculated from the baseline survey of PCDP 2005 for 22 weredas of the project.

altitudes between 500-800 masl. Animal off take from this area is on average 8.1 percent compared to 7.8 in areas with altitude above 800 masl. Across the weredas 68.5 percent of the surveyed weredas have a commercial off take of less than eight percent, 28 percent between 8-10 percent and the rest two percent have an off take of more than 10 percent. In new weredas commercial off take is estimated at about 7.9 percent. In general commercial off take accounted for about 30 percent of the total off takes.

Table 8: Livestock Off-take rates (%) by region, altitude and rainfall regime

Indicators	Off take (%)	
	consumption	commercial
Region	2.9	8.0
Oromia	2.1	7.6
Somali	3.5	8.2
Afar	3.3	8.0
SNNPR	2.1	7.9
Rainfall (mm)	-	
< 500	3.5	8.3
500-800	2.6	7.8
>800	1.9	7.7

Source: extrapolated and estimated from the PCDP baseline survey of 22 weredas of 2005

Predation by wild animals is also considerable. In 2005 survey the proportion of predation by wild animals was 6.5 percent of the total livestock population, and 12.6 percent of the total off takes. Higher predation rate was observed in the Somali and SNNPR (7.5 and 12.3% respectively). Conflict on resources particularly grazing and browsing as well as watering points is the common characteristics of pastoral livelihoods. In dry seasons and less than normal years, trans-boundary migrations are practical coping strategies. Such migrations always entail conflict with host populations. Inter-ethnic conflicts on resources therefore resulted in significant level of both human mortality and raiding of animals and devastation of assets. Raiding due to conflict therefore accounted for significant proportion of animal off takes in the lowlands. It was estimated that, raiding rate is on average about 3.6 percent significant in Somali, and SNNPR. Estimates also show that raiding rate in Somali region was 10.1 percent of the total off take or 6.4 percent of the total livestock population in 2005. Off take in terms of household consumption was insignificant. The same source revealed that consumption at household level was only 3.8 percent of the total livestock population and 7.4 percent of the total commercial and non commercial off take. The highest domestic consumption of live animals was observed in Oromia and SNNPR.

5.1.3. Livestock Diseases

The pastoral and agro-pastoral lowlands in general suffer from poor access to basic infrastructure. Poor road and communication network, weak extensions and veterinary services, are typical characteristics of the lowlands. Shortage of animal forage and shrinking of open grazing and browsing lands, shortage of water, significant seasonal migrations within the vast lowlands are leading factors for spread of many endemic and epidemic livestock diseases. According to some studies, livestock diseases accounted for more than 50 percent of the total mortality in the lowlands (Coppock, 1990). With dwindling forage

resources and supply of water, particularly in dry and bad season the spread of diseases increases and mortality rate reaches the highest proportion.

Irrespective of the location and agro-ecological zones of the lowlands, reinderpest, blackleg, pasteurolosis, camel diseases, bovine and ovine Pleuropneumonia, and other are the major killing diseases. Tick, various worms, flees and others are the main endo and exo- parasites with significant effect on animal health and productivity. The variability of climate, critical shortage of water and forage exacerbate the spread of diseases and parasites. Seasonal migration from place to place, both within the lowlands and sometimes to neighboring countries also create conducive environment for the sporadic out break of epidemics in the lowlands.

Though there are significant improvements in the availability of veterinary facilities in the lowlands in recent years, access to veterinary services in these areas is still incompatible with the growing incidence of diseases and animal population. Veterinary infrastructure is inadequate, lack qualified personnel, veterinary equipment and logistics, and even standard animal health facilities. Compared to the available livestock resources the supply of veterinary services and access of the population is more than inadequate. Medical supplies are rare and in most areas not consistent with epidemiology of these areas. Lack of communication and road network also constrain vaccination campaigns. In general, most of the livestock population in these weredas has inadequate access to modern veterinary services.

It is estimated that there were about 5.4 million veterinary livestock units in the 55 weredas¹³. The number of veterinary facilities in these weredas on the other hand is estimated at 161 consisting of 83 veterinary clinics and 78 vet posts constructed by the government and non-governmental organizations in the last 30 years. Of the total veterinary facilities 67 percent are located in Oromia and Afar regions (35 percent and 32 percent respectively). The remaining 33 percent were located in Somali and SNNPR regions. Of the 55 surveyed weredas four have no vet facilities at all, the majority in Somali region¹⁴. Refer for details table 9 and Annex 7. Furthermore the former PCDP weredas accounted for 69 percent of the vet clinics and 73 percent of vet posts. The distribution of the vet facilities is also incompatible with the number of livestock population. For example, of the total; VLU in the weredas 44 percent are in Somali region, 21 percent in Afar, 28 percent in Oromia and the rest seven percent in SNNPR. Compared to the available VLU in these weredas, the average number of animals per veterinary clinics and vet posts was about 154154, and 77321 VLU per vet post. In general an average veterinary facility in the lowland weredas serves about 109468 veterinary livestock unit. Average theoretical veterinary service coverage in these weredas is therefore estimated at 38 percent varying from 32 percent in weredas of Somali region to 61 in SNNPR. There is also significant variation in access to veterinary services among the weredas. About 41 percent of the weredas have theoretical coverage of less than 20 percent and 24 percent of the weredas have more than 50 percent. In general more than 72 percent of the livestock population in the lowlands has inadequate access to veterinary facilities. Furthermore there are extreme variations in access to physical vet infrastructure among the weredas. As indicated above almost four in 10 weredas have less than 20 percent coverage, one in 10 have more than 100 percent physical coverage. Another 19 percent have less than 10 percent and 35 have a theoretical coverage of between 20 and 50 percent. Beside critical shortage

¹³ Veterinary Livestock unit is used to measure the adequacy of animal health services. One VLU represents 100 chickens, 10 shoats, 2 cattle and a camel

¹⁴ These weredas include Girja(Oromia), West Ime, Hudet, and Gura dhamole in Somali region. West Ime is a former wereda of PCDP and expected to have at least vet post. Due to lack of data nothing has been said. Hudet also lack data as the wereda is new both to the PCDP and the region.

of vet infrastructure in the weredas, most of the health posts have no staff, equipment and poorly funded and equipped.

The major problem of the vet services particularly development of vet infrastructure and its efficient use is the sparse population density, the vast geographic area, poor infrastructure and the livelihood system that maintains the majority of the pastoral and agro-pastoral population. In these areas, increasing number of vet physical infrastructure does not mean increasing access to veterinary services. Fixed settlement pattern is not available in the vast lowlands except in peri-urban, river valleys and where there is significant practice of crop production. In other areas, the population is either mobile or temporarily settle depending on the availability of water and forage for the animals though return migration is common once or twice per year. On the other hand since population density is very low (particularly in arid lowlands), most of the physical infrastructures (including veterinary facilities) are under utilized for most part of the year. The vast geographic area of both kebeles and weredas also constrain the efficient utilization of the infrastructure. On average a density of vet facilities in the lowland is only one per 2469 km² which is almost over 300 times more than the area of kebeles in most highlands. Further analysis of the density also revealed that only a quarter of the weredas have one vet facility below 500 km², and 20 percent of the weredas above 3000 km². As indicated above most of the veterinary facilities in the lowlands are ill staffed. The number of veterinary personnel currently serving in the 28 weredas (excluding Somali and SNNPR) was about 579 consisting of six veterinarians, 89 assistant vets, 67 vet technicians and 417 animal health workers¹⁵. Excluding Somali and SNNPR, livestock vet personnel ratio is about 16911 VLU. Over 29 percent of the weredas have a ratio of more than 20000 VLU. Similarly, a veterinarian livestock ratio is 905322 and vet assistant animal ratio is on average 61033. In general the theoretical veterinary health personnel service coverage in all weredas is only 58 percent¹⁶. The lack of adequate logistics and vet equipments, lack of transportation and inadequate road net work, and generally the livelihood systems in the lowlands constrain the efficient use of both physical structures and human resources.

Table 9: Veterinary Services and its Covariates

Indicator	Region					rainfall (mm)		
	Oromia	Somali	Afar	SNNPR	Total	< 500	500-800	>800
Mortality rate (adjusted %)-	23.4	33.0	30.7	24.3	29.1	29.4	30.5	18.0
Theoretical vet coverage (%)	33.3	31.7	41.9	61.3	38.0	29.9	48.5	23.1
Animals per vet personnel (VLU)	20435	-	13387	-	16911	19996	15189	18442
Area/ vet facility (km2)	1837	4115	1055	2197	2469	3186	1941	951
VLU per vet facility (VLU)	68436	195416	63347	48145	109468	161173	65338	48876
Animals per clinic(VLU)	152358	195416	147609	48145	154154	195952	120926	72225
Animals per vet post(VLU)	954804	-	591618	-	1546422	269607	1111713	165102
vet clinic (no)	17	34	13	19	83	36	44	3
vet post(no)	39	-	39	-	78	23	51	4
Total vet facility (no)	56	34	52	19	161	59	95	7
Total Livestock ('000 VLU)	2560.8	4718.8	2090.6	672.1	10042.4	5658.2	3963.6	420463
Total vet personnel (no)	273	-	306	-	579	136	421	22
Animals per DVM (VLU)	171640	-	86086	-	128863	130825	128209	.
Animals per vet assistant (VLU)	20525	-	51996	-	35631	61298	28027	13761
Personnel Vet coverage (%)	213	-	230	-	113	56	174	102

Source: Extrapolated from Regional BoFEDs data

¹⁵ Data on vet personnel was not available for Somali region and SNNPR.

¹⁶ Vet personnel service coverage equals [(DVM*20000)+(VA*13500)+(VT*6700)+(3500*AHW)]/VLU

Due to shortage of vet facilities, inadequate vet personnel, shortage of logistics and other necessary vet equipment, animal mortality rate is significantly high. Animal diseases accounted for the majority of animal mortality. The regressed mortality rate for the 55 weredas is about 29.1 percent, mainly consisting of calves, and sheep.. The density of vet facilities and livestock mortality rates has also weak correlation. In weredas where vet facility density is less than 500 km², animal mortality rate is 29 percent, and where a vet facility serves, more than 3000 km² of area mortality rate is 26 percent. This is partly related to inefficiency of the existing vet service delivery system and its strategies. Furthermore in new weredas mortality rate is about 26.3 and former PCDP weredas about 30 percent. In general animal mortality rate due to diseases and associated factors is significant in Afar and Somali region. In Oromia and SNNPR mortality rate is approximated at about 23 and 24 percent respectively.

5.2. Crop Production (Sedentary Farming)

Sedentary agriculture has been started in most of the lowland pastoral areas in the 1980s. These households were either once pastoralists or urban dwellers who started farming along the river banks and some areas with suitable soils and rainfall. The majority however, in all regions are pastoral households who lost their cattle through conflict and drought or both. In general, crop production is practiced in very few areas of pastoral lowlands and it is an economic activity of poor households in most areas.

In Somali region the Gode, Mustahil, part of Warder, Dolo Ado, part of Chereti. Jijiga and Kerbri beyah and pocket areas of Shinile hosted some of the agro-pastoral and sedentary farming population. In this region, riverine farming systems along the Shebelle River, Genale and partly Dawa areas are common. Major crops produced are maize and sorghum, vegetables and fruits. In some moist mid altitude zones for example Jijiga wheat and barley as well as pulses including ground nuts were produced. Most of Oromia pastoral areas are agro-pastoralists with little variation in the magnitude of crop production. Fentale, Wadera, Sawena and partly Dire weredas are crop producers combined with livestock rearing particularly cattle.

Crop production, where conditions are suitable, is undertaken once per year following the main rainy season in April to June in most of Somali and Afar lowlands. Crop production, like in the highlands is generally traditional and subsistence undertaken by few households who have inadequate experience and access to improved farm practices and inputs. The amount of production and land under crop production is also increasing with increasing poor population and introduction of farm practices in the lowlands by the government. Currently most of the rangelands which have been used for seasonal grazing by pastoral households are under crop and almost all major river banks are transformed into crops. Crop production is also unsustainable. Most of the households produce crops as the only means of survival rather than sustainable way of life. Currently it is also a source of conflict on land use and communal resource management.

Data on the yield and area is lacking for almost all surveyed weredas¹⁷.

Crop production is however known to increase from year to year. The available secondary data shows that the volume of production increased by 11.3 percent per annum ranging from 15.8 percent in Somali to six

¹⁷ Area under crop in these weredas is not available at all. Data from CSA covers only few weredas of pastoral areas and aggregated on zonal level and hence not usable either through extrapolation or other means.

percent in Oromia. Extensive crop production based on seasonal rainfall is therefore the dominant form of crop farming. Extreme weather variability, poor soil fertility, lack of access to improved farm practices and inputs, lack of experience and extension support services are critical limiting factors to crop production

The main crops produced in most of the pastoral areas are maize, sorghum, ground nuts, vegetables and fruit crops and in rare cases pulses and oil seeds.

Maize and sorghum accounted for the majority production. Maize and sorghum are the major staple crops and the most adaptive crop varieties in arid and semi arid climate. Most of the sorghum and maize varieties are indigenous cultivars with low productivity but high adaptability to moisture stress, pests and diseases. They are planted with the onset of the main rainy season extending from April to June and harvested in the months of August and September. Early maturing varieties are lacking and with shortage and mal-distribution of rains the yield of the crops is declining sharply and in most areas farmers tend to feed their animals with extension of drought periods. In riverine areas maize and sorghum production is supplemented by traditional or modern irrigation though the proportion of households using this farm practices is very limited. Gode and Dolo areas of Somali regions are known for such type of cropping practices. Yet limited knowledge in both rainfed and irrigated crop production limited the potential production of the crops in almost all lowlands

Wheat, barley and pulses are produced in moist woina dega zones where moisture is relatively allowing the production of crops. The largest producers of wheat, barley, and pulses are pastoral weredas of Oromia region and part of Jijiga wereda of the Somali region.

Vegetables and fruit crops are largely produced in weredas with perennial rivers particularly along the river valleys of Wabe Shebelle, Awash and Genale rivers. The largest producers of horticultural crops are the Somali region dominated by riverine livelihood systems.

Yield of crops is also determined by the amount and distribution of rainfall, soil types and access to improved farm practices such as irrigation and farm inputs. In general however crop yields in all lowland areas is low. Per capita production of crops is also increasing with increasing cultivated land and volume of production.

Table 10: Estimated crop production in PCDP II weredas (metric ton)

year	Region				Total	Wereda Type	
	Oromia	Somali	Afar	SNNPR		Former	New
1995	61943	13139	5322	20623	101027	39709	61318
1996	77476	20957	6621	21961	127015	52653	74362
1997	55509	15867	8193	18325	97894	41742	56152
1998	67989	17280	4037	21022	110328	44600	65728
1999	72750	32789	4660	18601	128800	59320	69480
2000	82056	31772	4867	24653	143348	63027	80321
2001	77482	29279	4607	21361	132729	58636	74093
2002	55190	38633	2432	16626	112881	57421	55460
2003	82975	47802	7145	25342	163264	79217	84047
2004	108358	81361	17033	25128	231880	122822	109058
2005	126208	64080	20760	37063	248111	119339	128772
2006	100841	72020	13089	31095	217045	110923	106122
2007	142401	71076	33446	38904	285827	141027	144800
Total	1111178	536055	132212	320704	2100149	990436	1109713
Share (%)	52.9	25.5	6.3	15.3	100.0	47.2	52.8
Annual Growth rate (%)	7.18	15.1	16.55	5.43	9.1	11.14	7.4

Source: WFP/Vulnerability Analysis and Mapping, 2008. Soft copy

Between 1995 and 2007 per capita production of major crops in the 55 weredas of PCDP has been increasing by 6.1 percent annually. Per capita production in Somali region is growing faster than other regions. Annual growth rate in weredas of Somali region is about 9.2 percent between 1995 and 2007. Similarly growth rate for Oromia region is about 4.1 percent followed by Afar and SNNPR. Compared to the 210 kg crop demand to sustain an individual in rural areas, the volume of production obtained in the last 12 years is adequate to feed only a quarter of the population. Similarly over the same period coefficient of variation in per capita production is significant due to differences in potentiality and significant fluctuation of rainfall and total production in almost all weredas. The same data source indicated also that, 86 percent of the weredas have produced less than half of the total food requirement of an individual and four percent of the weredas have produced more than a benchmark of more than 210 kg per capita in the last 12 years (WFP, 2008). Coefficient of variation for all weredas is about 69 percent. Even though per capita production is low and fluctuating wildly from year to year, the majority of the pastoral households depended on milk and milk products. Crop production constitutes almost one third of the total food needs. Thus considering the dependence of the majority on own production of milk and milk products low per capita production will not necessarily be the indicator of food shortages. However in bad years milk and milk products dwindle and almost all households (both pastoral and agro-pastoral households) depended on either purchase or own crop production. In this period the decline in both crop and livestock production has critical impact on the wellbeing of the households.

In summary, crop production is a growing enterprise in the lowlands with declining number of livestock, asset depletion and pauperization of the pastoral population. It is traditional and low yielding supported by weak extension services, knowledge and experience. Crop production is rain-fed and its yield and volume of production is determined by the onset, amount and distribution of rainfall. In all lowlands rain-fed crop production is a risky business and sometimes it is the cause for environmental degradation in view of its extensive production systems, moisture stress, poor soils and poor farming practices. It is also a source of

conflict in many lowland weredas between the pastoral and agro-pastoral households, sedentary and mobile population. Crop production is the most important source of conflict and at the same time cause for shrinking of seasonal grazing lands.

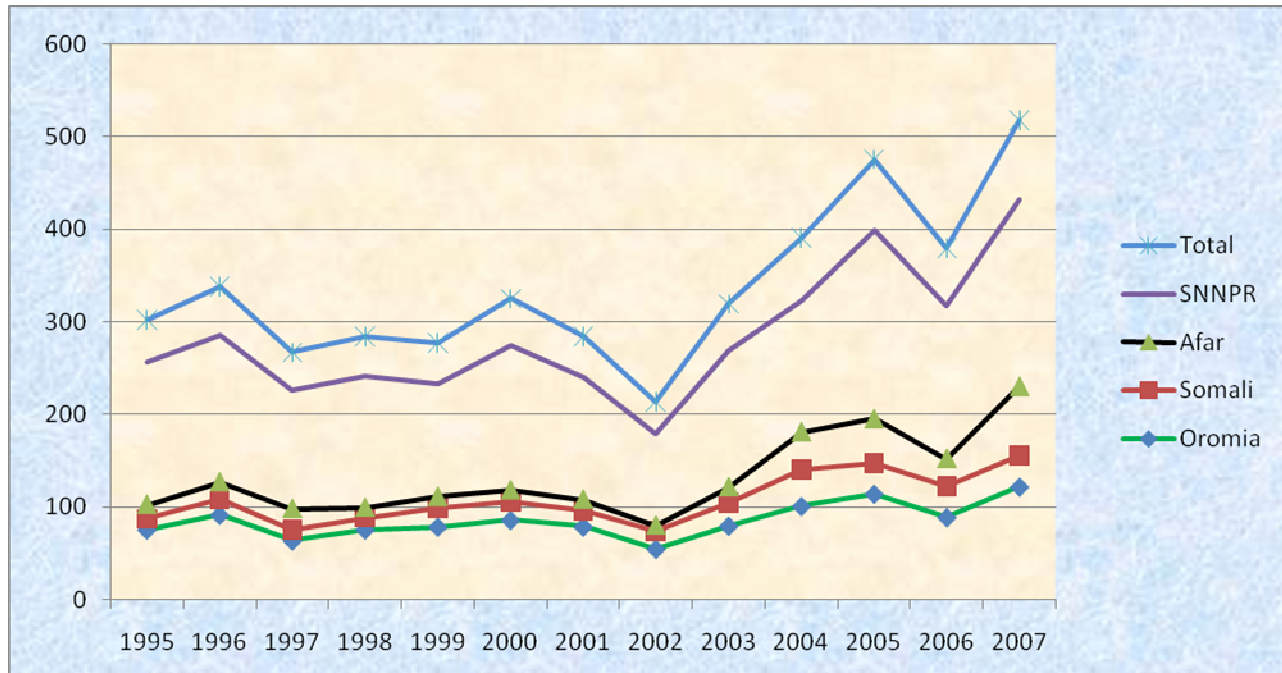


Figure 3: Per Capita food production In Pastoral weredas

5.3. Household Income and Expenditure

The main characteristics of the pastoral economy is traditional and subsistence livestock rearing, opportunistic crop production and limited off farm or non-pastoral activities. Commercial livestock production and crop husbandry is either non existent or very limited to pocket areas. Market and market infrastructure are weak and terms of trade is mostly against the pastoral population. Extension services and modern production system are merely available. Drought and conflict and other natural and man made calamities also limited the monetization of the pastoral economy. As a result, pastoral population tend to rear as many animals as possible to cope up with various socio-economic and environmental problems rather than dynamic transformation into commercial livestock production. Cumulative effect of the traditional and subsistence livestock production is limited access to cash income and declining animal productivity with increasing vulnerability of households to shocks. Cash expenditure is also limited by low level of cash income and subsistence economy. This chapter briefly deals with cash income and expenditure of the pastoral and agro-pastoral households in the surveyed 55 weredas.

5.3.1. Cash Income of the Households¹⁸

Cash income in pastoral areas is a function of the number of livestock owned by the household, family size and the level of dependence of the households on the market to fulfill their basic necessities mainly staple food crops, clothing and other basic needs. However for both pastoral and agro-pastoral households the main source of cash income is sale of live animals and animal product. With declining number of animals owned by the household cash income in general declines by significant level. Live animal sales accounted for almost two third of the total cash income of the households. For pastoral households livestock sales accounted for more than 80 percent of the total annual cash income.

Sales of animal product are the second largest source of cash income particularly for pastoral households. Sales of animal products accounted for 16 percent of the total cash income. This source includes milk, honey, ghee and butter. Skins and hides production and marketing is however limited. Animal products (as source of cash income) are dominant among the pastoral communities who rear large number of animals than agro-pastoralists who depend on crop and livestock production and some non-pastoral activities. Compared to the estimated volume of production in the lowlands the proportion of sales or marketed surplus is low. The dependence of pastoral and agro-pastoral households on milk and milk products for food and the subsistence nature of livestock production are the major reasons for low level of marketable surplus. The volume of sales also increases with good rains and increasing number of livestock ownership by the households. A simple regression analysis shows that income increases by 590 birr (from this products) as the number of animals generally increases by 10 TLU/hh. Similarly, a growth of animals by 10 TLU per household entails a 240 birr cash income increase from animal products. However, the income from milk and milk products is highly volatile with weather conditions in a year. In bad years, most of the milk and milk products are consumed by the households while in good rainy season more milk products will be sold out as the main source of cash income.

Crop sales are the third income source of the households. Crop production is the dominant form of income and food for the poor households and agro pastoralists. The pauperization of pastoralists from year to year enhanced the rapid transformation of the population into opportunistic farming of maize, sorghum, fruits and vegetables. Crop production in general accounted for 8.4 percent of the total income of the households. This income source is also dependent on the amount and duration of rainfall, access to irrigation and the soil type. Most of the crops produced by the households are also consumed at home. The dependence of crop production on seasonal rainfall in general contributed to unsustainable, volatile and low cash income. The income from crop production, unlike in the highlands, is not correlated with the size of land holding, as land is not a constraint in most of the lowlands. The proportion of cash income from crop sales is almost similar in all pastoral regions except SNNPR (about 13% of the total cash income, attributed to inclusion of the crop producing sedentary farming wereda of Maji). In other regions it ranges from 7.5 percent in Somali to 8.3 percent in Oromia rangelands

¹⁸ The cash income of the households was recalculated and readjusted based on the 2004/05 livelihood survey of Save the Children UK and DPPA. The adjustment for weredas for which data is not available and for the former weredas regression analysis is used considering the number of animals owned by the households. Thus the data is an updated version of the 2005 survey weighted against livelihoods and wealth groups in two step processes.

Table 11: Sources of Cash Income in Pastoral Areas, 2007

Source	Region					wereda type	
	Oromia	Somali	Afar	SNNPR	Total	Former	New
Fire wood	3.1	4.8	1.6	1.2	3.4	3.5	3.2
Animal sales	60.9	57.6	61.4	66.9	59.8	59.2	60.6
Wage labor	9.9	4.8	19.4	0.6	9.6	10.9	7.7
Animal product	15.6	24.5	2.9	17.5	16.5	16.2	16.9
Crop sales	8.5	7.5	7.7	13.3	8.1	8.7	7.0
Mining	1.8	0.0	0.0	0.0	0.4	0.4	0.4
Others	0.3	0.6	3.7	0.2	1.3	0.8	2.0
Petty trade	0.0	0.2	3.4	0.3	1.0	0.3	2.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Derived from Save the Children UK. Livelihood Study 2004 and 2005

Non-farm activities (non-pastoral) are limited in the lowlands. Labor based daily wage income is limited in urban areas and generates some income for the households. The labor based income, i.e., wage labor accounted for 10 percent of the total household cash income. It is the main source of income for agro-pastoral and poor households. Wage labor, unlike in the highlands, have no correlation with the number of household members in all pastoral areas. However, this income source is dominant in weredas with high urbanization level, sub humid crop farming and riverine livelihood systems.

Other income sources also include transfers (gifts, traditional mining, and others). This source accounted for about six percent of the total income of the households. Among this category of cash income sources, sale of fire wood accounted for the largest proportion (over half of the cash income from the source). Sale of fire wood and transfers are the main cash income for the poor households than the middle and better off. Sale of fire wood is also dominant among the Oromo and Somali pastoralists and agro-pastoral population. In other regions the proportion of cash income from this source is less than two percent of the total cash income.

Sources of income also vary between wealth groups. Livestock and livestock products are the major cash sources for other better off and middle income pastoral households. Sales of crops, mining, petty trades transfer, on the other hand are the major source of cash income for the poor pastoralists and agro-pastoral households.

5.3.2. Magnitude and Income Inequality

The average cash income of the households in the surveyed weredas was estimated at about 4820 birr with significant variations between weredas, wealth groups and livelihood systems. The average cash income of the household in general is a function of number of livestock holding than land or other assets. With increasing number of livestock the amount of cash income earned by the household also increases. The relationship between the number of animals and the cash income is therefore direct and positive for all weredas and households. For example with increasing livestock holding per household from less than 10 to more than 30 TLU, cash income per household increases from 4373 to 6212 Birr.

The average cash income of the weredas in general is modest compared to most of the highlands of Ethiopia owing to better weather condition in the past five years. Though there is inequality between wealth groups the pattern of income distribution is smooth. In general, 18 percent of the weredas obtain a cash income of less than 3000 birr varying from none in Somali to 100 percent in SNNPR pastoral weredas. The next income group between 3000-4000 birr per annum accounted for 11 percent (29% for Afar, 4.8% for Somali and 7.1% for Oromia region). Those who obtain an income of 4000-5000 birr per annum accounted for almost one third of the weredas consisting of almost half of the weredas of Somali, 29 percent of weredas of afar region and 21 percent of Oromia pastoral weredas. The highest income group (more than 6000 birr/annum) accounted for 18.2 percent of the weredas in the four regions. On the other hand, 74 percent of the new and 60 percent of the former PCDP weredas earn cash income of more than 4000 birr per year.

Income distribution in pastoral areas however characterized by significant inequalities between regions and weredas, livelihoods and wealth groups depending on the potentialities of the production system, environmental conditions, asset holding and population density. The average cash income of the Somali weredas is more than twice that of the SNNPR weredas, and 20 percent more than the income of the Oromia pastoral weredas. The income of the fifth quintile is 3.5 times more than the first, twice more than the second and 1.5 times more than the cash income of the third quintile.

There are four wealth groups qualitatively identified by different studies in the pastoral areas based on number of animals, land holding and other characteristics distinguishing one community from the other. These include wealthy (better off), the middle income, the poor and the very poor (destitute households). The income of this group of households significantly varies from one another by source, and amount of income. On average the better off households earn 7944 birr per annum while the destitute households about 567 birr. The wealthy in the Somali pastoral lowlands on the other hand earn an average income of 8412 while that of Afar about 9295 birr. Similarly the poor in Somali pastoral areas earn 3789 while that of SNNPR about 1333 birr. In general, there is significant income inequality between different wealth group and at the same time within the same groups. The income of the wealthy (for all weredas) is 14 times more than the very poor, 2.7 times of the poor and 1.5 times of the middle income groups. Within the regions, weredas of Oromia region have relatively low inequalities. In this region, the income of the wealthy households is 5.6 times more than the income of the very poor, 2.8 times the income of the poor and 1.6 times the income of the middle income group. Significant income inequality on the other hand is observed among the Somali pastoral lowlands. In this region, the income of the better off household is 97 times more than the income of the very poor, 2.2 times of the income of the poor and 1.3 times the income of the middle income group. In Afar and SNNPR, the income of the wealthy is 14 times larger than the poor households. On the other hand the very poor of Oromia pastoralists earn 16 times more income than the Somali very poor and 2.1 times more income of the Afar very poor households.

Table 12: Income and Income Inequality of PCDP II Weredas

Wealth Group	Region					wereda type	
	Oromia	Somali	Afar	SNNPR	Total	Former	New
very poor (no)	20046	1829	9357	0	31232	20412	10820
Poor(no)	40419	79576	31989	8000	159983	95161	64821
middle income(no)	68350	137708	77176	12889	296123	182084	114039
better off(no)	111523	176644	130131	18667	436965	245726	191239
Inequality (Rf: wealthy) ¹⁹							
very poor	5.6	96.6	13.9	0.0	14.0	12.0	17.7
poor	2.8	2.2	4.1	2.3	2.7	2.6	3.0
middle income	1.6	1.3	8.2	0.0	9.5	8.9	10.5
Income groups (% wereda)							
<3000	14.3	-	14.3	100.0	18.2	18.8	17.4
3000-4000	7.1	4.8	28.6	-	10.9	12.5	8.7
4000-5000	50.0	19.0	7.1	-	21.8	21.9	21.7
5000-6000	21.4	47.6	28.6	-	30.9	21.9	43.5
>6000	7.1	28.6	21.4	-	18.2	25.0	8.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: extrapolated from 2004/2005 Save the Children's UK Livelihood Study

5.3.3. Household Cash Expenditure

In almost all pastoral areas cash expenditure is a function of income which on the other hand is a function of number of animals owned by the households. The average cash expenditure of households in the 55 weredas is estimated at about 4277 birr. Somali region have the largest average household cash expenditure than other regions. In this region average cash expenditure is 5462 birr. SNNPR pastoral wereda has the smallest cash expenditure (2382 birr). Oromia and SNNPR weredas on the other hand have a cash expenditure of 3761 and 3853 birr respectively.

Due to the subsistence nature of the pastoral economy, the largest proportion of cash expenditure of the households is on basic necessities. The major household expenditure categories are staple food, non-staple food, clothing, inputs, household items, transfers and others. Staple food expenditure includes purchases of food items including maize and sorghum and other basic consumables food items. Non-staple food expenditures on the other hand include purchases of sugar, coffee, tea, salt and condiments. Social services on the other hand include expenditures on education, health, socio-cultural network (relationships) such as wedding, funeral, holydays, etc. Transfers are the social network and coping strategy of pastoral communities and extended to the poor in cash or in kind in times of bad years. These cash expenditure is dominant among the better off households.

These household expenditure categories could be grouped into two basic groups for easy analysis. The basic expenditures include staple and non-staple food expenditures, water and clothing and the non-basic expenditure categories includes outlays on social services, transfers, household items, and others. The basic expenditure accounted for 60 percent of the total cash expenditure of the households which is a typical expenditure behavior of subsistence household economy where vulnerability and poverty are

¹⁹ The wealthy is a reference group and represents the numerator in the equation. Thus the income of the wealthy group is weighted against the income of other wealth categories.

dominant socio-economic problems. Of the total basic expenditures food related expenditure accounted for about 78 percent while non-food expenditures for about 22 percent. A typical household in the lowlands have a per capita expenditure of 207 birr on basic necessities. Of the total non-basic expenditure (36 percent of total household expenditure) 19 percent was on social services, while 81 percent for transfers and other outlays.

Poor households usually expend more of their income on basic necessities and of this over 80 percent is on food and related items. Wealthy households are more or less self-sufficient and dependent on their own production. As a result food cash expenditure is less than that expended by the poor and middle income groups.

Table 13: Expenditure category of Households: PCDP II weredas (%)

	Region					wereda type	
	Oromia	Somali	Afar	SNNPR	Total	Former	New
Gift	2.1	1.9	0.4	0.0	1.5	1.5	1.5
Tax	1.9	4.0	0.0	0.0	2.4	2.7	2.1
Cloth	15.2	12.9	15.7	0.0	13.3	13.4	13.1
Social services	8.6	8.7	6.4	0.0	7.6	7.8	7.4
Inputs	12.2	8.6	3.1	0.0	7.6	7.5	7.8
Household Item	18.7	12.2	19.0	0.0	14.5	15.3	13.5
Non-staple food	18.1	28.7	12.3	55.0	24.2	23.2	25.4
stale food	19.8	16.0	34.5	37.6	22.4	21.6	23.4
water	0.3	0.2	0.0	0.0	0.2	0.2	0.1
Other	3.1	6.8	8.4	7.4	6.4	6.9	5.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: extrapolated from Livelihood assessments of Save the Children UK/DPPA, 2004/2005.

The other way of categorizing expenditure is investment and non-investment expenditures. Investment expenditure is usually small in pastoral areas. Very few households expended for example on restocking, agricultural inputs, and others. The main component of investment item in the lowlands particularly among the pastoral households is purchase of durable household items such as utensils. Very few households invest on inputs such as improved seeds, fertilizer, farm implements and others. In general investment cash expenditure accounted only for 22.1 percent of expenditure of the households. Of the total investment expenditure two third is on household items and the remaining one third on inputs. Investment on inputs is higher for agro-pastoral than pastoral households. On the other hand investment on household item is larger for pastoral than agro-pastoral households. In general, about 47 percent of household expenditure is on staple and non-staple food items, over 13 percent on clothing, 15 percent on household items and the rest on taxes, transfers and others.

The income and expenditure ratio, on the other hand, is 1.15, a proxy indicator of low cash savings potential of pastoral households. The income expenditure ratio is the highest for Afar and Oromia region (on average 1.30 and 1.24) the lowest for Somali (1.1) and less than one for SNNPR weredas²⁰. Typical

²⁰ The income expenditure ratio is a proxy indicator of saving potential of the households. For 21 percent of the weredas the ratio is less than one (indicating more expenditure over income), and for the rest 79 percent it is one or more (expenditure is either equal or less than income).

characteristics of these weredas is that dominated by agro-pastoral households (in crop producing areas), have highest number of livestock units per capita, relatively high level of urbanization (better access to markets) and relatively large population density. Cash saving in general for all weredas is only 15 percent of the total cash income. Furthermore, cash expenditure is 87 percent of the cash income.

Table 14: Expenditure Groups, per capita and Average expenditure of PCDP II weredas

Indicator	Region				Total	wereda type	
	Oromia	Somali	Afar	SNNPR		Former	New
Basic expenditure (%)	53.4	57.8	62.6	92.6	60.0	52.9	53.6
Non-basic expenditure (%)	46.6	42.2	37.4	7.4	40.0	47.1	46.4
Investment expenditure (%)	29.8	20.8	22.1	0.0	22.1	22.7	21.3
Consumption expenditure (%)	69.1	79.2	77.9	100.0	77.9	77.3	78.7
Food expenditure (%)	38.0	44.7	46.9	92.6	46.6	44.8	48.9
expenditure/capita (birr)	603	689	466	440	583	537	648
Average expenditure(birr)	3751	5452	3853	2382	4277	4095	4531
Expenditure group (weredas %)							
< 3000	28.6	0.0	42.9	83.3	27.3	34.4	17.4
3000-5000	57.1	28.6	28.6	16.7	34.5	31.3	39.1
5000-6000	14.3	52.4	21.4	0.0	29.1	25.0	34.8
>6000	0.0	19.0	7.1	0.0	9.1	9.4	8.7
Income expenditure ratio (%)	124.1	106.8	130.2	88.9	114.6	124.3	102.4

Source: Extrapolated from Livelihood survey (2004/05) of Save the Children UK.

5.4. Non-pastoral activities and diversification of livelihoods

Opportunistic crop production and livestock husbandry are the two major sources of income and livelihoods in all lowlands. The two sectors rely heavily on the duration, volume and distribution of rainfall. Unreliable rainfall is common characteristics of the lowlands with significant negative effect on the productivity of animals and crops as well as income and employments. The repeated episode of drought and associated risks are the main reason for pauperization of the pastoral population. Over the last five decades the ecology, demographic pattern and the poverty situation in the lowlands have been significantly changing. Main livelihood support systems are deteriorating with occurrence of shocks and population growth. Currently, productivity of the rangelands unable to feed animals human population. Crop production is expending but unstable with changing weather condition. Despite the rapid deterioration of livelihoods in the lowlands, adequate efforts have not been made to diversify the livelihoods and strengthen coping abilities and resilience of pastoral economy. Recently introduction of non-pastoral activities and diversification of employment have been started by the government and some NGOs particularly in provision of affordable credits to agro-pastoral and sedentary households. But lack of markets, knowledge and experience, poor entrepreneur capacity in the majority of the lowlands restrain the viability of the credit and saving schemes.

According to the data of federal and regional RuFIPs, there were 38 saving and credit cooperatives in 12 weredas. The cooperatives have a total of 2053 founding members of which 49.3 percent were females. Current number of members of the cooperative is incomplete for the majority of the weredas. The total capital of the cooperative is also estimated at 235991 birr (including registration, donation and paid up capital) The total saving of the cooperatives was also estimated at 483160 birr. In general the saving cooperatives have low capital and saving. The over all capita per founding members was 115 birr. Saving

is also estimated at 235 birr per capita. The proportion of loan disbursed and the number of credit beneficiaries however is unknown due to incomplete data. Refer Annex 21.

5.5. Food Security, Food Sources and Poverty

The food security of households in pastoral areas depends on the number of the animals they owned, the asset position and above all the weather condition that determine the availability of water and forage for the animals. In good rainy seasons, in most of the lowlands food security situation is better with better productivity of the environment and the animals. With changing weather conditions to worse, particularly the shortage of main rainy season which mainly extends from April to the end of June, the whole pastoral areas face critical shortage of forage, water and food. In this period most of the households migrate with their animals within the same lowland regime or to the neighboring regions and countries. Better small rainy season between September and December however revive the vegetation cover, fodder availability and supply of milk and milk products. For agro-pastoral households who mainly depend on food crop production, slight change in volume and duration of rain is devastating. The failure of rains in the two periods however ends in havoc and significant human and animal sufferings over extended period of time as easy re-bounce to normal is very difficult.

Furthermore, the limited opportunities to income and employment in the lowlands are the main reason for vulnerability of most of the pastoral and agro-pastoral households. Only few households have access to non-pastoral activities. Lack of experience outside pastoralism also limited diversification of income and employment in various economic activities. Poor access to information and network and general marginality of the lowlands also limited economic linkages between the crop surplus main highlands and the food deficit lowlands. Poor marketing infrastructure and services also limited the flow of goods and services. Extremely increasing prices of food commodity and declining animal prices in dry seasons and drought period affect the wellbeing of the poor pastoralists who already suffer from the dual social and economic problems. Terms of trade, in most years is negative for the pastoralist and favor crop producers and middle men.

The major sources of food for the pastoralists and agro-pastoralists is own production of animal products and crops, purchases, food aid, transfers and in few weredas wild foods. About nine percent of the food needs of the households in the surveyed 55 weredas come from food aid, and one percent from transfers. This food sources are dominant among the agro-pastoral and poor households. Afar and Oromia pastoral areas are more dependent on food aid than other regions. Of the total food sources, food aid accounted for 14 and 10 percent of the annual food needs of the households respectively. In Somali and SNNPR, it accounted for six and five percent of the food requirements of the households. The proportion of food from this source increases with increasing shocks such as drought, flood, pests and epidemics.

Livestock product in almost all areas is the main source of food. The sustainability of this food source however heavily depends on the number of the animals and the weather condition in a particular season. With declining number of animals, forage, water and shortage of rains households tend to shift the food sources to other alternatives such as purchases by selling out their animals and other assets. However, livestock products are the main sources for almost all households. It is also the food sources of the wealthy households than the poor and middle income groups. This food source accounted for slightly over 28 percent of the total food needs of the households varying from 19 percent for Oromia, to 35 percent for Afar pastoral areas. For Somali and SNNPR this food source covers 32 and 22 percent of their food needs. .

Own crop production is another food source particularly for the agro-pastoralists. This food source accounted for 20 percent of the total food needs of the households. In Oromia weredas, it covers 31 percent of the food needs. In weredas where agro-pastoralism is dominant the proportion of households obtain food from own production rises by significant proportion. The proportion of food needs covered from own production is 16, 13 and 27 percent for Somali, Afar and SNNPR respectively. This source is the most unreliable and volatile in most areas changing with the changing weather condition. Most of the crops produced are also sold to market in good seasons to supplement income from livestock and non-pastoral activities.

Purchases are another major food sources which mainly depends on the price and access to market as well as income of the households. Purchases accounted for 41 percent of the food needs. Pastoralist households depended more on purchases to supplement their food from animal products. The proportion of this food sources increases with shocks when both crop and livestock production are affected by failure of rainfall, pests and epidemics as well as price shocks. Somali and SNNPR pastoral weredas are more dependent on purchases than Oromia and Afar pastoral areas. In Somali and SNNPR purchases accounted for 46 and 44 percent. In Oromia and Afar it covers 38 and 36 percent of the total food needs of the households respectively. In general, as income increases from less than 3000 to more than 6000 birr, food purchases increases from 36 to 44 percent of the total food needs. Furthermore, the poor households seem to depend less on food purchases than the middle income and wealthy households.

Transfers accounted for one percent of the food sources. Transfers are the main food sources for the poor households who lack adequate cash income, livestock or land to produce crops. For these households this food source accounted for three percent of the total flow of food. The middle income groups obtain less than one percent of their food from transfers.

In general, proportion of food from aid declines with increasing income and poverty levels from about 10 percent for the poor to 6.4 percent for the better off households. Wild food is another food source for the poor households in times of disasters and covers about 1.1 percent of their food needs. Similarly own crops, though covers substantial food needs of all households it comprises one third of the food needs of the poor households compared to 12 percent for the wealthy households. In summary all food sources in the lowlands is highly unsustainable and dependent on the productivity and number of livestock, weather condition and the volume of crop produced. The absence of meaningful employment opportunities and diversification of income and employment further exacerbate the dependency of pastoral households on these unsustainable food sources. Access therefore depends on the volume and distribution of rain than income.

In general chronic and transient food insecurity is the major socio-economic problem of the lowlands. Environmental degradation, climatic variability, asset depletion, frequent conflicts, poor infrastructure and marketing services, poor linkages between the urban and pastoral areas, as well as between the surplus producing highlands and the lowlands, low level of urbanization, lack of diversification of income and employment, traditional subsistence livestock production systems, poor access to basic social services such as water, veterinary and human health services, high illiteracy and poor access to appropriate extension services are the deriving force for chronic vulnerability and food insecurity in the lowlands particularly among the pastoral population.

Table 15: Food Sources of the Households in PCDP II weredas (%)

Source of food	Region				Total	wereda type	
	Oromia	Somali	Afar	SNNPR		Former	New
Food Aid	9.6	5.9	13.9	4.7	8.8	8.2	9.5
Purchases	37.5	45.9	36.2	44.4	41.1	39.5	43.4
Animal Products	18.5	31.8	34.5	22.3	28.1	27.4	29.0
Own crop production	30.7	16.1	13.4	26.8	20.3	23.2	16.3
Wild food	3.4	0.0	0.0	0.6	0.9	0.9	1.0
Transfers	0.3	0.7	2.0	1.3	1.0	1.1	0.8
Total	100	100	100	100	100	100	100

Source: Extrapolated from Livelihood Study of Save the Children UK (2004/05).

Poverty is another manifestation of food insecurity and vulnerability. Though there is no detail account of the poverty situation in the selected lowland weredas, qualitative information collected by various non-governmental organizations, particularly save the children UK, revealed that poverty level is significant in almost all weredas. Poverty situation is seen in terms of wealth characterization of a particular wereda based on the criteria set for identification of wealth groups. In pastoral communities wealth is defined in terms of the number and type of animals owned by the households though there are also cases where social network is also important. In agro-pastoral communities, wealth is a function of cattle and ox and land holding as well as cash income. Social and cultural values and networks also have significant contribution in characterization of the wealth groups. However in general the number of animals is fundamental to the wellbeing of the population. The number and type of animals are determinant and qualifying criteria. Households with more camel and goat are wealthier than those with cattle or sheep. Similarly, as the number of the animals increases the coping and adaptive ability of the households' increases. Resilience is easier for the households with large number of animals than the poor who have few and limited type of animals. For these households restocking is very difficult unless traditional resource transfer systems are in place. Most of the poor households and agro-pastoralists who depend on crop farming currently are in one way or another are those who lost their animals through repeated shocks.

According to the qualitative survey of Save the Children UK²¹, the poor and very poor households accounted for 43 percent of the households in the 55 pastoral and agro-pastoral weredas who mainly depended on transfers, few animals, and crop production. This group of households constitutes 51 percent of Oromia, 43 percent of Afar, 36 percent of Somali and 28 percent SNNPR pastoral and agro-pastoral households. Middle income group accounted for 39 percent of the households. The proportion of these households accounted for 34 percent in Oromia, 36 percent in Afar, 42 percent in Somali and 48 percent in SNNPR.

The wealthy households who have large stock of animals, adequate access to food and other assets constitute 22 percent of households in the lowlands. In Somali almost a quarter of the households consider themselves wealthy relative to their community and in Afar it accounted for 23 percent.

²¹ The main problem of this method (wealth ranking) is on the concept and practices of what the wealth constitutes in different communities. Each individual member always compares himself with his community members. What he owned defines his status within the same community and members of that community. The wealthy in one community could be a poor in other community. Therefore, there is no universal benchmark to categorize individuals in different communities either as poor or wealthy. Due to lack of other alternatives this definition is used in this report.

Apart from the number of animals owned, the wealthy households obtain about 14 times more income than the very poor, 2.7 times more income of the poor and 1.5 times more income of the middle income group. The average cash income of the wealthy households is 7945 birr compared to 5384 and 2909 for the middle income and poor households. The poor households have few heads of cattle, sheep and goat depended heavily on transfers, and purchases of food. Wage labor accounted for the largest proportion of their annual cash income and livestock based income accounted for only less than 20 percent. The wealthy households on the other hand owned a number of heads of camels, shoats and cattle. The poverty level also increases among the agro-pastorals than pastoral population.

VI. ACCESS TO BASIC INFRASTRUCTURE

The main socio-economic problem and constraints to sustainable livelihoods in the lowlands is lack of access to basic services such as health, education, water supply road and transport services. The vast part of the lowlands have no access roads and transport systems. Commercial activities and flow of goods and services is restricted to localized areas. Health services are poorly developed but the epidemiology of the lowland areas is serious. Access to curative and preventive health care is restricted mainly due to shortage and inefficiency. The majority of the population is illiterate and almost seven in 10 school age population have no access to primary school education. Water supply and sanitation services are the major limiting factor for both livestock production and human consumption. The large proportion of the lowlands has no sustainable water resources and developments efforts to expand water supply services are inadequate. In general, marginality is the main characteristic of the lowland pastoral areas.

6.1. Health Services

The pastoral areas are a host of various vectors. The warm climate, drought, food insecurity and poor sanitation and health coverage are typical conducive environment for the spread of diseases. Until recently most of the pastoral lowlands have no or very few health infrastructure which is often poorly staffed and equipped. Access to modern health services is critical and the majority of the population suffers from endemic and epidemic diseases with no or little access to modern services. As a result traditional medicines are life support during out breaks of diseases. Food shortages and chronic malnutrition often triggered by drought and poor sanitation are also leading causes of diseases. Access to safe drinking water is critical for both human and animal population. The available water supply points are often dominated by ponds, hand dug wells and traditional sub surface water resources. These unsafe water resources are the main causes of communicable diseases and epidemics. Sanitation services and knowledge is inadequate. The combined effect of poor sanitation, low access to safe drinking water, malnutrition and seasonal hunger, low access to modern health services contributed to the spread of various diseases mainly gastro-intestinal ailments, skin diseases, intestinal parasites, respiratory tract infections, tuberculosis and others. These diseases are among the top ten diseases in the lowlands.

Malaria is endemic in all lowland weredas. The environmental conditions, the flat topography (with poor drainage), seasonal and erratic rainfall, the warm climate of the lowlands are suitable breeding grounds for mosquitoes. In these areas all type of malaria are available. Main malaria seasons coincide with the cessation of the main and small rainy season, i.e in June, July, November and December in most of the weredas. Estimates show that over 76 percent of the area of all weredas is malarious. This includes over 78 percent of the surface area of Somali region, 61 percent of pastoral area of Oromia, 82 percent of the pastoral wereda of Afar region and 65 percent of the pastoral weredas of SNNPR (WFP, 2008). Critical malaria breeding sites however, are the valleys of Dawa, Genale, Wabe Shebelle, Weib, Jerer, Daketa, Erer, fafan and other perennial and seasonal rivers as well as seasonal marshes in these weredas. Thus, over four million populations in the 55 weredas are assumed vulnerable to malaria and its synergistic effects such as iron deficiency, and malnutrition. Despite significant effect of malaria in the lowlands malaria control programmes are inadequate. The majority of the population has no access to anti-malaria drugs or mosquito nets or any form of mechanical and chemical control methods. Poor communication and transportation system, ill equipped health facilities make malaria control in these areas more difficult.

Health facilities, though improving in number in recent years, still they are inadequate both in the number and quality of services. As of the end of 2007, the number of curative and preventive health service facilities in the 55 weredas was 389 of which 49 were health centers, 64 were clinics and 276 were health posts. The average number of health facilities per wereda was seven (clinics, health posts and centers). This is equivalent to one health facility per four kebeles. The vast area of the weredas and low population density, the mobility of the population is limiting to comply with the National Health Service delivery facility strategies. On average a typical wereda in the lowland pastoral areas has an area of about 4236 km², almost more than some zones in the highlands. The population density is however only 19 people per square km. Thus the available health services on average seem adequate considering the national standard health delivery strategy. Yet the density of health facilities is less than one per 600 km². The preventive health facilities, (health post) density were only one per 844 km². Health centers is available every 4755 km² in the surveyed weredas. Furthermore, a primary health care unit (a health center and five health posts) strategy adopted by the Ministry of Health is also problematic for the lowlands. In the last 20 years, only 276 health posts and 49 health centers were constructed and in use. The ratio of the health post to health center is 6:1. Though this ratio is an average of all the 55 weredas there are a number of weredas which fall below the national average of 5:1 and even who have no health centers but health posts only. For example of the total 55 weredas only 44 has health centers, two have no health posts. Therefore roughly only 44 weredas have health posts and at the same time health centers. Considering the health infrastructure in all weredas almost two third (63 %) have health posts health center ratio of less than five, and 34 percent have more than five health posts per health centers. This equates to only 3.7 percent of the weredas which fulfill the standard of primary health care service strategy. Besides, the shortage and ill distribution of health facilities, the existing health infrastructure lack maintenance, trained personnel, adequate fund and logistics. Most of the health posts in most of the weredas have no manpower at all. Yet the theoretical health coverage (in terms of availability of physical infrastructure) is about 73.5 percent varying from 189 in SNNPR to 35.9 percent in Somali region. The theoretical health coverage of Oromia and Afar is 101 and 117 percent respectively. Of the total 55 weredas one third have a theoretical coverage of less than 50 percent, 24 percent of the weredas have 50-100 percent and the remaining 44 percent of the weredas have coverage of more than 100 percent²². However, this significant degree of theoretical coverage has no relation with the epidemiology of the area, the population density and surface area of the weredas.

²² Theoretical coverage is calculated as (number of health centers*25000)+(clinics*10000)+(health posts*5000) divided by the total population

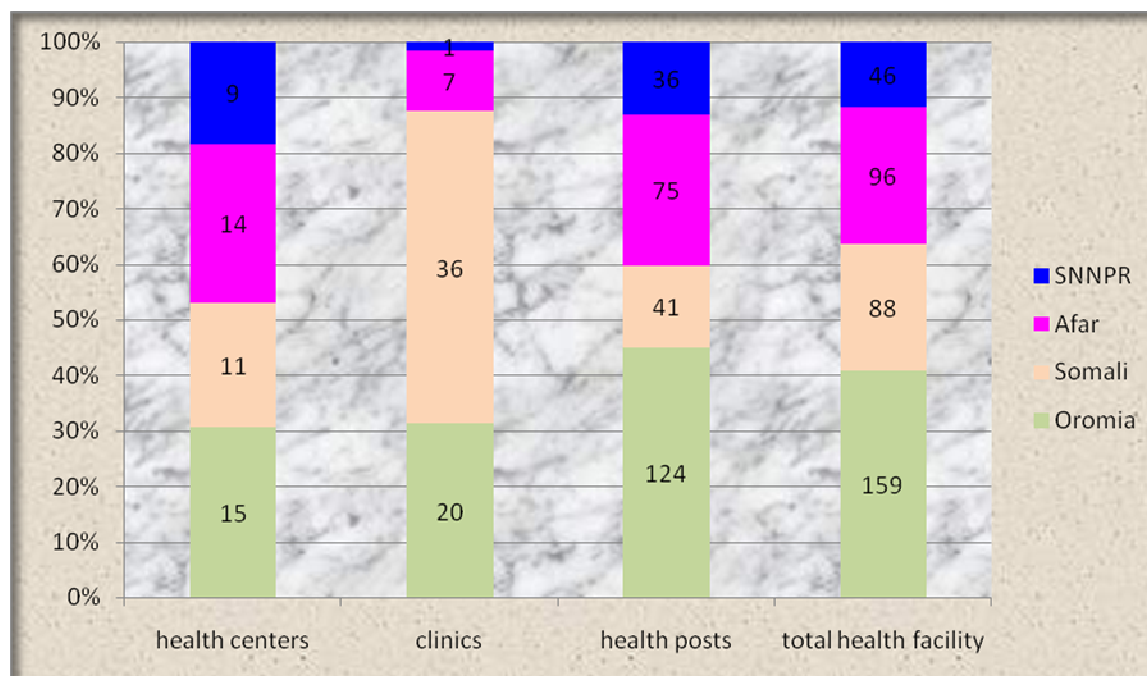


Figure 4: Number of Health Facilities

A number of health facilities have also inadequate skilled health personnel. There are only two physicians, 273 nurses and 81 sanitary and lab technicians, 56 health assistants and 515 human health workers²³. On average an existing health facility have only two health workers (irrespective of their skill, level of their education and profession). Considering high level professionals, a ratio of health centers to physician is less than 19 to 1. Average number of nurses and health assistants is only 0.9 and 0.2 per health facility. Therefore, physician population ratio is about 1.04 million, while health assistants and nurse ratio is 78874 and 16179 population respectively²⁴. None of the health facilities in the Oromia pastoral areas have reported to have a physician. There were also one sanitary and laboratory technician per 105165 and 113255 population²⁵. The largest number of health staff constitutes health workers providing preventive health care, vaccination, family planning and malaria control. These staff accounted for about 54 percent of the total health staff in the weredas. The ratio of the health extension workers to the population was about 8577 and 1.9 per health post. Though the number of these staff is adequate relative to others, the level of skills and responsibilities entrusted to them is inadequate to serve the population who suffer from multiple and debilitating diseases. Lack of health center in nearest vicinity also makes the service of these personnel and preventive health care programmes inefficient.

²³ data on health personnel for Somali region and health workers in SNNPR not available

²⁴ Compared to the WHO standard of 10000 and 5000 population per physician and nurse, the ratio of physicians and Nurses in the wereda is 221 and more than three times larger than this standard

²⁵ Data for Somali region on health staff was not available.

Table 16: Number of Health Personnel in Pastoral weredas of PCDP II, 2007.

Health Staff	Region				
	Oromia	Somali	Afar	SNNPR	Total
Physicians	0		2	-	2
All Nurses	129		93	51	273
Health Officers	15		15	4	34
Sanitarians	20		12	10	42
Lab Technicians	14		16	9	39
Health Assistants	37		12	7	56
Health Extension Workers	331		184	-	515
Total Health Personnel	546		334	81	880

Source: Regional BoFEDs, 2008

Data on curative and preventive health care services on wereda level is lacking²⁶. However scanty previous survey works indicated that of the total reproductive age group females, less than two percent have access to family planning services and similar proportion of pregnant women have access to professional delivery services. Post and antenatal care is on average about five percent mostly accessed by sedentary households and population in urban areas. Immunization coverage is however above 60 percent in most areas. But significant number of children from pastoral households has still inadequate access to full vaccination services. Furthermore, child growth monitoring and nutritional surveillance systems are inadequate and leading cause of morbidity and mortality in most of the lowlands.

In general, the health service delivery system in the lowlands is inadequate to satisfy the demands of the growing population and the epidemiology of the area. The existing health facilities are ill equipped and staffed. The distribution of the health facilities are also uneven and have little relation with the population density, the area of the weredas, livelihoods of the lowlands. The National Health Service delivery strategy and infrastructure development modalities are not consistent with the circumstances of the pastoral population and livelihoods of the lowlands.

²⁶ Information on preventive health care at wereda level is not available for all weredas. Data is aggregated at regional or zonal level by the regional health bureaus. Information on top ten diseases, malaria control and prevention statistics, family planning and other MCH service are either zonal or regional.

Table 17: Vital Health Infrastructure Indicator of PCDP II Weredas

Indicators	Region				
	Oromia	Somali	Afar	SNNPR	Total
Theoretical health coverage (%)	101.4	35.7	117.0	189.6	73.4
Health facility per kebele	0.5	0.1	0.6	0.3	0.28
Kebeles per health facility	2.23	8.28	1.68	2.91	3.54
Health post Health Center ratio	8.3	3.7	5.4	4.0	5.6
Population per health center	78540	212663	48582	24378	90142
Population per clinic	58905	64980	97164	219399	69015
Population Health Post ratio	9501	57056	9069	6094	16003
Population Nurse ratio	9133		7313	4302	7610 ²⁷
Population Health officer ratio	78540	-	45343	54850	61107
Population Health assistant Ratio	31841	-	56679	31342	37101
Population per Health extension worker	3559	-	3696	-	4034
Area per total Health facility (km ²)	509	1137	287	686	785
Physician population ratio	-	-	340075	-	1038826
Percent of area under Malaria risk	60.8	77.6	91.8	64.9	75.6
Health personnel per health facility	3.4	-	3.5	1.8	3.2
Nurse per health center and clinic	3.7	-	4.4	5.1	4.1
Health extension per health post	2.7	-	2.5	-	2.6

Source: Extrapolated from Data of Regional BoFED and WFP, 2008

6.2. Education Services

Lack of access to education services is one the major problem of the pastoral areas until recently. Illiteracy is extremely high and a number of children in lowland areas have inadequate access to primary education. Socio-cultural factors, the livelihood systems, inadequate attention to infrastructure development in the lowlands, geographical and. social marginality in general contributed to low access to education services. Educational attainment (due to high illiteracy) is extremely low. Gender disparity is also significant compared to any highland areas of the country. The number of school, infrastructure, the quality, proximity, and accessibility are also incomparably low. The mobility of the population and the vast surface areas, low population density, dependence on transhumant livestock production systems, temporary human settlements and far reaching seasonal migrations not only limited access to available education facilities but also contributed to under utilization of the infrastructure. As a result the number of students per school varies significantly from season to season except those located in fixed settlement and urban areas.

Since the mid 1990s a number of efforts were made to improve access of the pastoral population to education by the government, non-governmental organizations and other programmes and projects active in the lowlands.

²⁷ Did not include Somali. Data of health staff for this region was not available.

The number of schools including alternative basic education in four regions and the surveyed weredas is 1120 with mixed grade levels. About 34 percent of these schools (378 schools) were found in Oromia and 31 percent (348 schools) in Somali pastoral weredas. Afar and SNNPR pastoral weredas constitute the remaining 35.1 percent (340 in Afar and 53 in SNNPR) of the primary schools. The average number of schools per wereda is also 20 ranging from 27 schools in Oromia to six schools per wereda in SNNPR. The density of schools per kebele administration is also significant. The same regional sources indicated that the average number of schools per kebele is almost one (0.8 schools per kebele). In Oromia the number of schools is slightly greater than the number of kebeles and in Afar they are twice as many as the kebeles. In Somali and SNNPR one primary school serves 2.1 and 2.5 kebeles respectively. Across the weredas there is significant variation in the distribution of schools (as measured by the ratio of the kebeles to the schools). In about 45 percent of the weredas there is more than one school per kebele, and only 8.5 percent of the weredas have one school in each kebele. The rest have one school for more than one kebele. Though there is substantial variation in the number and distribution of schools, access to schools and education services is better for the majority than the period in 1980s and 1990s in all pastoral lowlands. The highest school density is observed in Oromia and Afar regions. Yet, a school, in the pastoral areas serves 1422 primary school age population though the real enrolment is less than 30 percent for most of the pastoral weredas. Due to sparse density of the primary schools (also due to low population density and mobility) and vast area of most of the weredas, Afar and Somali regions have the lowest gross and net enrolment rates.. The average density of Afar and Somali region is one school, per 81 and 287 km² respectively. Oromia and SNNPR have relatively high density 214 and 460 km² per school respectively. The low density of schools per area of a particular wereda and kebele is the major limiting factor for high enrolment particularly for girls whose access is limited by socio-cultural factors and gender discrimination. Yet the vast areas of the lowlands are not inhabited by people. Therefore increasing the number of schools will not necessarily increase enrolments and access to universal primary education. Besides, only few areas are seasonally inhabited by semi mobile pastoralists. As a result, seasonal variation in enrolment and drop out are typical characteristics of the education system in the lowlands dictated by mobility pattern, season, availability of water and health services, supply of forage etc. In bad seasons the majority of the pastoral and agro-pastoral households move to other areas where water and forage is available leaving behind few members of the family. In this season the majority of schools hosted very few students or none. This is typical problem of schools in remote rural areas of the lowlands.

The available stock of schools have about 4544 class rooms(sections), on average only four class rooms per school. Over 22 percent of the weredas have sections school ratio of less than three. About half of the weredas, have a ratio of 3-5 sections and the rest 28 percent of the weredas a ratio of more than five sections per school. Hence, the schools in the lowlands are of low grades and level as well as enrolment consistent with population number, density, and attitude and cultural aspiration towards formal and informal education. This ratio is relatively low in Somali and Afar region (four and three respectively). Similarly, the potential intake or capacity of the existing class rooms is roughly estimated at about 181760 students. Excluding the weredas of Somali region, the potential intake of class rooms in the three regions is 129200 students at optimum condition. This equates to an over crowding of 57 percent ranging from 44 percent in Oromia to 114.8 percent in Somali regions²⁸. Across the weredas however there is substantial variation. For example 38 percent of the weredas have an under crowding ranging from 10 to 49 percent of their capacity and 62 percent are over crowded varying from eight percent to almost five times the intake capacity of the class rooms).

²⁸ The over crowding rate is calculated based on 40 students per section. Thus the formula equals (total enrolment/intake) *100.

Under capacity of some schools is the function of livelihood and population density. With increasing pastoralism the number of non-functional schools and sections increases. Similarly, with increasing population, the proportion of non-functional sections decreases.

There were about 6313 teachers in these schools of which the majority are community teachers trained for three to six months serving in alternative basic education schools. The number of diploma graduate teachers is rare in almost all areas particularly in remote weredas. Due to low enrolment however, student teachers ratio is relatively low compared to the number of students per section. The number of students per teacher (STR) is on average 49 for all primary schools varying from 54 students in Somali to 35 students per teacher in SNNPR. Considerable variation also exists between weredas. The other proxy indicator of the adequacy of teachers is the number of sections per teachers. On average in all weredas the number of teachers per school is six²⁹. Thus a teacher in the lowland pastoral area serves 1.4 sections per year.

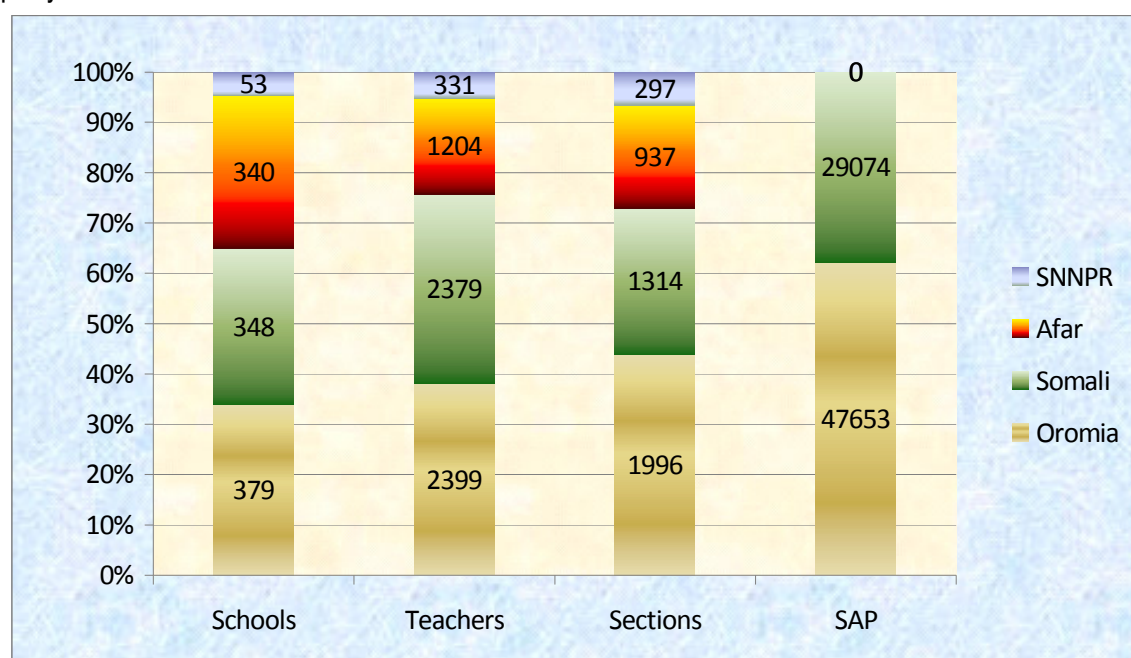


Figure 5: Number of Schools, Teachers, sections and school age population

In all lowland pastoral areas primary school age population is growing faster than the total population as the whole. The estimated number of primary school age population (5-14) is about 1.6 million children in the 55 weredas³⁰. The proportion of the school age population for some regions particularly Afar and Somali region is about 35 and 37 percent of their total population. On average a household in the lowland pastoral areas have more than two school age children. However, only 31 percent of the children (measured in terms of GER) enrolled in primary schools. In general, GER is the lowest for Somali and Afar regions (23.5 and 25.9 percent) and relatively high enrolment in Oromia and SNNPR pastoral weredas (47.5 and 31.8%). But considering, the net enrolment rate the majority of children in schools have low access to education pertinent to their age level. Contrary to the highland areas, however net and gross enrolment is almost similar due to seasonal migration of adult children and other socio-economic and cultural factors. The

²⁹ Four teachers per school in Afar, 6 each in Oromia and SNNPR and 7 in Somali region.

³⁰ Reliable information on school age population is not available for almost all regions. In this report age 5-14 is considered as primary school age population.

calculated average net enrolment rate for the three regions (Oromia, Afar and SNNPR) was 90 percent of the GER³¹.

Gender disparity in access to education is however not significant though there is inadequate information to substantiate this fact. In general however, due to the livelihood systems which requires the male children and adults to maintain herds and migrate seasonally in search of water and animal forage, female children have more opportunity to schooling than boys. Yet, their access is limited by distance factor, availability, social and cultural discrimination, and early marriage in most societies.

In general, enrolment rate is lower in pastoral areas than agro-pastoral dominant livelihood systems. The other determinant of GER is the number of animal holding per household, the number of school age children, density of schools per 1000 km², and population density. With increasing number of animal holding the enrolment rate of male children is decreasing while females have more opportunities for education. However, with dominance of pastoral livelihood system GER is decreasing as most of the family members particularly males are responsible to maintain herds. Similarly with increasing school age children families tend to send their children to school. On the other hand with increasing school density per area, GER increases. The denser the availability of schools the larger the gross enrolment rate in almost all surveyed pastoral areas.

Table 18: Vital Educational Statistics of PCDP II Weredas, 2007

Indicators	REGION				
	Oromia	Somali	Afar	SNNPR	Total
GER	47.5	26.6	25.9	31.8	32.4
NER	38.7	.	19.1	25.4	28.3
student teachers ratio	47.8	47.5	38.6	36.3	45.3
student class room ratio	57.4	85.9	49.7	40.5	63.0
students per school	302	324	137	227	255
schools per kebele	1.1	0.4	2.3	0.4	1.2
kebele –school ratio	1.0	3.1	0.5	3.4	1.7
class room school ratio	5.3	3.8	2.8	5.5	4.1
Over crowding rate (%)	43.6	114.8	24.1	1.2	57.4
Literacy (%)	11.1	7.5	7.0	3.9	7.9
Area per school (km ²)	249.2	350.2	79.0	575.9	278.8

Source: Calculated from Regional Bureau of Education, 2008

6.3. Water Supply

The main determinant of livelihoods in the lowlands is the volume and sustainability of water supply. In these areas, the supply of both terrestrial and sub surface water is inadequate. Duration of water supply shortage in most of the lowland areas is almost through out the year. Perennial rivers and other water resources are scarce in almost all target lowlands. Both human and animals either depend on perennial water resources or seasonal water points and run offs. As permanent rivers are scarce in most of the lowlands the majority of the population pursues adaptive strategy such as seasonal migration and

³¹ Data on net enrolment and gender disaggregated GER were not available for Somali region. There is also no school age population and enrolment by age to calculate both GER and NER for this region.

excavation of traditional wells, ponds and temporary storage structures. For the majority however, seasonal migration is a common adaptive strategy to cope up with shortage of water both for humans and animal population. Temporary water structures such as *brikads*, ponds, hand dug wells serve only in wet season where rainfall is adequate and surface run offs is relatively abundant. In almost all areas, such water structures and run offs support human and livestock population following the small and main rainy season which amounted only to less than five months in a year. Due to heavy transpiration and seepage these water supply points survives and water animals and human population for only three months on average. Other water sources are traditional *eelaas* (or deep wells dug by human labor) which are communally used (based on clan constituencies). These water resources are important source of water in dry season. But the distribution of these water sources and their number is limited to few areas. As a result, conflict on these resources is rampant particularly in prolonged dry season (intra and inter ethnic groups conflict) though these water resources were managed by traditional laws and regulation over many centuries in many places. The limited distribution of water resources also believed to contribute to environmental degradation around water points.

Ponds are also communally owned where the community built the structure by own contribution of local resources and labor. But many of the ponds available in the lowlands are constructed by NGOs, and the government. Maintenance and proper utilization as well as sustainability of these water sources are for short period often not more than three months. *Brikads* are constructed by the households and owned privately. These water structures are constructed by wealthy households, and also used as sources of cash income. They are of poor quality and survive only for short period of time. In prolonged drought periods *brikads* also dry up particularly those which were not protected by insulating materials.

The main river, the sustainable supply of water in the lowlands are the Wabe Shebelle, Dawa, Genale, fafan, Weib, and erer, and Awash rivers feeding Somali, Afar and Oromia pastoralists in the lowlands. However, most of these rivers either cross the border of the regions and weredas or they feed only few proportions of the weredas. As a result except those already reside around the river valleys, the majority of the pastoral population accesses these rivers only in prolonged drought period through seasonal migration. Yet, rivers support the lives than any other form of water resources in the lowlands.

Data on water resources in the lowlands is inadequate, inconsistent and unreliable. Water resource inventory is not conducted in all regions and as a result the number and type of safe and unsafe water supplies, status, and yield are unknown and poorly documented. In most areas only man made structures particularly the number of shallow and hand dug wells, deep boreholes, piped and pumped springs are available but with low consistency and accuracy. In most regions however data is available only for those structures constructed by the government.

The secondary data obtained from regional water bureaus, and BoFED however indicated that there are 1134 safe water points constructed in the 55 weredas consisting of dams, river diversions, shallow and hand dug wells, deep boreholes and spring development. Of the total safe water constructed so far in these lowlands, about 69 percent are shallow and hand dug wells, 5.8 percent are spring development and 25 percent are bore holes (deep wells) and the rest less than one percent are dams and river diversions. Considering the vast surface areas of the lowlands (both in terms of wereda or kebele) as well as high evapo-transpiration, poor management and intensive utilization through out the year considerable number of these water points are non-functional and supply inadequate water for the increasing human and animal population.

Table 19: Number of Man-made Water Supply Points by Region, 2007

Water Points	Region				Total
	OROMIA	SOMALI	AFAR	SNNPR	
Function water supply points (No)	338	280	79	249	946
River Diversion	0	7	-	-	7
Dam	-	1	-	-	1
Hand Dug wells	-	162	-	89	251
Spring development	26	1	3	29	59
Shallow wells	222	14	47	126	409
Deep wells	90	95	29	5	219
non functional water points (no)	104	39	45	0	188
Total Water Points (no)	442	319	124	249	1134

Source: Regional BoFEDs, Somali Water Resource Bureau, 2008

The same source revealed also that of the total water supply points in the weredas 17 percent are non-functional and in need of major/ minor maintenance. Of the total springs 11 percent are non functional. Similarly, only 85 percent of hand dug and shallow wells provide water for both human and animal consumption. Beside frequent damage, rapid decline of water yields in dry season, salinity and poor water quality restrain the accessibility of safe water from these sources. Most of the water points in Somali (Gode and Liben zones) and Afar weredas suffer from high concentration of salts and poor quality. For details refer to the annex.

The large surface areas of the weredas and kebeles, the limited availability of ground and terrestrial water resources make adequate and efficient service delivery in the lowlands difficult. On the other hand the number of population inhabiting these vast administrative structures (weredas and kebeles) is on average 81535 and 3254 people with an average density of about 19 people per km².

Thus not only the population but also the density of any form of social; infrastructure and services is very low in all pastoral weredas. A single functional safe water supply point in the lowlands serves about 246 km², and while the population density on average on this scale of size would be less than 19 people per km². Thus one can find only four safe water supply points in every 1000 km² in the lowlands. This also varies from region to region. In Somali and Afar the average density of water supply points per 1000 km² is less than three, while in Oromia and SNNPR weredas four and 10 respectively. 10 weredas have a density of less than one water point per 1000 km² and only 20 weredas have five functional water points per 1000 km² of the area of the weredas. Thus, even if the number of water points increased, area and livelihood factors constrain access to these water supply points. In terms of density of functional water supply points SNNPR weredas are better off. Over two third of the weredas in this region have a density of more than five water supply points per 1000 km². The least density of water supply points is observed in Afar region where only two out of 14 target weredas have a density of five functional water supply points per 1000 km². Functional water supply point density for Oromia and Somali (above five water supply points per thousand km²) is five and nine weredas respectively.

Furthermore the number of animals and human population served from a typical water supply point is extremely high. On average a typical water supply point in the weredas serve 4669 human and 10616 TLU of animals. Within the regions, this proportion is 8355 human and 16853 TLU in Somalia, 8609 and 26465 TLU in Afar 3486 and 7577 TLU of animals in Oromia and 1190 human and 3646 TLU of animals. On the

other hand in two third of the weredas the number of human population served from a single water supply point is more than 10000, and in 21.5 percent of the weredas a single functional water supply point serves less than 5000 population.

Due to prolonged drought periods, low level and sharply declining water tables the yield of the water supply points declines considerably. In arid areas most of the water supply points either dry up or barely yields the necessary water to satisfy the consumption demand for human and animal population. Roughly it is estimated that a hand dug well, and shallow well will yield a maximum 8 liters per second. Boreholes, dams and river diversions yields 40 liters and springs and other water sources about 15 liters per second. With this assumption, the daily sustainable supply of water in these areas is about 5.6 million m³ of which most of these is supplied by shallow and hand dug wells. On average thus, water supply per day from the existing functional water points is about 15315 m³ of water. On the other hand the daily demand of human and animal population per day is about 255127 m³ of water. The demand and supply equation however varies from season to season where in wet season demand for water from sustainable water points declines while supply increases due to ground water recharge and run off. In dry season demand from this water sources increases while water supply declines. Assuming normal condition, the demand for water is 17 times more than the available supply or current supply covers only six percent of the total demand at optimum condition. Generally under any given assumption and standards water supply in almost all lowland target weredas is inadequate, unsustainable and with poor quality. Similarly the density of water supply points has weak correlation with the number of animals and human population, and negative correlation with area of the weredas.

Shortage of water is also limiting the efficiency of service delivery of existing basic services particularly health centers and posts, veterinary services, education facilities, and others. Low enrolment and high drop outs in the dry season are common problems of education services in the lowlands. Not only migration of adult children with animals but also lack of water at school resulted in large drop out rates. Most of the health centers and posts give low services due to lack of water. Health services are also affected by lack of water mainly MCH (delivery services) and curative services.

In general, the theoretical safe water supply coverage in the 55 weredas is only 24.5 percent (WFP, 2008). The majority of weredas (over 23 weredas) have a theoretical coverage of less than 20 percent. The next 10 weredas have coverage of 20-40 and the rest above 40 percent. Similarly, Afar and Somali regions are the least in access to potable water supply. Considering the vast lowlands, arid climate, low ground water table, and poor quality, the yield of functioning water supply points will most likely cover only less than half of the stated figures or reported by various institutions..

Table 20: Vital Indicators of Water supply in PCDP II weredas, 2007

Indicators	Region				
	OROMIA	SOMALI	AFAR	SNNPR	Total
Coverage(%)	25.8	17.3	26.7	41.2	24.5
Population/ functional Water Point	3486	8355	8609	881	4669
Population per all water points	2665	7333	5485	881	3895
TLU/ functional water point	7577	16853	26465	2699	10616
functional Water supply points per 1000 km ²	10.3	8.6	4.0	10.4	8.1
Area / functional water point	559.5	996.0	952.9	139.1	773.1
Area/non functional water point	1181.1	2348.7	740.4	.	1510.9
Area /all water supply point	323.9	719.1	543.2	139.1	505.9

Source: Calculated for Data of regional BoFEDs, Somali Water Resources Bureau and WFP, 2008.

Therefore lack of access to potable water supply is the main causes for high prevalence of water born and water related diseases. Besides high morbidity rates, the economic cost of fetching water at distance and lack of access to it is immense. The cost of mobility have no real financial and economic values, as it is dictated mainly by social and physical factors which cannot be directly linked to economic activity. Shortage of water is also a source of conflict in the lowlands between various ethnic groups and clans and its human and asset costs is significant. Construction and development of sustainable water sources in these areas is also expensive and difficult to maintain. Simple water structure can store significant volume of water but sustain few animals and human resources only for few months following the wet season. Seepage and evapo-transpiration are main problems of sustainable use of these structures. Shallow wells and hand dug wells also loss their yield following the end of each rainy season. Traditional wells have been used for centuries yet currently they are over utilized by increasing human and livestock population. Mechanized deep wells and diversion of perennial rivers are sustainable water sources to fill the increasing multiple demands of the pastoral lowlands. Development of such water resources however needs huge capital investment, mobilizing local resources, capacity building of user population and linking these resources with various activities such as small scale irrigation and farming of marketable and food crops, animal fattening and marketing, cottage industries, settlement programmes etc for meaningful economic return from investments. Yet this needs significant effort and time, considering the livelihoods and socio-cultural setting of the pastoral lowlands.

6.4. Road Network

Most of the lowlands are marginal areas with no or few road, transport and communication networks. Very few weredas and population are linked with all weather roads. Modern transport systems are costly and inadequate. Transportation of goods and services to and from the lowlands are limited by poor transport networks. As a result terms of trade and commercialization of the pastoral economy is difficult. Food insecurity is significant in the lowlands, not only due to drought and low crop productivity but also lack of transactions of necessary commodities from the surplus highlands to the needy lowland areas.

The available network of roads is either seasonal gravel roads (community roads) or few all weather gravel roads with poor conditions. Major asphalt highways cross the vast lowlands and linked the regional capital but with no link with over 90 percent of the vast lowlands. Weredas are poorly linked with either seasonal or gravel all weather roads. Yet most of the weredas and major markets within the weredas have no link at all.

The current road network in the pastoral lowlands includes 551 kms asphalt roads linking major regional capital and neighboring countries to the east, north east and the south, 3785 kms all gravel roads (linking regional capital with zonal capital and few wereda capitals), and 7154 kms of community or dry weather roads³². Therefore the stock of road of the pastoral lowlands includes 3516 meters of all weather roads per 100 km² of surface area. Regional and wereda variation is extremely high. Road density of Somali region is only 1972 meters per 100 km². In Afar and Oromia it is only 7299 and 2892 meters per 100 km². The SNNPR weredas with no asphalt road and have 441 kms of all weather gravel and 143 kms of community road. Average density of all weather roads is only 177 meters per 100 km² of the surface areas of the six weredas. Across weredas, one in three weredas (16 weredas) have a density of only less than 500 meters per 100 km². While 10 weredas (18%) have a road density of 500-2000 meters, 18 weredas between 2000 and 5000 meters and the rest 11 weredas have more than 5000 meters of all weather roads per 100 km² of area. Thus this equates to an average of only 153 cms per capita, with the lowest per capita road network in Somali and Oromia Pastoral weredas (52 and 156 cm per capita). .

According to the WFP, VAM assessment, only one third of the surface areas of the target weredas have access to all weather road within 10 kms radius. The extrapolation from the same source also showed that 3.7 percent of the pastoral weredas of SNNPR, 23 percent of Oromia, and 43 percent of Somali and Afar regions surface area have access to all weather roads.

As briefly discussed in the above chapters, livestock commercial off take is in general low and averaged to 7.9 percent. With decreasing road network density, commercial livestock off take decreases from seven percent to less than three percent. Road network is also correlated with the level of urbanization which is the major transport and commercial sources in the lowlands. Fluctuation of prices of major food crops and livestock are also significantly high as road density declines.

³² The data on length and type of roads available in the lowlands are inadequate and unreliable. The above discussion is based on scanty information obtained from regional BoFEDs, and Rural Road Authorities. For some weredas in Somali region data is not available. For Afar the length of asphalt road is included in all weather gravel road. For Oromia region data on the length of dry weather and community road network is lacking and the discussion is based only on all weather asphalt and all weather gravel roads.

Table 21: Road Network of Pastoral weredas of PCDP, 2007

Indicators	Region				
	Oromia	Somali	Afar	SNNPR	Total
Asphalt (Km)	307	244	-	-	551
All Weather Gravel (Km)	1090	920	1372	403.4	3785.4
Community Road (Km)	-	6342	668.5	143.4	7153.9
Total Road (Km)	1397	7506	2040.5	584.1	11527.6
Road/100 Km ² (Meter)	28.9	19.2	73.0	17.4	35.2
Road/Capita (meter)	1.6	0.5	2.9	1.8	1.5
Percent of All Weather	100.0	23.6	60.8	77.3	62.7
percent of area with access to Road	23.1	43.0	43.0	3.7	33.9
Road Density (Meters)/ Km ²	2.2	2.2	3.1	2.2	2.4
Area Per Km of Road (Km ²)	93.7	39.4	29.1	345.8	95.7

Source: Regional BoFED, Somali and SNNPR regions Rural Road Authority, WFP

VII. CONCLUSION

The pastoral lowlands are the most deprived areas of the country in terms of access to development opportunities, infrastructure and services. They are also vulnerable to various natural and man-made shocks due to frequent failure of rains, poor infrastructure, weak linkages to markets, poor extension and support services. In the last 50 years efforts have been made to improve the wellbeing of the population of the lowlands. Yet, the lowland pastoral areas are still suffered from significant level of asset depletion, environmental degradation, poverty, diseases and illiteracy. Almost one in two households are poor and average income is less than 5000 Birr per year. Over 10 percent of the food demands of the households come through food aid. Chronic and seasonal food insecurity is basic socio-economic problems affecting the majority of the lowland pastoral areas. The number of livestock population is deteriorating due to drought and lack of restocking. Crop production is expanding though the environment is not conducive to this economic activity posing major constraints on rangeland development. The productivity of the rangelands in almost all lowlands is deteriorating due to bush encroachment, expansion of crop land, over grazing, frequent failure of rains and inadequate distribution of water supply points.

Over 62 percent of the population has no access to health services. The effects of diseases are significant and as a result mortality and morbidity is considerable. Basic preventive and maternal and child health care services are accessible to very few proportion of the population. Shortage and mal-distribution of health facilities and weak strategies also constrain the efficient utilization of the existing health service delivery. Literacy rate is less than 20 percent in almost all weredas. The largest proportion of primary school age children have no access to primary education at all. Schools are ill equipped and staffed. Distribution of these schools is also not consistent with pastoral livelihood systems. Drop out rates are very significant and in some areas it needs incentives to retain children in schools.

Water is the major socio-economic constraint and hindrance to the rapid transformation of the pastoral economy. Less than 40 percent of the population is estimated to have access to safe drinking water. Seasonal shortage, failure of the supply points, declining yields, inadequate distribution and conflict, poor management and maintenance services are the major problems. Water is also a major source of conflict in these areas.

Livestock production is traditional and subsistence. Though per capita livestock holding in pastoral areas is huge, only less than 10 percent of the total livestock population is marketed. Shortage of forage, considerable level of animal diseases, drought, poor access to markets are limiting factors for commercialization of the livestock sector in the lowlands. Mortality rate is more than 29 percent per year yet veterinary services are inefficient and in short supply.

In general the pastoral areas need focused and integrated development interventions. Above all, basic service infrastructure, markets, proper and timely disaster early warning and mitigation programmes, investments on livestock sectors (particularly veterinary, forage production, breed improvement, market and market infrastructure), development of adequate and sustainable water supply points, expansion of targeted support services, development of small scale irrigation and diversification of household economy are necessary conditions for the transformation of the pastoral livelihood systems into more commercial and sustainable economy.

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APPENDICES

Annex 1: Physical Characteristics of pastoral Weredas of PCDP II)

No	wereda	Region	Type of Weredas	Area) (km ²)	Kebeles	elevation (masl)	slope	Tree Cover (%)	Months with >100 mm RF	annual RF (mm)
1	Arero	Oromia	Former	10841.9	22	1194	2.0	9.0	3.0	636.0
2	Chinaksen	"	Former/separated	1625.0	48	1802.7	3.1	2.1	2.4	771.9
3	Dire	"	Former	6168.1	16	1210	2.6	6.2	1.6	609.7
4	Fentale	"	Former	1200.0	18	1057	3.2	3.8	2.0	757.6
5	Girja	"	New/separated	1571.4	20	1031	3.3	8.9	0.4	1025.9
6	Gola Oda	"	New	5554.9	32	1277	4.5	8.2	3.6	750.5
7	Laga Hida	"	New	4199.9	27	1244	4.1	10.3	3.4	878.2
8	Mada Walabu	"	New	8726.7	20	1244	5.2	15.9	3.1	716.8
9	Mi'eso	"	New	2573.4	50	1270	3.8	7.5	2.2	713.1
10	Mi'o	"	New/separated	6553.6	17	1705	6.9	32.4	3.9	609.7
11	Moyale	"	New	15575.5	18	1132	2.1	7.3	2.7	649.3
12	Raytu	"	Former	7055.2	19	934	2.7	7.1	2.7	653.5
13	Sawena	"	Former	8108.4	28	971	1.8	4.8	2.8	684.9
14	Wadera	"	New	1262.0	19	1705	6.9	32.4	3.9	1025.9
15	Ayisha	Somali	Former	6837.9	19	765.9	2.1	0.0	0.0	318.2
16	Chereti	"	Former	2528.0	33	450.3	1.5	4.6	1.0	372.0
17	Debewein	"	New	1725.6		461.0	0.8	0.2	1.0	317.1
18	Degahabour	"	Former	14612.0		1096.6	1.2	0.4	0.0	621.2
19	Dolo Ado	"	Former	4640.8	44	506.9	1.8	2.2	0.3	412.2
20	Duhun	"	New	1925.6	30	858.6	3.6	3.4	0.8	538.3
21	Erer	"	New	3811.2		824.3	2.2	0.9	1.0	410.8
22	Ferfer	"	New	564.4		422.0	0.8	0.2	0.0	276.9
23	Fiq	"	Former	3806.8	45	1035.2	2.2	1.9	0.8	594.6
24	Gode	"	Former	329.6	42	357.8	0.8	0.2	1.0	304.7
25	Guradhamole	"	New	3981.8		905.4	2.1	9.0	2.9	586.2
26	Hargele	"	New	3382.1		448.3	1.1	1.2	1.0	342.5
27	Hudet	"	New/separated	4684.7		1802.7	3.1	2.1	2.4	424.6
28	Jijiga	"	Former	3079.7	108	1802.7	3.1	2.1	2.4	771.9
29	Kebri Beyah	"	Former	4581.5	52	1529.7	1.7	1.1	1.0	675.3
30	Kebri Dehar	"	Former	12413.6	28	706.2	1.3	1.6	1.6	469.2
31	Kelafo	"	Former	550.2	218	374.3	1.6	0.4	0.6	280.1
32	Mustahil	"	New	2761.8		310.5	1.2	0.3	0.0	236.6

No	wereda	Region	Type of Wereda	Area) (km²)	Kebeles	elevation (masl)	slope	Tree Cover (%)	Months with >100 mm RF	annual RF (mm)
33	Shinile	"	Former	8660.9	31	758.6	0.9	0.2	0.5	369.9
34	Warder	"	Former	14139.9	53	943.5	0.5	0.1	0.0	379.3
35	West Ime	"	Former	1023.7	26	459.2	1.4	0.4	1.0	354.9
36	Afambo	Afar	Former	332.5	7	404	2.7	2.4	0.0	177.6
37	Argoba	"	Former	471.0	13	1215	4.9	4.9	2.0	751.2
38	Aura	"	Former	2672.9	11	459	2.9	3.8	0.0	401.1
39	Berhale	"	New	1594.6	9	233	3.1	0.6	0.2	113.6
40	Chifra	"	New	3290.7	20	825	1.3	1.6	1.4	457.8
41	Dalifagi	"	Former	374.2	11	838	3.1	4.4	2.0	630.6
42	Dalol	"	New	1795.1	14	660	8.5	0.7	0.3	172.4
43	Dewe	"	New	1059.6	10	802	2.5	3.7	2.0	621.3
44	Dubti	"	Former	3601.4	18	503	2.2	0.5	0.0	239.0
45	Dulecha	"	New	1259.9	12	831	1.3	4.2	2.0	565.1
46	Gewane	"	Former	7720.9	10	678	2.3	2.1	1.0	405.5
47	Golina	"	Former	1325.4	8	958	2.4	4.2	2.0	625.2
48	Koneba	"	Former	675.3	7	1150	8.9	1.6	0.9	308.2
49	Telalak	"	Former	1390.7	11	720	1.7	1.9	2.0	506.0
50	Bena Tsemay	SNNPR	Former	3754.2	23	1013	5.1	12.7	2.7	667.7
51	Dasenech	"	New/separated	3521.6	30	430	0.7	2.6	0.5	254.5
52	Hamer	"	Former	5742.0	24	1013	5.1	12.7	2.7	551.4
53	Maji	"	New	4909.7	22	2003	6.2	57.1	7.8	254.5
54	Nyangatom	"	New/separated	1643.4	14	430	0.7	2.6	0.5	993.2
55	Surma	"	New	4798.8	21	2088	5.6	63.6	7.5	254.5

Source: Oromia BoFED, WFP/VAM, 2008.

Annex 2: Agro-ecological Zonation (%)

No	wereda	Dry dega	Moist dega	Wet dega	Dry w/dega	Moist w/dega	Wet w/deg	dry kola	Moist kola	Wet kola	Dry kola
1	Arero				8.1			91.93			
2	Chinaksen	1.25			98.2			0.58			
3	Dire	0.02			15.0			84.95			
4	Fentale				2.2			97.78			
5	Girja		2.05		5.9	83.2		8.86			
6	Gola Oda				0.0			98.49	1.48		
7	Laga Hida				0.0	17.4		82.59			
8	Mada Walabu		0.02		9.9	6.3		82.81	0.29		0.7
9	Mi'eso	0.02	0.02		8.9	1.2		89.85			
10	Mio	0.02			15.0			84.95			
11	Moyale				0.0			99.98			
12	Raytu				0.8			99.09			0.16
13	Sawena				0.6	6.5		92.87			
14	Wadera		2.05		5.9	83.2		8.86			
15	Ayisha				0.2			99.79			
16	Chereti							100			
17	Debewein							100			
18	Degahabour				1.5			98.47			
19	Dolo Ado							100			
20	Duhun							98.64			1.36
21	Erer				2.5			97.52			
22	Ferfer							100			
23	Fiq							100			
24	Gode							100			
25	Guradhamole				0.1			99.91			
26	Hargele				0.1			99.91			
27	Hudet							100			
28	Jijiga	1.25			98.2			0.58			

No	Wereda	Dry dega	Moist dega	Wet dega	Dry w/dega	Moist w/dega	Wet w/deg	dry kola	Moist kola	Wet kola	Dry kola
29	Kebri beyah				62.3			37.72			
30	Kebri Dehar							100			
31	Kelafo							100			
32	Mustahil							100			
33	Shinile				0.08			99.79			0.13
34	Warder							100			
35	West Ime							100			
36	Afambo							100			
37	Argoba S				5.16			94.84			
38	Aura							100			
39	Berhale				10.83			89.17			
40	Chifra				0			100			
41	Dalifagi							100			
42	Dalol	4.29			24.66			71.05			
43	Dewe							100			
44	Dubti				0			100			
45	Dulecha							100			
46	Gewane				0.18			99.82			
47	Golina				2.52			97.48			
48	Koneba	0.23			21.36			72.61			5.81
49	Telalak							100			0
50	Bena Tsemay		0.03		7.28	5.54		87.15			
51	Dasenech							100			
52	Hamer				0.67			99.33			
53	Maji			99.14					0.86		
54	Nyangatom							100			
55	Surma					22.94	7.19	69.4		0.01	0.47

Source: World Food Programme, VAM, 2008

Annex 3: Projected Population of the Pastoral Weredas in '000 (1995-2030)

No	wereda	Year										
		1994	2000	2003	2005	2007	2008	2010	2015	2020	2025	2030
1	Arero	30.800	36.754	40.110	42.448	44.893	46.148	48.703	55.325	62.216	69.171	76.001
2	Chinaksen	106.943	124.990	135.126	142.335	149.929	153.877	161.874	183.731	208.539	236.698	268.658
3	Dire	52.900	63.127	68.890	72.906	77.105	79.260	83.648	95.023	106.858	118.804	130.534
4	Fentale	60.048	71.657	78.199	82.757	87.524	89.970	94.951	107.863	121.297	134.857	148.173
5	Girja	68.894	82.212	89.719	94.949	100.417	103.223	108.939	123.753	139.166	154.723	170.000
6	Gola Oda	44.440	53.031	57.873	61.247	64.774	66.584	70.271	79.827	89.769	99.804	109.659
7	Laga Hida	38.052	45.408	49.554	52.443	55.463	57.013	60.170	68.352	76.865	85.458	93.896
8	Mada Walabu	61.919	73.889	80.636	85.336	90.251	92.773	97.910	111.224	125.077	139.059	152.789
9	Mi'eso	93.701	111.815	122.024	129.137	136.575	140.392	148.165	168.313	189.277	210.435	231.214
10	Mio	33.441	39.906	43.549	46.088	48.743	50.105	52.879	60.069	67.551	75.102	82.518
11	Moyale	88.937	106.130	115.820	122.572	129.632	133.254	140.632	159.756	179.653	199.736	219.458
12	Raytu	31.056	37.060	40.443	42.801	45.266	46.531	49.107	55.785	62.733	69.746	76.633
13	Sawena	35.769	42.684	46.581	49.296	52.136	53.593	56.560	64.251	72.254	80.331	88.263
14	Wadera	65.449	78.102	85.233	90.201	95.396	98.062	103.492	117.565	132.208	146.987	161.500
15	Ayisha	43.340	50.108	54.227	57.154	60.216	61.788	65.013	73.333	81.802	90.176	98.346
16	Chereti	61.406	70.995	76.832	80.978	85.317	87.544	92.113	103.901	115.900	127.765	139.341
17	Debewein	63.951	73.938	80.016	84.335	88.853	91.173	95.931	108.207	120.704	133.060	145.116
18	Degahabour	85.724	99.111	107.258	113.047	119.105	122.213	128.592	145.048	161.799	178.362	194.523
19	Dolo Ado	127.727	147.673	159.813	168.438	177.463	182.096	191.600	216.119	241.077	265.756	289.835
20	Duhun	26.422	30.548	33.059	34.844	36.711	37.669	39.635	44.707	49.870	54.975	59.956
21	Erer	72.517	83.841	90.734	95.631	100.755	103.385	108.781	122.701	136.871	150.883	164.554
22	Ferfer	29.888	34.555	37.396	39.414	41.526	42.610	44.834	50.572	56.412	62.187	67.821
23	Fiq	106.348	122.956	133.063	140.245	147.759	151.616	159.530	179.945	200.725	221.273	241.323
24	Gode	117.574	135.935	147.109	155.049	163.357	167.621	176.369	198.939	221.914	244.631	266.796
25	Guradhamole	19.015	22.691	24.763	26.206	27.716	28.490	30.068	34.156	38.410	42.704	46.921
26	Hargele	61.148	70.697	76.509	80.638	84.959	87.176	91.726	103.465	115.413	127.228	138.756
27	Hudet	36.178	41.828	45.266	47.709	50.266	51.578	54.270	61.214	68.284	75.274	82.094
28	Jijiga	248.465	287.266	310.881	327.660	345.216	354.227	372.715	420.412	468.963	516.970	563.811
29	Kebri Beyah	151.052	174.641	188.997	199.198	209.871	215.349	226.589	255.585	285.101	314.287	342.764
30	Kebri Dehar	97.701	112.958	122.244	128.842	135.745	139.289	146.558	165.314	184.405	203.282	221.701
31	Kelafo	76.981	89.002	96.319	101.518	106.957	109.749	115.477	130.255	145.297	160.171	174.684
32	Mustahil	46.669	53.957	58.393	61.544	64.842	66.534	70.007	78.966	88.085	97.102	105.900

No	wereda	Year										
		1994	2000	2003	2005	2007	2008	2010	2015	2020	2025	2030
33	Shinile	82.590	95.487	103.337	108.915	114.750	117.745	123.891	139.745	155.884	171.841	187.411
34	Warder	91.865	106.211	114.942	121.146	127.637	130.968	137.804	155.439	173.390	191.139	208.458
35	West Emi	36.178	41.828	45.266	47.709	50.266	51.578	54.270	61.214	68.284	75.274	82.094
36	Afambo	12.965	14.865	15.904	16.613	17.334	17.713	18.459	20.329	22.236	24.156	26.050
37	Argoba	9.993	11.457	12.258	12.805	13.361	13.653	14.228	15.669	17.139	18.618	20.079
38	Aura	17.736	20.335	21.757	22.727	23.713	24.232	25.252	27.810	30.419	33.045	35.637
39	Berhale	31.996	36.685	39.249	40.999	42.779	43.714	45.555	50.170	54.877	59.613	64.289
40	Chifra	70.262	80.559	86.190	90.033	93.941	95.995	100.036	110.172	120.507	130.908	141.177
41	Dalifagi	44.589	51.124	54.697	57.136	59.616	60.919	63.484	69.916	76.475	83.076	89.592
42	Dalol	45.199	51.823	55.445	57.917	60.432	61.753	64.352	70.873	77.521	84.212	90.818
43	Dewe	55.200	63.290	67.714	70.732	73.803	75.417	78.591	86.555	94.674	102.846	110.913
44	Dubti	64.353	73.784	78.942	82.461	86.041	87.922	91.623	100.907	110.373	119.899	129.304
45	Dulecha	14.471	16.592	17.752	18.543	19.348	19.771	20.603	22.691	24.819	26.962	29.076
46	Gewane	26.781	30.706	32.852	34.317	35.807	36.589	38.130	41.993	45.932	49.897	53.811
47	Golina	16.386	18.787	20.101	20.997	21.908	22.387	23.330	25.694	28.104	30.529	32.924
48	Koneba	35.649	40.873	43.730	45.680	47.663	48.705	50.756	55.898	61.142	66.419	71.629
49	Telalak	63.128	72.379	77.439	80.891	84.403	86.248	89.879	98.986	108.272	117.617	126.843
50	Bena Tsemay	28.636	34.536	37.767	39.986	42.279	43.449	45.814	39.986	58.132	64.430	70.592
51	Dasenech	32.636	39.360	43.043	45.571	48.185	49.518	52.214	45.571	66.253	73.430	80.453
52	Hamer	30.545	36.838	40.285	42.652	45.098	46.346	48.869	42.652	62.009	68.726	75.299
53	Maji	17.481	21.083	23.056	24.410	25.810	26.524	27.968	24.410	35.488	39.332	43.094
54	Nyangatom	15.529	18.729	20.481	21.684	22.928	23.562	24.845	21.684	31.525	34.940	38.282
55	Surma	23.773	28.671	31.354	33.196	35.099	36.071	38.034	33.196	48.261	53.489	58.604

Source: Projected from CSA. 1994 Population and Housing Census.

Annex 4: Vital Population Indicators of Pastoral Areas (%), 2007

No	wereda	Crude Density	Sex Ratio (%)		Female (%)		% RAG (15-49)		EAP(15-64)		Young age		Old Age		PSAP		U5C (%)	
			Both	Rural	Both	Rural	Pop	female	Both	Rural	Both	Rural	Both	Rural	Both	Rural	Both	Rural
1	Arero	4.1	102.7	102.33	49.3	49.4	20.0	38.0	45.0	45.1	50.4	50.1	4.6	4.9	34.1	33.3	16.3	16.7
2	Chinaksen	94.7	98.3	98.34	50.4	50.4	22.1	43.0	51.1	49.0	46.7	48.8	2.2	2.2	32.4	34.4	14.3	14.4
3	Dire	12.5	100.4	99.82	49.9	50.0	19.9	39.6	46.5	43.6	50.6	53.4	2.9	3.0	37.7	40.5	12.9	12.9
4	Fentale	72.9	110.8	114.09	47.4	46.7	23.3	59.3	56.2	54.6	42.8	44.7	1.0	0.7	29.7	30.9	13.1	13.8
5	Girja	63.9	102.5	102.20	49.4	49.5	20.1	39.9	45.5	43.8	50.6	52.5	3.9	3.7	31.7	32.2	18.9	20.3
6	Gola Oda	11.7	106.0	105.41	48.6	48.7	25.1	48.4	52.1	52.4	47.1	46.4	0.8	1.2	34.0	33.9	13.1	12.5
7	Laga Hida	13.2	99.6	98.61	50.1	50.4	21.9	37.9	46.0	46.0	51.5	51.5	2.5	2.4	34.0	34.0	17.5	17.5
8	Mada Walabu	10.3	103.0	102.28	49.3	49.4	20.6	38.7	45.0	44.9	52.5	52.6	2.5	2.5	34.3	34.3	18.3	18.2
9	Mi'eso	53.1	105.1	105.71	48.7	48.6	22.1	45.8	49.7	49.0	48.2	50.4	2.1	0.6	33.5	34.1	14.7	16.3
10	Mi'o	7.5	101.2	100.62	49.7	49.8	19.8	39.9	46.5	43.6	50.6	53.4	2.9	3.0	37.7	40.5	12.9	12.9
11	Moyale	8.3	110.7	109.45	47.5	47.7	19.1	43.7	46.5	43.6	50.6	53.4	2.9	3.0	37.7	40.5	12.9	12.9
12	Raytu	6.4	108.2	107.18	48.0	48.3	21.8	46.4	49.4	49.4	48.7	48.7	1.9	1.9	35.0	35.0	13.8	13.7
13	Sawena	6.4	100.1	99.01	50.0	50.2	20.7	38.1	45.1	45.1	52.0	52.0	2.9	2.9	32.8	32.7	19.3	19.4
14	Wadera	75.6	102.5	102.20	49.4	49.5	20.1	39.9	45.5	43.8	50.6	52.5	3.9	3.7	31.7	32.2	18.9	20.3
15	Ayisha	13.1	96.8	96.39	50.8	50.9	24.1	43.3	52.2	51.2	45.2	46.1	2.6	2.6	33.3	34.2	12.0	12.0
16	Chereti	6.9	120.0	119.61	45.5	45.5	20.8	48.4	48.0	48.0	50.9	50.9	1.1	1.1	38.4	38.4	12.4	12.4
17	Debewein	161.5	141.8	141.35	41.4	41.4	19.1	61.7	50.1	50.2	48.8	48.7	1.2	1.1	38.0	38.0	10.8	10.7
18	Degahabour	43.1	121.0	126.99	45.3	44.1	20.6	50.3	49.2	49.0	49.3	49.6	1.5	1.4	36.7	36.8	12.6	12.8
19	Dolo Ado	20.5	109.9	109.62	47.6	47.7	21.4	44.2	47.5	47.5	51.1	51.2	1.3	1.3	38.5	39.1	12.6	12.2
20	Duhun	2.6	118.3	117.28	45.8	46.0	19.4	44.8	46.5	46.5	52.3	52.3	1.2	1.2	39.1	39.1	13.2	13.1
21	Erer	98.4	114.2	115.63	46.7	46.4	21.1	47.5	48.6	47.2	50.0	51.4	1.4	1.4	34.1	35.0	15.8	16.5
22	Ferfer	124.9	116.3	115.45	46.2	46.4	19.9	42.0	43.8	43.8	55.0	55.0	1.2	1.2	39.7	39.5	15.3	15.5
23	Fiq	313.7	118.5	118.07	45.8	45.9	18.8	43.0	42.8	42.8	56.3	56.4	0.9	0.8	41.6	41.5	14.8	14.8
24	Gode	61.1	121.3	116.92	45.2	46.1	20.6	52.1	49.6	48.4	48.9	50.2	1.5	1.4	36.0	36.3	12.9	13.9
25	Guradhamole	2.5	76.3	76.34	56.7	56.7	24.1	29.3	47.4	47.4	49.3	49.3	3.3	3.3	31.5	31.5	17.8	17.8
26	Hargele	25.8	136.4	134.17	42.3	42.7	19.8	56.8	48.6	49.2	50.1	49.4	1.3	1.4	39.3	38.7	10.8	10.7
27	Hudet	276.6	110.3	110.32	47.5	47.5	21.2	44.7	47.6	47.5	51.1	51.3	1.2	1.2	37.3	37.5	13.8	13.8

No	wereda	Crude	Sex Ratio (%)		Female (%)		% RAG (15-49)		EAP(15-64)		Young age		Old Age		PSAP		U5C (%)	
		Density	Both	Rural	Both	Rural	Pop	female	Both	Rural	Both	Rural	Both	Rural	Both	Rural	Both	Rural
28	Jijiga	192.3	102.5	102.82	49.4	49.3	21.7	44.9	51.1	49.0	46.7	48.8	2.2	2.2	32.4	34.4	14.3	14.4
29	Kebri beyah	230.2	102.8	108.32	49.3	48.0	22.1	43.1	49.7	49.4	48.8	48.9	1.6	1.6	35.5	35.9	13.3	13.0
30	Kebri Dehar	37.7	123.5	127.28	44.7	44.0	19.2	52.8	49.0	48.3	49.7	50.5	1.4	1.2	39.3	40.3	10.3	10.2
31	Kelafo	84.9	106.0	105.14	48.5	48.7	19.1	36.6	42.0	41.6	56.6	57.0	1.4	1.3	41.1	41.7	15.5	15.4
32	Mustahil	8.4	114.7	113.23	46.6	46.9	18.4	39.9	41.6	41.1	57.1	57.6	1.3	1.3	40.6	40.9	16.5	16.7
33	Shinile	86.6	113.8	115.25	46.8	46.5	23.3	50.6	52.4	52.2	45.6	46.0	2.0	1.8	33.8	34.0	11.8	12.0
34	Warder	189.0	122.9	124.20	44.9	44.6	20.3	52.1	48.8	48.2	49.8	50.4	1.4	1.3	37.6	38.4	12.2	12.1
35	west Ime	36.1	110.3	109.29	47.5	47.8	21.3	44.7	47.6	47.5	51.1	51.3	1.2	1.2	37.3	37.5	13.8	13.8
36	Afambo	2.5	112.3	110.87	47.1	47.4	24.6	55.9	56.3	56.3	41.8	41.8	1.8	1.8	29.8	29.8	12.1	12.1
37	Argoba	5.3	104.3	103.07	48.9	49.2	22.2	44.4	51.2	51.2	45.2	45.2	3.6	3.6	30.6	30.6	14.5	14.5
38	Aura	13.7	115.1	113.54	46.5	46.8	21.2	49.6	49.8	49.7	48.6	48.6	1.6	1.7	35.8	35.8	12.8	12.8
39	Berhale	2.9	121.0	120.39	45.2	45.4	19.7	50.1	47.9	48.2	50.0	49.8	2.0	2.0	37.2	37.3	12.8	12.5
40	Chifra	20.2	129.7	128.58	43.5	43.7	21.0	54.9	51.0	50.7	47.5	47.7	1.5	1.5	38.2	38.4	9.3	9.3
41	Dalifagi	31.0	141.5	139.45	41.4	41.8	19.9	58.5	49.6	49.6	48.4	48.4	2.0	2.0	37.3	37.3	11.1	11.1
42	Dalol	15.9	117.2	115.65	46.0	46.4	22.2	47.6	49.1	49.1	49.3	49.3	1.6	1.6	35.1	35.1	14.1	14.1
43	Dewe	130.8	134.7	132.86	42.6	42.9	20.6	56.5	50.8	50.8	47.4	47.4	1.8	1.8	37.7	37.7	9.7	9.7
44	Dubti	22.6	135.8	144.90	42.4	40.8	21.6	67.5	57.8	53.6	40.6	44.6	1.6	1.8	29.6	32.6	11.0	12.0
45	Dulecha	58.7	113.7	112.25	46.8	47.1	24.1	54.6	55.0	55.0	43.3	43.3	1.7	1.7	32.5	32.6	10.8	10.8
46	Gewane	9.0	124.6	129.36	44.5	43.6	22.0	52.5	51.3	50.5	47.4	48.3	1.3	1.2	35.1	37.0	12.4	11.3
47	Golina	6.5	122.6	121.18	44.9	45.2	21.2	54.9	51.7	51.5	46.1	46.4	2.1	2.1	33.7	34.0	12.4	12.4
48	Koneba	10.2	124.4	122.80	44.6	44.9	19.8	49.7	46.5	46.5	52.2	52.2	1.3	1.3	37.7	37.8	14.5	14.4
49	Telalak	27.4	140.0	138.05	41.7	42.0	20.5	62.8	53.9	53.9	43.5	43.5	2.6	2.6	35.1	35.1	8.4	8.4
50	Bena Tsemay	11.3	101.1	100.54	49.7	49.9	27.0	50.2	55.6	55.5	42.7	42.8	1.7	1.7	30.7	30.9	12.0	11.9
51	Dasenech	13.7	105.1	104.16	48.8	49.0	18.4	45.4	50.6	43.7	46.8	47.3	2.6	9.0	35.4	36.0	11.3	11.3
52	Hamer	7.9	99.2	97.94	50.2	50.5	27.3	49.3	55.6	55.5	42.7	42.8	1.7	1.7	30.7	30.9	12.0	11.9
53	Maji	5.3	93.2	92.24	51.8	52.0	24.7	43.9	55.6	54.2	39.9	41.3	4.5	4.5	24.0	24.1	15.8	17.2
54	Nyangatom	14.0	99.9	100.07	50.0	50.0	18.8	43.2	50.6	43.7	46.8	47.3	2.6	9.0	35.4	36.0	11.3	11.3
55	Surma	7.3	119.1	119.08	45.6	45.6	24.9	62.8	57.4	57.4	41.6	41.6	1.0	1.0	29.3	29.3	12.3	12.3

Annex 5: Livelihood Systems. Number of Households and Family Size

No	Wereda	Households			Livelihood			Family size				
		Male	Female	Total	sedentary	agro-pastoral	pastoral	very poor	poor	middle	better off	average
1	Arero	5306	6731	12037		2457	9580	6.0	7.0	7.0	10.0	6.4
2	Chinaksen	16864	7418	24282	10398	13884		6.0	6.0	7.0	7.0	6.5
3	Dire	18313	9863	28176		9205	18971	6.5	7.5	7.5	11.0	7.7
4	Fentale	7338	1068	8406	573	3014	4820	5.0	6.0	7.0	8.0	7.7
5	Girja	7334	1695	9029		9027						7.6
6	Gola Oda	18782	988	19770		19770						7.3
7	Laga Hida	8262	1234	9496		9496						7.4
8	Mada Walabu	13080	920	14000		14000						6.1
9	Mi'eso	18019	4653	22672		1443	5773		6.5	7.5	7.5	5.6
10	Mi'o	7016	5593	12609		4119	8490	6.0	7.0	7.0	10.0	5.3
11	Moyale	26231	1381	27612		3215	28932		6.8	8.8	10.2	7.2
12	Raytu	4744	553	5297		3591	1706	6.0	7.0	8.0	10.0	8.3
13	Sawena	7970	736	8706		3280	5426	6.0	7.0	8.0	10.0	4.2
14	Wadera	10637	560	11197		11197						4.2
15	Ayisha	5911	562	6473			6473		6.0	7.0	10.0	7.3
16	Chereti	7930	1917	9847	2483		7364		6.5	7.0	8.5	7.2
17	Debewein	6084	1448	7532		4539	2993		7.5	9.5	11.0	9.0
18	Degahabour	4665	4342	9007		6327	2680		7.5	8.5	9.8	8.4
19	Dolo ado	11003	3308	14311	8458	1410	4443	6.3	6.9	8.0	11.3	8.2
20	Duhun	1846	655	2501		431	2070		6.5	8.8	10.8	8.1
21	Erer	9392	481	9873		2084	7788		6.7	7.7	8.7	7.5
22	Ferfer	3066	882	3948	1933	859	1156		7.0	9.5	12.5	8.2
23	Fiq	8435	3852	12287			12287		6.8	8.0	10.5	8.0
24	Gode	9935	1428	11363	2942	4959	3462		7.5	9.5	11.5	8.1
25	Guradhamole	9075	1699	10774			10774		6.4	9.4	11.0	9.5
26	Hargele	7772	1916	9688	1938		7750		6.0	7.0	8.0	7.2
27	Hudet	11626	1992	13618			13618		6.0	7.7	9.3	7.6
28	Jijiga	28244	4841	33085	30112	2973			5.2	7.3	8.3	7.0
29	Kebri beyah	22437	7586	30023	27325	2698			6.0	7.0	9.0	7.1
30	Kebri Dehar	8326	2742	11068	1777	5333	3958		6.5	10.0	13.5	8.7
31	Kelafo	8378	1648	10026	6789	2158	1079		8.3	8.7	10.7	8.9

No	Wereda	Households			Livelihood			Family size				
		Male	Female	Total	sedentary	agro-pastoral	pastoral	very poor	poor	middle	better off	average
32	Mustahil	4770	1117	5887	4121	1177	589		8.5	8.5	11.0	9.0
33	Shinile	10613	532	11145		1101	10044		6.0	7.0	11.0	7.5
34	Warder	7554	2253	9807			9807		6.0	13.0	11.0	10.4
35	West Ime	4504	756	5260	3864		1395					5.5
36	Afambo	1677	1318	2995		1502	1921	5.0	6.5	8.5	10.0	7.8
37	Argoba	1293	1016	2309		2309	0	5.0	5.0	8.0	10.0	6.8
38	Aura	2300	1807	4107		511	3578	5.0	7.0	7.5	11.5	9.3
39	Berhale	4172	3278	7449		1478	10013	6.5	6.5	8.0	10.0	9.1
40	Chifra	9152	7190	16342		3345	10040		7.5	9.0	13.5	9.3
41	Dalifagi	5768	4532	10301		970	10884		8.5	8.5	12.0	4.9
42	Dalol	5674	947	6621		1655	4966		6.5	10.5	12.0	8.1
43	Dewe	7141	5611	12752		1630	14677					9.5
44	Dubti	8940	7025	15965	5340	3018	9435		5.8	7.5	12.0	9.1
45	Dulecha	3624	681	4305		469	3836		6.0	10.0	15.0	7.8
46	Gewane	3784	2973	6757		4054	2703		6.0	8.0	12.0	7.7
47	Golina	2140	1681	3821		1205	3424		10.0	10.0	13.0	11.0
48	Koneba	4609	3648	8257		1347	3147		6.0	8.0	11.0	7.5
49	Telalak	8167	6417	14584		13293	3323		5.0	8.0	15.0	9.1
50	Bena Tsemay	6620	2444	9064		6617	2447		5.5	8.5	7.5	7.4
51	Dasenech	6464	1766	8231		823	7408					4.5
52	Hamer	6833	2523	9355		3274	6081		5.5	7.5	8.0	7.1
53	Maji	3653	1577	5230	5230							5.9
54	Nyangatom	3360	918	4278			4278					4.5
55	Surma	6152	1843	7995		7995						5.9

Source: Regional BoFEDs, Save the Children UK, PARDB (Afar) and LIU

Annex 6: Livestock Population and Vital Statistics

No	wereda	Livestock ('000 heads)					Total TLU('000)	Ratios GR/BR	Other animals Camel ratio	TLU/ HH	TLU/ Capita	Density TLU/km²	animal Heads/HH	Mortality Rate (%)	commercial off-take(%)	HH Cnsum(%)
		Cattle	Shoats	Equines	Camel	Total										
1	Arero	142.0	77.0	5.5	25.2	249.7	161.6	2.2	9	13.4	3.60	14.9	21	25.29	7.60	1.99
2	Chinaksen	259.5	605.5	48.6	1.3	914.8	386.5	1.5	731	15.9	2.51	237.8	38	25.52	7.98	2.52
3	Dire	371.1	159.5	90.5	37.3	658.4	437.2	4.1	17	15.5	5.68	70.9	23	17.74	7.66	2.58
4	Fentale	71.5	159.2	10.8	61.4	302.9	178.8	0.5	4	21.3	2.04	149.0	36	28.15	7.94	2.95
5	Girja	72.7	44.9	6.2	0.0	123.8	70.7	5.3		7.8	0.70	45.0	14	6.38	7.45	2.27
6	Gola Oda	281.8	89.2	12.8	94.4	478.2	361.9	1.6	4	18.3	5.59	65.1	24	27.12	7.68	2.43
7	Laga Hida	147.3	62.9	17.9	23.1	251.3	169.5	2.8	10	17.8	3.06	40.3	26	22.56	7.73	2.54
8	Mada Walabu	162.3	192.9	8.0	43.4	406.6	230.6	1.2	8	16.5	2.55	26.4	29	27.33	7.79	2.12
9	Mi'eso	114.8	66.6	8.0	19.3	208.7	133.3	2.3	10	10.6	0.98	51.8	29	24.20	7.78	1.89
10	Mi'o	165.0	66.0	11.6	13.2	255.8	166.0	4.0	18	5.2	3.40	25.3	20	17.17	7.59	1.55
11	Moyale	37.5	17.1	2.6	5.0	62.2	40.7	2.9	11	5.6	0.31	2.6	2	22.78	7.19	1.76
12	Raytu	25.9	41.7	5.1	13.5	86.2	50.8	0.9	5	9.6	1.12	7.2	16	33.44	7.51	2.62
13	Sawena	48.7	32.3	4.2	13.4	98.6	64.7	1.6	6	7.4	1.24	8.0	11	32.39	7.40	0.83
14	Wadera	104.5	89.2	9.0	0.6	203.3	108.6	3.7	341	9.7	1.14	86.1	18	18.13	7.55	1.03
15	Ayisha	23.0	192.1	7.7	21.4	244.2	98.2	0.3	10	15.2	1.63	14.4	38	28.41	7.98	2.82
16	Chereti	64.5	198.6	0.0	108.3	371.4	233.4	0.3	2	23.7	2.74	92.3	38	28.54	7.98	2.79
17	Debewein	54.8	260.2	6.0	26.7	347.7	144.3	0.5	12	19.2	1.62	83.6	46	26.99	8.16	3.77
18	Degahabour	54.4	275.1	6.6	89.2	425.4	226.5	0.3	4	25.1	1.90	15.5	47	27.29	8.19	3.55
19	Dolo ado	19.7	98.6	2.3	22.2	142.8	69.0	0.3	5	4.8	0.39	14.9	10	45.38	7.37	2.39
20	Duhun	34.0	130.1	2.8	38.0	204.9	107.7	0.3	4	43.1	2.94	56.0	82	25.08	8.95	4.45
21	Erer	20.4	193.5	4.6	46.1	264.6	124.9	0.2	5	12.7	1.24	32.8	27	31.35	7.74	2.58
22	Ferfer	44.1	151.1	2.1	71.0	268.3	161.3	0.3	3	40.9	3.88	285.8	68	25.74	8.64	4.06
23	Fiq	11.1	98.0	2.7	45.8	157.6	92.3	0.1	2	7.5	0.62	24.2	13	41.57	7.43	2.38
24	Gode	75.6	268.3	6.9	61.9	412.8	206.7	0.4	6	18.2	1.27	627.3	36	28.35	7.95	3.13
25	Guradhamole	19.8	295.5	6.8	111.2	433.3	233.2	0.1	3	21.6	58.93	58.6	40	28.52	8.03	3.76
26	Hargele	82.9	282.2	0.0	99.2	464.3	256.7	0.3	4	26.5	3.02	75.9	48	27.10	8.20	3.09
27	Hudet	54.1	162.8	2.2	90.8	309.9	196.6	0.3	2	14.4	1.90	42.0	23	32.58	7.65	2.53
28	Jijiga	23.4	35.6	1.6	8.7	69.3	38.6	1.0	7	1.2	0.11	12.5	2	104.88	7.19	1.68
29	Kebri beyah	67.6	233.5	7.7	21.7	330.5	142.3	0.7	14	4.7	0.58	31.1	11	40.36	7.39	1.98
30	Kebri Dehar	86.7	1234.7	12.0	362.0	1695.4	835.8	0.1	4	75.5	6.16	67.3	153	23.93	10.52	6.72
31	Kelafo	95.0	213.0	22.3	0.0	330.2	142.3	1.7		14.2	1.33	258.6	33	25.58	7.87	3.35

No	wereda	Livestock ('000 heads)					Total TLU('000)	Ratios GR/BR	Other animals Camel ratio	TLU/ HH	TLU/ Capita	Density TLU/km²	animal Heads/HH	Mortality Rate (%)	commercial off-take(%)	HH Cnsum(%)
		Cattle	Shoats	Equines	Camel	Total										
32	Mustahil	81.2	128.1	17.8	0.0	227.0	107.1	2.3		18.2	1.65	38.8	39	23.54	8.00	3.53
33	Shinile	36.6	348.1	6.5	29.8	421.0	156.9	0.3	13	14.1	1.37	18.1	38	28.52	7.98	2.90
34	Warder	111.4	1255.9	2.7	445.3	1815.3	956.4	0.1	3	97.5	7.49	67.6	185	23.65	11.22	8.34
35	West Ime	58.4	243.2	7.3	62.5	371.4	188.6	0.4	5	35.9	3.75	184.2	71	25.51	8.70	3.07
36	Afambo	1.5	28.6	1.1	27.8	59.0	43.9	0.0	1	12.8	2.53	131.9	17	37.06	7.53	2.44
37	Argoba	17.2	13.8	2.4	0.6	34.0	19.0	3.6	59	8.2	1.42	40.3	15	18.17	7.47	1.96
38	Aura	86.1	246.0	3.7	34.1	370.0	171.7	0.6	10	42.0	7.24	64.3	90	24.51	9.14	5.16
39	Berhale	6.5	83.7	2.3	2.5	95.1	30.8	0.3	37	2.7	0.72	19.3	8	50.51	7.33	2.69
40	Chifra	352.3	649.0	25.0	126.3	1152.6	604.4	0.9	8	45.2	6.43	183.7	86	24.38	9.04	5.05
41	Dalifagi	61.5	206.8	5.7	21.0	294.9	128.6	0.6	13	10.8	2.16	343.6	25	30.35	7.70	1.50
42	Dalol	57.4	338.3	15.6	10.2	421.5	152.8	0.6	40		2.53	85.1				
43	Dewe	53.8	173.6	4.1	20.7	252.1	112.9	0.6	11	6.9	1.53	106.5	15	35.37	7.49	3.05
44	Dubti	40.6	99.5	0.0	6.0	146.1	62.8	0.9	23	3.5	0.73	17.4	8	43.49	7.33	2.68
45	Dulecha	111.0	127.7	5.7	35.3	279.7	163.8	1.2	7	38.1	8.47	130.0	65	24.68	8.58	3.84
46	Gewane	119.7	224.0	0.6	72.8	417.1	237.3	0.6	5	35.1	6.63	30.7	62	25.60	8.51	3.67
47	Golina	11.2	192.3	0.3	25.8	229.6	89.0	0.1	8	19.2	4.06	67.1	50	27.32	8.24	4.63
48	Koneba	6.0	220.0	6.6	3.0	235.6	68.5	0.2	78	15.2	1.44	101.4	52	26.95	8.30	3.34
49	Telalak	96.7	282.5	1.0	49.0	429.2	205.2	0.6	8	12.3	2.43	147.6	26	30.38	7.72	3.18
50	Bena Tsemay	81.2	93.5	13.6	0.0	188.2	95.1	3.1	47059	10.5	2.25	25.3	21	21.45	7.60	2.40
51	Dasenech	219.4	309.6	14.1	0.2	543.3	253.5	2.3	2858	30.8	5.26	72.0	66	23.13	8.60	2.56
52	Hamer	62.9	147.0	17.0	0.0	226.8	97.5	1.7	13342	10.4	2.16	17.0	24	26.84	7.68	2.37
53	Maji	67.2	107.9	0.0	0.0	175.0	77.3	1.9		14.8	3.00	15.8	33	25.01	7.88	2.16
54	Nyangatom	54.2	103.4	6.3	0.1	164.0	71.7	1.8	2342	16.8	3.13	43.6	38	24.91	7.99	1.76
55	Surma	98.0	14.0	0.0	0.0	111.9	77.0	21.0		9.6	2.19	16.0	14		7.46	1.59

Source: Regional BoFEDs, and Own Calculation

Annex 7: Veterinary Service facility and Vital Indicators

no	wereda	vet facilities			number of staff					Vet Coverage (%)	VLU/vet	VLU/	VLU/	VLU/	Area/	staff/	vet staff coverage
		clinics	vet posts	total	DVM	asst. vet	vet technician	AHW	Total		Clinic	PV	vet facility	VA	VF (km²)	VF	
1	Arero	2	4	6	0	6	4	11	21	66.8	49988	24994	16663	16663	1807	4	143
2	Chinaksen	1		1		4			4	9.2	216638	0	216638	54160	1625	4	25
3	Dire	1	9	10	1	8	5	46	60	29.8	269754	29973	26975	33719	617	6	116
4	Fentale	1	8	9	0	0	7	9	16	76.6	96052	12006	10672		133	2	80
5	Girja	1	0	1		5	4		9	44.4	45032	0	45032	9006	1571	9	207
6	Gola Oda	2	1	3	3	8	4		15	21.2	110289	220577	73526	27572	1852	5	88
7	Laga Hida	0	3	3		5			5	19.1	0	35014	35014	21009	1400	2	63
8	Mada Walabu	2	3	5		5	1		6	44.7	67289	44859	26916	26916	1745	1	54
9	Mi'eso	1	2	3	0	6	4		10	40.7	82019	41009	27340	13670	858	3	130
10	Mi'o	2	2	4	0	3	3		6	50.4	52929	52929	26464	35286	1638	2	57
11	Moyale	1	1	2	0	5	8	8	21	104.7	25498	25498	12749	5100	7788	11	576
12	Raytu	1	3	4		6	2	36	44	142.1	28218	9406	7054	4703	1764	11	758
13	Sawena	2	2	4		5	1	42	48	137.7	19384	19384	9692	7753	2027	12	552
14	Wadera	1	1	2	0	6	2		8	39.5	67608	67608	33804	11268	631	4	138
15	Ayisha	2		2						83.8	23854		23854		3419		
16	Chereti	1		1						16.5	121321		121321		2528		
17	Debewein	1		1						27.1	73781		73781		1726		
18	Degahabour	1		1						17.5	114428		114428		14612		
19	Dolo ado	4		4						228.9	8739		8739		1160		
20	Duhun	1		1						35.9	55668		55668		1926		
21	Erer	1		1						33.0	60655		60655		3811		
22	Ferfer	1		1						24.0	83421		83421		564		
23	Fiq	2		2						88.2	22667		22667		1903		
24	Gode	4		4						74.1	26975		26975		82		
25	Guradhamole	0		0						0.0	0		0				
26	Hargele			1						15.0	133612		133612		3382		
27	Hudet	na		0						0.0	0		0				
28	Jijiga	3		3						274.1	7296		7296		1027		
29	Kebri beyah	4		4						106.2	18839		18839		1145		
30	Kebri Dehar	1		1						5.0	399902		399902		12414		
31	Kelafo	3		3						75.1	26647		26647		183		

no	wereda	vet facilities			number of staff					Vet Coverage (%)	VLU/vet Clinic	VLU/PV	VLU/vet facility	VLU/VA	Area/VF (km²)	staff/VF	vet staff coverage
		clinics	vet posts	total	DVM	asst. vet	vet technician	AHW	Total								
32	Mustahil	2		2						64.1	31207		31207		1381		
33	Shinile	1		1						26.6	75208		75208		8661		
34	Warder	1		1						4.3	463341		463341		14140		
35	West lme	0		0						0.0							
36	Afambo	1		1		1	5	14	20	93.3	21444		21444	21444	333	20	437
37	Argoba	1		1		1	1	26	28	170.7	11713		11713	11713	471	28	914
38	Aura		8	8		2	0		2	57.9		11564	11564	46256	334	0	29
39	Berhale	1		1		1		9	10	139.9	14297		14297	14297	1595	10	304
40	Chifra	1	7	8		2		21	23	19.8	338318	48331	42290	169159	411	3	29
41	Dalifagi	1		1		2	0	30	32	29.3	68239		68239	34120	374	32	186
42	Dalol	1	1	2			1	5	6	34.9	76482	76482	38241		898	3	31
43	Dewe	1	1	2		1	3	35	39	44.4	60080	60080	30040	60080	530	20	251
44	Dubti	1	7	8		2	4	24	30	191.5	34939	4991	4367	17470	450	4	383
45	Dulecha	1	1	2		2	2	29	33	28.0	95211	95211	47605	47605	630	17	144
46	Gewane	1		1	1	1	2	33	37	15.3	130825		130825	130825	7721	37	120
47	Golina	1	8	9	1	1	2	10	14	178.0	41346	5168	4594	41346	147	2	194
48	Koneba	1		1		1		7	8	67.5	29636		29636	29636	675	8	124
49	Telalak	1	6	7			2	22	24	54.8	109903	18317	15700		199	3	79
50	Bena Tsemay	6		6						209.4	9549		9549		626		
51	Dasenech	4		4						52.8	37898		37898		880		
52	Hamer	5		5						183.8	10882		10882		1148		
53	Maji	1		1						43.5	45953		45953		4910		
54	Nyangatom	2		2						96.8	20653		20653		822		
55	Surma	1		1						38.0	52683		52683		4799		

Source: Regional BoFEDs, and PARDB (Afar) and Own Calculations

Annex 8: Estimated Crop production in metric ton (1995-2007)

No	Wereda	Production year												
		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
1	Arero	1744	2181	1563	1914	2048	2310	2181	1554	2336	3051	3553	2839	4009
2	Chinaksen	5665	7086	5077	6218	6654	7505	7086	5048	7589	9910	11543	9223	13024
3	Dire	1450	1814	1300	1592	1703	1921	1814	1292	1943	2537	2955	2361	3334
4	Fentale	7088	8866	6352	7780	8325	9390	8866	6315	9495	12399	14442	11539	16295
5	Girja	5863	7333	5254	6435	6885	7766	7333	5223	7853	10256	11945	9544	13477
6	Gola Oda	5829	7290	5223	6398	6846	7721	7291	5193	7808	10197	11876	9489	13400
7	Laga Hida	2616	3272	2344	2872	3073	3466	3273	2331	3505	4577	5330	4259	6014
8	Mada Walabu	9082	11359	8138	9968	10666	12031	11360	8092	12165	15887	18504	14785	20878
9	Mi'eso	5925	7411	5310	6504	6959	7849	7412	5279	7937	10365	12073	9646	13622
10	Mi'o	1541	1927	1381	1691	1810	2041	1927	1373	2064	2695	3139	2508	3542
11	Moyale	4866	6086	4360	5340	5714	6445	6086	4335	6518	8511	9913	7921	11185
12	Raytu	2690	3364	2410	2952	3159	3563	3365	2397	3603	4705	5481	4379	6184
13	Sawena	2015	2521	1806	2212	2367	2670	2521	1796	2699	3525	4106	3281	4633
14	Wadera	5569	6966	4991	6113	6541	7378	6967	4962	7460	9743	11348	9067	12804
15	Ayisha	232	405	264	291	677	625	544	711	959	1821	1315	1599	1277
16	Chereti	197	346	225	248	577	533	463	606	817	1552	1121	1363	1088
17	Debewein	55	96	63	69	161	148	129	169	228	432	312	379	303
18	Degahabour	91	159	104	114	266	245	213	279	376	714	516	627	501
19	Dolo Ado	339	593	386	426	990	914	795	1040	1402	2663	1922	2337	1867
20	Duhun	55	96	62	69	160	148	128	168	227	431	311	378	302
21	Erer	363	635	414	456	1060	979	851	1114	1502	2852	2059	2503	2000
22	Ferfer	539	943	615	677	1574	1454	1264	1654	2230	4234	3057	3717	2969
23	Fiq	481	841	548	604	1405	1297	1128	1476	1990	3778	2728	3316	2649
24	Gode	1079	1189	2765	2553	2219	2905	3917	7437	5369	2912	5369	2912	13197
25	Guradhamole	2675	3346	2397	2936	3142	3544	3346	2383	3583	4680	5450	4355	6150
26	Hargele	102	178	116	128	298	275	239	313	421	800	578	702	561
27	Hudet	160	280	183	201	468	432	376	492	663	1259	909	1105	883
28	Jijiga	2816	4929	3214	3539	8233	7601	6608	8648	11661	22142	15986	19435	15527
29	Kebri beyah	1108	1939	1264	1392	3239	2990	2599	3402	4587	8710	6289	7646	6108
30	Kebri Dehar	116	203	132	146	339	313	272	356	481	912	659	801	640
31	Kelafo	1353	2368	1544	1700	3956	3653	3175	4156	5604	10640	7682	9340	7461
32	West Ime	96	168	109	120	280	258	225	294	396	753	543	661	528

No	Wereda	Production year												
		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
33	Mustahil	831	1454	948	1044	2428	2242	1949	2551	3439	6531	4715	5732	4580
34	Shinile	410	718	468	516	1199	1107	963	1260	1699	3226	2329	2832	2262
35	Warder	41	71	46	51	118	109	95	124	168	319	230	280	223
36	Afambo	836	1040	1287	634	732	764	724	382	1122	2676	3261	2056	5254
37	Argoba	648	806	998	492	567	593	561	296	870	2074	2528	1594	4073
38	Aura	5	6	8	4	5	5	4	2	7	17	20	13	33
39	Berhale	171	213	264	130	150	157	148	78	230	549	669	422	1078
40	Chifra	337	420	519	256	295	308	292	154	453	1079	1315	829	2119
41	Dalifagi	557	693	857	423	488	509	482	255	748	1782	2172	1370	3500
42	Dalol	317	394	487	240	277	290	274	145	425	1013	1235	779	1990
43	Dewe	405	504	623	307	354	370	350	185	543	1295	1579	995	2543
44	Dubti	858	1068	1321	651	752	785	743	392	1152	2747	3348	2111	5394
45	Dulecha	331	412	510	251	290	303	287	151	445	1060	1292	814	2081
46	Gewane	171	212	263	129	149	156	148	78	229	546	666	420	1072
47	Golina	2	2	3	1	2	2	2	1	2	6	7	4	11
48	Koneba	183	228	282	139	160	167	158	84	246	586	714	450	1150
49	Telalak	501	623	771	380	439	458	434	229	673	1603	1954	1232	3148
50	Bena Tsemay	2254	2400	2003	2298	2033	2694	2335	1817	2770	2746	4051	3399	4252
51	Dasenech	926	986	823	944	835	1107	959	747	1138	1128	1664	1396	1747
52	Hamer	2352	2505	2090	2397	2121	2812	2436	1896	2890	2866	4227	3546	4437
53	Maji	7888	8400	7009	8040	7115	9429	8170	6359	9693	9611	14176	11893	14880
54	Nyangatom	432	460	384	441	390	517	448	348	531	527	777	652	815
55	Surma	6771	7210	6016	6902	6107	8094	7013	5459	8320	8250	12168	10209	12773

Source: World Food Programme, VAM, 2008

Annex 9: Estimated Average Income of Pastoral Households by Source

No	Wereda	Source (Birr)								
		Fire wood	Live animals	labor	Animal Product	crop	Mining	others	trade	Total
1	Arero	0	2822	848	408	18	211	0		4307
2	Chinaksen	0	3019	328	1076	1619	0	0		6042
3	Dire	0	2609	806	407	28	222	0		4072
4	Fentale	608	2482	15	0	855	0	0		3960
5	Girja	149	2966	483	759	412	88	14		4871
6	Gola Oda	161	3200	521	819	445	95	15		5255
7	Laga Hida	150	2980	485	763	415	88	14		4895
8	Mada Walabu	147	2926	477	749	407	86	14		4806
9	Mi'eso	310	2080	211	2287	69	0	0		4957
10	Mi'o	0	2609	806	407	28	222	0		4072
11	Moyale	196	3745	64	1099	0	0	104		5207
12	Raytu	0	1764	106		49	0	0		1919
13	Sawena	0	1068	432		421	0	0		1921
14	Wadera	180	3589	585	919	499	106	17		5894
15	Ayisha	1030	3548	630	362	0	0	0		5570
16	Chereti	683	2612	126	742	0	0	0		4164
17	Debewein	82	4209	0	953	200	0	22		5466
18	Degahabour	79	3305	0	1142	174	0	80		4781
19	Dolo ado	377	2008	125	1132	243	0	16		3900
20	Duhun	437	2673	0	2775	0	0	47		5932
21	Erer	392	3601	654	1114	10	0	0		5771
22	Ferfer	503	3667	292	1036	119	0	22		5639
23	Fiq	362	2842	96	2384	0	0	51		5735
24	Gode	320	2861	306	1311	948	0	36		5782
25	Guradhamole	454	2116	0	2703	323	0	12		5608
26	Hargele	196	4280	468	1178	0	0	0		6122
27	Hudet	0	4073	0	1114	0	0	43		5231
28	Jijiga	0	2865	333	743	733	0	183		4858
29	Kebri beyah	75	2774	60	1588	529	0	0		5026

No	Wereda	Source (Birr)								Total
		Fire wood	Live animals	labor	Animal Product	crop	Mining	others	trade	
30	Kebri Dehar	59	4574	173	3560	52		97		8516
31	Kelafo	318	2426	969	391	2256		0	228	6588
32	Mustahil	260	1235	501	349	2191		16		4552
33	Shinile	74	5596	488	529	15		11		6714
34	warder	0	5498	668	3199	0		45		9409
35	West Ime	205	3528	0	1579	1404		0		6716
36	Afambo	456	2005	1434	5	1879		0	52	5830
37	Argoba		1451	113	310	439		0		2312
38	Aura	4	4956	1833	68	0		0		6861
39	Berhale	0	1509	1806	56	0		99	182	3652
40	Chifra	0	4913	203	0	0		81		5196
41	Dalifagi	52	2054	650	96	257		123	114	3347
42	Dalol	0	1584	727	311	145		1640	1980	6388
43	Dewe	0	3329	0	0	0		18		3347
44	Dubti	0	3614	0	577	0		0		4191
45	Dulecha	132	3091	699	236	1344		0	18	5521
46	Gewane	432	2251	1742	10	1233		7		5676
47	Golina	0	7198	2536	0	0		567		10301
48	Koneba	0	858	1644	315	0		0		2817
49	Telalak	0	3495	0	0	0		7		3502
50	Bena Tsemay	45	1386	0	249	349		2	10	2040
51	Dasenech	32	1779	16	465	354		6	7	2659
52	Hamer	23	1279	34	327	364		0		2028
53	Maji	0	1129	0	415	43		11	6	1603
54	Nyangatom	26	1430	13	374	285		5	6	2138
55	Surma	21	1155	10	302	230		4	5	1726

Source: Own calculation and extrapolation from Livelihood assessment of SCUK, 2005 and 2006.

Annex 10: Average Income of Households by Wealth group

No	WEREDA	Average	Wealth Group			
			very poor	poor	Middle income	Wealthy
1	Arero	4315	2262.4	2701.0	4796.6	8369.0
2	Chinaksen	6040	2459.2	4460.6	5928.6	10582.7
3	dire	4066	2139.8	2632.1	4468.7	8027.8
4	Fentale	3947	1844.4	2647.8	4903.1	8316.5
5	Girja	4871	2553.9	3049.0	5414.6	9447.3
6	Gola Oda	5255	2139.4	3880.5	5157.6	9206.5
7	Laga Hida	4895		2860.8	5355.2	7820.5
8	Mada Walabu	4806		2808.9	5258.1	7678.7
9	Mi'eso	4957		2897.0	5423.0	7919.5
10	Mi'o	4066	2139.8	2632.1	4468.7	8027.8
11	Moyale	5207		3268.4	6149.2	7349.4
12	Raytu	1919	476.0	1169.0	2303.0	3750.0
13	Sawena	1920	874.5	1528.7	2131.6	3185.6
14	Wadera	5998	3156.4	3882.6	6591.8	11841.6
15	Ayisha	5570		3410.0	5914.0	8800.0
16	Chereti	4164		3755.0	6780.0	16454
17	Debewein	5470		3844.4	5577.8	7955.8
18	Degahabour	4781		2995.8	5002.8	7840.5
19	Dolo ado	4422	421.4	2697.0	4695.3	7120.9
20	Duhun	5932		4196.3	6901.5	9126.9
21	Erer	5772		3620.3	6126.1	8862.9
22	Ferfer	6964	778.1	5474.9	7610.6	8528.3
23	Fiq	5735		3864.0	6754.4	8864.9
24	Gode	5781		4155.3	5797.3	9298.1
25	Guradhamole	5615		3939.0	6030.6	9876.1
26	Hargele	6122		4820.0	5052.0	8420.0
27	Hudet	5231		2755.3	5542.3	8135.3

No	WEREDA	Average	Wealth Group			
			very poor	poor	Middle income	Wealthy
28	Jijiga	4858		2619.1	5359.3	7193.4
29	Kebri beyah	5026		1822.5	6007.5	9147.8
30	Kebri Dehar	8507		4778.3	11353.7	9947.0
31	Kelafo	6588		4391.5	6907.7	11003.7
32	Mustahil	4552		2998.0	4683.8	7463.0
33	Shinile	6712		3509.9	8059.8	9642.5
34	warder	9409		5499.0	11392.6	12515.0
35	West Ime	5636	629.6	4430.5	6158.9	6901.6
36	Afambo	5830	2655.1	4549.0	5740.5	9171.3
37	Argoba	2312	864.0	1559.0	2994.5	4110.0
38	Aura	6861		1772.5	8615.0	12830.0
39	Berhale	6439		2529.8	7082.5	11791.8
40	Chifra	5196		2416.0	5280.0	9680.0
41	Dalifagi	4953	1851.0	3340.0	6415.3	8805.1
42	Dalol	6388		779.3	3983.1	17568.1
43	Dewe	3347		1227.0	4067.0	5791.0
44	Dubti	4191		850.0	3750.0	6711.0
45	Dulecha	5521	2192.5	2292.0	4845.0	13086.5
46	Gewane	5071	1794.6	3376.6	5238.1	7031.5
47	Golina	10301		3977.5	13005.0	12735.0
48	Koneba	2817		2400.0	2990.0	3920.0
49	Telalak	3502		920.0	3170.0	6900.0
50	Bena Tsemay	2040		1297.5	2182.0	2860.0
51	Dasenech	2659		1716.3	2662.3	4193.9
52	Hamer	1896		1223.9	1898.5	2990.8
53	Maji	2019		1283.9	2159.1	2829.9
54	Nyangatom	2138		1380.1	2140.9	3372.6
55	Surma	1726		1097.9	1846.3	2420.0

Annex 11: Household cash Expenditure by Source

No		Average Expenditure (birr)										
		Others	Gift	Tax	Cloth	Services	Inputs	HH item	non- staples	Staples	Water	Average
1	Arero	0.00	83.23	99.00	239.10	360.01	487.20	421.04	602.05	727.42	24.20	3043.24
2	Chinaksen	76.23	115.38	51.80	1240.34	148.08	548.18	1227.46	545.43	401.35	0.00	4354.26
3	dire	0.00	74.01	86.49	224.22	339.09	452.96	389.26	589.72	609.21	20.27	2785.22
4	Fentale	262.49	30.57	25.43	412.09	370.05	369.73	672.78	275.41	860.14	0.00	3278.68
5	Girja	105.80	94.71	82.07	660.91	380.23	580.41	846.70	628.69	811.59	13.89	4205.08
6	Gola Oda	117.96	105.59	91.49	736.82	423.91	647.08	943.96	700.90	904.81	15.49	4687.76
7	Laga Hida	110.43	98.85	85.66	689.82	396.87	605.81	883.75	656.20	847.10	14.50	4389.40
8	Mada Walabu	115.34	103.24	89.46	720.47	414.50	632.72	923.02	685.35	884.74	15.14	4583.67
9	Mi'eso	627.63	30.00	90.00	573.75	224.18	353.25	621.73	1533.00	593.00	0.00	4646.53
10	Mi'o	0.00	49.90	53.76	185.29	284.36	363.41	306.13	557.49	300.06	9.98	2110.38
11	Moyale	72.80	188.88	120.72	708.72	443.76	416.38	552.58	1714.67	1071.67	0.00	5290.18
12	Raytu	0.00	0.00	0.00	273.50	101.30	72.20	445.24	115.86	601.60	0.00	1609.70
13	Sawena	0.00	0.00	9.18	371.76	108.24	45.88	396.18	37.08	670.21	0.00	1638.53
14	Wadera	148.30	132.75	115.03	926.37	532.96	813.54	1186.80	881.21	1137.57	19.47	5893.82
15	Ayisha	554.00	107.50	150.00	660.00	291.50	128.50	592.65	1330.13	1607.86	0.00	5422.14
16	Chereti	528.75	22.50	249.38	642.50	332.38	303.38	396.85	1271.11	396.11	0.00	4142.94
17	Debewein	159.46	156.70	288.76	654.17	886.27	160.84	819.36	1171.11	874.84	0.00	5171.51
18	Degahabour	124.40	237.39	244.90	744.39	510.87	341.90	621.66	951.41	575.32	0.00	4352.22
19	Dolo ado	116.06	105.35	149.50	594.02	447.77	236.27	491.93	1377.64	496.25	0.00	4014.80
20	Duhun	102.06	0.00	164.51	676.25	389.00	411.80	933.09	2472.34	841.95	0.00	5991.01
21	Erer	504.90	60.61	89.98	696.70	366.69	236.56	721.91	1607.40	1059.17	0.00	5343.92
22	Ferfer	138.29	143.05	203.55	711.96	476.06	503.05	643.70	2021.11	853.17	0.00	5693.93
23	Fik	87.53	18.75	175.76	634.38	421.88	339.94	881.51	2451.22	749.88	0.00	5760.83
24	Gode	124.30	127.97	314.63	742.58	536.48	853.88	778.30	1738.59	548.95	0.00	5765.68
25	Guradhamole	336.46	172.31	245.02	730.71	960.67	242.42	563.29	1344.84	745.25	0.00	5340.98
26	Hargele	1320.00	0.00	360.00	980.00	454.00	1664.00	302.20	1515.00	249.00	0.00	6844.20
27	Hudet	70.00	136.15	137.23	750.13	344.75	436.19	594.76	1855.63	1088.42	0.00	5413.26
28	Jijiga	376.11	37.16	106.63	681.39	256.66	815.08	799.18	1045.70	474.86	78.75	4671.53
29	Kebri beyah	860.00	0.00	175.00	550.00	195.00	286.60	538.30	1627.70	400.00	0.00	4632.60
30	Kebri Dehar	312.61	204.03	335.85	690.35	1032.80	302.90	822.25	1546.58	1299.84	0.00	6547.22

No		average expenditure (birr)										
		Others	Gift	Tax	Cloth	Services	Inputs	HH item	non- staples	Staples	Water	Average
31	Kelafo	340.92	36.98	256.05	608.22	315.97	1118.57	811.80	1172.77	653.71	0.00	5315.00
32	Mustahil	148.00	10.00	164.20	497.60	56.30	321.90	536.30	1365.80	465.70	0.00	3565.80
33	Shinile	591.18	49.35	89.80	596.48	277.21	175.73	539.16	2101.81	1788.14	0.00	6208.86
34	warder	566.00	430.00	495.00	1195.00	922.50	467.50	938.55	1257.00	2229.50	139.50	8640.55
35	West Ime	382.33	106.78	228.31	729.06	492.11	485.48	692.18	1621.79	903.63	11.34	5653.37
36	Afambo	982.47	42.70	0.00	854.50	459.09	62.15	1300.66	931.37	639.50	0.00	5272.43
37	Argoba	0.00	0.00	20.00	402.50	142.88	329.25	373.50	141.18	298.31	0.00	1707.61
38	Aura	332.16	21.50	0.00	531.29	345.68	359.20	840.06	224.61	1737.70	0.00	4392.19
39	Berhale	0.00	88.03	0.00	782.18	318.56	56.55	1057.95	495.25	2639.75	0.00	5438.27
40	Chifra	0.00	0.00	0.00	639.69	206.13	117.00	499.09	300.30	2129.25	0.00	3891.45
41	Dalifagi	217.43	11.10	1.01	406.91	165.70	79.76	491.56	318.30	892.78	0.45	2585.00
42	Dalol	475.90	0.00	0.00	1176.21	313.36	217.46	761.77	660.64	2675.51	8.84	6289.67
43	Dewe	0.00	0.00	0.00	381.52	100.30	54.06	376.97	472.51	918.41	0.00	2303.77
44	Dubti	466.14	0.00	0.00	774.00	129.20	119.00	536.34	265.68	609.60	0.00	2899.96
45	Dulecha	678.52	0.00	0.00	684.63	377.11	56.90	1246.15	976.13	425.91	0.00	4445.33
46	Gewane	751.73	10.80	0.00	567.14	335.41	75.79	694.41	805.62	1036.38	0.00	4277.28
47	Golina	201.56	57.60	0.00	673.45	371.73	61.80	1158.57	460.56	2692.50	0.00	5677.77
48	Koneba	431.54	0.00	0.00	280.20	89.58	35.10	506.18	392.40	672.45	0.00	2407.45
49	Telalak	0.00	0.00	0.00	337.50	103.20	40.50	415.10	198.00	1263.00	0.00	2357.30
50	Bena Tsemay	181.98	0.00	0.00	0.00	0.00	0.00	0.00	986.26	690.73	0.00	1858.97
51	Dasenech	254.73	0.00	0.00	0.00	0.00	0.00	0.00	1883.90	1289.36	0.00	3428.17
52	Hamer	79.66	0.00	0.00	0.00	0.00	0.00	0.00	948.75	633.61	0.00	1662.03
53	Maji	179.16	0.00	0.00	0.00	0.00	0.00	0.00	1325.00	906.84	0.00	2411.32
54	Nyangatom	211.63	0.00	0.00	0.00	0.00	0.00	0.00	1565.16	1071.21	0.00	2847.53
55	Surma	154.93	0.00	0.00	0.00	0.00	0.00	0.00	1145.84	784.22	0.00	2085.26

Source: calculated and extrapolated from Livelihood Assessment of SCUk and LIU

Annex 12: Vital Expenditure of Income and Expenditure

No		Expenditure/ capita	consumption Expenditure (%)	Basic Expenditure (%)	Food Expenditure (%)	Income/ capita	Income from Non-pastoral	IER
1	Arero	474.5	70.2	32.6	43.7	671.55	24.6	141.5
2	Chinaksen	670.3	59.2	37.7	21.7	930.14	5.4	138.8
3	dire	361.1	69.8	30.7	43.0	527.98	25.2	146.2
4	Fentale	425.8	68.2	38.8	34.6	514.29	15.7	120.8
5	Girja	551.4	66.1	35.3	34.3	638.76	15.1	115.8
6	Gola Oda	645.3	66.1	35.3	34.3	723.40	15.1	112.1
7	Laga Hida	596.1	66.1	35.3	34.2	664.81	15.1	111.5
8	Mada Walabu	747.3	66.1	35.4	34.3	783.57	15.1	104.9
9	Mi'eso	836.0	79.0	25.1	45.8	891.82	10.5	106.7
10	Mi'o	396.1	68.3	23.5	40.6	764.36	25.2	193.0
11	Moyale	734.7	81.7	33.7	52.7	723.20	7.0	98.4
12	Raytu	193.1	67.9	54.4	44.6	230.20	5.5	119.2
13	Sawena	394.5	73.0	63.6	43.2	462.47	22.5	117.2
14	Wadera	1418.8	66.1	35.3	34.3	1418.89	15.1	100.0
15	Ayisha	747.9	86.7	41.8	54.2	768.21	29.8	102.7
16	Chereti	577.4	83.1	25.1	40.2	580.39	19.4	100.5
17	Debewein	572.7	81.0	29.6	39.6	605.39	1.9	105.7
18	Degahabour	518.3	77.9	30.3	35.1	569.36	3.3	109.8
19	Dolo ado	489.6	81.9	27.2	46.7	475.58	13.3	97.1
20	Duhun	736.2	77.6	25.3	55.3	728.99	8.2	99.0
21	Erer	717.3	82.1	32.9	49.9	774.57	18.1	108.0
22	Ferfer	695.6	79.9	27.5	50.5	671.55	14.5	141.5
23	Fiq	722.9	78.8	24.0	55.6	719.73	8.9	99.6
24	Gode	707.7	71.7	22.4	39.7	709.61	11.5	100.3
25	Guradhamole	564.5	84.9	27.6	39.1	592.79	8.3	105.0
26	Hargele	950.6	71.3	18.0	25.8	850.25	10.8	89.4
27	Hudet	710.7	81.0	34.0	54.4	686.68	0.8	96.6
28	Jijiga	667.8	65.4	26.4	32.5	694.38	10.6	104.0
29	Kebri beyah	652.5	82.2	20.5	43.8	707.83	2.7	108.5
30	Kebri Dehar	755.6	82.8	30.4	43.5	982.79	3.9	130.1

No		Expenditure/ capita	consumption Expenditure (%)	Basic Expenditure (%)	Food Expenditure (%)	Income/ capita	Income from Non-pastoral	IER
31	Kelafo	594.6	63.7	23.7	34.4	737.03	23.0	124.0
32	Mustahil	396.2	75.9	27.0	51.4	505.78	17.1	127.7
33	Shinile	831.7	88.5	38.4	62.7	899.37	8.5	108.1
34	warder	830.8	83.7	41.2	40.4	904.73	7.6	108.9
35	West Ime	1031.3	79.2	29.1	44.7	1225.22	3.1	118.8
36	Afambo	676.6	74.2	28.3	29.8	748.18	33.3	110.6
37	Argoba	252.0	58.8	41.0	25.7	341.25	4.9	135.4
38	Aura	471.5	72.7	51.7	44.7	736.51	26.8	156.2
39	Berhale	598.4	79.5	62.9	57.6	401.82	57.2	67.2
40	Chifra	416.8	84.2	71.2	62.4	556.47	5.5	133.5
41	Dalifagi	532.3	77.9	50.3	46.9	689.27	28.1	129.5
42	Dalol	781.0	84.4	61.4	53.0	793.19	68.1	101.6
43	Dewe	243.2	81.3	56.4	60.4	353.29	0.5	145.3
44	Dubti	319.4	77.4	47.7	30.2	461.53	0.0	144.5
45	Dulecha	567.0	70.7	25.0	31.5	704.22	15.4	124.2
46	Gewane	558.9	82.0	37.5	43.1	741.61	38.4	132.7
47	Golina	518.0	78.5	59.3	55.5	939.84	30.1	181.4
48	Koneba	321.4	77.5	39.6	44.2	376.15	58.4	117.0
49	Telalak	260.5	80.7	67.9	62.0	386.91	0.2	148.5
50	Bena Tsemay	250.0	100.0	37.2	90.2	274.39	2.8	109.7
51	Dasenech	759.1	100.0	37.6	92.6	588.71	2.3	77.6
52	Hamer	234.2	100.0	38.1	95.2	285.72	2.8	122.0
53	Maji	409.3	100.0	37.6	92.6	272.04	1.0	66.5
54	Nyangatom	630.5	100.0	37.6	92.6	473.41	2.3	75.1
55	Surma	354.0	100.0	37.6	92.6	293.02	2.3	82.8

Source: Extrapolated and Estimated from SCUk Livelihood Assessment

Annex 13: Wealth Category in the Lowlands

No	wereda	Wealth category (%)				
		very poor	poor	middle	rich	Total
1	Arero	23.8	37.8	27.0	11.4	100
2	Chinaksen	15.7	27.5	38.6	18.1	100
3	dire	21.0	32.6	31.7	14.7	100
4	Fentale	20.6	35.5	31.3	12.6	100
5	Girja	15.5	33.1	33.6	17.8	100
6	Gola Oda	15.5	33.1	33.6	17.8	100
7	Laga Hida	15.5	33.1	33.6	17.8	100
8	Mada Walabu	15.5	33.1	33.6	17.8	100
9	Mi'eso		30.0	45.0	25.0	100
10	Mi'o	21.0	32.6	31.7	14.7	100
11	Moyale		40.0	36.0	24.0	100
12	Raytu	17.0	32.0	31.0	20.0	100
13	Sawena	20.0	30.0	30.0	20.0	100
14	Wadera	15.5	33.1	33.6	17.8	100
15	Ayisha		35.0	45.0	20.0	100
16	Chereti		32.5	45.0	22.5	100
17	Debewein		29.3	49.9	20.8	100
18	Degahabour		33.8	47.5	18.8	100
19	Dolo ado	14.3	29.6	33.9	22.2	100
20	Duhun		45.0	35.0	20.0	100
21	Erer		34.2	42.3	23.4	100
22	Ferfer		28.6	45.3	26.2	100
23	Fiq		42.5	37.5	20.0	100
24	Gode		35.1	43.9	21.0	100
25	Guradhamole		37.5	42.9	19.6	100
26	Hargele		20.0	40.0	40.0	100
27	Hudet		30.0	43.3	26.7	100
28	Jijiga		30.5	45.2	24.3	100
29	Kebri beyah		30.0	50.0	20.0	100
30	Kebri Dehar		30.5	43.2	26.3	100
31	Kelafo		48.3	30.0	21.7	100

No	wereda	Wealth category (%)				Total
		very poor	poor	middle	rich	
32	Mustahil		40.0	40.0	20.0	100
33	Shinile		34.7	45.3	20.0	100
34	warder		30.0	45.0	25.0	100
35	West Ime		40.0	40.0	20.0	100
36	Afambo	21.0	20.0	30.5	28.5	100
37	Argoba	22.5	30.0	30.0	17.5	100
38	Aura		37.5	43.0	19.5	100
39	Berhale		39.2	38.2	22.6	100
40	Chifra		37.5	40.0	22.5	100
41	Dalifagi	22.5	30.0	30.0	17.5	100
42	Dalol	0.0	36.8	36.4	26.8	100.0
43	Dewe	0.0	38.8	39.0	22.2	100
44	Dubti	2.0	22.0	34.0	42.0	100
45	Dulecha	13.5	24.5	42.0	20.0	100
46	Gewane	8.1	28.2	30.7	33.0	100
47	Golina		29.0	39.0	32.0	100
48	Koneba		51.0	32.0	17.0	100
49	Telalak		35.0	35.0	30.0	100
50	Bena Tsemay		28.0	49.5	22.5	100
51	Dasenech		28.0	49.5	22.5	100
52	Hamer		27.0	45.5	27.5	100
53	Maji		27.8	48.7	23.5	100
54	Nyangatom		27.8	48.7	23.5	100
55	Surma		27.8	48.7	23.5	100

Source: Extrapolated and estimated from SCUk Livelihood Assessment and LIU, APARDB

Annex 14: Health Facilities. Personnel and Indicators, 2007

No	Vereda	Health Facility				Number of health personnel							
		HC	clinics	HP	total	physician	Nurses	HO	sanitarian	LA	HA	HEW	Total
1	Arero	1	3	5	9	0	9	1	1	1	1	15	28
2	Chinaksen	2	1	11	14		10	2	1	1	2	31	47
3	Dire	1	0	4	5	0	7	1	1	0	1	11	21
4	Fentale	1	0	13	14	0	7	1	1	0	1	23	33
5	Girja		1	6	7		3				3	18	24
6	Gola Oda	1	1	11	13		3	1	2	1		31	38
7	Jaga Hida	1	1	10	12		5		1	1	5	35	47
8	Mada Walabu	1	3	8	12		10		2	1	7	10	30
9	Mi'eso	1	3	7	11	0	23	2	4	3	2	46	80
10	Miyo	1	2	6	9	0	12	0	1	1	1	15	30
11	Moyale	2	1	8	11	0	19	6	3	3	7	30	68
12	Raytu	1	2	13	16		6		1	1	5	15	28
13	Sawena	1	2	12	15		8		1		1	33	43
14	Vadera	1	0	10	11	0	7	1	1	1	1	18	29
15	Yyisha	1	2	2	5								
16	Chereti	1	0	2	3								
17	Debewein	0	1	1	2								
18	Degahabour	1	4	3	8								
19	Dolo Ado	1	4	3	8								
20	Duhun	0	1	1	2								
21	Erer	1	3	1	5								
22	Erfer	0	1	1	2								
23	Fiq	1	1	2	4								
24	Gode	0	5	5	10								
25	Suradhamole	0	1	0	1								
26	Hargele	0	2	1	3								
27	Hudet	na	na	na	0								
28	Ijiga	1	7	2	10								
29	Kebri beyah	1	1	1	3								
30	Kebri Dehar	0	0	4	4								
31	Kelafo	1	0	4	5								

No	Vereda	Health Facility				Number of health personnel							
		HC	Clinics	HP	total	Physician	Nurses	HO	Sanitarian	LA	HA	HEW	Total
32	Mustahil	1	0	1	2								
33	Shinile	0	1	3	4								
34	Varde	1	1	2	4								
35	West Ime	0	1	2	3								
36	Mambo	1		2	3		4	1	1	1	3	13	23
37	Argoba	1		7	8		2	1	1	1	1	8	14
38	Kura	1		2	3		2	1				14	17
39	Berhale	1	1	8	10		3	2	1	1	1	16	24
40	Chifra	1		9	10		14	-	1	2		12	29
41	Dalifagi	1		4	5		6	1	2	3	1	7	20
42	Dalol	1	1	8	10		4	-				18	22
43	Dewe	1		4	5		4	2		1	1	8	16
44	Dubti	1	3	8	12	1	18	1				24	44
45	Dulecha	1		2	3		7	1	2	1		13	24
46	Dewane	1	2	4	7	1	9	1	2	2	3	18	36
47	Golina	1		9	10		8	1		1		16	26
48	Koneba	1		3	4		4	-	1	1		10	16
49	Telalak	1		5	6		8	3	1	2	2	7	23
50	Bena Tsemay	1		9	10		20	1	2	3	1		
51	Dasenech	1		8	9		3	1	2	2	2		
52	Hamer	3		12	15		14	2	3	3	0		
53	Maji	2		4	6		8	0	1	0	2		
54	Nyangatom	1		2	3		3		2	1	1		
55	Surma	1	1	1	3		3				1		

Source: Regional BoFEDs

Annex 15: Education Indicators, 2007

No	wereda	Schools	No. of	No. of	No. of	SAP('000)	GER	NER	STR	Student per		Literacy	schools per kebele	Area per school (km2)
		(1-8)	Students	Teachers	sections	(5-14)				school	SCR	(%)		
1	Arero	22	4519	153	133	15.296	43.2	33.9	29.5	205.4	34.0	6.16	1.0	492.8
2	Chinaksen	51	11162	145	139	49.791	67.8	57.4	77.0	218.9	80.3	3.84	1.1	31.9
3	Dire	24	7895	172	138	29.006	40.1	31.2	45.9	329.0	57.2	8.64	1.5	257.0
4	Fentale	26	9816	226	188	26.002	60.8	52.2	43.4	377.5	52.2	54.5	1.4	46.2
5	Girja	12	5520	85	36	31.853	24.2	17.3	64.9	460.0	153.3	2.15	0.6	130.9
6	Gola Oda	37	9725	171	224	22.037	14.1	12.2	56.9	262.8	43.4	8.15	1.2	150.1
7	Laga Hida	27	7146	183	132	18.861	53.8	48.4	39.0	264.7	54.1	2.13	1.0	155.6
8	Mada Walabu	26	9396	193	180	30.947	46.0	36.1	48.7	361.4	52.2	4.57	1.3	335.6
9	Mi'eso	45	15600	259	225	45.718	47.1	42.3	60.2	346.7	69.3	12.2	0.9	57.2
10	Mi'o	16	7386	137	110	18.394	63.9	50.3	53.9	461.6	67.1	8.64	0.9	409.6
11	Moyale	22	8778	216	126	48.825	28.8	22.6	40.6	399.0	69.7	15.19	1.2	708.0
12	Raytu	19	3442	145	99	15.822	33.4	28.1	23.7	181.2	34.8	3.42	1.0	371.3
13	Sawena	28	4690	170	150	17.075	39.8	35.2	27.6	167.5	31.3	2.15	1.0	289.6
14	Wadera	24	9542	144	116	30.261	102.2	75.1	66.3	397.6	82.3	24.19	1.3	52.6
15	Ayisha	7	1330	38	34	20.036	11.4		35.0	190.0	39.1	4.92	0.4	976.8
16	Chereti	11	2462	75	48	32.795	14.9		32.8	223.8	51.3	5.13	0.3	229.8
17	Debewein	6	1939	31	20	33.772	11.5		62.5	323.2	97.0	8.26		287.6
18	Degahabour	20	6848	187	104	43.713	29.3		36.6	342.4	65.8	6.53		730.6
19	Dolo ado	12	1066	25	26	68.378	3.1		42.6	88.8	41.0	11.28	0.3	386.7
20	Duhun	11	1279	36	38	14.355	18.0		35.5	116.3	33.7	2.06	0.4	175.1
21	Erer	14	4880	62	52	34.394	24.9		78.7	348.6	93.8	12.2		272.2
22	Ferfer	8	2209	51	32	16.48	27.4		43.3	276.1	69.0	10.19		70.6
23	Fiq	15	2655	71	43	61.396	9.3		37.4	177.0	61.7	2.06	0.3	253.8
24	Gode	28	12622	285	116	58.835	39.3		44.3	450.8	108.8	10.19	0.7	11.8
25	Guradhamole	11	2626	64	38	1.248	26.0		41.0	238.7	69.1	3.7		362.0
26	Hargele	11	3158	69	48	33.366	19.2		45.8	287.1	65.8	5.13		307.5
27	Hudet					38.573	57.9					11.28		
28	Jijiga	74	31280	683	310	111.705	46.3		45.8	422.7	100.9	10.38	0.7	41.6
29	Kebri beyah	34	9726	155	107	86.467	23.8		62.7	286.1	90.9	10.38	0.7	134.8
30	Kebri Dehar	20	6257	231	60	53.377	23.6		27.1	312.9	104.3	8.26	0.7	620.7

No	wereda	Schools	No. of	No. of	No. of	SAP('000)	GER	NER	STR	Student per		Literacy	School/ Kebele	Area per school (km2)
		(1-8)	Students	Teachers	sections	(5-14)				school	SCR	(%)		
31	Kelafo	21	8225	79	72	43.972	39.6		104.1	391.7	114.2	10.19	0.1	26.2
32	Mustahil	7	2902	31	22	26.356	23.1		93.6	414.6	131.9	10.19		394.5
33	Shinile	11	2850	63	40	38.784	12.7		45.2	259.1	71.3	4.92	0.4	787.4
34	Warder	17	2978	104	68	47.976	12.0		28.6	175.2	43.8	6.12	0.3	831.8
35	West Ime	10	5632	39	36	18.733	57.9		144.4	563.2	156.4	3.42	0.4	102.4
36	Afambo	19	1482	56	34	5.159	39.76	29.91	26.5	78.0	43.6	4.16	2.7	17.5
37	Argoba	17	2306	39	62	4.094	66.36	52.58	59.1	135.6	37.2	19.84	1.3	27.7
38	Aura	20	1794	53	9	8.488	16.57	11.58	33.8	89.7	199.3	2.2	1.8	133.6
39	Berhale	46	5181	130	104	15.919	28.87	18.98	39.9	112.6	49.8	6.26	5.1	34.7
40	Chifra	31	3848	112	107	35.845	15.74	10.98	34.4	124.1	36.0	4.16	1.6	106.2
41	Dalifagi	16	1320	66	43	22.235	7.36	4.46	20.0	82.5	30.7	0.9	1.5	23.4
42	Dalol	27	5901	114	49	21.234	33.51	25.93	51.8	218.6	120.4	6.26	1.9	66.5
43	Dewe	19	1338	61	55	27.801	6.51	4.63	21.9	70.4	24.3	0.9	1.9	55.8
44	Dubti	29	6944	224	140	25.473	45.55	31.32	31.0	239.4	49.6	4.16	1.6	124.2
45	Dulecha	32	2051	72	68	6.286	15.83	11.11	28.5	64.1	30.2	19.84	2.7	39.4
46	Gewane	27	2894	99	78	12.553	26.96	21.44	29.2	107.2	37.1	19.84	2.7	286.0
47	Golina	19	1781	60	47	7.385	27.05	18.78	29.7	93.7	37.9	2.2	2.4	69.8
48	Koneba	23	5501	99	94	17.981	29.73	24.09	55.6	239.2	58.5	6.26	3.3	29.4
49	Telalak	15	4189	19	47	29.647	3.39	1.7	220.5	279.3	89.1	0.9	1.4	92.7
50	Bena Tsemay	14	2941	107	83	12.989	34.2	27.3	27.5	210.1	35.4	3.4	0.6	268.2
51	Dasenech	6	1314	37	27	17.069	11.9	9.1	35.5	219.0	48.7	3.77	0.2	586.9
52	Hamer	7	1372	59	41	13.855	15.2	10.4	23.3	196.0	33.5	3.4	0.3	820.3
53	Maji	18	4911	83	104	6.202	105.4	87.5	59.2	272.8	47.2	6.18	0.8	272.8
54	Nyangatom	3	411	18	20	8.122	7.5	4.3	22.8	137.0	20.6	3.77	0.2	547.8
55	Surma	5	1071	27	22	10.278	16.6	13.7	39.7	214.2	48.7	3.02	0.2	959.8

Source: Regional Education Bureaus, Somali BoFED and own calculations.

Annex 16: Safe Water Supply, coverage and other Indicators

No	Wereda	estimated Coverage(%)	Area /functional water point(km ²)	water points			water points per '000 km ²	population per water	TLU per Water point	estimated demand (m ³ /year)		
				Total	Functional	%NFW				human	Livestock	Total
1	Arero	20.00	516.28	21	16	23.8	1.5	2806	10101	245789	1364032	1609821
2	Chinaksen	32	52.42	31	29	6.5	17.8	5306	13326	842477	2839002	3681479
3	Dire	29.52	171.34	36	28	22.2	4.5	2750	15615	421639	4083667	4505306
4	Fentale	94.87	66.67	18	13	27.8	10.8	6733	13756	479194	1034463	1513657
5	Girja	5	26.63	59	52	11.9	33.1	1931	1360	549785	671938	1221723
6	Gola Oda	20.43	205.74	27	25	7.4	4.5	2591	14475	354639	2897871	3252510
7	Laga Hida	6.43	599.98	7	7	0.0	1.7	7923	24208	303662	1501143	1804805
8	Mada Walabu	24.01	218.17	40	28	30.0	3.2	3223	8235	494124	1688704	2182828
9	Mi'eso	13.31	111.89	23	20	13.0	7.8	6829	6663	747750	1130945	1878696
10	Mi'o	47.6	436.91	15	11	26.7	1.7	4440	15090	267377	1546578	1813955
11	Moyale	18.80	1557.55	10	4	60.0	0.3	32408	10180	709733	361151	1070883
12	Raytu	21.36	440.95	16	10	37.5	1.4	4527	5082	247832	338023	585855
13	Sawena	10.04	111.07	73	29	60.3	3.6	1798	2230	285443	512304	797747
14	Wadera	18.13	19.12	66	66	0.0	52.3	1445	1646	522296	980504	1502800
15	Ayisha	20.21	525.99	13	10	23.1	1.5	6022	9818	329685	441590	771275
16	Chereti	8.69	316.00	8	7	12.5	2.8	12188	33344	467112	1114422	1581534
17	Debewein	25.81	431.39	4	1	75.0	0.6	88853	144284	486471	742937	1229408
18	Degahabour	24.40	584.48	25	24	4.0	1.6	4963	9435	652097	1037658	1689756
19	Dolo Ado	50.85	928.17	5	5	0.0	1.1	35493	13798	971611	327952	1299563
20	Duhun	9.11	481.40	4	2	50.0	1.0	18355	53873	200991	536298	737288
21	Erer	16.48	346.47	11	7	36.4	1.8	14394	17846	551632	506159	1057792
22	Ferfer	21.2	188.14	3	3	0.0	5.3	13842	53766	227356	773269	1000626
23	Fiq	9.11	634.46	6	6	0.0	1.6	24627	15378	808983	368661	1177643
24	Gode	3.53	82.39	4	4	0.0	12.1	40839	51686	894378	1086565	1980943
25	Guradhamole	12.31	995.45	4	2	50.0	0.5	1979	116599	21665	864373	886038
26	Hargele	14.23	845.52	4	3	25.0	0.9	28320	85568	465149	1262034	1727183
27	Hudet	17.25		0	0		0.0			566663	952314	1518976
28	Jijiga	34.14	19.87	155	148	4.5	48.1	2333	261	1890058	262214	2152272
29	Kebri beyah	13.14	305.43	15	10	33.3	2.2	24391	14230	1335395	827832	2163227
30	Kebri Dehar	25.81	827.57	15	11	0.0	0.9	12340	75980	743206	3032202	3775407

No	Wereda	estimated coverage	Area /functional water point(km ²)	water points			water points per '000 km ²	population per water	TLU per Water point	estimated demand (m ³ /year)		
				Total	Functional	%NFW				human	Livestock	Total
31	Kelafo	6.36	36.68	15	15	0.0	27.3	7130	9487	585590	1072397	1657986
32	Mustahil	7.96	1380.88	2	2	0.0	0.7	32421	53557	355008	880663	1235671
33	Shinile	20.21	666.22	13	13	0.0	1.5	8827	12072	628257	652668	1280925
34	Warder	7.25	1571.10	9	5	44.4	0.4	25527	191273	698811	3543815	4242627
35	West Ime	14.23	255.92	4	2	50.0	2.0	25133	94298	275204	939703	1214907
36	Afambo	22.33	47.50	7	2	71.4	6.0	8667	21935	94906	161948	256854
37	Argoba	41.00	52.34	9	9	0.0	19.1	1485	2111	73150	171219	244369
38	Aura	29.02	205.61	13	8	38.5	3.0	2964	21468	129830	1007881	1137711
39	Berhale	13.00	265.77	6	6	0.0	3.8	7130	5139	234215	123699	357914
40	Chifra	22.33	329.07	10	10	0.0	3.0	9394	60441	514328	3984770	4499098
41	Dalifagi	29.02	37.42	10	6	40.0	16.0	9936	21427	326398	744452	1070850
42	Dalol	13.00	199.45	9	9	0.0	5.0	6715	16981	330863	808887	1139750
43	Dewe	29.02	96.33	11	5	54.5	4.7	14761	22573	404072	651032	1055105
44	Dubti	22.33	-	0	0		0.0	-	-	471073	406057	877130
45	Dulecha	41.00	90.00	14	7	50.0	5.6	2764	23403	105930	1180584	1286514
46	Gewane	41.00	1102.99	7	2	71.4	0.3	17903	118639	196041	1422894	1618935
47	Golina	29.02	132.54	10	5	50.0	3.8	4382	17793	119948	300101	420049
48	Koneba	13.00	135.06	5	3	40.0	4.4	15888	22830	260956	220716	481671
49	Telalak	29.02	106.98	13	7	46.2	5.0	12058	29314	462106	1155245	1617352
50	Bena Tsemay	38.86	55.21	68	68	0.0	18.1	622	1399	231480	828457	1059937
51	Dasenech	33.00	95.65	37	37	0.0	10.5	1309	6885	263809	2067677	2331486
52	Hamer	46.44	64.52	89	89	0.0	15.5	507	1095	246910	732022	978932
53	Maji	66.00	223.17	22	22	0.0	4.5	1173	3516	141310	600871	742181
54	Nyangatom	33.00	95.65	17	17	0.0	10.5	1334	4171	125531	548357	673888
55	Surma	30.00	299.93	16	16	0.0	3.3	2194	4810	192169	810858	1003027

Source: WFP, Regional BoFEDs, and Somali Water, Mineral and Energy Resources Development Bureau.

Annex 17: Road network of Pastoral Weredas and basic Indicators

No	wereda	Length of roads (km)					All weather/ 1000 km2	Area/ km (meter)	Road/ Capita(meter)	Accessible Area(%)
		asphalt	AWGR	Total	community	Grand Total				
1	Arero	0	50	50		50	4.61	216.8	1.11	14.2
2	Chinaksen		28	28		28	17.23	58.0	0.18	43.0
3	Dire	75	66	141		141	22.86	43.7	1.83	29.3
4	Fentale	68	135	203		203	169.17	5.9	2.32	85.1
5	Girja	na	na				0.00		0.00	36.5
6	Gola Oda	na	na				0.00		0.00	1.4
7	Laga Hida		65	65		65	15.48	64.6	1.17	0.0
8	Mada Walabu		153	153		153	17.53	57.0	1.70	6.2
9	Mi'eso	98	28	126		126	48.96	20.4	0.92	63.6
10	Mi'o	24	17	41		41	6.26	159.8	0.84	29.3
11	Moyale	42	9	51		51	3.27	305.4	0.39	6.6
12	Raytu		445	445		445	63.07	15.9	9.83	10.3
13	Sawena		57	57		57	7.03	142.3	1.09	0.6
14	Wadera	0	37	37		37	29.32	34.1	0.39	36.5
15	Ayisha		180	180	287.2	467.2	26.32	38.0	2.99	43.0
16	Chereti		62	62	440	502	24.53	40.8	0.73	43.0
17	Debewein		60	60	2114	2174	34.77	28.8	0.68	43.0
18	Degahabour	68	60	128	387	515	8.76	114.2	1.07	43.0
19	Dolo ado		120	120	540	660	25.86	38.7	0.68	43.0
20	Duhun		na	0	na		0.00		0.00	43.0
21	Erer	na	na	0	na		0.00		0.00	43.0
22	Ferfer	41	60	101	314	415	26.50	37.7	1.00	43.0
23	Fiq		40	40	451	491	70.87	14.1	0.96	43.0
24	Gode		125	125	630	755	32.84	30.5	0.85	43.0
25	Guradhamole		na	na	na		0.00		0.00	43.0
26	Hargele		70	70	250	320	20.70	48.3	0.82	43.0
27	Hudet		na	na	na		0.00		0.00	43.0
28	Jijiga	80	60	140		140	45.46	22.0	0.41	43.0
29	Kebri beyah	55	48	103	264	367	22.48	44.5	0.42	43.0
30	Kebri Dehar	na	na	0	na		0.00		0.00	43.0
31	Kelafo		35	35	300	335	63.61	15.7	0.33	43.0
32	Mustahil		na	na	na		0.00		0.00	43.0

No	wereda	Length of roads (km)					All weather/ 1000 km ²	Area/ km (meter)	Road/ Capita(meter)	Accessed area
		asphalt	AWGR	Total	community	Grand Total				
33	Shinile				365	365	0.00		0.00	43.0
34	warder		na	na	na		0.00		0.00	43.0
35	west lme		na	na	na		0.00		0.00	43.0
36	Afambo		79	79		79	237.59	4.2	4.56	43.0
37	Argoba		10	10	77.5	87.5	21.23	47.1	0.75	43.0
38	Aura		65	65		65	24.32	41.1	2.74	43.0
39	Berhale		236	236		236	148.00	6.8	5.52	43.0
40	Chifra			0	233	233	0.00		0.00	43.0
41	Dalifagi		15	15	105	120	40.09	24.9	0.25	43.0
42	Dalol		150	150		150	83.56	12.0	2.48	43.0
43	Dewe			0	58	58	0.00		0.00	43.0
44	Dubti		314	314		314	87.19	11.5	3.65	43.0
45	Dulecha		239	239		239	189.69	5.3	12.35	43.0
46	Gewane		56	56	45	101	7.25	137.9	1.56	43.0
47	Golina		123	123		123	92.80	10.8	5.61	43.0
48	Koneba		38	38	79	117	56.27	17.8	0.80	43.0
49	Telalak		47	47	71	118	33.80	29.6	0.56	43.0
50	Bena Tsemay		159.5	159.5	48.5	208	42.49	23.5	3.77	10.9
51	Dasenech		37.4	37.4	32.5	69.9	10.61	94.3	0.78	0.0
52	Hamer		189.1	189.1	47.2	236.3	32.93	30.4	4.19	10.8
54	Maji			2.9		2.9	0.59	1693.0	0.11	0.0
55	Nyangatom		17.4	17.4	15.2	32.6	10.61	94.3	0.76	0.0
56	Surma			34.4		34.4	7.17	139.5	0.98	0.4

Source: SNNPR and Somali Rural Road Authorities, Oromia BoFED and Own calculations.

Annex 18: List of Rural Saving and Credit Cooperatives, Membership and Capital

No	RuSACOs	Wereda	Region	founding members			end of year members			capital				saving
				male	female	total	male	female	total	registration	paid up	donation	total	
1	Café Gudina	Mi'eso	Oromia	519	16	535	179	16	195	1950	3900		5850	
2	Ifan Kae	"	"	0	122	122				1220	3675	0	4895	
3	Ifa Bultuma	"	"	0	145	145				1450	5075	3880	10405	
4	Bedatu Areda	"	"	0	60	60				300	3000	2580	5880	2400
5	Sera Webä	Fentale	"	0	29	29	0	29	29	870	1450		2320	200
6	Gudina Alge	"	"	26	6	32				3200	800		4000	480
7	Ela	"	"	0	86	86				5100	860		5960	
8	Eftu Gudina	"	"	0	25	25				2500	250		2750	
9	Gola	"	"	39	2	41					2250		2250	
10	Gemechise	"	"	39	2	41					2250	3257	5507	
11	Bati	Moyale	"	0	28	28				520	1400		1920	
12	Weldegeti	"	"	2	29	31				310	1550		1860	
13	Gemechis	"	"	0	31	31				620	1550		2170	
14	Rekofeyesa	"	"	5	15	20				200	1000		1200	
15	Bikiltu	"	"	20	5	25				1250	3250		4500	
16	J/Garagalcha	Mi'o	"				15	22	37	420	2100	25000	27520	7140
17	Jirenga	Dire	"	20	27	47				564	2360		2924	35170
18	Baha Qabeya	"	"	18	18	36				360	1800		2160	33600
19	Kayo Konbo	"	"	12	1	13				280	1400		1680	32800
20	Chokorsa	"	"	17	19	36				360	1800		2160	18600
21	Hangatu Raytu	Raytu	"	100		100				500	4200	27880	32580	3360
22	Halo Bedada	"	"	0	20	20				300	1000	20000	21300	
23	Bedada Belda	"	"	0	20	20				300	1000	20000	21300	
24	Berdintu	"	"	0	20	20				300	1000	20000	21300	
25	Hara Dube	"	"	0	20	20				300	1000	20000	21300	
26	Gurarga	"	"	14	26	40				600	12000		12600	2000
27	Hawlwadaag	Chereti	Somali	0	30	30	0	48	48				0	40920
28	Al Asad	Hargele	"	0	25	25	0	50	50				0	45450
29	Kalineys	D/ Ado	"	0	72	72	0	115	115				0	164390
30	Tawakal	"	"	0	25	25	0	48	48		3500		3500	21780
31	Wadajir	"	"	0	30	30	0	42	42		4200		4200	4200
32	Horsed	K/beyah	"	8	7	15	8	7	15				0	1725
33	Dalsan	"	"	20	12	32	20	12	32				0	3680
34	Jarar Qaho	"	"	13	11	24	13	11	24				0	2760
35	Karamardha	Jijiga	"	29	3	32	29	3	32				0	32960
36	Jighidhile	"	"	90	13	103	90	13	103				0	19545
37	Tudahidi	"	"	33	7	40	33	7	40				0	5600
38	Efonta	Dubti	Afar	17	5	22	17	5	22					4400

Source: Somali and Oromia RuFIP, Federal Cooperative Agency/RuFIP.

Annex 19: Comments on Result Framework Monitoring Indicator of PCDP II

	Project Outcome Indicators	Comments and Status
1	70 % community members satisfied with timeliness, quantity and quality of disaster early response	The baseline could not be established for this indicator. The proportion of households satisfied with the project activities is only verified through participatory evaluation and monitoring. The baseline is zero almost for all weredas (new and the former). The disaster early warning sub component was not implemented in phase I. Furthermore, the indicator is progress monitoring indicator and must be considered during implementation not before it. If the sub component is claimed to have been operational in phase I, then there must be an evaluation report of the phase I. But there is no evaluation of PCDP I outcomes. No information is obtained both from the regions and the federal project coordination unit with regard to evaluation or review of PCDP I. The indicator is also weak and could not capture the variation between former weredas and the new ones. For example there are weredas which already achieved the stated 70% benchmark. Some might achieve 100 %. Others could be 20 or 30%. The new weredas should start from zero percent and scale up to about 70% in any given year during project implementation. Therefore, the indicator will lead to wrong and unfair conclusion
2	70% of the targeted community members satisfied with service delivery through PCDP-financed social infrastructure	This has also the same implication as above. It will be monitored on yearly basis and is not the domain of the baseline. This is for many reasons. First, it is performance indicator, second the satisfaction level is measured after the project is implemented not before it. Third, the base is zero for the new weredas. Fourth, for PCDP I, most of the weredas are currently above the stated 70%. In this case the 70% scenario does not qualify even for monitoring; fifth, all indicators are for PCDP one where the case of PCDP I was already closed after evaluation. Thus the baseline for PCDP II is simply zero percent; Sixth, if the continuation of results of PCDP I should be evaluated then there should be separate result framework indicators for the new and former weredas. The result framework does not qualify to measure such issues; seventh, the baseline survey is indication of current situation and aimed at generating the outcome indicators of the project. Eight, the satisfaction level of PCDP II project activities is zero because PCDP phase II is not started yet
3	Increased average income of pastoral saving and credit loan beneficiaries	This is measurable indicator. However, the indicator is concerned with the performance of PCDP phase I. Thus, there must be evaluation and survey of households which were benefiting from saving and credit cooperatives in the phase I. Yet, no evaluation so far to establish a baseline for this component. Similarly data available at federal and regional cooperative agencies (RUFIP) is inadequate. It mainly focuses on number of members, capital; saving and for few loan disbursed, year established and lists of the cooperatives. There are no audit reports, and comprehensive data including, profit and loss statements, balance sheet items, loan and default rate, changes in income of the beneficiaries, etc. Thus this component need comprehensive survey of current status and evaluation of performances
4	Pastoral EWS established and functional in all agro-pastoral weredas	This is also performance indicator to be monitored on annual or bi-annual basis. For the new weredas the baseline is zero and the answer is no. For former PCDP weredas the results of final evaluation will be the baseline. Yet there is no evaluation of PCDP I. Thus needs comprehensive survey and evaluation. Most of the component of PCDP I, risk management component was not implemented in almost all weredas also.
Component One: Sustainable Livelihoods Enhancement		
Subcomponent (a): CIF		

5	% of community members, disaggregated by gender attending Project-related meetings (t, f, y)	This is also difficult and simple monitoring indicator. If this indicator is for PCDP II, the baseline is zero because PCDP phase II is not started yet. If baseline is a source, then the cumulative and weighted averages of the number of attendants of meeting over the last five years and its trends year by year. This information will be obtained from PCDP phase I final evaluation, but there is no evaluation of the phase at all. Needs evaluation and survey
6	% of approved (budgeted) community sub-projects completed each year	Similar to the above. It is a monitoring indicator. For former weredas need final evaluation. For new weredas it is zero percent
7	% of sub-projects completed that receive recurrent costs associated with PCDP CIF social investments	It is progress monitoring indicator. The baseline for PCDP I weredas must be covered in final evaluation report. But no evaluation of the phase. For phase II the baseline is zero percent as there is no PCDP II activity so far.
8	First and second cycle education gross enrolment rate for Grade 1–4 and 5–8 (f, m) disaggregated by region	This is the second measurable outcome indicator of the result framework. There is no Gambela in Phase II (rather Oromia, Somali, Afar and SNNPR). Data were collected (number of schools, GER, teachers, sections, etc) for all of the weredas (55) and report prepared. However, the data is incomplete. Because there is no gender disaggregated GER, NER and related education indicators. Because there is no consistent data particularly for Somali and Afar region. Furthermore, there are no schools as such designated as 1-4 and 5-8. because in almost all weredas schools are of mixed grade levels (1-2, 1-4, 1-5, 1-6, 1-8, etc). Thus disaggregating such type of schools into distinct categories is difficult and has a problem of double counting of schools which actually did not exist. Data on enrolment rate on the other hand lacks number of students by age and gender, and school age population of each wereda. This problem is common for 35 weredas of Somali and Afar regions. For Oromia and SNNPR the data is complete. For Somali and Afar regions further data gathering at wereda level might be needed as regional education bureaus have no disaggregated data
9	% of HH in beneficiary community with access to potable water	The data for 55 weredas in the four regions is collected from regional BoFEDs and Somali region water, Mineral and Energy resources development Bureau. The report on the sector is completed. Vital indicators drawn for each water supply points and each wereda
10	O&M arrangements are in place and functioning for >80% of infrastructure that requires maintenance	These are performance indicators and could not qualify for baseline indicator for most of the weredas. About 17 percent of all water supply points are functional as of 2007 in 55 weredas. Operation and maintenance is weak in all areas. As a baseline, there should be an evaluation report of PCDP phase I. The results of this evaluation could be a baseline for PCDP I weredas (32). For the new weredas the baseline is zero. However, this is also a weak indicator and does not qualify to measure the variations in achievements between former and new weredas. To establish a reliable indicator there must be an evaluation report and inventory of all water supply points in the 55 weredas
11	% of weredas posting wereda CIF plans, budgets and service performance at public centers	This is also a simple performance monitoring indicator. For PCDP I. final evaluation report should be available, but this is not in place. For the new weredas the base line is zero. PCDP II not started and no need to collect data on this, particularly for the new weredas. Simply it is the routine operation activities of PCDP beneficiary communities.
12	% of weredas with a complaint redressal system for CIF	This is also a simple monitoring indicator. The final evaluation of PCDP I (if Available) is the baseline for former weredas and zero for new weredas

Subcomponent (b): Rural Livelihoods Program		
13	# of credit beneficiaries	The data were already collected from federal and regional RuFIP offices. Current members by gender, year of establishment, capital and saving collected. But the number of credit beneficiaries is incomplete at wereda level
14	% of rural saving & credit groups established that are offering credit service two years after establishment	Similar as above. The data on this indicator is incomplete. Need evaluation and independent survey
15	% of saving & credit groups with <5% 30 day overdue payments	Data not available at all. Needs survey and evaluation
16	% of saving and credit beneficiaries whose HH income has increased	No data and needs independent evaluation or survey of the cooperatives
Component Two: Pastoral Risk Management		
Subcomponent (a): Pastoral Early Warning and Response Program		
17	>80% of early warning monthly reports and quarterly early warning bulletins produced and disseminated (national and regional) EWRD/MoARD	This is a simple monitoring indicator. The data should be collected and organized on monthly or appropriate period during implementation. No reliable benchmark can be established at the zero project year. If the data on PCDP I weredas are needed the final evaluation results could be a bench mark. But there is no final evaluation of phase I
18	80% of pastoral and agro-pastoral weredas prepare and update DPCPs	It is a simple monitoring indicator. Needs evaluation of PCDP I to establish a baseline for former weredas. For new weredas no baseline will be established as they were not benefiting from phase I activities
19	% of DCF-financed early response activities within one month of pastoral area EWS identifying change from "normal" conditions	This is monitoring indicator. Similar reasons as above
Subcomponent (b): Disaster Preparedness Strategic Investment Program		
20	Five regions prepare comprehensive strategic disaster preparedness investment plans	If this is considered as outcome of the project, the benchmark is yes or no. For PCDP I weredas results of evaluation report is a baseline. But no evaluation at all. For new weredas it is simply zero because there was no PCDP intervention in these weredas in the last five years.
21	% of available DPSIP resources expended on prioritized strategic investments by region	Same as above.
22	% of community-based disaster preparedness infrastructure investments that are operational and have maintenance plans	Evaluation result of PCDP I will be a baseline for former weredas. None for new weredas
Component Three: Knowledge Management and Participatory Learning		
23	Number of website visits per month	The PCDP I evaluation result could be a baseline for former weredas. None for new weredas as there was no PCDP I intervention in these weredas in the last five years

24	# of PAL groups that have completed research activities	Final evaluation report of PCDP I will be a source. But no evaluation report. For new weredas it is none.
25	# of quarterly federal and regional EPDGON meeting held and minuted	For all weredas the baseline is zero. Because it is a performance monitoring indicator. Impossible to establish a baseline before implementation. If achievements of phase I is needed the final evaluation result of the phase could be a baseline for former weredas. But none for new weredas
26	# of policy implementation studies and # of decisions legislated in support of policy recommendation	the same as above
Component Four: Program Management and M&E		
27	% of semi-annual project progress report submitted at federal (4 weeks), regional (3 weeks) and <i>wereda</i> (2 weeks) level after the end of each semester	Monitoring indicator and need to be monitored during implementation of phase II. Not before it
28	% of quarterly financial reports submitted at federal (4 weeks), regional (3 weeks) and <i>weredas</i> (2 week) level after end of each quarter	Monitoring indicator and baseline could not be established
29	Monitoring indicator and baseline could not be established	PCDP I evaluation result is a baseline for former weredas. None for new weredas. It is also a progress monitoring and indicator
30	Consolidated annual work plan and budget prepared in accordance with government fiscal planning cycle	As above
31	% of agreed training plans completed each year (gender, communications, social accountability, conflict, MIS, M&E and IT	As above and monitoring indicator

In general the result framework monitoring indicators are not comprehensive and inline with the components and sub components of PCDP II. The following are some of its major weaknesses

1. The indicators are simple monitoring indicators and weak to measure outcomes.
2. they are limited to components of capacity building but lacks vital indicators for livelihood and risk management components
3. They are too qualitative and have no measurable values of impacts. Example preparing a plan is not an end. The impact of the plan on the livelihood and well being matters. These monitoring indicators could be measured and tracked during implementation.
4. While only education, credit and water supply are weakly indicated as result framework indicators, important components such as human health, veterinary services, access roads, training and capacity building, small scale irrigation and other support services were forgotten. Therefore the indicators are more than inadequate and incomplete.
5. The objective of PCDP is improved well being of pastoral agro-pastoral households. The indicators must measure changes in well being. Posting plans, planning for the sake of planning and other related indicators have little to do with improved well being.
6. Almost all RF monitoring indicators have no room for variations between the former and new weredas. The beginners and the experienced are treated equally. These indicators must be re-evaluated for their reliability, measurability, applicability and other valuable indicator quality.