



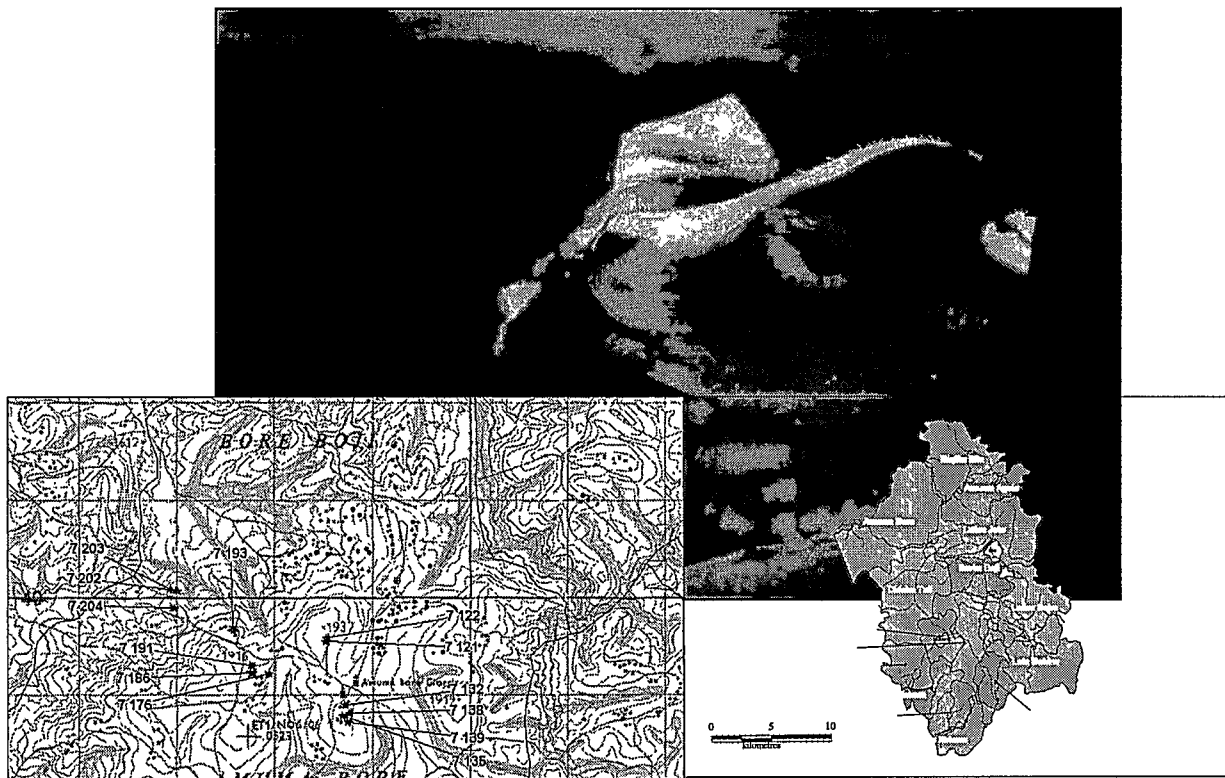
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# Technical report on census undertaken in Boji district, West Wellega Ethiopia

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## **Abstract**

The census was undertaken from November 22, 2001 to March 13, 2002 in the district of Bodji (West Wellega, Ethiopia). Its total cost was 117, 919 ETB. Pre-test surveys were carried out in April-July 2001. Twelve enumerators were recruited and received a specific training. The census questionnaire collected information on the household composition, the farm geographical positions, the number of animals and of exchanges (at the date of the census and during the last 12 months), the type and the surface of the crop produced. Fifteen peasant associations were surveyed (287 km<sup>2</sup>, 31% of the district). A total of 6192 farms were visited. Fifty-eight percents of them had cattle at the date of the survey (the total number of cattle was 26,902 and the mean herd size was 7). The average cattle density was 91 heads per km<sup>2</sup>.

## 1. Introduction

CIRAD-EMVT and ILRI are undertaking a project called 'Modeling of the within and between-herds dynamics of CBPP' that is operating in the Highlands of Ethiopia, West Wellega Zone, Boji District. The main result expected out of this project is to obtain robust and flexible models to implement cost benefit analysis of different control strategies.

The project is composed of two phases. Phase I deals the within-herd CBPP spread modeling. Phase II involves the between-herds CBPP spread modeling, where farmer-census is one of the research activities.

The main objective of the census was to describe and assess the risk factors for between-herds transmission of CBPP. Principally, the loans of animals between farmers are considered to be the major factor of the disease's spread among cattle in the region.

The census was designed in collecting the intended information by interviewing all farmers within 15 selected Peasant Associations (PA) and the town of Bila in the district of Boji in West Wellega. Fig 1 depicts the district of Boji and the shaded part in the middle is the census zone. Targeted information were data on family composition, spatial locations, number of cattle owned, respiratory abnormalities and vaccination taken, farm size, type and amount of crop produced, nature and frequency of cattle movement between farms during the last 12 months.

This present report summarizes the methodology used (study area, pre-test survey and questionnaire building, implementation of the census, logistic issues, checking and packing in the field, database management, and cost break down) and the preliminary results (human and cattle population data, and crop production data).

## 2. Material and Method

### 2.1. Study area

Boji district is situated in west Wellega Zone (Western Ethiopia) and covers 966-km<sup>2</sup>. According to CSA (2001), Boji is populated with 100,300 inhabitants (population density of 104/km<sup>2</sup>). Geographically, the district is located at latitude of 9.36° N, longitude of 35.59° E, and altitude range of 1200 – 2100m asl. In the area, annual rainfalls vary between 1300 and 2000 mm (Laval and Assegid, 2002).

Boji has a total of 36 PAs (CSA, 1996). The selected 15 PAs are further subdivided into administrative zones (AZ) and AZs are further divided into sections. Section was taken as the smallest unit to interview farmers, check, and pack questionnaires.

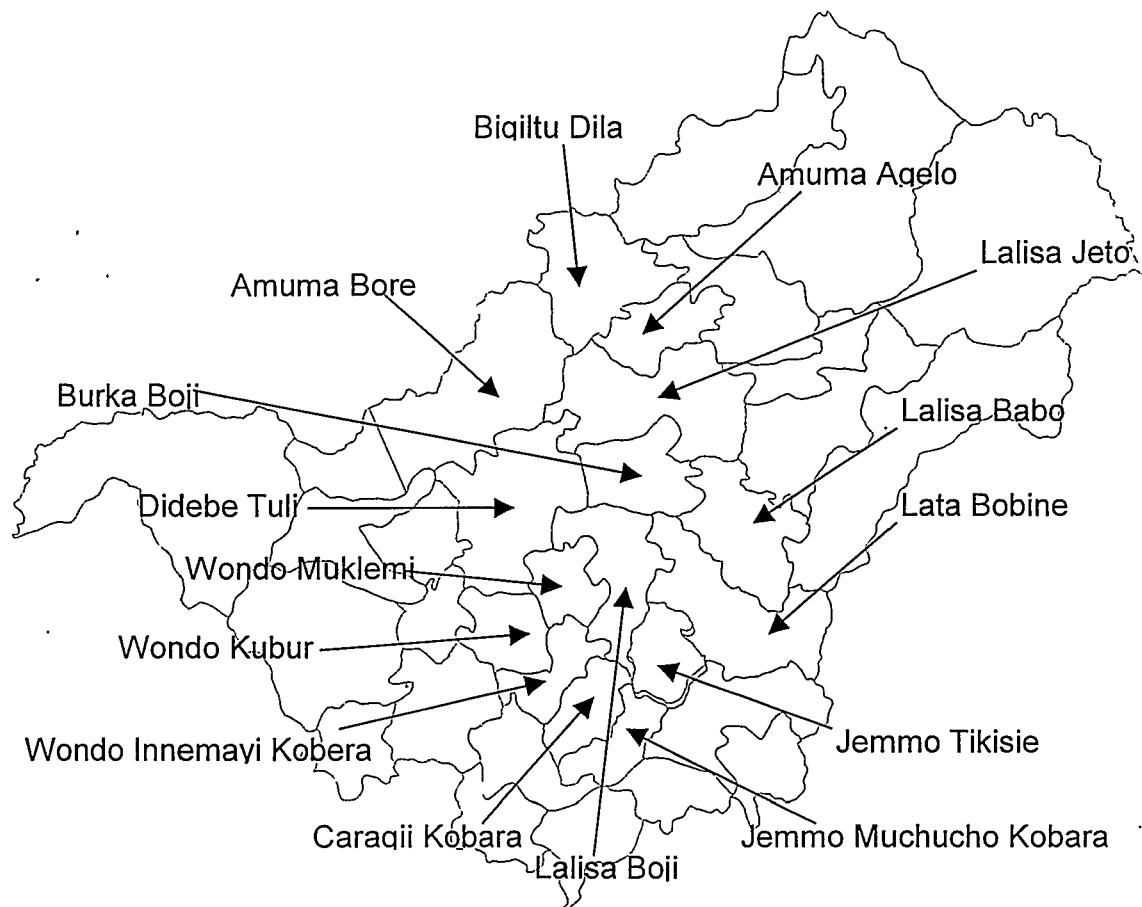


Fig. 1: Census zone (selected PAs) in the district of Boji, West Wollega, Ethiopia.

## 2.2. Pre-test survey and questionnaire building

A first pre-test census was carried out between April and July 2001 to design the questionnaire (Descamps, 2001 and Pins, 2001) and a second was undertaken just prior to the main census.

The questionnaire had four main parts (*Annex 1*):

- information on composition of a household,
- geographical position of a farm (UTM Metric system),
- number of animals at home and in Della<sup>1</sup>, and cattle exchange at the moment and during the last 12 months,
- characterization of crop production.

<sup>1</sup> A Della is a wood-fenced shelter out side of a farmer's house where cattle spend the night.

A feasibility study was undertaken to know the distance that enumerators should cover, where to fix temporary sites, to estimate how many enumerators to recruit, what type of transport to use, and materials needed.

Finally, a supervisor was assigned with the following duties:

- to train enumerators on how to fill forms and manipulate GPS<sup>1</sup>,
- to make follow up and verify whether enumerators fully understood filling the form,
- to assign each enumerator to his corresponding section per time,
- to check whether all farmers are interviewed using PA official lists and census zone map,
- to pack and collect filled questionnaire formats to Addis/ILRI,
- to establish team work and manage all activities in the field

The training ended when the questionnaire was effective in collecting the intended data and when enumerators were capable of handling the census independently.

### *2.3. Implementation of the census*

The census was undertaken from Nov 22, 2001 to March 13, 2002.

Twelve enumerators were recruited and two groups were formed in two sites (PAs at the north and south of Bila). Two houses were rented in Bila and Muklemi towns and equipped with the necessary materials and equipments to serve as residence sites for northern and southern PAs, respectively. In each group, teams of two enumerators were established and they were assigned in adjacent sections.

The main duties of enumerators were:

- to visit each farm early in the morning before farmers leave their home for work or market,
- to fill questionnaires appropriately with head of the household,
- to record GPS information about the farm,
- to make preliminary checking on the filled questionnaires,
- to return back again to search and interview if farmers were missed in one visit.

Ten bicycles were purchased and allocated in the two sites. Enumerators might have walked more than 2 to 3 hrs when PAs were not accessible by bicycle.

Farmers without cattle in Bila and Muklemi towns were ignored since most residents were dependent on non-agricultural activities.

On average, each enumerator filled 7 questionnaires per day. Questionnaires were collected, packed per section and sent to Addis Ababa for data entry.

### *2.4. Cost estimation*

The grand total costs<sup>2</sup> incurred were 117, 919 ETB (Annex 2).

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<sup>1</sup> Geographical Positioning System is a device used to collect geographical positions such as Altitude, Latitude, and Longitude.

Salaries (39%), equipment purchase (37%), other payments (10%), photocopies (8%), contingency (3%), car fuel and spare parts (3%), and stationary materials (0.3%) were the costs employed to carry out the census successfully. The largest single cost spent was for enumerators' salary (25%) followed by purchase of GPS (18%).

### *2.5. Checking and packing in the field*

The filled questionnaires were collected and checked every day. Official PA lists from the chairmen of each PA were used as a reference to check whether farmers were forgotten. However, as most official lists were old, inconsistent and unorganized by sections, care was taken to avoid the missing of those farmers not enlisted by official PA lists.

The checked questionnaires were packed per section per enumerator followed by questionnaire number sequence. Summary information such as name of the enumerator, PA, zone, section, questionnaire number range, and remarks (if any) was posted on the top of each pack.

When there were farmers not interviewed but enlisted on the official PA lists, the enumerator in charge was expected to return back and verify with the corresponding section head. In most cases, it was discovered that these people either died or migrated except in a very few cases where returning back some other time to their farm and interview was mandatory.

### *2.6. Data entry and cleaning*

Data were entered in an Access® relational database (Annex 3).

Four data entry workers were recruited and given training on how to manipulate the format, to save, to zip, and to store data on diskettes. The data entry was done from February 1 to May 15, 2002. Within the total of 89 days, 17 questionnaires were entered on average per day and data entry worker. After data entry, questionnaires were filed in file boxes. Questionnaires in a given box were arranged first by PA, and then enumerator, followed by questionnaire number sequence.

Data proofreading and corrections were made using Access® Queries and other relevant software such as Arch-View 3.0 and SPSS 11.0.

## **3. Preliminary results**

### *3.1. General results*

A total of 31 AZs and 111 sections within the selected 15 PAs were covered during the census (Annex 4). The total number of farmers interviewed was 6192 (Annex 5).

Surface area of the census zone was 297 km<sup>2</sup> (30.7% of Boji district) (Annex 6). Ammmuma Bore covered the largest surface area (14%) followed by Lalisa Jetoo (11%) and Didebi Tuli (10.9%) while Wondo Muklemi and Wondo Innemayi Kobera covered the least surface area of 3% each.

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<sup>2</sup> The over all cost estimation included some of the assets that may be sold in the future.

Interviewed farmers who were not enlisted in the PA official list were 9 % (Annex 5). Farmers enlisted on the PA official list but not located on the ground during the census period were 2 % (Annex 5).

3.2. Human population data

The largest PA in terms of human population size was Lata Bobine (10%) followed by Didebe Tuli (9.9%) and Lalisa Jetoo (8%) while Amuma Agelo (4%) was the least (Fig 2). We excluded Bila and Wondo Muklemi towns from this comparison since we were not interviewing those farmers who didn't possess cattle (the relative small population size of these PAs, therefore, was artificial).

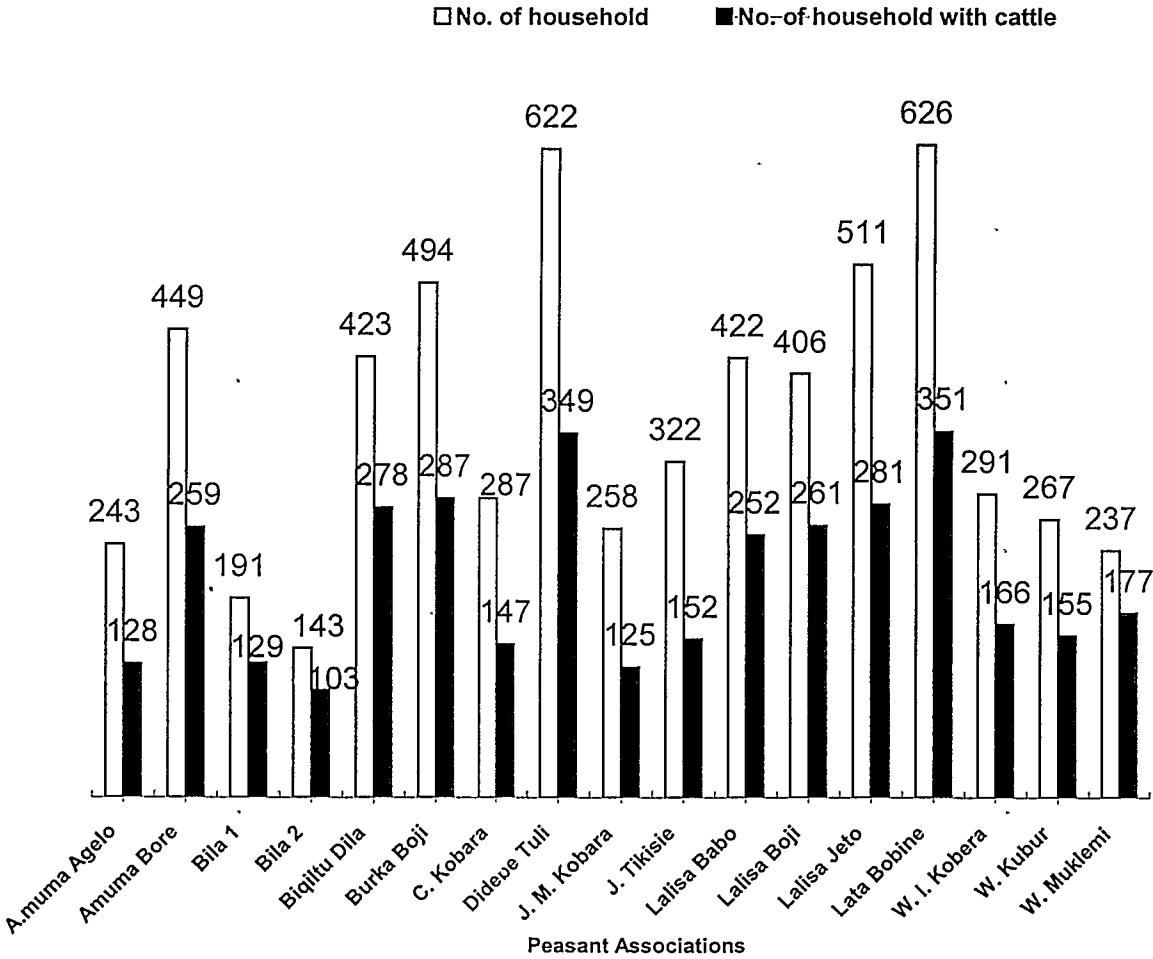


Fig2: Farmers interviewed and household with cattle in the selected PAs.

Among population living in the census zone, 84% household heads were male. Distribution of family size of the zone is indicated in Fig 3 and Table 1. Family size in the region varied from 1 to 20 with a mean of 6 and median 5. Human population density of the area was 115-inhabitants/ km<sup>2</sup>.

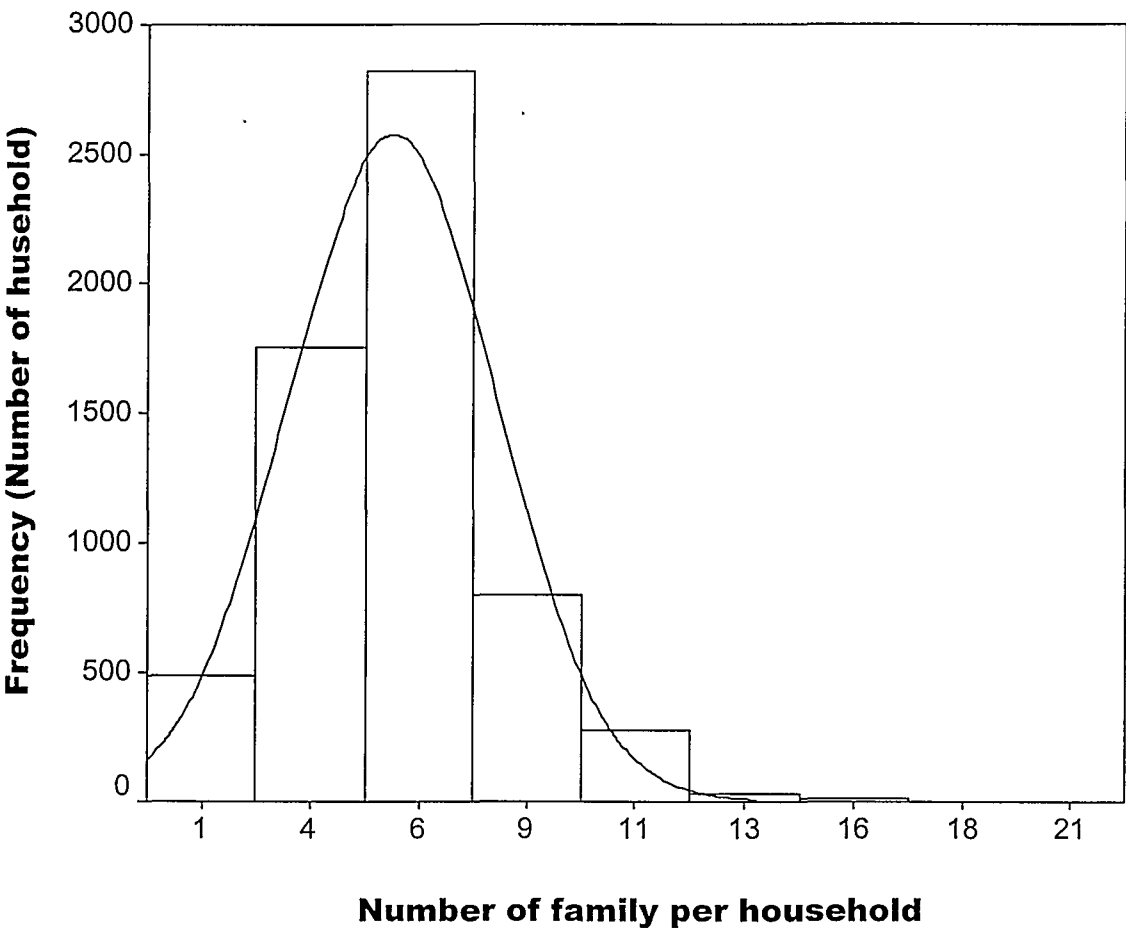


Fig 3: Distribution of family size in the census zone.

Table 1: Statistical summary of the distribution of family size in the census zone.

Parameter	Value
Mean	5.5
Minimum	1
Maximum	20
Percentiles	
25%	4
50% (Median)	5
75 %	7



### 3.3. Cattle population data

The household with cattle present in the farm at the moment of the census represented 58% (Annex 7).

Total number of cattle in the area was 26,902. Cattle herd size distribution in the area is depicted in Figure 4. Herd size varied from 1 to 43 cattle (Table 2) with a mean of 7. Cattle population density of the area was 91 per km<sup>2</sup>. Amuma Agelo (9.4) had the largest average herd size followed by Burka Boji (8.8), and Bila 1 (3.0) had the smallest.

**Table 2: Statistical summary distribution of cattle in the census zone (among household with cattle).**

Parameter	Value
Mean	7
Minimum	1
Maximum	43
Percentiles	
25%	3
50% (Median)	7
75 %	10

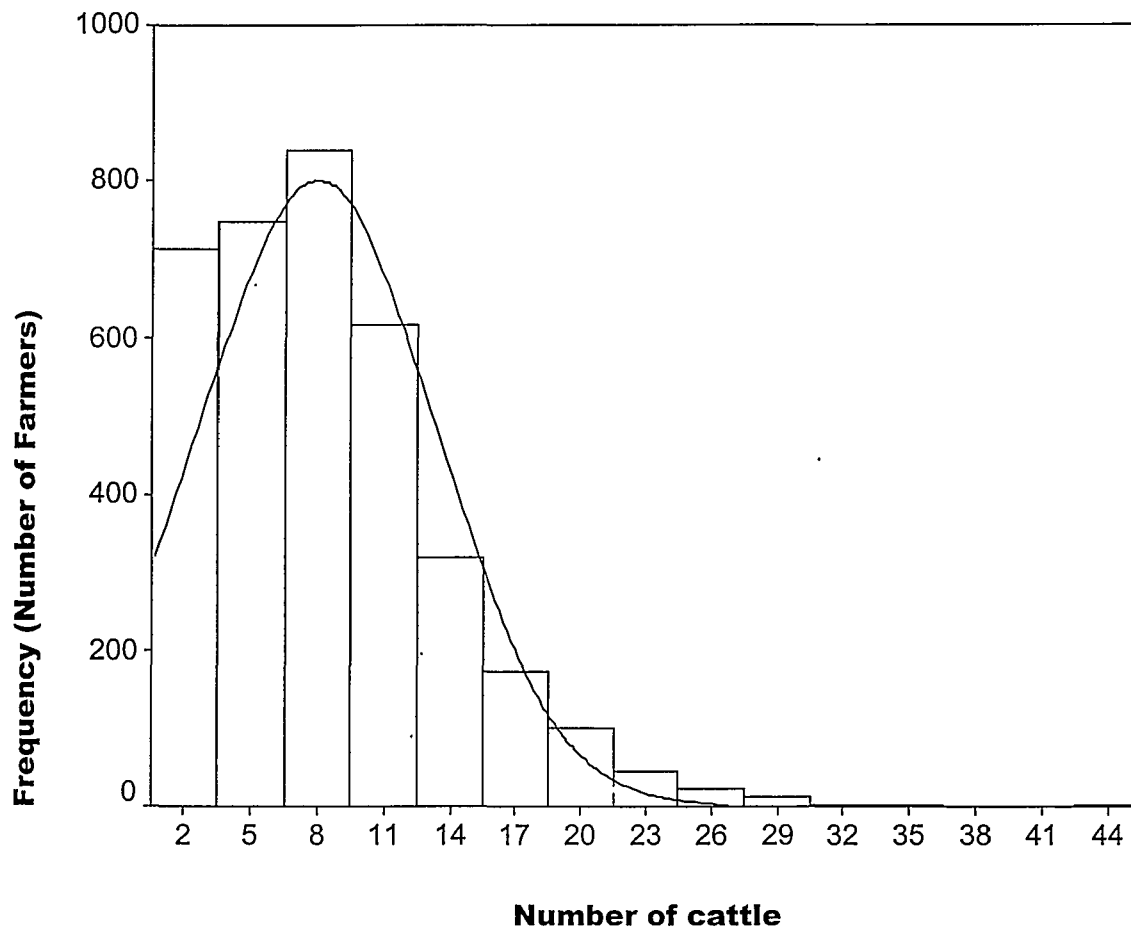
Among the farmers who had cattle, 12 % of them had no della (cattle was kept at home). The mean herd size for these farmers was 2 heads. The mean herd size was 9 heads for those who had della.

**Table 3: Percentage of farmers per holding category and mean herd size in each category.**

	Percentage of farmers	Mean herd size
Farmers with cattle	58.1	7.5
Farmers without Della <sup>3</sup>	11.7	1.8
Farmers with Della <sup>4</sup>	46.4	8.9
Farmers without cattle	41.9	-

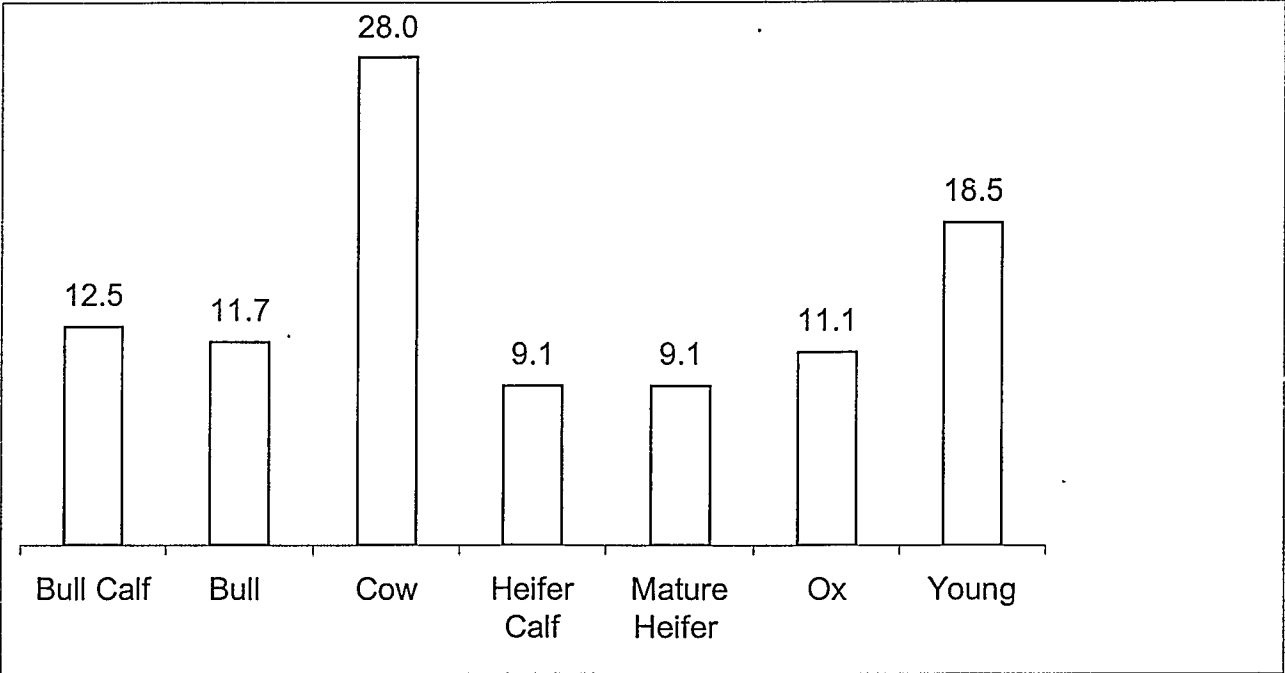
<sup>3</sup> These were farmers who had cattle at hand but had no Della in their farm where the cattle were sleeping at home

<sup>4</sup> These were farmers who had cattle at hand and had Della in their farm where there cattle spent the night



**Fig 4: Cattle herd size distribution in the census zone.**

Young at home (27%) followed by cow (26%) were the dominant livestock and heifer calf (7%) was the least important cattle category (Fig 5).



**Fig 5: Percentage of cattle per categories in the census zone (Young represent males and females less than 1 year old).**

*3.4. Crop production data*

Ninety-five percents of the households had croplands (Annex 7).

Average farm size (average over household with cropland) was 6 messas<sup>5</sup>. Figure 6 shows the cropland distribution in the area. Farm size in the area varied from 0.2 to 33.3 messas (Table 4). The mean farm size in the area was 6 messas with median of 5.5 messas.

<sup>5</sup> Messa is a local measurement unit which is estimated to be 0.25 hectare (ha).

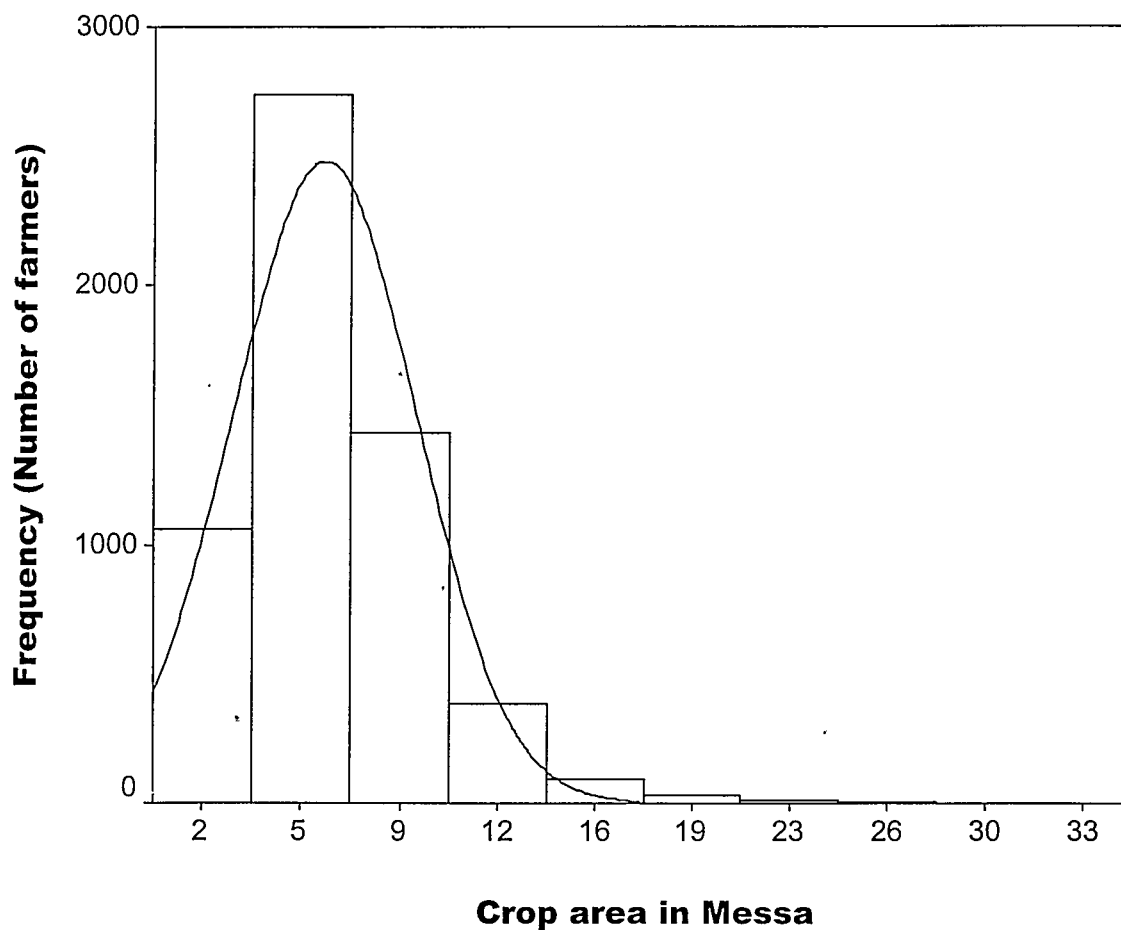


Fig 6: Distribution of cropland in the census zone.

Table 4: Statistical summary of cropland distribution of the census zone.

Parameters	Value
Mean	6.1
Minimum	.3
Maximum	33.3
Percentiles	
25%	4
50% (Median)	5.5
75%	7.5

Teff (26%) and Barley (2%) covered the largest and the least surface area of the census zone, respectively (Table 5).

**Table 5: Type of crops and percentage of their area coverage.**

Type of Crop	Percentage
Barley	2.3
Cocho	9.0
Maize Bonne	15.2
Maize House	18.2
Millet	8.2
Nug	4.4
Others	3.4
Sorghum	13.1
Teff	26.3

#### 4. References

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## 5. Appendices

Annex 1: The latest version of the questionnaire used for the census in Boji district



### FARMERS CENSUS QUESTIONNAIRE

Questionnaire number: \_\_\_\_\_ Name of the enumerator: \_\_\_\_\_

Date of interview: \_\_\_\_ / \_\_\_\_ / \_\_\_\_ (European Calendar)

Date of computer entry: \_\_\_\_ / \_\_\_\_ / \_\_\_\_ (European Calendar)

Did you have already the visit of someone from the CBPP project recently? Yes / No

If Yes : when ? \_\_\_\_\_ (If yes be aware that it might be a duplication of efforts)

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#### PART 1 – DESCRIPTION OF THE FARM

1.1- Wereda:

1.2- Peasant association (PA):

1-3- Administrative zone within PA:

1-4- Administrative section within zone (kaladii):

1.5- Local name within section:

1.6- What is the origin of the local name?

1.7- Name of the head of the family: (H) (F) (GF)

1.8- Sex of the head of the family: Male / Female

1.9- Name of the elder son (or daughter) in the farm now and still alive:

1.10- Name of the nearest neighbor in distance: (H) (F) (GF)

1.11- Composition of the family: → all the adults and children who live or work now and all the year in the farm. Workers (example: shepherds) who were not born in the family have to be counted but casual workers don't have to be considered here.

1.11a- number of children (< 15 years old):

1.11b- number of adults (including the head of the family):

1.12- Do some family members have some non-agricultural activity, which provides a regular salary? Yes/ No

1.12a- If yes, how many people from family have a salary? \_\_\_\_\_.

1.12b- If yes, which working activity(s) is this? \_\_\_\_\_/

1.13- GPS data of the main house:

1.13a- GPS NUMBER   WAYPOINT N°: \_\_\_\_\_.

1.13b- Altitude (m) \_\_\_\_\_ longitude      latitude

1.14- Is the roof made of sheet metal? Yes / No

## PART 2 - DESCRIPTION OF THE CATTLE PRESENT IN THE FARM NOW (CATTLE AT HAND)

Do you have a della now? Yes / No → If No: fill the chapter 2.1  
If Yes: fill the chapter 2.2

### 2.1- Farm with no della

2.1.1- Are you responsible of cattle, that sleep in your home? Yes / No

If Yes: fill the table

	Oxen	Bulls	Bull calves	Cows	Mature heifers	Heifer calves	Youngs	Total number
Owned or shared								
Kept for a contract								

2.1.2- Are you responsible of cattle, that sleep in the della of a neighbour? Yes / No

If Yes: fill the table

	Oxen	Bulls	Bull calves	Cows	Mature heifers	Heifer calves	Total number
Owned or shared							
Kept for a contract							

Describe the owner of this della:

Name	Wereda	Pa	Locality

### 2.2- Farm with a della

2.2.1- Describe the composition of the della (all the animals which sleep in the della):



		Oxen	Bulls	Bull calves	Cows	Mature heifers	Heifer calves	Young at home	Total of each class
Owned or shared									
Animals of the neighbours	①								
	②								
	③								
Kept for a contract									
Total number									

2.2.2- Identify those neighbours:

	Name of the neighbour (H, F, G)	Wereda	Pa	Locality
①				
②				
③				

### 2.3- Which of the animals declared in 2.1 or 2.2 are shared by other farmers :

*Remark: All animals declared kept by contracts in 2.1 or 2.2 have to be described in Part 3 and*

## PART 3 - DESCRIPTION OF CATTLE MOVEMENTS (CONTRACTS AND COMMERCIAL MOVEMENTS)

### 3.1- Contracts (dereba or qoubo)

3.1.1- At the moment: - Do you receive any animal from other farmers? Yes / No  
- Do you lend some animals to other farmers? Yes / No

3.1.2- During the last 12 months: - Do you receive any animal from other farmers? Yes / No  
- Do you lend some animals to other farmers? Yes / No

→ for each contract, ask the following questions and fill the Contracts table (annex):

What is the identification of the farmer who is in the contract?

What is the distance between the two farms by foot? (precise the unit: minute / hour of walking)

What is the total duration (planned if not finished) of the contract? (precise the unit: day / month / year)

If this duration is not exactly known (example: for such a running dereba), you have to assess with the farmer the probable total duration and fill the 4 possible cases:  
< 3 months / 3-6 months / 6-12 months / > 1 year

What is the type of concerned animals?

How many animals are concerned?

Which month began the contract (dereba or a qoubo)? → Fill the european month. You can help the farmer with the seasons (Bona, Arfasaa, Gana or Birra):

Bona: December – January – February  
 Arfasaa: March – April – May  
 Gana: June – July – August  
 Birra: September – October – November

### 3.2- Commercial exchanges

3.2.1- Did you buy any cattle during the last 12 months? Yes / No

If Yes: give details about the transaction

Name of the seller (H, F, G) / market / butcher	Wered a	Pa	Locality	Type of cattle	Number of animals	Month (european)

3.2.2- Did you sell any cattle during the last 12 months? Yes / No

If Yes: give details about the transaction

Name of the buyer (H, F, G) / market / butcher	Wered a	Pa	Locality	Type of cattle	Number of animals	Month (european)

**3.3- During the last 12 months, have you used oxen from other farmers to plough your land (not dereba nor qoubo)?** Yes / No

## PART 4 - DESCRIPTION OF CATTLE DISEASES

4.1- Do some of your animals present acute respiratory symptoms at the moment? Yes / No

If Yes: can you describe those symptoms?

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4.2- Did you vaccinate during the last 12 months (all type of vaccinations without specification)? Yes / No

If Yes: Where (PA and local name) and at which month (european)?

(Precise if this vaccination was done by our CBPP project)

## PART 5 – DESCRIPTION OF THE CROPS

List below each type of crop and its characteristics:

Type of crop: cocho / maize (house crop) / maize (bonné) / millet / sorghum / tef / barley / nug	Main crop in terms of surface	Number of fields for each crop	Surface of each crop (in messa)
Total surface (in messa)			

Coffee	Yes / No
Banana	Yes / No

AT THE END OF PART 5, DON'T FORGET TO CHEK QUESTION 3.3 (P. 3)

## PART 6 - OTHER REMARKS:

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Identification of the farmer					Distance between the 2 farms	Duration of the contract	Type of animals	Number of received or sent animals	Month (european) of beginning of the contract	
Name (H, F, G)	Wereda	PA	Local name	Dereba					Goubo	
PART A (animals coming IN)	At the moment						-		-	-
							-		-	-
							-		-	-
							-		-	-
							-		-	-
PART A (animals coming IN)	Started and Finished during the last 12 months						-		-	-
							-		-	-
							-		-	-
							-		-	-
							-		-	-
PART B (animals going OUT)	At the moment						-		-	-
							-		-	-
							-		-	-
							-		-	-
							-		-	-
PART B (animals going OUT)	Started and Finished during the last 12 months						-		-	-
							-		-	-
							-		-	-
							-		-	-
							-		-	-

**Annex 2: Estimated cost break down utilized to undertake the census in Bodji district**

Item	Details	Total (Birr)
<b>Equipments</b>		
Bicycles	10 Bicycles * 1130 Birr each	11300
Bicycles spare parts	10 Bicycles * 4 months * 50 Birr average	2000
GPS <sup>f</sup>	14 GPS * 1500 Birr each	21000
Batteries for GPS	12 Enumerators * 2 batteries * 5 times * 10 birr each	1200
Sleeping bags	13 Sleeping Bags * 185 Birr each	2405
Clip boards	13 Clip Boards * 17 Birr each	221
Bags	13 Bags for Document Holding * 60 Birr each	780
Beds	14 Beds * 150 Birr each	2100
Mattress	14 Mattress * 50 Birr each	700
Tables and chairs	4 Tables of 300 birr & 4 long chairs of 200birr & 6 chairs of 180 birr	680
Cooking and related Materials	2 Small Stove of 82 Birr, 2 pots of 50 birr, 15 forks & spoons of 60 birr, 15 plats of 75 birr, 2 tea pots of 40 birr, 15 tea glasses of 30 birr, other related minute equipments of 50 birr	387
Drinking equipments	2 buckets of 40 birr, 2 Jericans and 2 Jogs of 75 Birr, 15 water glasses of 45 birr, other related minute things of 50 birr	210
Other materials	2 Oil Lamp of 60 Birr, 4 keys of 7 birr each	88
<b>Stationary Materials</b>		
Exercise books	15 Exercise Books * 2 Birr each	30
Printing paper	3 Packs * 30 birr each	60
Pens	2 Pens * 13 persons * 1 birr each * 4 months	104

<sup>f</sup> Global Positioning System (GPS). It should be taken into account that the GPSs could be reused for another puroposes and/or sold.

Pencils	1 Pencil * 13 persons * 2 times * 50 cents each	13
Markers	6 Small markers * 10 birr each	60
Stapler & Staples	2 Staples of 60 birr + 4 packets of Staples of 12 birr	72
<b>Photocopies</b>		
Questionnaire format	Questionnaire 7000 * 5 pages* 0.25 Birr each	8750
Other copies	Other Photocopies include annex, calendar, letters 400 pages * 0.25 Birr	100
<b>Car</b>		
Fuel	2 Trips/mon * (1320 km/trip: 1lt/9km=146.7 lt) * 8 round * 2.5 birr/lt	2934
<u>Car Spare Parts<sup>g</sup></u>	135 Birr * 4 months	540
<b>Salaries</b>		
Supervisor salary	3000 Birr * 4 months	12000
Data Entry salary	4 People* 780 birr * 4 months	3120
Enumerators salary	748 Birr * 10 enumerators* 4 months	29920
Casual Workers salary	People who showed borders of 111 sections * 5 birr each	555
Guard salary	150 Birr * 4 months	600
<b>Other payments</b>		
Supervisor per diem	80 Birr/day * 30 days + (3 month * 2 trips * 7 days)	5760
Driver per diem	100 Birr/day * 4month * 2 trips * 7 days	5600
Costs for information	Costs to get information and lists from PA	150
House rent	100 Birr + 20 birr for 2 house * 4 months	480
<b>Contingency costs</b>	For items unlisted and other expenditures forgotten	4000
<b>Grand total</b>		117919

<sup>g</sup> Car repair hasn't been taken into account

### Annex 3: Structure of the database and detail description of tables

**Table T\_Enumerator**

Variable	Description	T <sup>c</sup>	L <sup>d</sup>	D <sup>e</sup>
idenumerator	Identity of the enumerator	N	2	0
nameenum	Full Name of the enumerator	C	20	

**Table T\_Census\_Zone**

Variable	Description	T	L	D
pa	Name of the PA	C	50	
zone	Name of the zone (within the PA)	C	50	
section	Name of the section (within the zone)	C	50	
remarks	Remarks if there is	C	250	

**Table T\_Farmer**

Variable	Description	T	L	D
idenum	Identity of the enumerator	N	2	0
questnumber	Questionnaire number	N	3	0
dateinterview	Date of interview	D		
datecomputer	Date of computer entry	D		
weredafarmer	Wereda of the farmer	C	60	
pafarmer	PA of the farmer (within the wereda)	C	60	
zonefarmer	Zone of the farmer (within the PA)	C	60	
sectionfarmer	Section of the farmer (within the zone)	C	60	
localityfarmer	Name the Locality where the farmer lives (within the section)	C	60	
originlocality	Origin the local name was derived from	C	60	
idfarmer	Identity of the farmer	N	4	0
namefarmer1	First name of the farmer	C	20	
namefarmer2	Name of his father	C	20	
namefarmer3	Name of his grand-father	C	20	
namesun	First name of his elder son (or daughter)	C	20	
nameneigh1	First name of his nearest neighbour	C	20	

<sup>c</sup> T : Type of Data

<sup>d</sup> L : Field Size

<sup>e</sup> D : Decimal Place

nameneigh2	Name of the father of his nearest neighbour	C	20	
nameneigh3	Name of the grand-father of his nearest neighbour	C	20	
sexfarmer	Sex of the farmer: M: male F: female	C	1	
nbchild	Number of children (< 15 years) in the farm	N	2	0
nbadult	Number of adults (>= 15 years) in the farm	N	2	0
nbact	Number of family numbers who have a regular non agricultural activity	N	2	0
act1	First non agricultural activity	C	60	
act2	Second non agricultural activity	C	60	
gpsnumber	GPS number	N	2	0
waypoint	GPS waypoint number of the farm	N	3	0
altitude	Altitude of the main house of the farm (m)	N	4	0
longfarm	Longitude of the main house of the farm (Utm Adindan)	N	6	0
latfarm	Latitude of the main house of the farm (Utm Adindan)	N	7	0
roof	Binary variable which declares if the roof is made of sheet metal: 1: yes 0: no	N	1	0
respsympt	Binary variable which declares if some animals in the farm show respiratory symptoms at the moment: 1: yes 0: no	N	1	0
vacc	Binary variable which declares if the herd was vaccinated during the last 12 months: 1: yes 0: no	N	1	0
typvacc	Type of vaccination	C	20	
placevacc	Name of the place where vaccination was given	C	60	
monthvacc	Month of the vaccination: JAN / FEB / MAR / APR / MAY / JUN / JUL / AUG / OCT / NOV / DEC	C	3	
oxen	Binary variable which declares if the farmer used oxen from other farmers to plough his land (not dereba nor qoubo) during the last 12 months: 1: yes 0: no	N	1	0



**Table T\_Animal\_Farm**

Note: Owned animals sleeping in the farm (at home or in a della) at the date of the interview

Variable	Description	T	L	D
idfarmer	Identity of the farmer	N	4	0
typsleep	Where the animals sleep: HOM: home of the farmer DEL: della of the farmer	C	3	
typanim	Type of animals: OXE: ox (bœuf) BUL: bull (taureau) BUC: bull calve (taurillon) COW: cow (vache) HEM: mature heifer (génisse immature) HEC: heifer calf (génisse immature) . YOU: young at home (jeune dormant dans la maison)	C	3	
nbanim	Number of animals	N	3	0
shared	Binary variable which declares if the animals are shared or not: 1: yes 0: no	N	1	0

**Table T\_Animal\_Movement**

Variable	Description	T	L	D
idfarmer	Identity of the farmer	N	4	0
catmove	Category of the movement: INC: incoming OUT: outgoing	C	1	
typmove	Type of the movement: DER: dereba QOU: qoubo NEI: animals kept for the night from a neighbouring farm (for incomings) or animals of the farmer which sleep in a neighbouring della (for outgoings) COM: commercial movement (buy or sell)	C	3	

runmove	Declares if the movement is running or not at the date of the interview: RUN: the movement is running FIN: the movement is finished  Note: This variable has to be filled only for derebas or qoubos	C	3	
typanim	Type of animals: OXE: ox (bœuf) BUL: bull (taureau) BUC: bull calve (taurillon) COW: cow (vache) HEM: mature heifer (génisse immature) HEC: heifer calf (génisse immature) YOU: young at home (jeune dormant dans la maison)	C	3	
nbanim	Number of animals	N	3	0
namefarmmov1	First name of the farmer who is involved during the movement or: Market Butcher	C	20	
namefarmmov2	Name of his father if the individual is known	C	20	
namefarmmov3	Name of his grand-father	C	20	
namewemove	Name of his wereda	C	60	
namepamove	Name of his PA	C	60	
namelocalmove	Name of his locality	C	60	
distmove1	Distance (by foot) between the two farms: day of walking	N	2	0
distmove2	Distance (by foot) between the two farms: hour of walking	N	2	0
distmove3	Distance (by foot) between the two farms: minutes of walking	N	2	0
durmove1	Total duration the dereba or qoubo exists when it is known: in days	N	4	0
durmove2	Estimation of the total duration of the dereba or qoubo when it is not known: 0-3: less than 3 months 3-6: more than 3 months and less than 6 months 6-12: more than 6 months and less than 12 months 12+: more than 12 months 24+: more than 2 years 36+: more than 3 years	C	4	
monthmove	Month of the movement: JAN / FEB / MAR / APR / MAY / JUN / JUL / AUG / OCT / NOV / DEC	C	3	

**Table T\_Crop**

Variable	Description	T	L	D
idfarmer	Identity of the farmer	N	4	0
typcrop	Type of crop: COC: cocho MAH: maize (house crop) MAB: maize (bonne) MIL: millet and dagussa SOR: sorghum TEF: tef BAR: barley NUG: nug CAF: coffee BAN: banana	C	3	
maincroparea	Binary variable which declares the principal crop in area: 1: yes 0: no	N	1	0
nbfield	Number of fields for the crop	N	2	0
areacrop	Area for the crop (in messa)	N	4	2

**Annex 4: List of Peasant Associations, administrative zones, and sections involved during the census**

No	Pa	Zone	Section
1	Lalisa Boji	Wondo Ebicha	Kirose
	Lalisa Boji	Wondo Ebicha	Tulu
	Lalisa Boji	Wondo Ebicha	Tikse
	Lalisa Boji	Egu Boji	Abesa Maos
	Lalisa Boji	Egu Boji	Golgaa
	Lalisa Boji	Egu Boji	Dimbilee
2	Wondo Muklemi	Ake	Ararso Mole
	Wondo Muklemi	Ake	Fida Solan
	Wondo Muklemi	Ake	Widé Kusa
	Wondo Muklemi	Ake	Age Game
	Wondo Muklemi	Gobu Chali	Gobu Chali
	Wondo Muklemi	Gobu Chali	Yadeta Ilu
	Wondo Muklemi	Gobu Chali	Buba Jijo
	Wondo Muklemi	Gobu Chali	Alulu Liben
	Wondo Muklemi	Dula Bulcho	Dula Bulcho
	Wondo Muklemi	Dula Bulcho	Boshera Boka
	Wondo Muklemi	Dula Bulcho	Chali Ammuma
	Wondo Muklemi	Dula Bulcho	Bidu Boji
	Wondo Muklemi	Dula Bulcho	Minte Boneya
	Wondo Muklemi	Dula Bulcho	Fida Buruso
	Wondo Muklemi	Darartu	Darartu
	Wondo Muklemi	Biqiltu	Biqiltu
	Wondo Muklemi	Geba Hara	Geba Hara
3	Wondo Kubur	Wondo Kubur	Jaro
	Wondo Kubur	Wondo Kubur	Cancho
	Wondo Kubur	Wondo Kubur	Haro
	Wondo Kubur	Wondo Kubur	Damoto
4	Wondo Innemayi Kobera	Wondo Innemayi Kobera	Burka Shobar
	Wondo Innemayi Kobera	Wondo Innemayi Kobera	Lalisa Babeche
	Wondo Innemayi Kobera	Wondo Innemayi Kobera	Leta Kobera
	Wondo Innemayi Kobera	Wondo Innemayi Kobera	Burka Kobera
	Wondo Innemayi Kobera	Wondo Innemayi Kobera	Lalisa Figa

No	Pa	Zone	Section
	Wondo Innemayi Kobera	Wondo Innemayi Kobera	Yaadesa
5	Amuma Agelo	Amuma Agelo	Agelo
	Amuma Agelo	Amuma Agelo	Fiyisa Demera
	Amuma Agelo	Amuma Agelo	Bikiltu Bedeso
6	Amuma Bore	Bore Gorgis	Kila
	Amuma Bore	Bore Gorgis	Tomi
	Amuma Bore	Bore Gorgis	Dibili
	Amuma Bore	Bore Gorgis	Bedi Gafare
	Amuma Bore	Bore Dila	Bonga
	Amuma Bore	Bore Dila	Agalo
	Amuma Bore	Bore Dila	Nono
7	Biqiltu Dila	Gida Boji	Bildima
	Biqiltu Dila	Gida Boji	Dila
	Biqiltu Dila	Gida Boji	Warke
	Biqiltu Dila	Amuma Ena	Ena
	Biqiltu Dila	Amuma Ena	Amuma
8	Jemmo Muchucho Kobara	Jemmo Muchucho Kobara	Ganka
	Jemmo Muchucho Kobara	Jemmo Muchucho Kobara	Jemo
	Jemmo Muchucho Kobara	Jemmo Muchucho Kobara	Muchucho
	Jemmo Muchucho Kobara	Jemmo Muchucho Kobara	Firde
9	Jemmo Tikisie	Jemmo Tikisie	Homi
	Jemmo Tikisie	Jemmo Tikisie	Tikisie
	Jemmo Tikisie	Jemmo Tikisie	Qepharo
	Jemmo Tikisie	Jemmo Tikisie	Jemmo
	Jemmo Tikisie	Jemmo Tikisie	Babo
	Jemmo Tikisie	Jemmo Tikisie	Tullu
10	Caraqii Kobara	Caraqii Kobara	Innemay Toggi
	Caraqii Kobara	Caraqii Kobara	Lalisa Innemay
	Caraqii Kobara	Caraqii Kobara	Hale Charaki
	Caraqii Kobara	Caraqii Kobara	Jemmo Caraqii
	Caraqii Kobara	Caraqii Kobara	Guyyo Golba
11	Burka Boji	Burka Into	Damota
	Burka Boji	Burka Into	Lilu
	Burka Boji	Burka Into	Yako
	Burka Boji	Burka Into	Agalo

No	Pa	Zone	Section
	Burka Boji	Gombo Boji	Boji
	Burka Boji	Gombo Boji	Lalisa
	Burka Boji	Gombo Boji	Guduru
	Burka Boji	Gombo Boji	Lilu Tikse
12	Lalisa Jeto	Amuma Badhas	Maru Kora
	Lalisa Jeto	Amuma Badhas	Sanbeto
	Lalisa Jeto	Amuma Badhas	Daye and Botero
	Lalisa Jeto	Amuma Badhas	Bulache
	Lalisa Jeto	Amuma Gabi	Walgo
	Lalisa Jeto	Amuma Gabi	Jeto
	Lalisa Jeto	Amuma Gabi	Gabi
	Lalisa Jeto	Amuma Gabi	Gombo
13	Lalisa Babo	Babo Conge	Kope
	Lalisa Babo	Babo Conge	Jarso
	Lalisa Babo	Babo Conge	Boji
	Lalisa Babo	Babo Waro	Inima Jarso
	Lalisa Babo	Babo Waro	Babo Kololi
	Lalisa Babo	Babo Waro	Babo Waro
	Lalisa Babo	Babo Waro	Dereba
14	Lata Bobine	Gombo Ebicha	Granche
	Lata Bobine	Gombo Ebicha	Tewo
	Lata Bobine	Gombo Ebicha	Geba Kemisa
	Lata Bobine	Gombo Ebicha	Innemayi
	Lata Bobine	Enango Chitatute	Hale Ebicha
	Lata Bobine	Enango Chitatute	Enango Kora
	Lata Bobine	Enango Chitatute	Enango Decha
	Lata Bobine	Enango Chitatute	Muchucho Huwa
	Lata Bobine	Enango Chitatute	Burkitu Dicha
	Lata Bobine	Enango Chitatute	Aderie Aba Bekie
15	Didebe Tuli	Igu Tuli	Aba Eba
	Didebe Tuli	Igu Tuli	Sejo
	Didebe Tuli	Igu Gafare	Wacho
	Didebe Tuli	Igu Gafare	Aderash
	Didebe Tuli	Yako Jate	Adrash
	Didebe Tuli	Yako Jate	Gute Aba Korma

No	Pa	Zone	Section
	Didebe Tuli	Yako Jate	Karsa
	Didebe Tuli	Yako Jate	Amuma Gunji
16	Bila 01	Bila 01	Sinodos Mirga
	Bila 01	Bila 01	Maru
	Bila 01	Bila 01	Gebriel Sefer
	Bila 01	Bila 01	Sinodosi Bitu
	Bila 01	Bila 01	Geba Hara
	Bila 01	Bila 01	Sefere Minani
17	Bila 02	Bila 02	Bila 02

**Annex 5: Number of farmers enlisted on official PAs list, interviewed, uncensused, and additionally discovered farmers during the census**

Peasant Associations	No of farmers in PA list (1)	No of farmers censused (2)	No of farmers in (1) but not in (2)	No of farmers-in (2) but not in (1)
Lalisa Bodji	391	406	4	11
Amuma Agelo	234	243	3	6
Bikiltu Dila	395	423	4	24
Amuma Bore	414	449	7	28
Jemo Muchucho Kobera	244	258	3	11
Cheraqi Kobera	276	287	5	6
Wondo Kubur	222	267	4	41
Wondo Innemayi Kobera	279	291	2	10
Lata Bobine	551	626	14	61
Burka Bodji	430	494	6	58
Jemo Tiksie	155	322	4	163
Lalisa Babo	358	422	7	57
Dedibe Tuli	599	622	12	11
Lalisa Jeto	481	511	7	23
<b>Total</b>	<b>5029</b>	<b>5621</b>	<b>82</b>	<b>510</b>
Wondo Muklemi	346	237 <sup>h</sup>		
		<b>Censused with Questionnaire<sup>i</sup></b>	<b>Censused with out questionnaire<sup>j</sup></b>	
Bila01	408	191	255	
Bila 02	397	143	169	
<b>Gand Total</b>	<b>6180</b>	<b>6192</b>		

<sup>h</sup> In the three zones of Muklemi town -Biqiltu, Geba Hara, and Derartu, those farmers who don't have cattle weren't interviewed.

<sup>i</sup> In Bila town, those who have only cattle at hand or send to the near by PAs were interviewed.

<sup>j</sup> Those residents in Bila town but don't possess cattle were enlisted, not interviewed.



**Annex 6: Surface area, number of people interviewed per sex and age categories, mean family size, and population density**

Peasant Association	Surface area (km <sup>2</sup> )	No. of people censused			No. of people live within the census zone			Mean family size	Population density
		Male	Female	Total	< 15 yrs	> 15 yrs	Total		
Amuma Agelo	13.59	186	57	243	521	774	1295	5.33	95.29
Amuma Bore	41.36	362	87	449	1021	1555	2576	5.74	62.28
Bila 1		157	34	191	374	665	1039	5.44	
Bila 2		118	25	143	331	525	856	5.99	
Biqiltu Dila	24.46	354	69	423	1059	1307	2366	5.59	96.73
Burka Boji	16.5	418	76	494	1007	1727	2734	5.53	165.70
Caraqii Kobara	10.59	248	39	287	653	977	1630	5.68	153.92
Didebe Tuli	32.54	548	74	622	1318	2073	3391	5.45	104.21
Jemmo Muchucho Kobara	9.92	241	17	258	670	890	1560	6.05	157.26
Jemmo Tikisie	10.87	273	49	322	717	1007	1724	5.35	158.60
Lalisa Babo	22.24	335	87	422	854	1359	2213	5.24	99.51
Lalisa Boji	18.92	334	72	406	909	1342	2251	5.54	118.97
Lalisa Jeto	33.05	422	89	511	951	1789	2740	5.36	82.90
Lata Bobine	30.4	523	103	626	1378	2073	3451	5.51	113.52
Wondo Innemayi Kobera	10.25	255	36	291	700	957	1657	5.69	161.66
Wondo Kubur	12.28	213	54	267	535	823	1358	5.09	110.59
Wondo Muklemi	9.92	188	49	237	502	748	1250	5.27	126.01
<b>Total</b>	<b>296.89</b>	<b>5175</b>	<b>1017</b>	<b>6192</b>	<b>13500</b>	<b>20591</b>	<b>34091</b>	<b>5.51</b>	<b>114.83</b>

Annex 7: Surface area, household head, cropland, household with cattle, cattle population, farm sizes within the census zone

Peasant Association	Surface area (km <sup>2</sup> )	Household head	No. of household with cattle	Total no. of cattle[k]	Cattle population density per km <sup>2</sup>	Average herd size	No. of household with cropland	Total farm size	Average farm Size
A.muma Agelo	13.59	243	128	1198	88.15	9.36	228	1105	4.85
Amuma Bore	41.36	449	259	2089	50.51	8.07	445	2731.15	6.14
Bila 1		191	129	385		2.98	21	50.25	2.39
Bila 2		143	103	314		3.05	14	101	7.21
Biqiltu Dila	24.46	423	278	2170	88.72	7.81	415	2186.25	5.27
Burka Boji	16.5	494	287	2516	152.48	8.77	486	3306.95	6.8
C. Kobara	10.59	287	147	1172	110.67	7.97	278	1565.98	5.63
Didebe Tuli	32.54	622	349	2607	80.12	7.47	616	3974	6.45
J. M. Kobara	9.92	258	125	965	97.28	7.72	254	1566	6.17
J. Tikisie	10.87	322	152	1048	96.41	6.89	314	1769.5	5.64
Lalisa Babo	22.24	422	252	1972	88.67	7.83	413	2532.35	6.13
Lalisa Boji	18.92	406	261	2051	108.40	7.86	398	2960.1	7.44
Lalisa Jeto	33.05	511	281	2397	72.53	8.53	509	3210	6.31
Lata Bobine	30.4	626	351	2530	83.22	7.21	615	3264.225	5.31
W. I. Kobera	10.25	291	166	1139	111.12	6.86	286	1568.35	5.48
W. Kubur	12.28	267	155	1082	88.11	6.98	266	1615	6.07
W. Muklemi	9.92	237	177	1267	127.72	7.16	194	1391.5	7.17
<b>TOTAL</b>	<b>296.89</b>	<b>6192</b>	<b>3600</b>	<b>26902</b>	<b>90.61</b>	<b>7.47</b>	<b>5752</b>	<b>34897.61</b>	<b>6.07</b>