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REPORT

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ANALYSIS DIAGNOSIS OF AN AGRICULTURAL REGION OF SOUTHERN ETHIOPIA (KAMBATTA, HOMA *KEBELE*)

**Towards the DIPLOMA OF AGRONOMY (MASTER'S DEGREE),
From the Institut National Agronomique Paris-Grignon.**



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We cannot forget Estefanos, who has been our faithful translator, friend and guide, during these four months. Thanks to him, we felt at home in Obichaka and in the whole region. For all this, we warmly thank him.

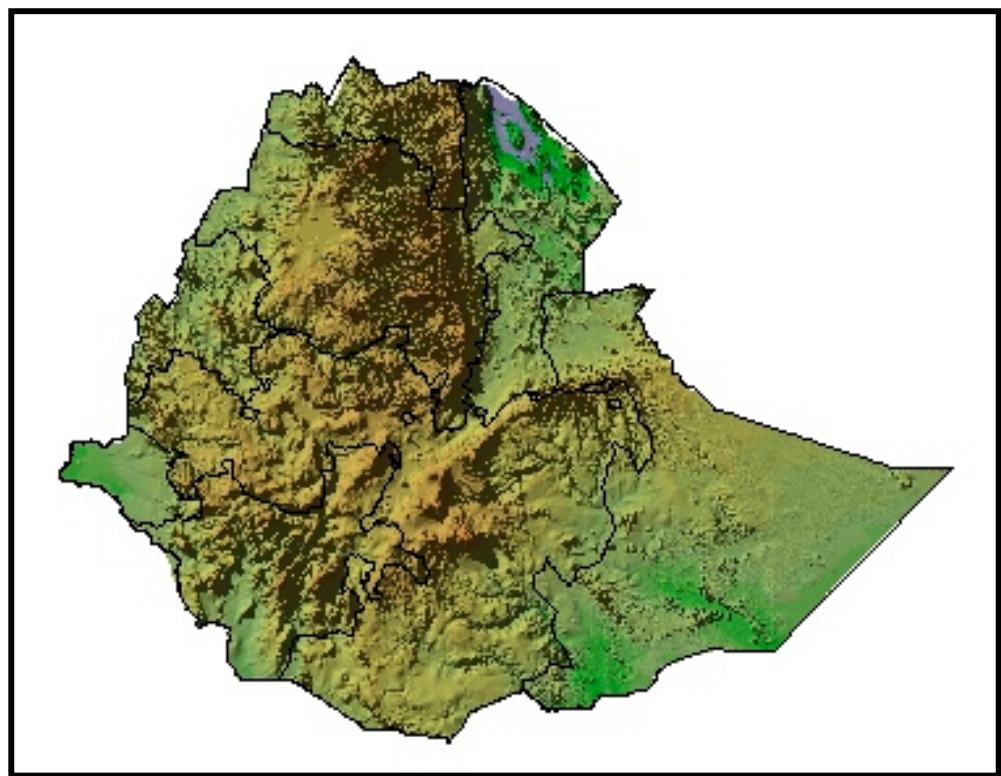
We would like to sincerely thank the entire Inter Aide staff, in Addis as well as in Soddo, for their help and their support during our stay in Homa. The list is too long to cite all of them by name... But François Bourgois and Christophe Humbert's support has been particularly precious, and comforting after quite a few events! Inter Aide support has not been limited to the four months field work, we also thank Damien du Portal and Philippe Redon for their guidance back in France.

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Although we are not able to draw up an exhaustive list of all the people who have, in one way or another, participated in this report, and who helped and supported us in Ethiopia and in France, they can be certain that we remember them now that we come to print and show our work.

<p>I. GENERAL PRESENTATION OF THE STUDY AND OF THE REGION</p>
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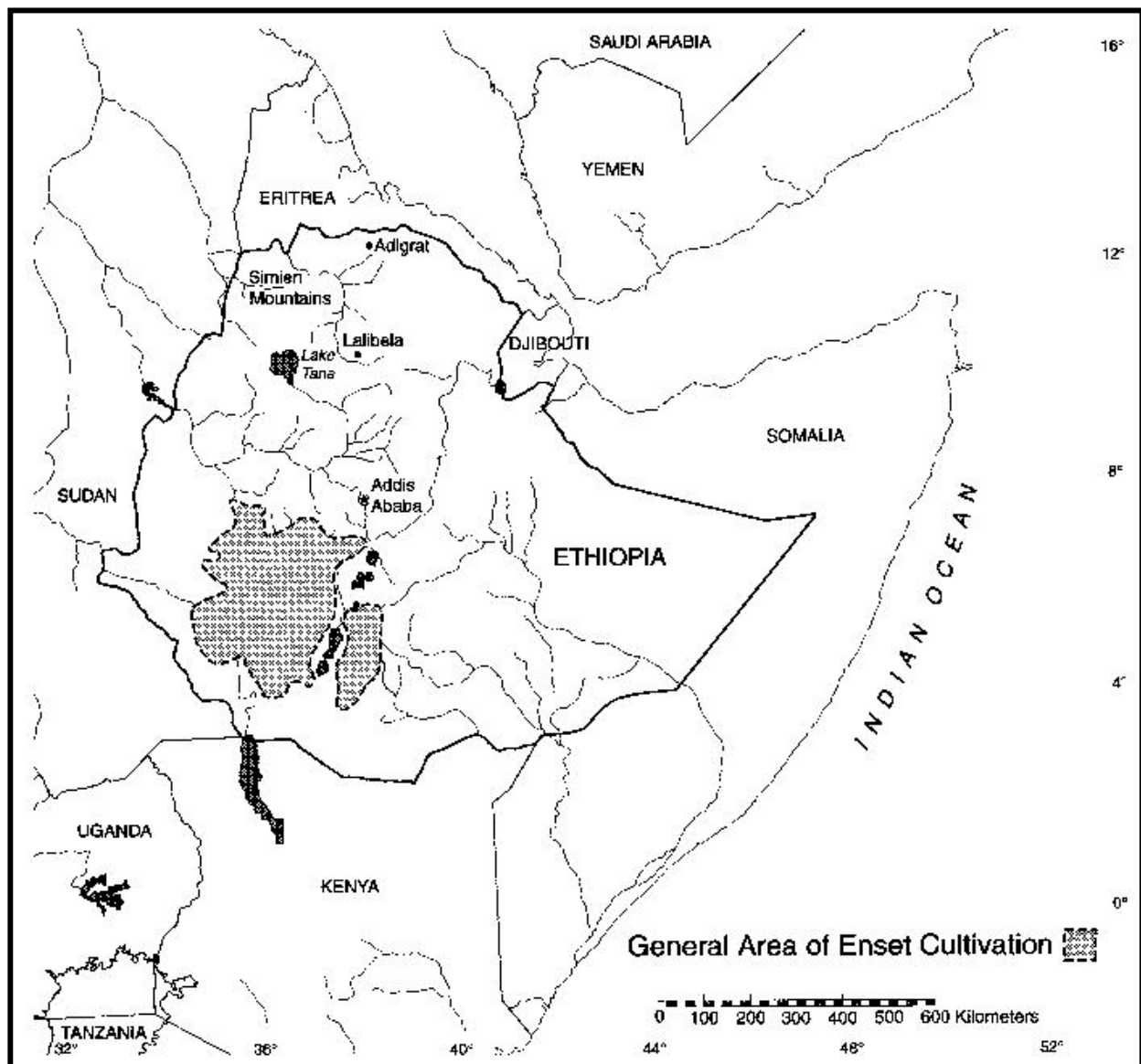


Opposite: topographical map of Ethiopia.

Source : www.fao.org

Below: Area of cultivation of enset

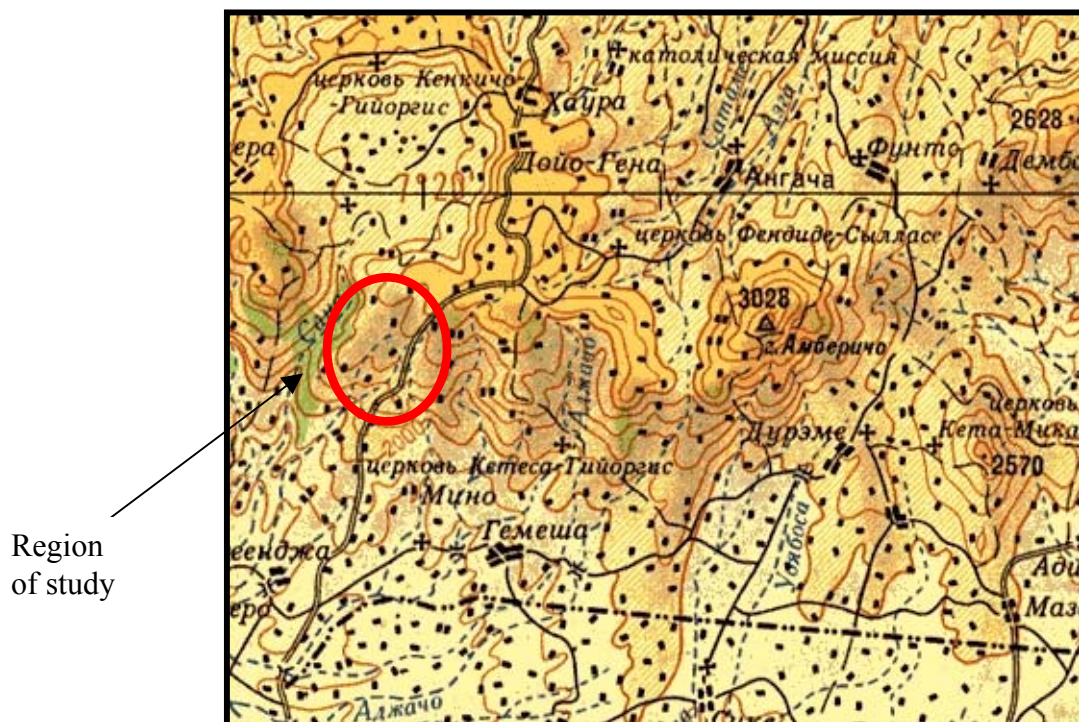
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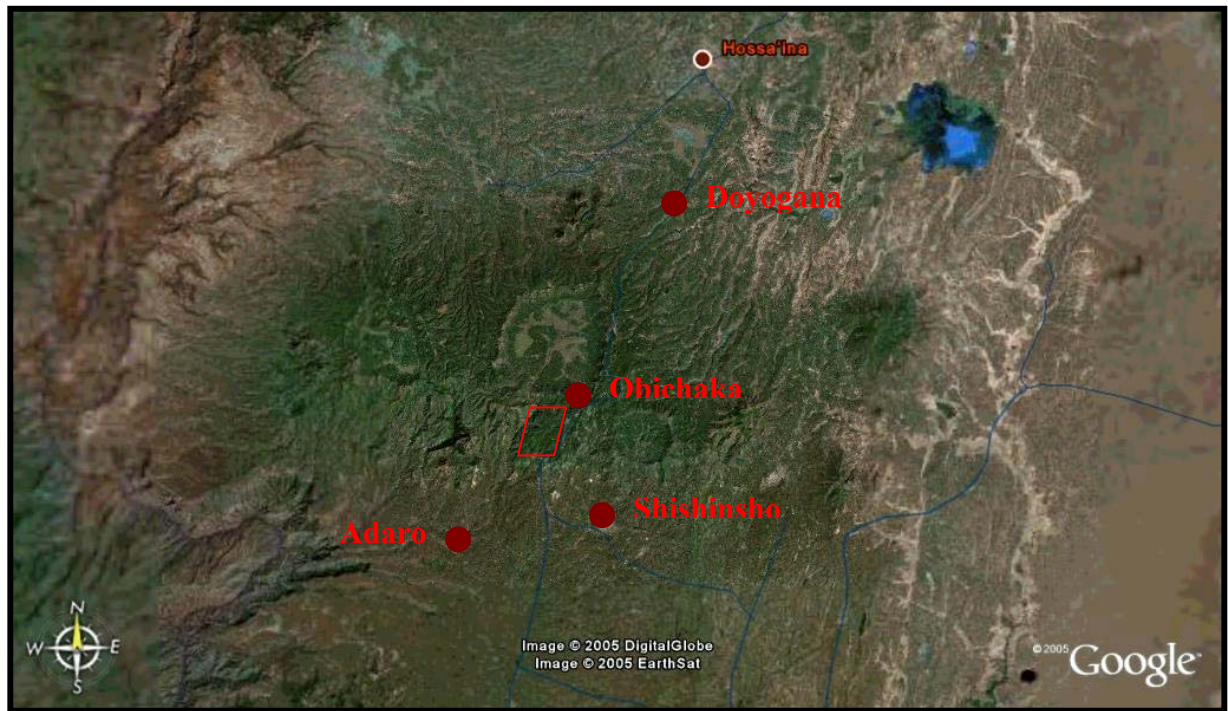




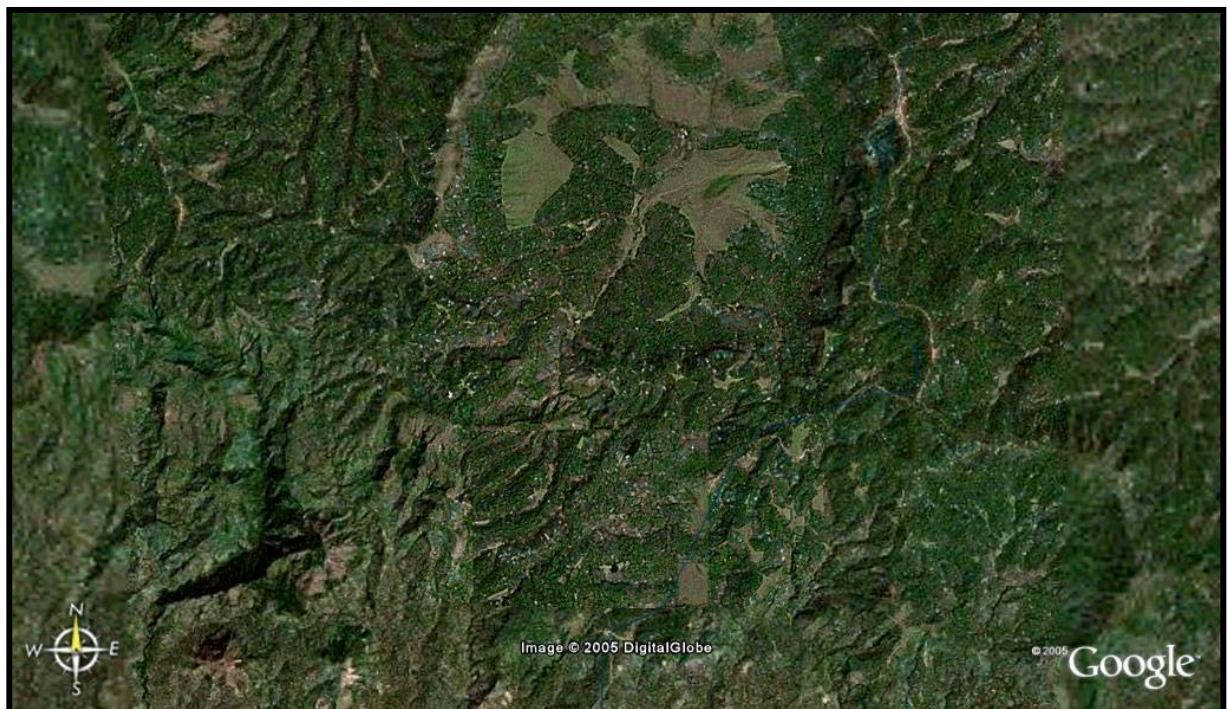
Above: satellite picture of southern Ethiopia. Source : www.earth.google.com

Below: detailed map of Kambatta region (given by Inter Aide)





Satellite pictures of the region of study.
Source : www.earth.google.com



1 THE METHODOLOGY USED

We present in this report the results of our four-month fieldwork carried out in Ethiopia. This study is part of the specialization in agricultural development that we have followed at the National Institute of Agronomy of Paris - Grignon. It consists of an analysis and a diagnosis of an agricultural region in Southern Ethiopia. The purpose of this study was the understanding of the agrarian systems of that region.

“An agrarian system is a way of exploitation of the environment, evolved through time and lasting, a system with growth of production, adapted to bio-climatic conditions of a given area and answering the current conditions and needs”. (Mazoyer, 1985 in Bedu et al., 1987)

According to the methodology of the agrarian diagnosis perfected by the department of compared agriculture of the National Institute of Agronomy of Paris - Grignon, we divided this fieldwork into three main stages:

- Study of the landscape (geology, relief, occupation of the environment,...) that has enabled us to become acquainted with the region of study and to identify at first sight several homogeneous zones on the basis of the way of exploitation of the environment.
- Thanks to inquiries with old people, study of the history that has enabled us to relate the evolution of the agrarian systems and to explain the appearance of the current agrarian system.
- Technical then economical study of the current agrarian system thanks to detailed farming interviews with the peasants of the region.

At the end of this diagnosis, we are able to submit a clear view of the agricultural practices of the region and of the whole agrarian system. The heterogeneousness of the interests, of the means of production and of the social and economical conditions of the peasants have been integrated into a typology of farmers and agricultural production systems. This modelization puts forward the complexity of the social relationship of production that link the farmers of the region together. It finally brings to the study another argumentation for the identification of the main problems of this agriculture.

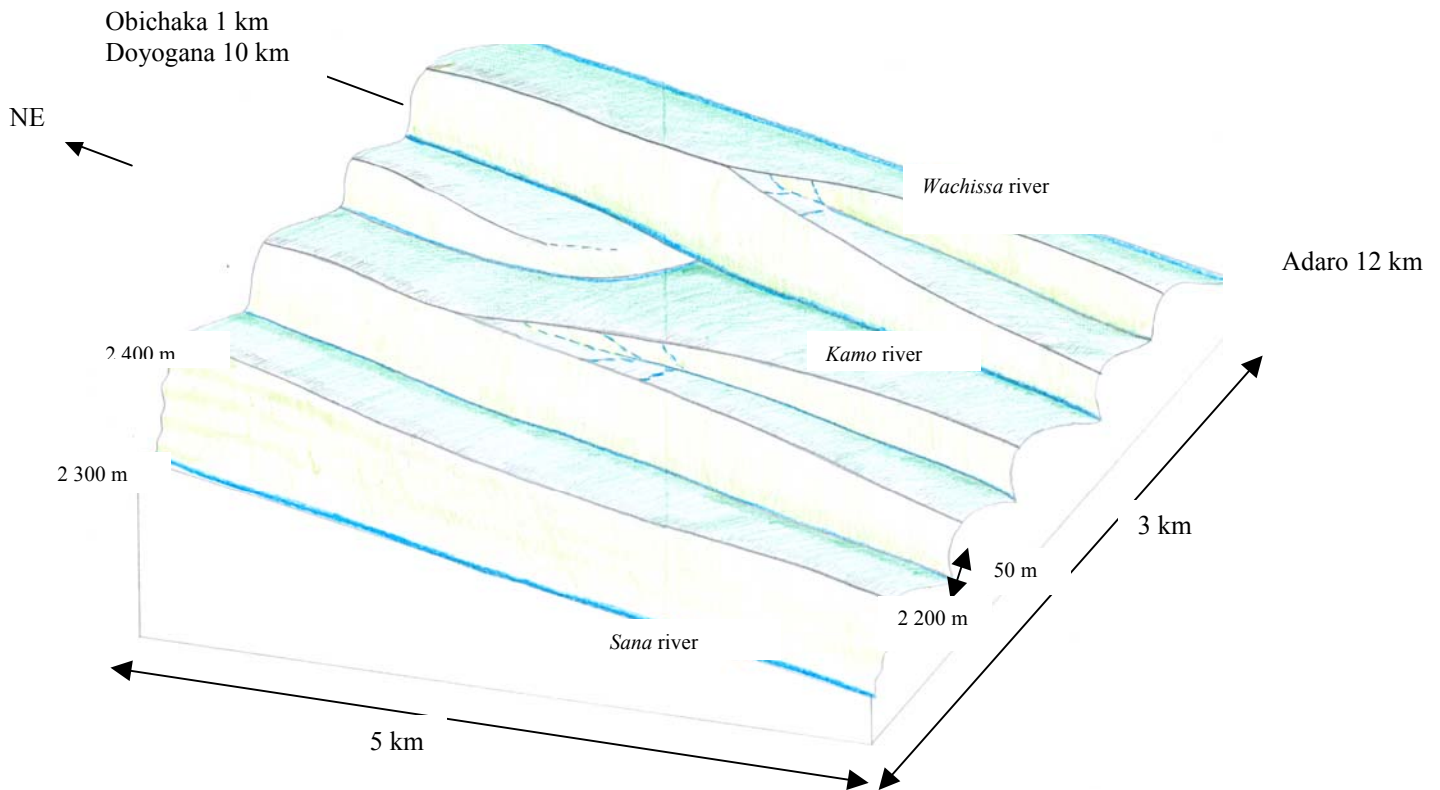
2 CONTEXT OF THE STUDY

Ethiopia is part of eastern Africa. Twice as large as France (more than 1 200 000 km²), the country counts more than 48 millions of inhabitants, unevenly spread over the whole territory but mainly rural (more than 80%).

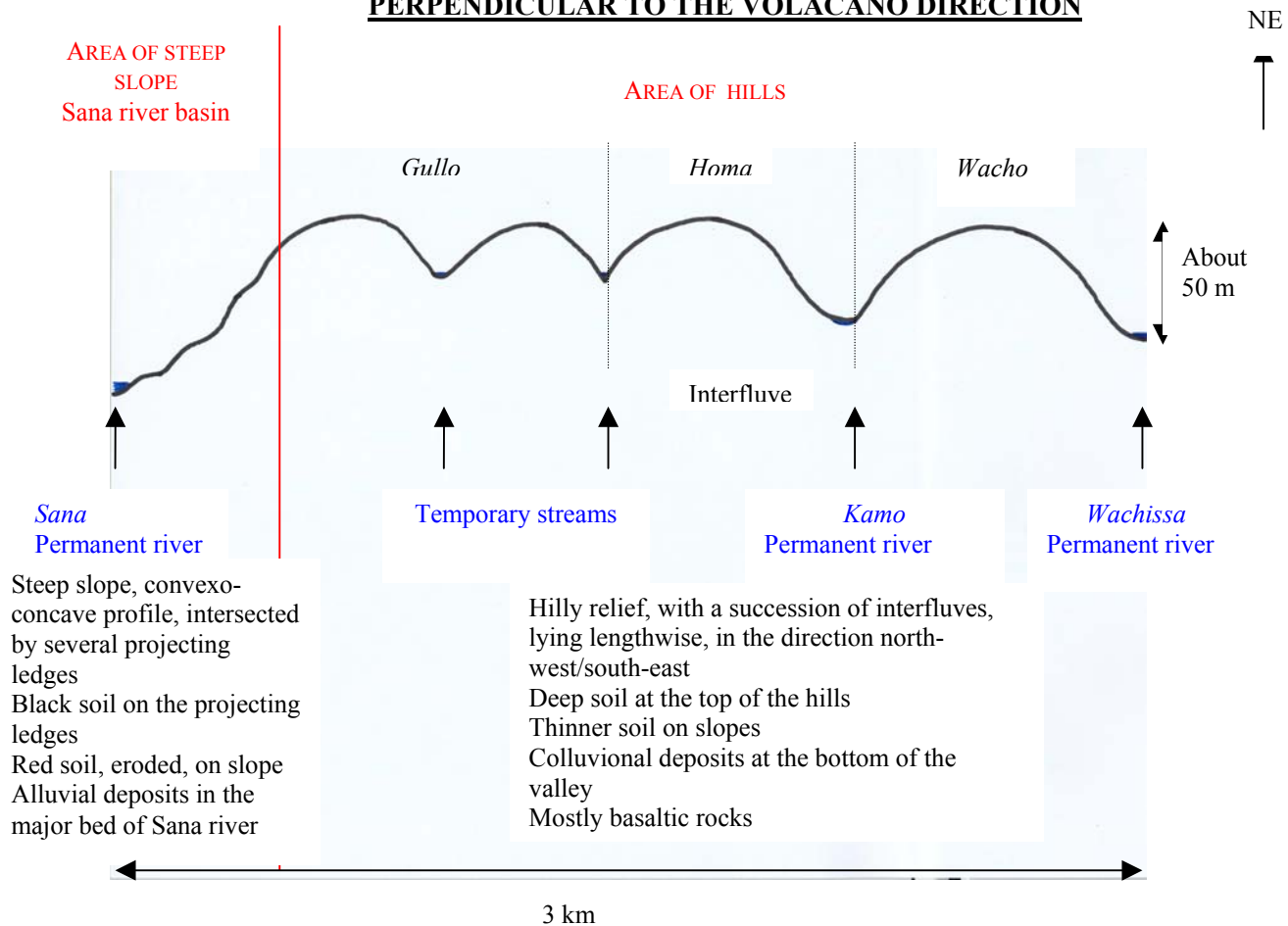
Ethiopia is characterized by a large range of ecosystems: highlands in central and northern Ethiopia, dry regions in the Rift Valley, desert areas above sea level in the north-eastern part of the country, the green hills of the southern part, to give only few examples. The abundance of these ecosystems and of the agrarian systems can be partly explained by the emphasized terracing: the alpine level up to 3500 m, highlands or *dega* between 2 500 m and 3 500 m, the *woina dega* or midlands from 1500 m up to 2 500 m and the *kola*, lowlands below 1 500m.

It is in this vast southern region, whose cultural identity is strongly claimed, that is located the Kambatta region where we carried out our study. The cultivation of a plant, the *enset* (*Ensete Ventrisocum*), often considered as the “plant of miracles”, is tied to this region. This plant is from the family Musaceae, it resembles a “false banana” and the whole plant is consumed at once after

BLOCK DIAGRAM OF THE REGION OF STUDY



TRANSVERSAL SECTION NORTH-WEST/SOUTH-EAST OF THE REGION OF STUDY, PERPENDICULAR TO THE VOLACANO DIRECTION



Source : V. Barthès and N. Boquien from our field observations

a cycle of 6 to 8 years. Offering good resistance to climatic hazards, enset is largely cropped in this region and is the population's staple food.

Whereas the southern region is often pointed out to be the "happy Ethiopia" (Gascon, 2000) because of agro-climatic conditions suitable to agriculture, the region is not free from issues of food security, as proven by the high frequency of food-starvation.

Thus it is in this context of chronic food insecurity that several NGO's such as Inter Aide, Action against hunger and SOS Sahel intervene. The French NGO Inter Aide proposed this region for our study. By the time of our arrival in Ethiopia, Inter Aide was upon to start its new food security project covering different fields such as agriculture, water management and health – and that answered the European Union's invitation to tender.

3 PRESENTATION OF THE AREA OF STUDY

3.1 Situation of the region

Our area of study belongs to the vast region SNNPR (Southern Nation and Nationalities People's Region) of southern Ethiopia. More precisely, our agrarian diagnosis set up in the *kebele* or grouping of villages of Homa, in the department or *woreda* of Kacha Bira that is located in the Kambatta region. Homa, whose surface area is about ten square kilometers, is itself shared into five villages or *sub-kebele* : Wacho, Homa, Gullo, Wella, Birro.

This narrow region is located in the highlands (from 2200 up to 2400 meters), about twenty kilometers away from Shishinsho, close to the very small town of Obichaka. It is served by the gravel-road Shishinsho-Hossana. Apart from Obichaka, the main towns are Doyogana and Hossana to the North and Shishinsho and Areka to the South.

We delimited our area of study with the help of Inter Aide. They wanted us to carry out this study in the highlands where they set up their project. The limits of the chosen region are:

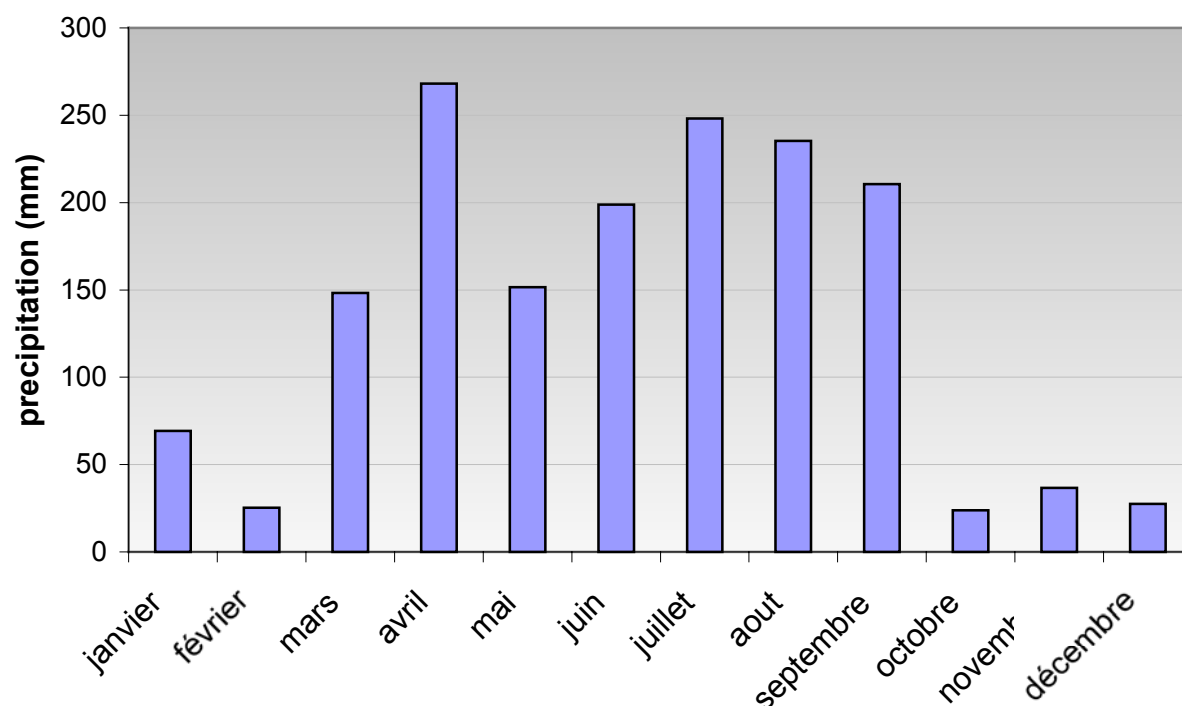
- To the East and the West, the valleys of two permanent streams, the Sana river (border of the Kambatta and Hadiya regions) and the Wachissa river.
- To the South, the contour line of 2 200 meters. Above it, due to the altitude, new agrarian systems based, no longer on enset and cereals, but on cash crops like maize, coffee and ginger appear.
- To the North, a limit chosen by our own ability to reach on foot various parts of this region within the time limit.

3.2 The relief

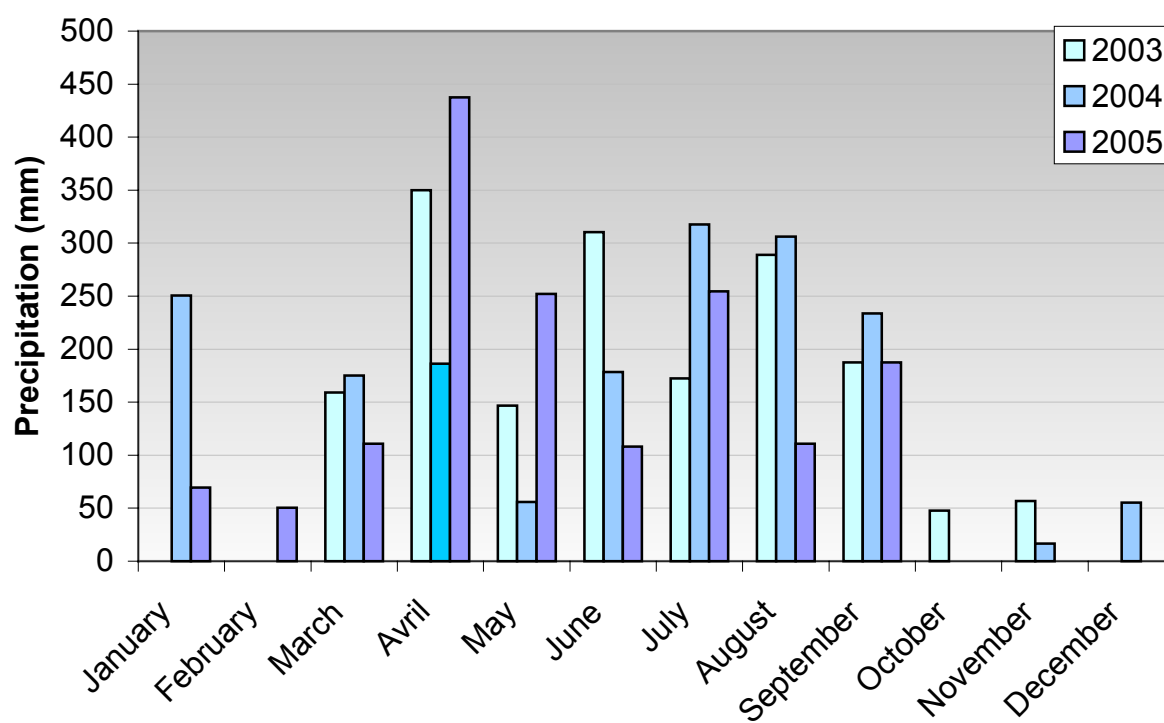
Our area of study is located on the southern slope of a volcano. This volcano is comparable to a large depression of about ten kilometers of diameter. We believe that this depression is in fact a caldera, a volcano that crumbled after successive eruptions causing a depression.

The southern slope of the volcano, where the region is, goes down slightly. A set of interfluvies lying lengthwise, in a north-west/south-east direction, composes the river system. Thus the relief can be characterized as hilly due to these interfluvies that are parallel one to the other and are separated by mostly V valleys. Several rivers are permanent (Sana, Wachissa, Kamo), and a high number of ephemeral streams appears during the rainy season. This dense network of rivers guarantees a good drainage of the region.

DIAGRAM OF PRECIPITATION ON AVERAGE YEAR
KACHA BIRA WOREDA



INTERANNUAL VARIABILITY OF PRECIPITATION,
EXAMPLES OF THE YEARS 2003 TO 2005



Source : data from the office of the Minister of agriculture of Shishinsho

Originally, this relief results from the uplift of the swell in Tertiary period. The fracturing of the lithosphere under tension enabled intrusions of magma then deposit of basaltic rocks. Afterwards that relief was shaped by erosion, through rivers that dug deep valleys.

Thus, most of the soils of the region have been formed from the weathering of those basaltic rocks. They are black soils, made of clayey texture, deep at the top of the hill and thinner on the slopes. Red soils can also be observed on the steepest slopes, such as on the eastern side of the Sana river basin. These soils are strongly leached.

Colluvial deposits resulting from erosion can accumulate at the bottom of the slopes. Some other soils mostly made of alluvial deposits are located on the edge of the rivers.

Rocks that may be from sedimentary origins are observed at the bottom of the valley. Other rocky outcrops can be seen on the eastern side of the Sana river basin. They might be volcanic and tough ashes.

3.3 Some climatic datas

The annual average rainfall is around 1700mm, and the mean annual temperatures fluctuate between 14 and 26°C.

The regime of precipitation shows a slight bimodal scheme, with three specific seasons:

- A small rain season between the end of January and May (Belg), during which it can pour monthly between 150 and 200 mm of rain.
- A large rain season between June and the beginning of September: 55% of the annual rainfalls on average occur during this second rain season (*Keremt*). The monthly average rainfalls are between 200 and 300 mm.
- A dry season between September and December that is characterized by the lowest average rainfall (around 25 mm per month).

This bimodal regime allows an eight-month cultivable season, spread over two cropping seasons: from the end of January up to May-June, and then from July up to November-December.

A considerable inter-annual variability of rainfall cycles exists, and is based on two main factors:

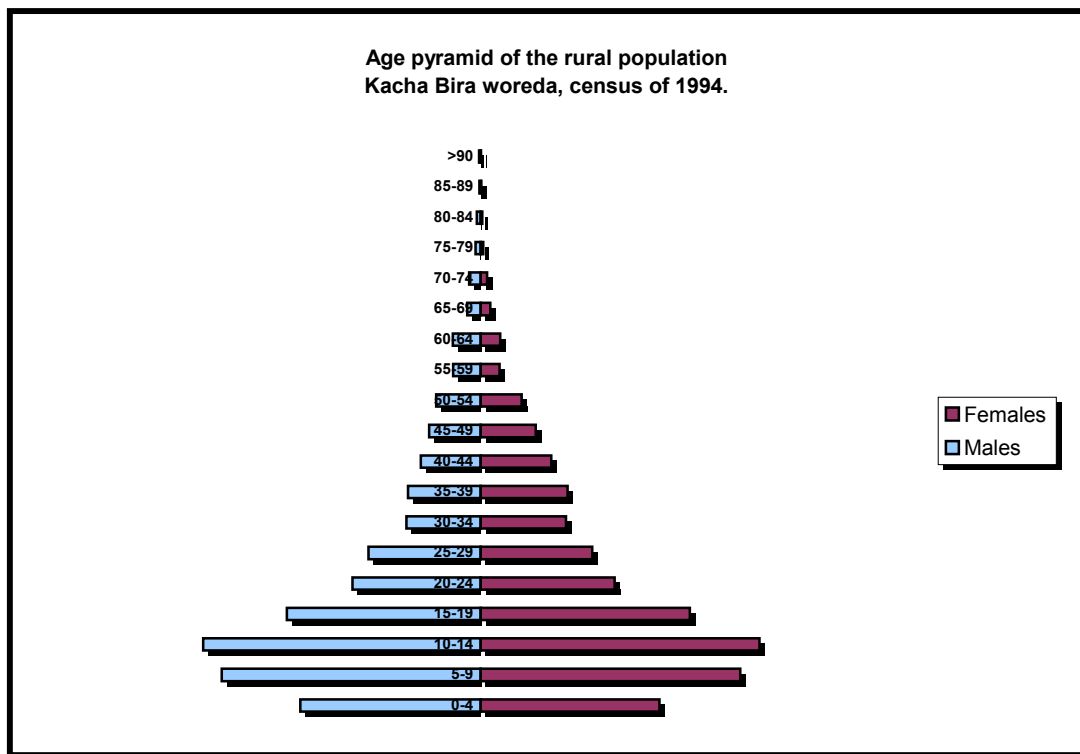
- distribution of rainfalls between both rainy seasons
- date of arrival of the first rainfall (more or less late, between the beginning of January and the end of February)

This variability has strong consequences on cropping systems. Particularly, a late sowing of the crops of the first rain season can disrupt the soil preparation and the sowing of the second rain season. In fact the duration between the harvest of the crops of the first rainy season and the sowing of the crops of the large rain season does not exceed one month.

3.4 Some demographic data

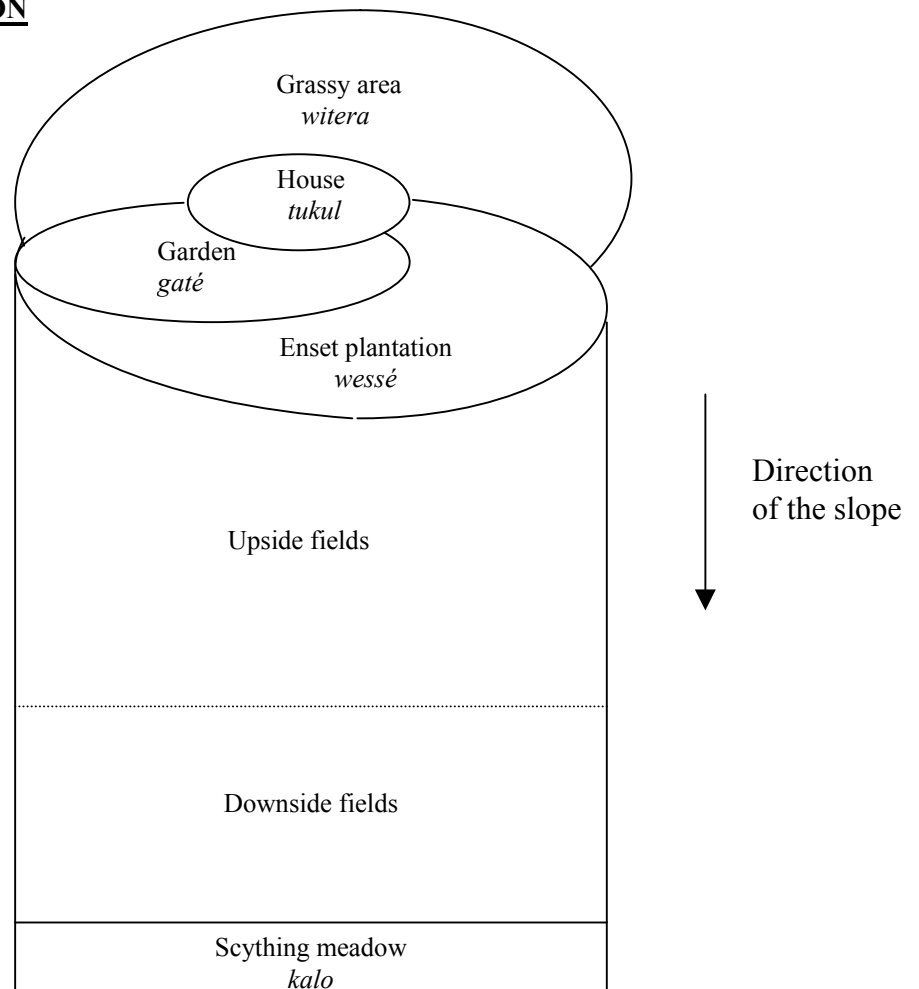
The population of Homa *kebele* is composed of 555 families, amounting to about 4 000 inhabitants. According to statistical data, the population density should be of 600 inhabitants per square kilometres for the whole department. However, this figure does not appear reliable and accurate if we take into account the settlement of the region and in comparison with the neighbouring region of Wolayta (department of Damot Gale). We actually estimate it around 300 inhabitants per km².

The working and life unity of this population is nuclear; on average, families are made up of 6 to 7 persons. Moreover, the rural population of this region is very young: 60% of the population is less than 20 years old, according to the census of 1994.



Source : Population and housing census of Ethiopia, 1994

SCHÉME OF THE ORGANIZATION OF A FARM:



Source : V. Barthès and N. Boquien from our field observations.

All the people come from Kambatta region; very few migrations take place from or towards Homa, access to the region being quite difficult. Moreover, Kambatta region does not offer any job opportunities outside agriculture.

However, some families coming from northern Ethiopia settled in the area at the time of the conquest of the Kingdom by the army of Emperor Menelik II.

The whole working population is agricultural. The agriculture is familial and its main purpose is the subsistence of the family. Nevertheless, some inhabitants practise others activities, such as pottery or forging. Some farmers are also traders or have small speculative activities on markets at harvesting or sowing periods. Many other short-term activities are practised by the peasants during the periods of low activity in fields, such as construction, woodwork, craft industry (sold at markets of neighbouring areas).

3.5 Way of exploitation of the environment

3.5.1 *The landscape of the area: an anthropized landscape*

In this so densely inhabited area, the ecosystem can be qualified as entirely cultivated. Like in all southern Ethiopia, the settlement is scattered. Thus the landscape unit is the farm and its proliferation creates the landscape of the area, quite homogeneous.

Historically, the preferred localization of the habitat was at the top of the hills, where soils are the deepest, and thus most favourable with crops. Nowadays, however, many houses are located on the slopes, due to demographic growth and the resulting parcelling out of the farm linked to it. Indeed, at each generation, all the sons of the same family equally inherit from their father and receive a part of their father's lands.

Let us start by describing the basic landscape unit or element: the farm. Each farm is organized according to the same scheme, and only the relative proportions of the various units of the farm vary from one farm to another one. There we find :

- The **house** or *tukul*. It is made of eucalyptus and bamboo wood bound by fibres of enset for the roof and walls framework. The roof is made out of straw and the walls in cob. Houses are multifunctional. The families, the crop and the animals, for which a corner is set aside, all share the same roof.
- The *witera* or **grassy area**. It is located in front of the house and is used as an "auxiliary pasture" for the cattle led to the stake and as a beating/winnowing place for cereals and leguminous plants.
- The **garden**, *gaté*, and the **enset plantation**. They are below the house, to facilitate the transport and the spreading of manure
- The **fields**. They are located on the slopes, below enset plantation
- A small scything meadow, the *kalo*, used as a **pre of mowing and pasture**. It is never cropped. It is located at the bottom of the valley or the slope only on farms with large land area.
- The **eucalyptus and bamboo plantation** is generally located at the bottom of the slope or at the edge of the plot.

In space, these various units follow each others in the direction of the slope. Thus the house, the grassy area in front and the garden are located at the top of the hill or on a projecting ledge on the middle of the slope, the other units are lower down the slope.

THE DIFFERENT ZONES OF THE AREA OF STUDY



Landscape of Sana river basin



Source : V. Barthès and N. Boquien, pictures taken on field

In this ecosystem where almost the entirety of the land available is currently cultivated, little common pastoral land remains (it represents today less than 1% of the surface area of the *kebele* of Homa). The primary forests were all cleared.

Nevertheless, trees hold a major place in the landscape. Some local species are still planted inside the fences and can be found punctually (*Syzygium guinsense*, *Juniperus procera*....), but the eucalyptus is the most commonly grown species. It's fast growth has made it the major tree of the area. Possibly associated to some bamboo and cedar (*Juniperus procera*), it is planted in the grassy area in front of the house, on the edge of fields, and at the bottom of slopes. It is used for the construction of roofs and fences.

Thus although this landscape was initially deforested, this region is nevertheless wooded.

Quickset hedges of local species of trees or bushes (*Cordia africana*, *Justicia schimperiana*, *Juniperus lutanica*...) delimit the borders of gardens, of enset plantations and of fields in each farm. Their main aims are to protect crops from cattle, and to produce an auxiliary fodder for the cattle in period of scarcity. The proliferation of farms with ensuing abundance of hedges thus creates a kind of bocage.

3.5.2 The eastern side of Sana river basin, a specific way of exploitation of the environment

The only exception to this landscape is to be found in the area situated on the western edge of our region of study. This zone is the eastern side of Sana river basin and reveals a different approach to the occupation of the environment. The slope is intersected by several projecting ledges; a unit located between such projecting ledges presents a convexo-concave profile. These projecting ledges could be due to alternate layers of hard and crumbly grounds. These slopes are steeper than in the rest of the area resulting in more acute erosion with the appearance of underlying rocks. These slopes being so steep, settlement there is impossible. Thus, this area is entirely occupied by fields, with very few trees and hedges. This zone, not suited for habitation, was historically common pastoral land. With the passing of generations, as will detailed thereafter, all this land was allotted to peasants.

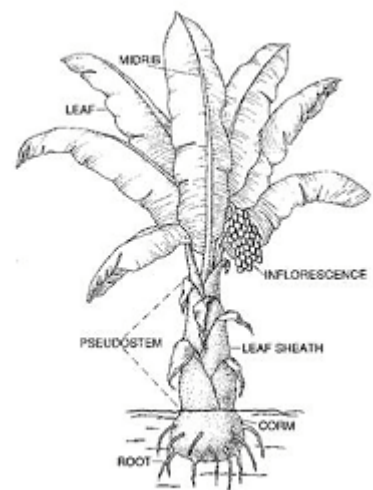
3.6 The agriculture of the region

Located at more than 2 000 meters of altitude, in the highlands of southern Ethiopia, Homa *kébélé* is part of what is called the "enset zone", i.e. the surface of cultivation and consumption of the enset.

Regional production systems are based on enset and cereals.

Enset is an endemic plant cultivated only in Ethiopia, generally called "false banana tree". In this area, enset represents the essential caloric intake in the population's diet and is its staple food.

Its priory usage is for daily human consumption in fermented pulp form (*kocho*) and in boiled root form. Although the *kocho* represents the principal product derived from the transformation of enset, *bulla* and *merero* are two other products of this transformation.



OCCUPATION OF THE SPACE AT INTERFLUVE LEVEL



Examples of interfluves with houses and enset plantation at the top of the hill, fields on the slope and eucalyptus plantation at the bottom of the valley



Source : V. Barthès and N. Boquien, pictures taken on field

- *Bulla* is "the best part" issued from the transformation process of enset into *kocho*. The internal part of the pseudostem is scraped with a piece of bamboo in order to separate the starch from the fibre. This pulp is then pressed with the feet to collect the juice, which is then left to decant. This decantation produces the *bulla* which is then left to ferment for several weeks. It is consumed on specific occasions (religious, traditional feasts) or in the honour of guests.
- Lastly, *merero* is the product obtained from the lowest third of the pseudostem which is prepared and put to ferment separate from the highest two thirds. It is generally prepared in June and July in order to be eaten exclusively at the time of the traditional feast of *Meskel* (fest of the Cross) in September.

Enset also has various roles in the production systems of this area. We must emphasise its importance for the feeding systems of cattle (the leaves constitute the main fodder during the period of shortage; the roots and the pseudostem are used to fatten up bovines). Finally, its regular production gives it a preponderant place in the household's finances through the weekly sale of *kocho* and other by-products such as ropes and cords. These by-products are obtained from lesser fibrous products resulting from the transformation of enset into *kocho*.

Concerning field crops, the eight-month cultivable season and the distribution of rainfalls throughout the year allow two cropping seasons. Cereals (maize, barley, tef, wheat), as well as leguminous plants (broad beans and pea), are cultivated during the main rain season, from July to December; whereas, maize and potatoes are cropped during the first cropping season, from January to June. Among cultivated cereals, tef is an endemic cereal cultivated only in Ethiopia. Mainly cultivated in northern Ethiopia, it is also cropped in our region on not very fertile soils. This cereal is consumed in a large fermented wafer form called *injera* and constitutes the dish of feast in the area.

Maize is consumed fresh, boiled or roasted, just as pea, broad bean and potatoes. Wheat and barley are mainly consumed in roasted seed form or *kollo*. Crops cultivated in fields have a double part to play: self-consumption for the crops of lower rain season, and cash crops for the crops of higher rain season.

As explained thereafter, the enset cropping system strongly depends on the regular spreading of organic matter, and thus on the existence of a small herd of cattle breeding on the farm. Animals owned by peasants are especially bovine and ovine, horses and donkeys for the carrying of goods, and poultry. Some caprine can be found, but it is seldom bred. In addition to their function in the production of organic manure, other products resulting from their breeding constitute an essential additional income for the farm's finances: sale of young animals and reformed animals, sale of butter and cheese, eggs, renting of the animals to carry goods. However, cattle feeding - almost exclusively made up of fodder produced on the farm - has become today a major stake for the majority of peasants.

Contrary to the neighbouring Wolayta region, Kambatta region and specifically Homa *kebele* has never benefited from governmental popularization programs of new varieties or from any other "technical package". The veterinary services offered by the office of the Ministry of agriculture are restricted to yearly vaccination programs of cattle, and to the introduction of some new cereal varieties and market gardening. Only a few peasants, selected on "vague" criteria by rural development agents, are concerned by these programs. _

THE MARKETS



Above: Transport of goods to the market



Opposite: stall of cereals at Adaro market

Above: selling of wooden handles for hoes, and mats made of straw



3.7 The distribution chain

Each peasant sells weekly a part of his agricultural and breeding products to ensure himself regular income, and in a more specific way to deal with his important expenses. All the products are sold at local markets. Women themselves sell regularly small amounts at markets and in retail throughout the year. However, at harvesting time for cereals and leguminous plants, direct sale to traders is common. The prices they then propose are lower than those from markets but peasants whose harvest is greater are confronted with carriage difficulties for these goods.

The various weekly markets are located at least ten kilometres from Homa, except the narrow markets of Wadolle and Obichaka. Only accessible through dirt roads and almost impassable in the rainy season.

Located for the majority in lowlands area (Adaro, Shishinsho, Doyogana), these markets see the gathering of farmers and traders coming from neighbouring areas: Kambatta, Hadiya, Wolayta. Thus, the products exchanged there, a result of various sources, are diversified:

- Enset, bamboo, young bovine coming from highlands like Homa.
- Coffee, ginger, tubers, eggs coming from lowlands and middle lands such as southern Kambatta, Wolayta, Hadiya regions.

The seasonal fluctuations of the prices there are strongly marked, particularly for field crops, with for example a doubling of the prices of wheat and broad bean between harvest and sowings.

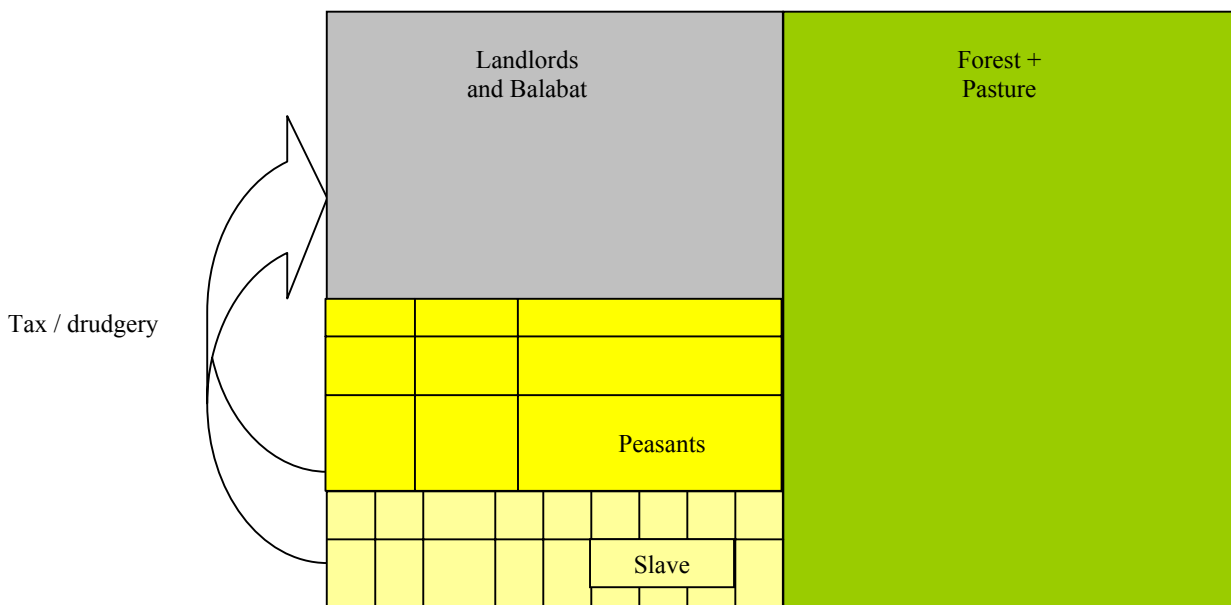
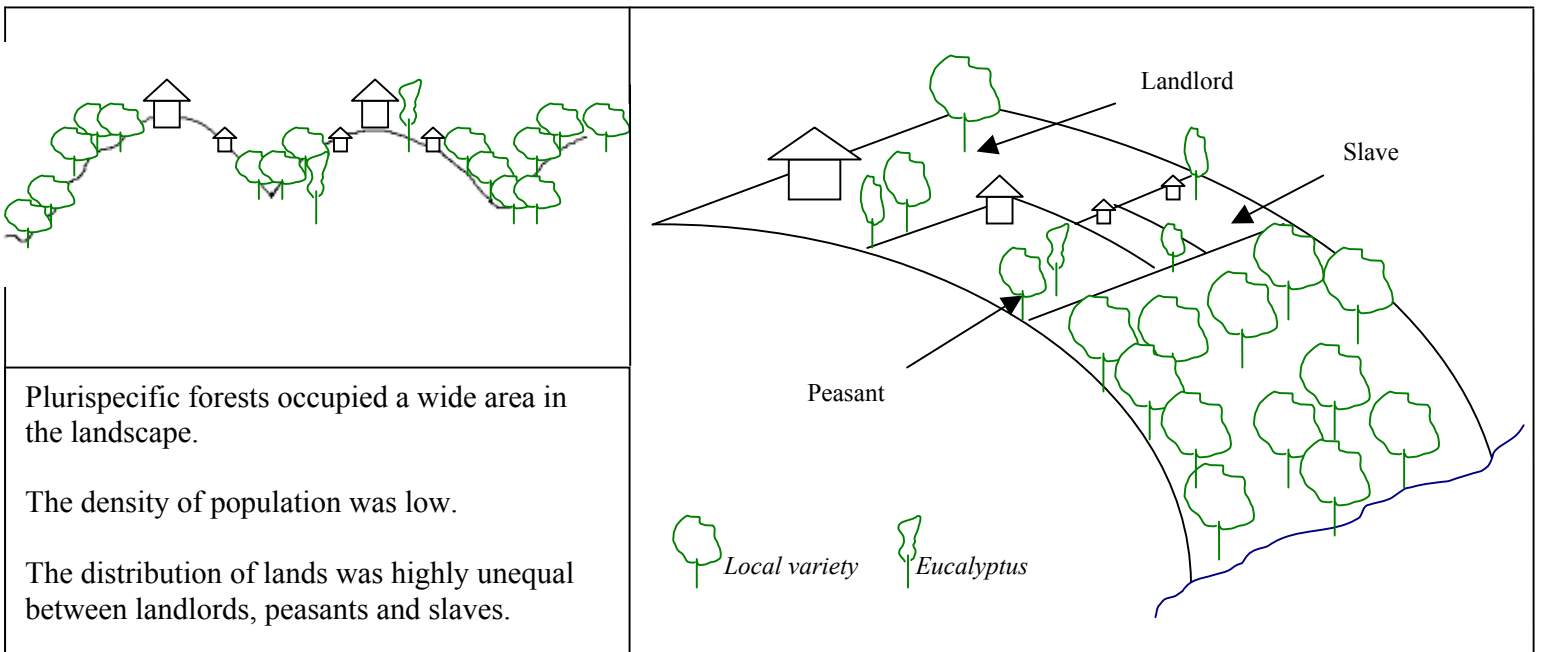
ROAD SHISHINSHO-HOSSANA, VILLAGE OF OBICHAKA



Source : V. Barthès and N. Boquien, picture taken on field

II. AGRARIAN HISTORY

OCCUPATION OF THE SPACE AND SOCIAL RELATIONSHIP OF PRODUCTION DURING THE IMPERIAL PERIOD (UNTIL 1974)



Source : V. Barthès and N. Boquien, from interviews with peasants

1 THE IMPERIAL PERIOD, FROM THE AMHARA'S CONQUEST TO THE REVOLUTION OF 1974

As with the history of the whole southern Ethiopia, that of Kambatta region was disrupted by the Amahara conquest at the end of the nineteenth century. Emperor Ménélik II, reigning over Abyssinia, following his dream of creating a "Large Ethiopia", invaded all the independent kingdoms of the southern region one after the other. Kambatta kingdom is among the last kingdoms to be conquered and integrated in 1894.

The arrival of the Amhara changed the organization of the society. The Amhara rule was different throughout all the conquered territories. The southern region was split into two kinds of territories:

- the *gasha* land: Amhara territory divided into numerous individual properties, each one being land granted by Ménélik II to Amhara people as reward for loyal services rendered to the throne (war, ect...). This territory was entirely ruled by the Amhara, the local chiefs were dismissed.
- the *gimita* land: territory controlled by Menelik II but still ruled by local and traditional chiefs. Our area of study was part of this territory.

(These informations, first read in literature, were confirmed by our inquiries with the peasants of the region).

Let us go into details in our explanation of the running of the *gimita* territory.

1.1 The ecosystem and the occupation of the space

Throughout the imperial period, the population density in the region remained low. At the empire's downfall, in 1974, the number of households was twice less numerous than today (information received from the leader of Homa *kebele*). The settlement was located at the top of the hillocks.

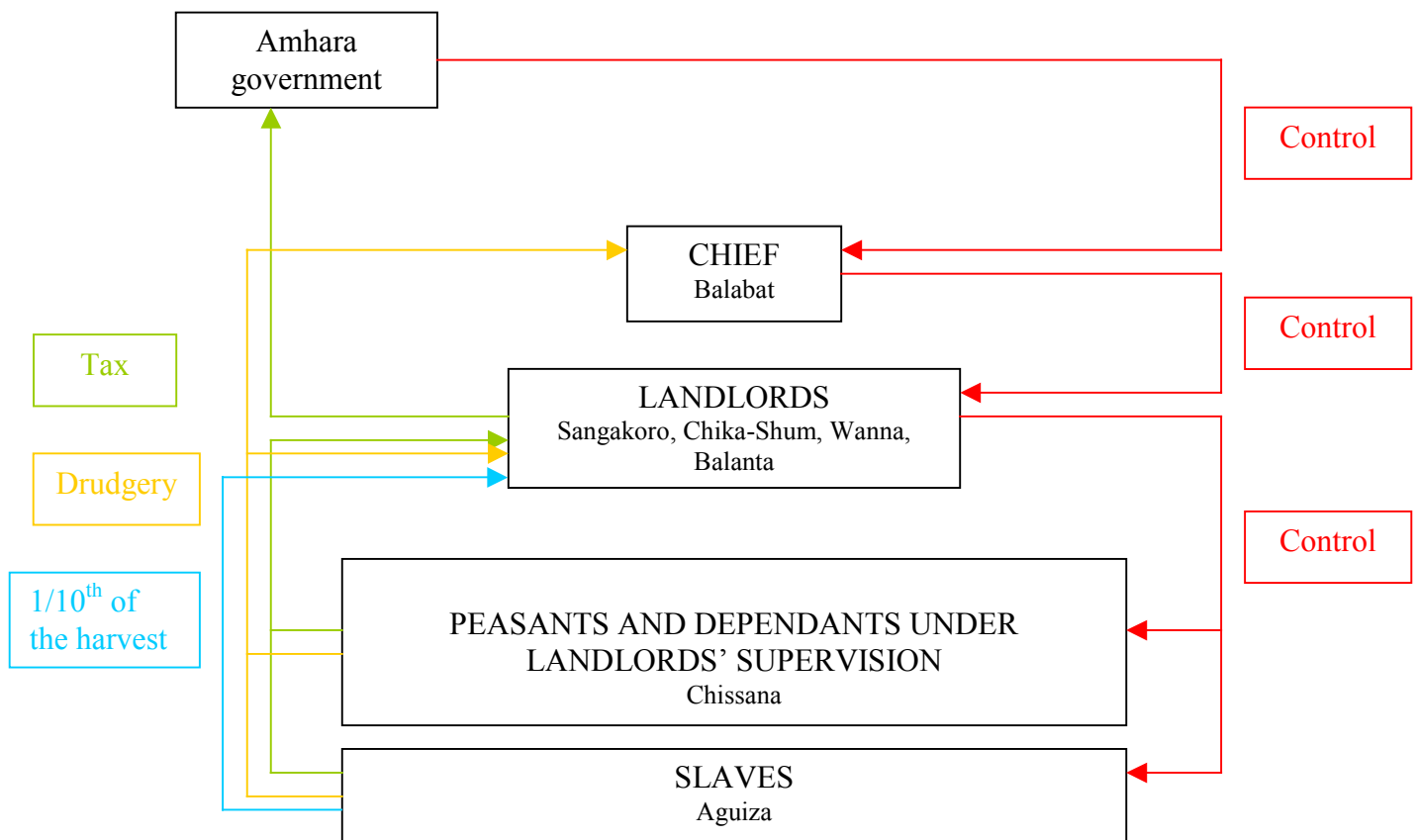
Forest was widely spread. It covered all of the Garbe area – on the eastern side of Sana river basin. Elsewhere, the forest occupied the lower part of the slopes and could even spread over the whole hillock. Hunting and picking did not seem developed. Lots of pest animals lived in those forests: foxes, hyenas, wild pigs, monkeys...

According to our inquiries with old peasants of the region, this primary forest was multispecific. Species such as *Cordia africana*, *Acacia albida*, *Syzygium guinsense*, *Hagenia abyssinica*, *Juniperus procera*, grew up there. Animals fed on the foliage of some species of trees or bushes such as *Justicia schimperiana*, *Juniperus lustanica*, *Ficus*...

Some species of trees found in that forest were preferentially used to make the wooden part of tools. Others were used for construction, like the *masana* for doors, tables and coffins. Slaves and peasants used the *Ficus* species, which gave a wood of lesser quality, for similar purposes. The *Syzygium guinsense*, the *Hagenia abyssinica* and the bamboo were used for the building of houses. The *Ficus* and the *Juniperus procera* could also be used as fuel. The eucalyptus did not grow in those forests; only few farmers cropped them in their farm and used them for construction.

Some areas of meadow were part of the ecosystem. They were used as land reservoir and pasture whose access was granted freely to the population. We could not determine their origins.

SOCIAL ORGANIZATION AT IMPERIAL PERIOD:



Source : V. Barthès and N. Boquien from our interviews with the peasants of the region

1.2 Organization of the society and social relationship

At that period, the organization of the society was pyramidal.

At the top of the society was the *Balabat*, **local chief** of the territory but under the control of the Amhara. He would have been from the *Oyeta* tribe, the tribe from which all kings of the Kambatta kingdom originated before the conquest of the Amhara. The *Balabat* owned more than 60 hectares of cultivated lands, in addition to wide areas of forest.

The **local aristocracy** (*wannas*, *balantas*, *chika-shum*, *sangakoro*) came under the control of the *Balabat*. It consisted of landlords who were owner of their land and the chiefs of peasants (*chissanas*) who lived on their land. They had control those peasants and collected taxes. They could also benefit from drudgery, a free and imposed work performed by their peasants (*chissanas*) and slaves (*aguizas*).

The main duty of the **wanna** was the collection of taxes among his peasants and among the *balantas*, *chika-shum* and *sangakoro* to whom he was related, and who had themselves collected it from their own peasants, dependants and slaves. Thereafter, the *wannas* would hand over the whole amount (in theory) to a governmental office in Hossana, current main administrative town of the Hadiya region.

The title of *wanna* was transmissible from father to son. Before his death, a *wanna* shared equally between all his sons the number of peasants he controlled and from whom he received the tribute. He gave his title to one of his son. His other sons became *balantas*.

At the end of Haile Selassie's reign, a *wanna* would have owned between 1.25 and 2.5 hectares of cultivated land, in addition to his private forest, garden, enset plantation and scything meadow. Each of them controlled between 0 and 15 families.

The *chika-shum*, who controlled the *wannas*, was elected among the *wannas* by the peasants of the region, for a ten-year mandate maximum. Once elected, the former *wanna* that had just reached the title of *chika-shum* kept all his privileges and control over his own peasants. However he transmitted his title of *wanna* to one of his brothers. A *chika-shum* would be responsible for about fifty *wannas*, controlling their work and obliging them to collect taxes.

The *Sangakoro*, who controlled the *Chika-shum*, was elected among the *wannas* by the *wannas*, for a mandate lasting more than ten years. He kept control over his peasants. He also had to supervise the *Chika-shum* to whom he was related (about three). Officer of the *Balabat*, in case of war, fighting was part of his traditional duties.

Most of the **peasants** or *chissanas* were under one landlord's supervision. The contributions or duties that had to be fulfilled were numerous: free and forced work on the land of the landlord, payment of an annual monetary tax and donation of one tenth of the harvest (*asrata*) until the Italian invasion. We will go into those details hereafter.

Only few **peasants were free**: they owned their own land and did not have any duties towards one landlord. We were only able to collect sparse information on that social group. It would have represented few persons, and we could not establish their origins.

The **dependants** were peasants who decided, of their own initiative, to go under the protection of a landlord, due to their lack of land and the scarcity of their resources. In search of land to crop, those peasants and their families accepted to work freely for a landlord for more than five years in exchange for food and shelter. At the end of this period, they could hope to be granted with a small piece land that they could farm for themselves (0.25 hectare maximum), transmissible to their sons subject to landlord's agreement. All the contributions they had to face were the same as the peasantry. By contrast with the other peasants or *chissanas*, the women and their children had to work for the landlord: looking after the animals for the children, care of enset, preparation of *kocho* and cooking for the women. However they were free to be released from obligations to their landlord to go somewhere else.

The **slaves** or *aguizas* were at the bottom of that society's structure. They were caught in other regions or made prisoner, and could then be bought and sold by landlords. Once bought by a landlord, the slave became his property, he had to work full time for the landlord and could not be released from him. If the slave had a family, he could cultivate a narrow plot of 0.25 hectare maximum for himself but for which he had to pay tax and give one tenth of his harvest.

In that society, mainly agricultural, some craftsmen could be found. Joiners and blacksmiths were also farmers, they had the same rights and had to face the same obligations as the peasants. Whereas potters and tanners, who did not cultivate any land, were itinerant going from place to place and were not controlled by any landlord.

The duties and contributions the peasants had to give were as follows:

- Drudgery - free and forced work - on the landlord's lands, two days per week
- Donation of one tenth of the harvest or *asrata* to the landlord he was dependant from
- Payment in cash of an annual tax to the landlord. After having collected all the amount, the landlord gave it to the Amhara government

According to several inquiries, the taxes would have represented the equivalent in kind of 40% of the peasant's harvest. Having to give one tenth of his harvest and after storing his seeds, only 20 to 30% of his harvest would remained for himself and his family.

All parts of the ecosystem were owned by the landlords. The forest occupied about half of the property of each landlord. One fourth of that property was allotted to his peasants, dependants and slaves, and the remaining fourth was the landlord's cultivated land.

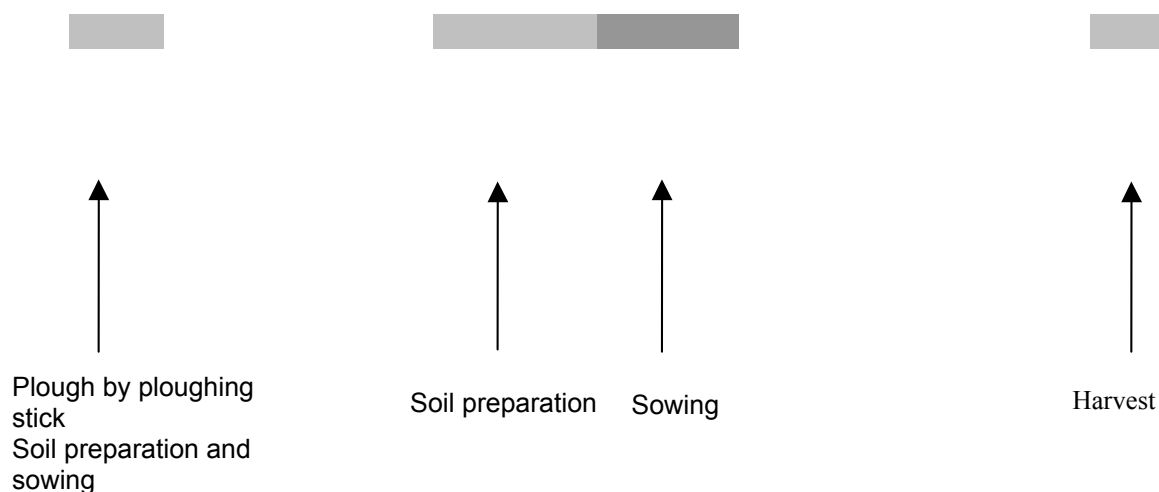
Each plot of forest was the property of a landlord and each clearing needed the landlord's agreement. All the peasants had the right to let their animals graze in these forests.

Only landlords and free peasants were owners of their land. Contrarily, other peasants only had a right of usufruct on their land, it meant only concessional and working rights over the land but no certainty of rights over that tenure. That right was granted by landlords. The access to land for a farmer depended from the approval of the landlord. Thus the division of the land from one social class to another was highly unequal.

The peasants who had access to limited surface, and who wanted to crop more land, had to look into available land to crop in indirect tenure type (share-cropping). Those peasants and rich peasants complied with a particular share-cropping agreement. Indeed, some farmers whose allotted land, granted by landlord, was too large were not able to crop all of it themselves, because of their obligation to work two days a week for their landlord.

Crop calendar of the main crops cultivated in the region:

	Jan	Feb	March	April	May	June	July	Aug	Sept.	Oct.	Nov.	Dec
Garden												
Maize												
red bean												
cabbage												
local pot												
Field												
Potatoe												
Maize												
Red bean												
Wheat												
Barley												
Tef												
Fresh b.bean												
Dry b.bean												
Fresh pea												
Dry pea												



Source : V. Barthès and N. Boquien, from our interviews with the peasants of the region

1.3 The cropping systems at imperial period

Two major cropping systems were practiced at that time: **manual cultivation**, and **swing-plough oxen cultivation**.

The peasants who ploughed by oxen could have access to one complete pair of oxen in different ways:

- peasants who owned two oxen
- peasants who owned one ox and who took out a partnership contract or *taja* contract to form a pair thus creating a yoke. They used this pair in turns, three days per week each.
- peasants who did not own any ox but who took out an oxen contract called *agazu*: a peasant without ox could, by agreeing to work a yoke owning peasant's land for two days, in return use that pair of oxen to plough his land for one day.

We could not determine the date of the advent of the plough in the region. But what is certain is that the ploughing stick and the hoe have been the tools of manual cultivation for a long time prior to the conquest of the Amhara.

The ploughing stick is the traditional ploughing tool in manual cultivation, specific of southern Ethiopia. It is still used nowadays. It creates a deep plough of approximately 30 centimeters, and thus allows a more efficient fight against weeds. Three persons are needed to farm with this tool, farmers organize themselves to plough their three plots by rotation (*gezima* system): together they work the field of one of them on the first day, then the second field the following day and the last field on the third day, and so on in rotation. The three men, who are on the same side of the tool, move simultaneously the stick and succeed in taking off big lumps of earth that overturn towards the slope. The grassy part of the lump of earth by this burying and ensuing deterioration is then destroyed. The three men plough in the direction of the slope and begin at the bottom of the slope. One week is necessary to plough a plot of 0.25 hectare by three men. This work must take place before the first rainfalls.

The complementary tool of the ploughing stick is the small hoe or *kalta*. It is used subsequently on the field that has been previously ploughed with the ploughing stick. This work intervene after the first rainfalls that make this work by hoe easier. The aim is to break and to crumble the lumps of earth. It can be done by the owner of the field on his own or thanks to the *gezima* system explained previously. The small hoe is also the tool used in manual cultivation.

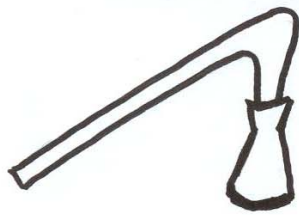
Previously, farms were organized on the same bases as today. Only the relative proportions of differing units of the farm varied from one social class to another. All production systems included the *enset* and garden cropping systems. However, the ownership of a field was a criterion of differentiation from one farm to another: slaves, dependants and some peasants, who had only a very limited land surface to crop (less than 0.25 hectares), could not have any field.

In the fields, only one cropping season was practiced. Peasants used to crop sorghum, wheat and barley on limited surfaces not exceeding 0.5 hectare. Crops cultivated by landlords were much more diversified due to their available land and the labour force they could rely on. They used to crop wheat, barley in the first rain season and tef, bean, broad bean, sorghum, maize, oats, flax in the second.

SCHEME OF THE TOOLS



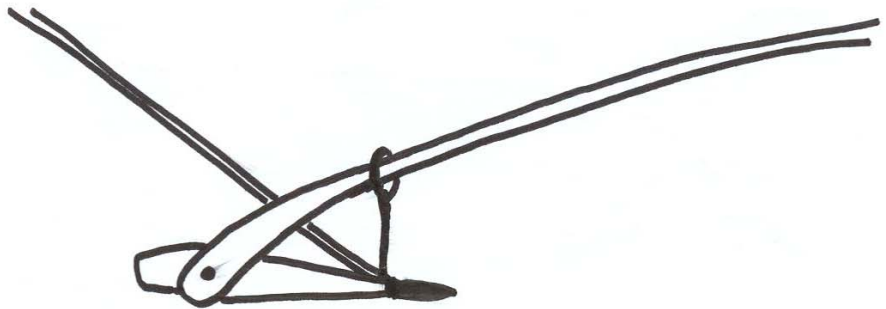
Ploughing stick
(*Wonicho*)



Hoe (*Woudjé kalta*)



Sickle (*Baché*)



Plough

Source : V. Barthès and N. Boquien, from our field observations

Neither slaves nor small peasants were able to include fallow land in their crop rotations because they were confined to very narrow surfaces. Only landlords and rich peasants who received more land could include a three or four-year fallow land in their crop rotations after three years of cultivation.

Neither fertilizers nor manure were used in fields. The fertility renewal was provided by the long-term fallow land (more than 2 years) and by the short-term fallow land that took place between two cropping seasons (six months over 12 from December to June or July).

Peasants involved in manual cultivation worked by ploughing stick in January before the first rainfall. Afterwards, they worked the same field by hoe between the middle of May and the beginning of June. After further work by hoe, sowing followed. Peasants sowed broadcast wheat and barley seeds and in lines (made by hoe) bean and broad bean seeds. Then covered the seeds using the hoe.

Peasants with oxen only ploughed using the ploughing stick after a long-term fallow or after a season of leguminous plant. After that, they worked once only with the hoe and were able to plough with oxen once before sowing. According to interviews carried out with older peasants, after the harvests of the first rain season and before sowing the crops of the second rain season, peasants would have ploughed using oxen more frequently than nowadays (up to 5 times). These repeated activities would ensure a more thorough destruction of weeds. That practice seemed to be linked to manual weeding.

In fact, the weeding of dicotyledons was performed manually in September and October. Weeding 0.25 hectare required a week's work for one person. Beyond that, peasants removed the newly grown weeds from time to time.

1.4 The breeding systems at imperial period

Like nowadays, each farm owned its own cattle that provided the manure necessary for the growth of enset and for the garden. At night time, all animals were kept in the same house as the family, with adequate space allocated to them. That practice tended to avoid animal thefts and facilitated the collection of manure. Straw could be added in the stalls if it was available. It was cleaned once or several times per week by the woman, who transported the manure to enset plantation and to the garden using a stretcher made of bamboo. These practices are still current nowadays.

However, the ownership of cattle represented a great source of differentiation between all social classes and within the same class:

- Some slaves could not own one head of cattle (bovine or ovine), only few hens where and when possible.
- Others could have two or three cows but no ox.
- The strongest differentiation was among peasants, some of whom could own up to 50 heads of cattle (bovine, ovine, caprine, equine) or even more.
- Each landlord owned about 40 heads.

The ownership of cattle during imperial time was not linked to the total cultivated land. Forests where animals could feed were wide and landlords allowed peasants and slaves to have free access to them. Moreover, the crop rotations included long-term and short-term (only one cropping season) fallow that were grazed. Thus, animals fodder was not a criterion restricting cattle ownership.

TPOLOGY OF THE FARMS AT THE END OF THE 1960's

Very small farms in manual cultivation

Social class: slaves, dependants, peasants with narrow surface area

Land: right of usufruct, no security in their land tenure
< 0,25 ha

Cattle: 1 to 3 cows by share-breeding contract

poultry

Labour force: familial

Cropping systems: enset, garden

Contributions:

- for peasants: tax, drudgery,
donation in kind (1/10th of the
harvest)

- for slaves and dependants:
forced work for the landlord
7days/7, tax

Medium farms with ploughing oxen

Social class peasants

Land: right of usufruct, no security in their land tenure
eventually narrow surface in share-cropping contract*
from 0,25 to 1,25 ha

Cattle: from 2 to 5 heads of bovine and ovine
1 to 2 oxen

poultry

Cropping systems: enset, garden
fields

Labour force: familial

Contributions:

tax, drudgery,
donation in kind
(1/10th of the
harvest)

Large farms with ploughing oxen

Social class: free peasants and landlords

Land: ownership, right to sell and exchange the land
> 15 ha

Cattle: from 5 to 50 heads of bovine and ovine, given by contract
for most of them to slaves and peasants
poultry
carrying animals (mule, donkey, horse)

Cropping systems: enset, garden

fields
forest

Labour force: peasants, dependants and slaves

Contributions:

tax

Peasants who did not own any animals could subscribe keeping contracts or contracts of shared breeding to have access to cattle (still current nowadays, details in appendix). That agreement linked those peasants to rich peasants or landlords who owned too many heads of cattle to be able to care for all of them. These contracts enabled the poorest farmers to have access to manure, milk products (butter and cheese) that could be sold, and, in the long-term, to animal ownership for some. However, some landlords forced their peasants to care for their animals for free. In such cases, these peasants could only get manure.

1.5 Typology of the farms

According to this data, three main types of farms could be distinguished. Their differentiation was based mainly on social criteria, through the contributions and the land tenure that depended on the social class:

- small farms in manual cultivation
- middle farms with ploughing oxen
- large farms with ploughing oxen

2 THE SOCIALIST REGIME, THE *DERG* PERIOD : 1974 – 1991

2.1 The agrarian reform in 1975

Following the revolution of 1974, an agrarian reform was proclaimed on March 4th, 1975, with the aim of democratising the access to land (cf. text in appendix). This reform led to the end of the traditional social relationships and to the abolishment of all levying which peasants had to face.

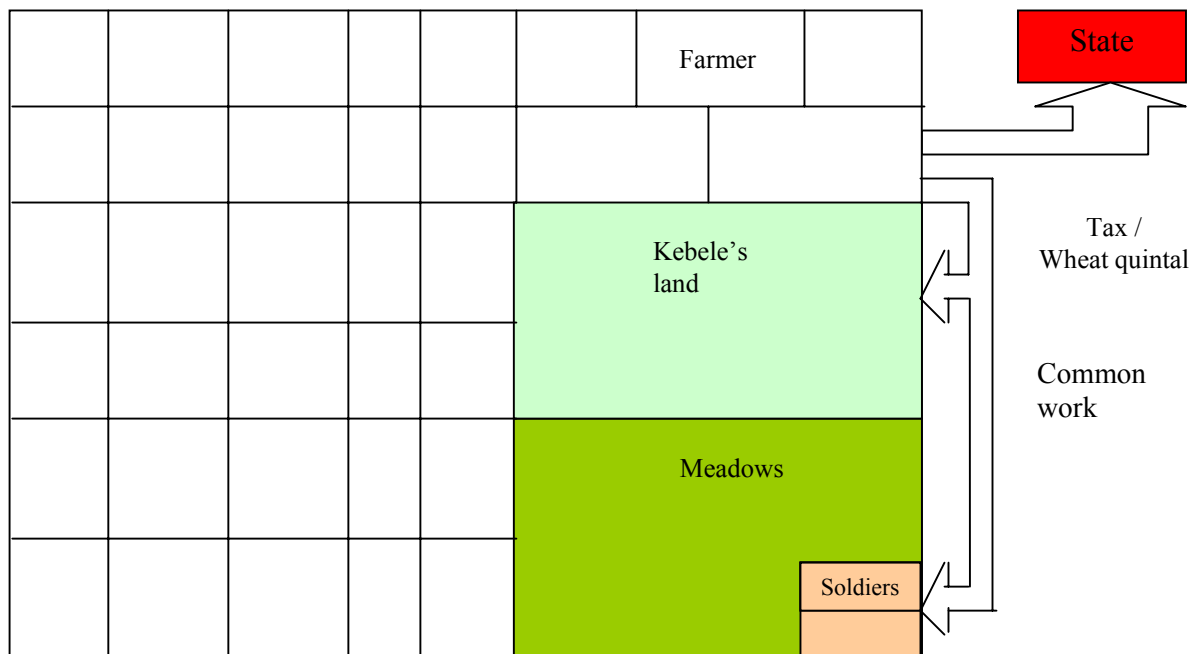
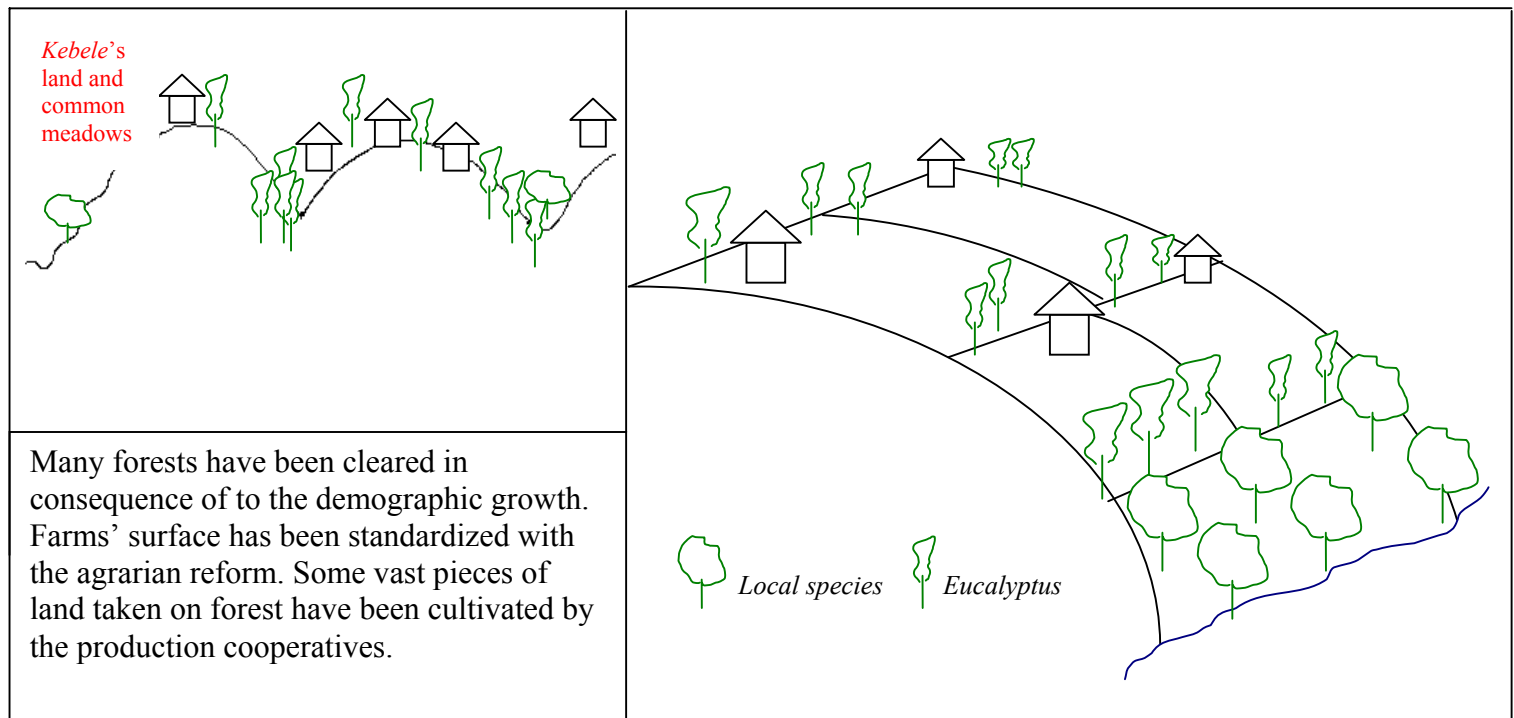
Locally, this reform was organised thanks to the setting up of peasants associations -« *kebeles* ». These associations were created with the help of students coming from Addis, called *zemachas*. Each association was constituted of about 300 heads of families, representing a land surface of around 900 ha, and the borders of each association were decided collectively by the local population. Land distribution was organised according to criteria decided independently in each association. A 7 members comity, elected by the population and from various social origins managed the setting up of this agrarian reform.

Here are the criteria retained in Homa *kebele* for land distribution:

- a piece of land is allocated to each nuclear family who ask for it, the surface is decided according to the size of the family (number of consumption units), and eventually by the quality of the soil. Indeed, when the land is judged of poor fertility, the allocated surface is doubled.
- in the case of a woman living alone, or polygamy, a piece of land can be allocated to women.
- the handcrafters, potters and tanners, who did not farm before, could receive land.
- young farmers who settled at the time of the reform received a piece of forest land to clear.
- finally, in few cases, the *kebele* leaders attempt to regroup land, sometimes even between several *kebeles*.

Contrary to other regions of southern Ethiopia, the production means owned by each farmer (yoke, plough) were not selected as a criterion to receive land.

LAND OCCUPATION AND SOCIAL PRODUCTION RELATIONSHIPS,
DERG PERIOD (LATE 1980'S)



Source : V. Barthès et N. Boquien, d'après les entretiens avec les agriculteurs

In Homa, the surfaces allocated varied from 0,4 to 1,5 hectare per nuclear family, with an average around 1 hectare. The former slaves, dependants or peasants could, in most cases keep the land they were previously cropping, and an additional land could be allocated to them (taken on former nobles' land). Even if several corruption cases were witnessed (bribes paid to the *kebele* leaders for one fourth or half additional hectare), the allocated surfaces were, in general, homogeneous. This reform has therefore been radical, in its written form as well as in its setting up.

At the same time, all indirect tenure (share-cropping contracts, hiring of land, salaried work) became forbidden, as well as all land transaction. Land became common property of Ethiopian people, and farmers only have usufruct's rights on it.

Forests and common pasture were kept as land reserve, in order to be allocated gradually, depending on the needs and demographic growth.

2.2 New inequalities based on cattle ownership

However, the reform did not change radically the former inequalities, given that cattle were not redistributed. Let us look further into the pre-reform situation.

At the end of the imperial period, inequalities were based on the surface of land cropped (high disparities between social categories, and even inside each category) as well as on cattle ownership.

At the time of the agrarian reform, even if no law was passed concerning cattle redistribution, some farmers, slaves or dependants, decided to keep for themselves the noble's animals they were looking after previously (freely or as share-breeding). This allowed many farmers to acquire cattle, but it did not erase pre-existing inequalities.

Soon after this reform, some farmers remained without any cattle, as well as former nobles owning about 15 animals. These nobles were giving up part of their herd as share-breeding contract, with the same modalities as during the imperial period.

2.3 The levying abolition, and the onset of a phase of intensification in work related to the cropping and breeding system

The various taxes which farmers had been subjected to (duty, tax) were reduced to a single tax, paid to the Ethiopian government, which amounted to 7 birrs per nuclear family. According to the interviews we had with farmers, this amount was very low, compared to taxes people had to pay previously. Therefore, this reduction of levies led to a new repartition of added value, whose main beneficiaries were henceforth farmers.

At that time, the government set up an access to input policy (fertilizers, weed killers), that farmers were able to use for the first time. Fertilizers were subsidized by campaign credits; farmers only had to pay for transport at purchasing time (at sowing time), and would pay the actual fertilizers price at harvest. That policy allowed all farmers, whatever their social and economical situation, to have access to inputs. The fertilizers price represented only about 5% of the fields gross product, that means the price farmers could get from the cereals sale at harvest time.

The result of this farmers' liberation, who could thus benefit from higher working time and greater investment capacities, as well as improved access to inputs, was an intensification of cropping and breeding systems.

2.3.1 The evolution from one to two cropping seasons

Until the revolution, the practice of two cropping seasons was really rare. Only few nobles, or rich peasants, did crop an early barley (called *gulalo*) during the first rain season. According to our interviews with farmers, we can assume that the renewal of the soil fertility was restraining this practice. Indeed, when farmers were cropping only during a single season, for the other 6 months they were leaving the field as fallow, which was ploughed several times before sowing. The passage to a double cropping season resulted in farmers giving up the fallow.

That is why the development of fertilizers use, together with access to weed killers (which decreased the time that farmers spent weeding), enabled farmers to do away with this labour intensive weeding activity.

Moreover, we have to emphasize that at that time, the only crop which was cultivated during the first rain season was the early barley. It is only after the introduction of potatoes and new varieties of maize (adapted to altitude), at the end of the 1970's, that farmers could really start to crop during the first cropping season.

At the same time, this change made it possible to increase the per hectare added value, which was very important in a context of division of the farms (demographic growth).

However, farmers who had plots located near forests could not grow potatoes or maize, as these crops were damaged by pest animals such as monkeys and wild pigs. That is why it is only with the spread of forest clearance, linked to demographic growth, that the great majority of farmers adopted this practice.

2.3.2 The progressive disappearance of fallow in rotations

Soon after the agrarian reform, the size of farms was quite homogeneous, around one hectare per family. Under these conditions, it was not possible to continue to practice rotations such as "three years of crops / three years of fallow", which before was the norm adopted by nobles and rich peasants. Indeed, this method of rotation obliged the farmer to leave half of his land as fallow each year. For farmers with small surfaces, this practise was not viable. By using chemical fertilisers they became able to give up fallows while maintaining soils fertility renewal. Thus rotation and fallows progressively disappeared.

The disappearance of fallows, and the generalisation of two cropping seasons reduced the sources of available fodder. This change greatly modified the way of feeding cattle. We will detail it later.

2.4 The adjustment on Sovietic Union : the hardening of the régime (1979-1991)

A few years after this agrarian reform, Ethiopia's adjustment on Soviet Union approach had considerable consequences for the country's agriculture. Several collectivisation programs were conducted over the whole country. Here are details of these programs concerning Homa *kebele*.

A portion of the land of the region was cropped collectively by members of the peasants' association (i.e. all farmers who received a piece of land at the time of agrarian reform). These production cooperatives were managed at *kebele* level, and each peasant had to work there two

days a week using his own means of production (tools and yoke). These plots were situated on former forests land, which had been cleared. Teff, maize and wheat were cultivated in those lands. Harvests were sold on the market and the ensuing income was managed by the peasant association comity. This comity used that income for administrative purposes (office building, transport fees for *woreda* level meetings, transport fees for soldiers sent to war), and the remaining income was given to the *woreda* government office.

Other common work was managed by each *kebele*, and the farmers were regularly mobilized for:

- building infrastructures and fixing and repairs (roads and bridges mainly)
- participation in the "villagisation" programs in neighbouring *kebeles* (located to the south of the region, near the towns of Shishinsho and Adaro)

These "villagisation" programs were carried out over a large part of southern Ethiopia. Officially, their main objectives were economical and social (agricultural collectivisation to achieve food security, access to health services, education, infrastructures, energy...), but they also made possible a rigorous control of the population (Fontrier, 1999). However, any program of villagisation took place in Homa, because of the difficulty to move the enset plantation.

Some population resettlements were also organised, with the aim of « adapting the population density to the nutritional capacities that the natural environment offers » (Fontrier, 1999). In Homa, about 100 inhabitants were moved to Gambela region, near the Sudanese border, in South Ethiopia. Most of these farmers had been chosen by the *kebele* leaders, on economical criteria: difficulties to pay taxes, to give back credits, etc. A few others volunteered to leave, as *kebele* leaders promised them better living conditions. The welcoming and living conditions in Gambela were in fact a catastrophe, and only a small number of settlers survived.

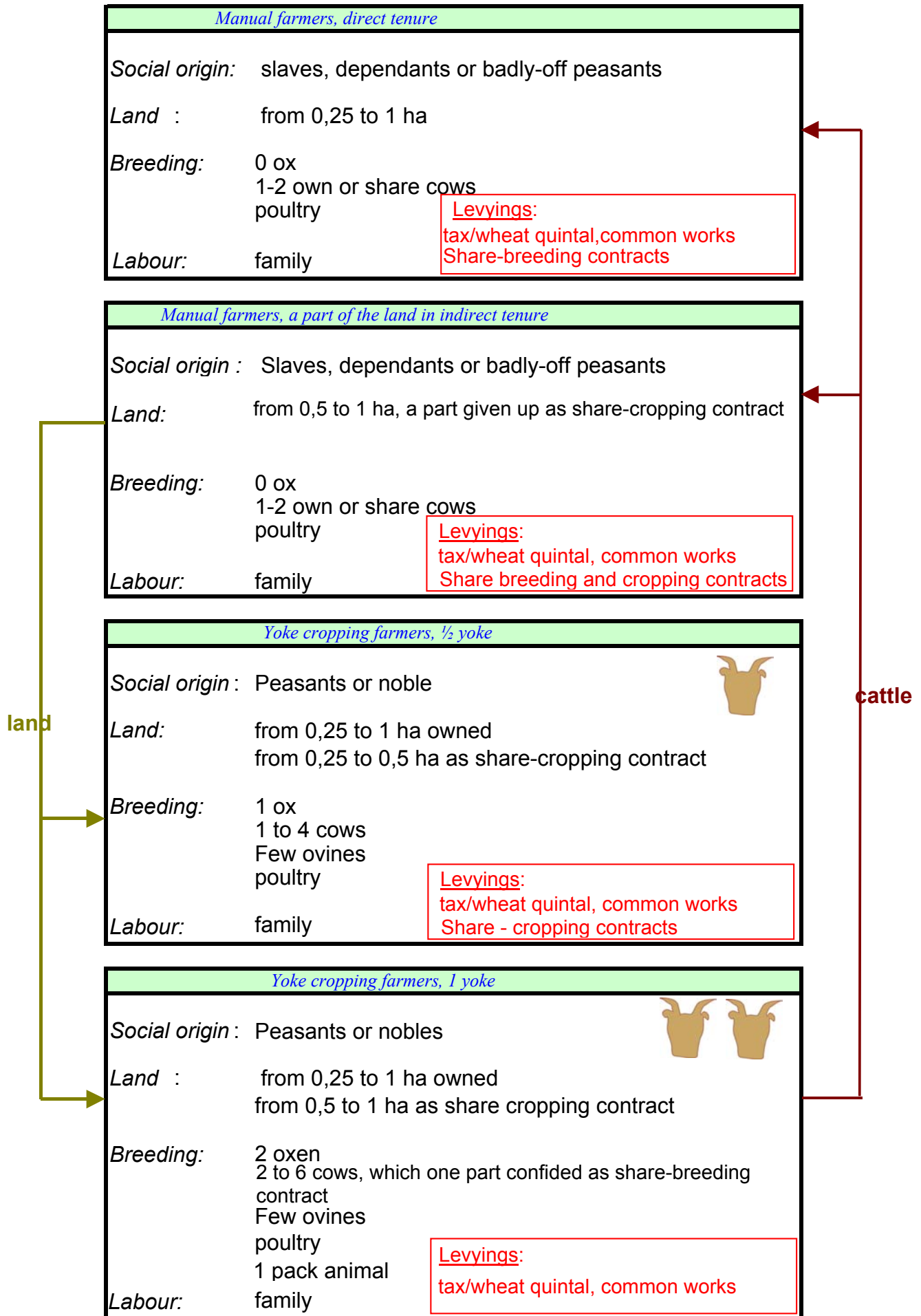
At that time, Ethiopia was at war with Erythrea and Somalia. Some peasants left the region to go fighting, but each family who remained in the region had to contribute to the national war effort. In addition to the two compulsory days of common work, each peasant had to work an extra day per week on the soldiers' land.

Simultaneously, land tax whose amount was very low at revolution time, increased a lot. This tax was not related to the surface owned by each peasant, but depended on each farmer's capital level. Three classes were created, according to this capital level (estimated by the *kebele* committee according to the herd's size), and for each class an amount of tax was fixed, with varying results. Indeed, in 1990, land tax represented between 200 and 300 birrs as opposed to 25 birrs in 1979 (constant birr).

Finally, the agricultural prices control policy at national level was translated, at local level, by an extra-taxation of the peasantry: cereals prices were maintained low (about 50% of the free market prices), in order to encourage consumption by urban population. Thus, peasants had to supply a fixed quota of cereals to the *kebele* every year (1 quintal of wheat per family at 35-40 birrs/quintal, actual birr). Farmers with insufficient crops had to make up that shortfall by buying it at higher prices from free market, (75-80 birr/quintal, actual birr). In fact, most of the peasants of the region did not get any returns from this contribution of one quintal of wheat.

In addition to this quintal of wheat, all skins from slaughtered animals for *Meskel* feast had to be given, freely, to each *kebele*.

FARMS TYPOLOGY ATE THE LATE 1980'S



Source: V. Barthès and N. Boquien according to interviews with farmers

In the late 1980's, the levying amount in kind and cash was equivalent, to about 3 quintals of wheat :

- from 1 to 2 quintals to pay land tax
- 1 quintal for the cooperative

For the smallest farms (size of about 0,4 ha), these levies meant about **one third of the fields gross product**. To these levies on goods were added working time levies: 3 days per week, equivalent to 50% of the working time.

The adding of all these levies contributed to increase the gap between farms. This taxing forced the farmers to gradually sell all their cattle, thus eroding the capital of the farm.

A farmer confided to us: "*We did not work to improve our lives, we worked just to pay taxes...*"

As the agrarian reform did not equally redistribute the production means, a new kind of differentiation, based on the number of cattle kept by farmers arose at that time.

2.5 Typology of the farms in the late 1980's

Different types of farms could be distinguished at that time, some with large land superficies, due to indirect tenure development that began very early in the region, in spite of its official ban.

Actually, the maximum superficies that a farmer can plough depends directly on his ownership of one or several oxen. The limiting work peak is in June and July, with soil preparation and sowing. Access to oxen is determining at this time: it conditions the maximum surface each family can cultivate.

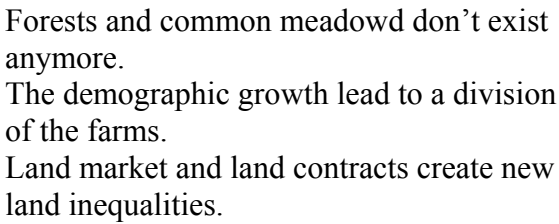
- 0 ox, manual ploughing : 0,5 hectare maximum
- ½ ox : 0,6 hectare maximum
- 1 ox : 1,25 hectares maximum
- 2 oxen or more : until 2,5 hectares

However, during that time, farmers could rely only on **half of their working time** (due to all the common work duties they had to contribute to), thus these periods were divided by half, and some farmers were **unable to plough their entire land themselves**. As a consequence, some farmers in manual ploughing, who had too much land to plough themselves, made available part of their fields for share-breeding contract to other farmers, in yoke cropping. |

We could distinguish 4 farms types:

- manual ploughing farms, with surfaces smaller than 0,5 hectare
- manual ploughing farms, with surfaces larger than 0,5 hectare, which were partly made available for share cropping contract to other farmers
- yoke ploughing farmers, with half a yoke, with an additional small surface in indirect tenure
- yoke ploughing farmers, with a full yoke, with an additional large surface in indirect tenure

CURRENT PERIODE (2000's)



Source : V. Barthès and N. Boquien, according to interviews with farmers

3. THE LIBERAL PERIOD : FROM 1991 UNTIL TODAY

During that period, the trends which began during the *Derg* went on: decrease in the common pastoral lands, in common grazing on fields after harvest, generalisation of two cropping seasons, development of land contracts.

With the end of this regime, farmers got rid of certain government levies, but they also missed out on input subsidies.

The subsidies removal gave rise to an explosion of fertilisers prices, which were increased six folds and more. Prior to that, we were able to estimate, by talking to farmers, that to buy one quintal of fertilisers with subsidies, one had to sell 75 kg of wheat (actually from 60 to 125 kg depending on the year). Nowadays, to buy the same fertilisers, a farmer has to sell about 5 quintals of wheat. In this context, a majority of farmers stopped using fertilisers, or decreased the quantities used previously. As a direct result, we noticed in that period the development of manure fields (without fertiliser but with manure), and a general decrease of yields in fields. A farmer told us: "I had to stop to use fertilisers, it had become really too expensive. Now I can only pray to God and ask him to make crops grow..."

Since the agrarian reform in 1975, farms have been divided due demographic growth. At the time of the reform, 280 farmers received a piece of land, and in total there were about 2,000 inhabitants in the *kebele*. Nowadays, the total population of the *kebele* has doubled (4,000 inhabitants according to the 2005 local census). Even if we do not have more accurate data concerning this demographic growth, we can still describe its consequences.

The demographic growth is visible in the landscape by the expanding settlements on forests areas, which have been allotted to young farmers, and by the modification of housing location. With inheritances, the same piece of land is divided amongst descendants, and the new farmers have to settle for level portion half-way down slopes when possible, or even on downwards slope.

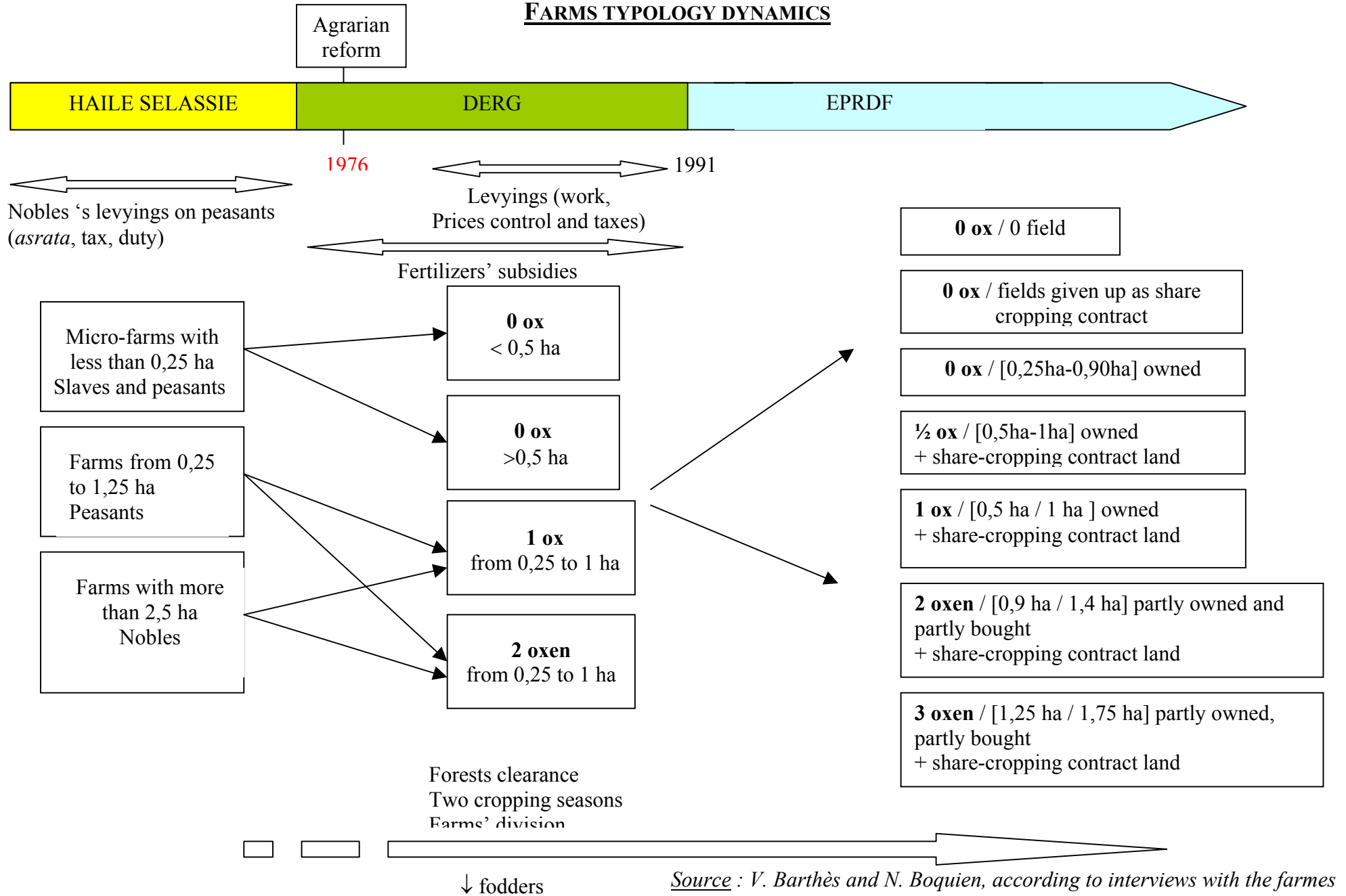
Moreover, the allotment of land for young or new farmers leads to a progressive clearance of forests. As wood availability became scarce to find in forests, farmers started to produce their own wood for they daily requirement. Although several local species have been maintained, especially in fences around farms, it is the eucalyptus and bamboos to a lesser extent, which are usually planted for common uses: timber, firewood, and construction wood.

Furthermore, the results of giving up of grassy fallows, combined with forests clearance, called for a different approach to cattle feeding, which no longer fitted with the new environmental development under way. Consequently, a new foddering system, more work intensive, has appeared and has been generalised to the entire farming community.

The cattle feeding is no longer based on free grazing outside the farm, but on foddering inside the stable, with fodders produced on the farm. Thus farmers applied new practices in the cropping systems to meet breeding needs:

- systematic pulling up of enset weeds,
- regular cutting of enset leaves,
- systematic pulling up of fields weeds,
- grass mowing on private or common grassy plots (paths bords).

FARMS TYPOLOGY DYNAMICS



These practices are labour intensive as they require daily harvesting of fodder available on the farm. The farmers went from a breeding system based on the availability of extensive common pastoral land, less labour intensive, to a system of "zero grazing" requiring a great deal of handling work.

This radical change in the approach to cattle feeding was brought about by the liberation of labour, the abolition of levies and of common work.

Consequently, the number of heads of cattle owned by a farmer is directly affected by his capacity to feed his herd. Contracts on cattle, which already existed but were not generalised, spread out between farmers unable to feed all their cattle, and others who, having run out of capital were unable to acquire a new herd.

New social relationships of production set up, and condition of new unequal repartition of added value: share-cropping and share-breeding contracts, indirect tenure, usurious rates of credits...

Closer look into the current agrarian system explanation.

III. THE CURRENT AGRARIAN SYSTEM

1. BREEDING AND CROPPING SYSTEMS

1.1 The enset cropping system

1.1.1 The enset plantation takes a fundamental place in the farms

First of all, let us remind the readers of the numerous roles of enset that explain the fundamental place enset plantation occupies in the farm.

Essential base of the population's diet, the enset provides a lot of fresh matters per unit of surface. It is difficult to give an accurate figure due to the large range of yields of fresh *kocho* per unit of surface to be found in written documents. Thanks to the comparison of our field data and of read data, we have taken a figure of the order of 10 tons of fresh *kocho* per hectare. According to document, *kocho* loses 60% of its weight due to heat, thus we arrive at a yield of 6 tons of cooked *kocho* per hectare. Another advantage of this plant for human consumption is the spacing out of harvests and of the transformation into *kocho* throughout the year.

Enset is also used in animal feeding. The leaves are the main fodder during the fodder bridging period. Roots and pseudostem are specially used to fatten oxen and to feed oxen during the "work peak".

Enset also plays an important part in households' finances. The sale of *kocho*, and of other products derived from enset (ropes, cord, mat), is the principal source of weekly income that the woman can then use for her daily and basic expenses such as oil, salt, coffee, soap,...

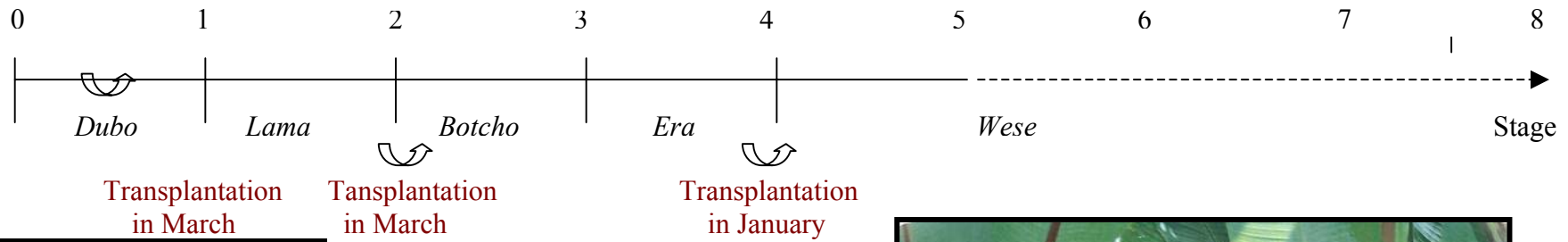
The relative proportion of enset plantation into the overall surface of the farm is variable according to the total cultivated surface of the farm and its production of manure.

For farms with total surface inferior to 0.6 hectare, the surface of enset plantation increases proportionally to the total surface of the farm. Thus, for small range surfaces, peasants favor their enset plantations because of the plant's numerous applications in the farm.

For farms with total surface superior to 0.6 hectare, enset plantation remains constant at 0.25 hectare and thus these exploitations increase the surface of their fields. The maximal threshold of enset plantation is the farm's ability to fertilize it.

Enset plantation is so essential for a farm that the slightest disease of enset can endanger the viability of the most precarious farms: through the destruction of his enset plantation the peasant will lose his staple food and a source of income. History shows the frequent reappearance of a bacterial enset disease called *Alloya* in Amharic. This disease spreads quickly inside the plantation. However the only treatment known for the present is the cultivation of an alternative crop for at least three years, a method that is difficult if not impossible for the smallest peasants. A model simulating the loss of 75% of the enset plantation in some small farms, where enset plantation represents a third of the farm's total surface (without any share-cropping field), shows a depletion of 20% of the GAV and nearly 50% of the agricultural income.

THE CYCLE OF ENSET



Dubo, one-year old enset



Sima : two and three-years old enset (*lama* and *botcho*)
planted inside the same plot

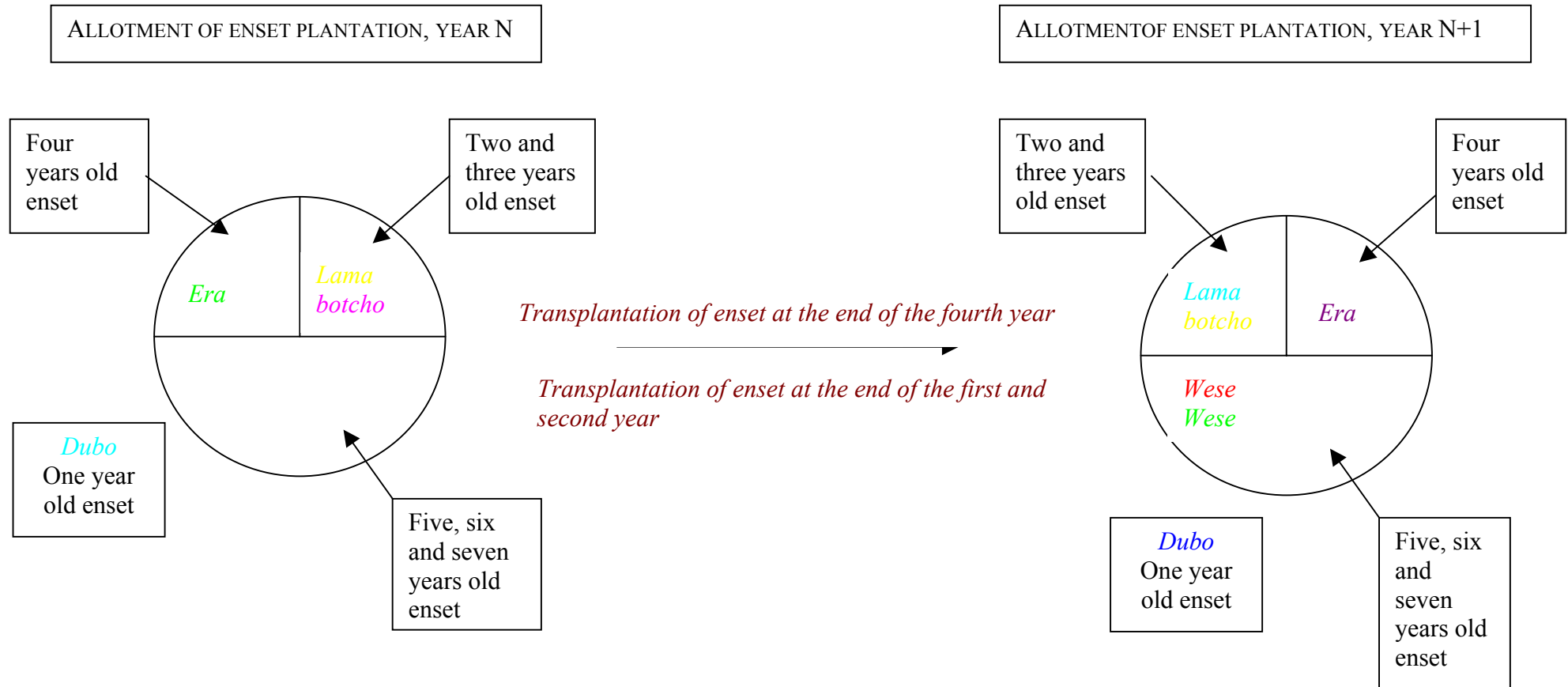


Enset plantation of
more than 4 years,
(*wese*)



ALLOTMENT OF ENSET PLANTATION

26



Source : V. Barthès and N. Boquien, from our interviews with peasants

THE TRANSFORMATION OF ENSET



*Above and opposite :
women preparing kocho*



*Bellow: the bulla, one of the
products coming from the
transformation of enset*



Source : V. Barthès and N. Boquien, pictures taken on field

1.1.2 The enset varieties

Each enset plantation is made of a sample of several varieties of enset, each variety playing a specific part and their combination expressing the priorities of each peasant:

- some varieties are known to give a kocho of pleasant flavour (*Gimbo, Itine, Sabara, Argama, Tasa, Gobmorsa, Wochamada...*)
- others are more resistant against the Alloya, the enset's bacterial disease (*Dirbo, Wolantche*)
- some others give stronger fibrous products arrived at during the transformation of enset into *kocho*. They are usually used for the fabrication of ropes (*Siskela, Guichira*)
- others are cropped for their medicinal properties

Among these varieties, peasants distinguish two kinds, male and female. Male enset would give higher yields of *kocho* per enset, would reach maturation more quickly than female enset and would be more resistant to the enset's bacterial disease *Alloya*. Female enset would give a tastier kocho and would be the only one whose root can be consumed.

1.1.3 The cycle of the enset

The enset is a semi-perennial plant that is harvested at once after a cycle lasting from 6 to 8 years. The growth of enset includes several stages and three transplantations:

- the *dubo* stage: it is the first year of the enset's cycle. In January, enset older than six-years is cut. The full and unsplit root is buried and abundantly fertilized by manure. This root will give new suckers during the following year.
- the *lama* stage: the transplantation of *dubos*, young one-year old enset, occurs in March. These enset are thus called *lama*.
- the *botcho* stage: at the end of the second year, *lamas* are transplanted in March and reach the stage of *botcho*. They remain at this step for one full year. The *lama* and *botcho* enset are cropped into the same plot: two *botchos* are spaced by two *lamas* planted together. The whole *lama* and *botcho* mixed together are called *sima*.
- the *era* stage: it is the four-year old enset
- the *wese* stage: the *era* at the end of their fourth year are transplanted in January and are thus called *wese*. They remain at that stage until their transformation into *kocho*.

1.1.4 The enset plantation : a manual and work-intensive cropping system

It is a cropping system very intensive in work. The **transplantation** of *dubo* (one-year old enset), *lama* (two year-old enset) and *era* (four year-old enset) represent the male “work peak” for this cropping system in January and March. Mutual assistance is often required to perform these tasks. Another “work peak”, that is **ploughing with ploughing stick** in some parts of the plantation in January, is also done thanks to mutual assistance.

Weeding takes place in May and June. From August up to the end of October, the peasant **curves the outer leaves** of each enset plant. These leaves will get dry during the dry period. Women will use the dried central nervure or *wodaro* to make mat. These two jobs do not constitute an important workload as they are done daily over a long term.

The **spreading of manure** is exclusively a woman's work, each enset plant is fertilized, on average, once in a year.

The women “work peaks” occurs during the transformation periods of the enset into *kocho*. This work is always done in groups: women and female teenagers of the family, association of women of several families that are preparing *kocho* rotate in turn in each farm, wife of the head of the family and daily or contract workers that are paid in kind (*kocho*) and cash.

1.1.5 The enset plantation : a criterion of differentiation of the farms

A differentiation of enset plantation between farms is observed on the following criteria:

- Annual frequency of *kocho* preparation

The best seasons to prepare *kocho* are the months of June, July and August during the rainy season, as well as December and January during the dry season. *Kocho* prepared during those months will be much tastier; some peasants explain this by saying that in these periods, the leaves of enset are not (or are less) cut. During rainy season, peasants only weed in the plantation and at the beginning of the dry season, the fodder is still sufficiently abundant in other fields not to require cutting the enset's leaves, or to a lesser extent. The transformation of enset in June, July and August, will also give a higher yield of *kocho*, because of a greater water content in the *kocho*.

However, some families prepare *kocho* every month of the year: these families generally have a smaller enset plantation and therefore fewer enset of age to be cut each month.

- Age of enset entering the transformation into *kocho*

The tastiest *kocho*, also the ones giving the best yield, would be prepared with enset cut just after flowering (8-9 years old), at complete maturation stage. Only the wealthiest peasants who have large enset plantation and for whom *kocho* does not represent their staple food, can afford to reach the full maturation of enset. Most of peasants transform their enset when they are 7 or 8 years old; but all options can be seen. Some peasant cannot wait more than 5-6 years before cutting their enset and transforming them; in these particular cases, the yield of *kocho* per enset is very low and the *kocho* is less tasty.

- Duration of fermentation of *kocho*

Once prepared and before being consumed, *kocho* is left in a hole inside the ground of enset plantation to ferment. The gustative quality of *kocho* depends as well on the length of fermentation. Duration higher or equal to three months is generally recognized to be the minimum period to get a "good" *kocho*. However, some families, during the bridging period or otherwise in difficult situation, cannot afford to wait more than a month, even fifteen days, for fermentation. As they do not have enough food, the *kocho* prepared the previous month, is eaten the following month. Moreover, they prepare a lesser amount of enset each month (2 to 4 per month). The surface of their enset plantation and the age of the enset do not allow them to prepare more.

- The consumption of enset roots

Enset is mostly consumed in *kocho* form. However, the roots of enset, called *amitcho*, may be consumed separately, without being transformed or fermented before; the rest of the enset is given to animals as fodder. The roots are eaten boiled, as an accompaniment of colostrums after calvation. It may also be consumed during the bridging period, from February to May. The number of enset cut for this type of consumption varies from one family to another, and depends on the *kocho* availability or the possibility to buy other goods in the market. The families having an enset plantation smaller than 0,25 hectare consume an important quantity of boiled roots during the bridging period. However, the low number of enset in their plantation does not allow them to consume roots during the whole bridging period.

- **Preparation and sale of *merero***

The *merero*, consumed traditionally for the feast of Meskel, comes from a specific way of the transformation of enset. However, peasants whose enset plantation is very limited cannot prepare it.

Among the peasants who produce *merero*, *only* those who prepare an important quantity can sell it on market. *Merero* demand carries a very high price in September because of the Meskel feast (more than four times the price of *kocho*, for the same quantity). The sale of *merero* is an important additional income that women can use for purchasing other goods necessary for the feast and butter in particular.

- **Sale of *kocho***

Generally, peasants who own an enset plantation bigger than 8 acres sell *kocho* every week on the market (from one to three times a week). This sale of *kocho* provides a regular income that enables the woman to face up to other daily food expenses: coffee, oil, chili...

- ***Wodaro* mat confection** (*Wodaro* is the central nervure of desiccated leaves)

Only the families, with sufficient enset to use the leaves in that particular way and not only as fodder for animals, are able to confection some mats. The sale of these mats is not a negligible income (0,6 to 0,8 € per mat, from November to March on Adaro market, in lowlands area where enset is less cultivated).

Here is an idea of the combination of those different criteria, according to the surface of enset plantation:

	Surface of the enset plantation (are)		
	<8	[8-12]	[12-25]
Annual frequency of <i>kocho</i> preparation	6 to 12 (1 if very few enset)		4 to 6
Age of enset used to produce <i>kocho</i>	6-7 years		7-8 years
Fermentation time of <i>kocho</i>	1 month	1-3 months	3 months
Sale of <i>kocho</i> (per week)	0	1 to 2	3
Consumption of roots of enset	+++		+
Preparation and sale of <i>merero</i>	0	+	+++
<i>Wodaro</i> mats realization	0	+	+++

Thus for enset plantations smaller than 8 ares, leaves of enset are kept exclusively to feed the animals, some roots are eaten during the whole bridging period, six-year old enset are cut to prepare *kocho* each month and *kocho* is left less than a month into the ground to ferment. Finally, they prepare so little *kocho* that they cannot sell it and they do not prepare *merero*.

1.1.6 Evolution of this cropping system in the history

During the last decade, some technical points for this cropping system have been modified:

- generalisation of weeding inside enset plantation in May and June to produce fodder for cattle, due to the scarcity of fodder

- generalisation of the transformation of enset into *kocho* before flowering
- decrease in the time of fermentation that could reach a full year before

These last two points are caused by the decrease in the total surface of the farm and thus of the enset plantation, due to the splitting out of farms.

1.2 The garden cropping system

Crops cultivated in the garden are intended exclusively for families' self-consumption. The main crops are maize and green cabbage that is eaten with *kocho* and supplements the diet.

This cabbage is cropped in rotation with maize that is cultivated as much for self-consumption as for the foddering of cattle. Maize is sown in January (after the first rainfall) and is harvested in June for the variety coming from Kenya and in August for the local variety.

In June and July, progressively with the harvest of maize, should it be unfinished, the cabbage is planted out. The young seedlings can be bought on market or come from peasants' garden nursery.

The planting out of cabbage does not constitute a workload peak; this task is executed daily by the man before or after his normal working day. The hoeing of cabbage begins one month after its planting out and is generally executed few days per week in short spell of time (half an hour to one hour), by the man, before or after his working day.

The same plant is worked at fifteen days of interval. This task continues then until the end of harvest.

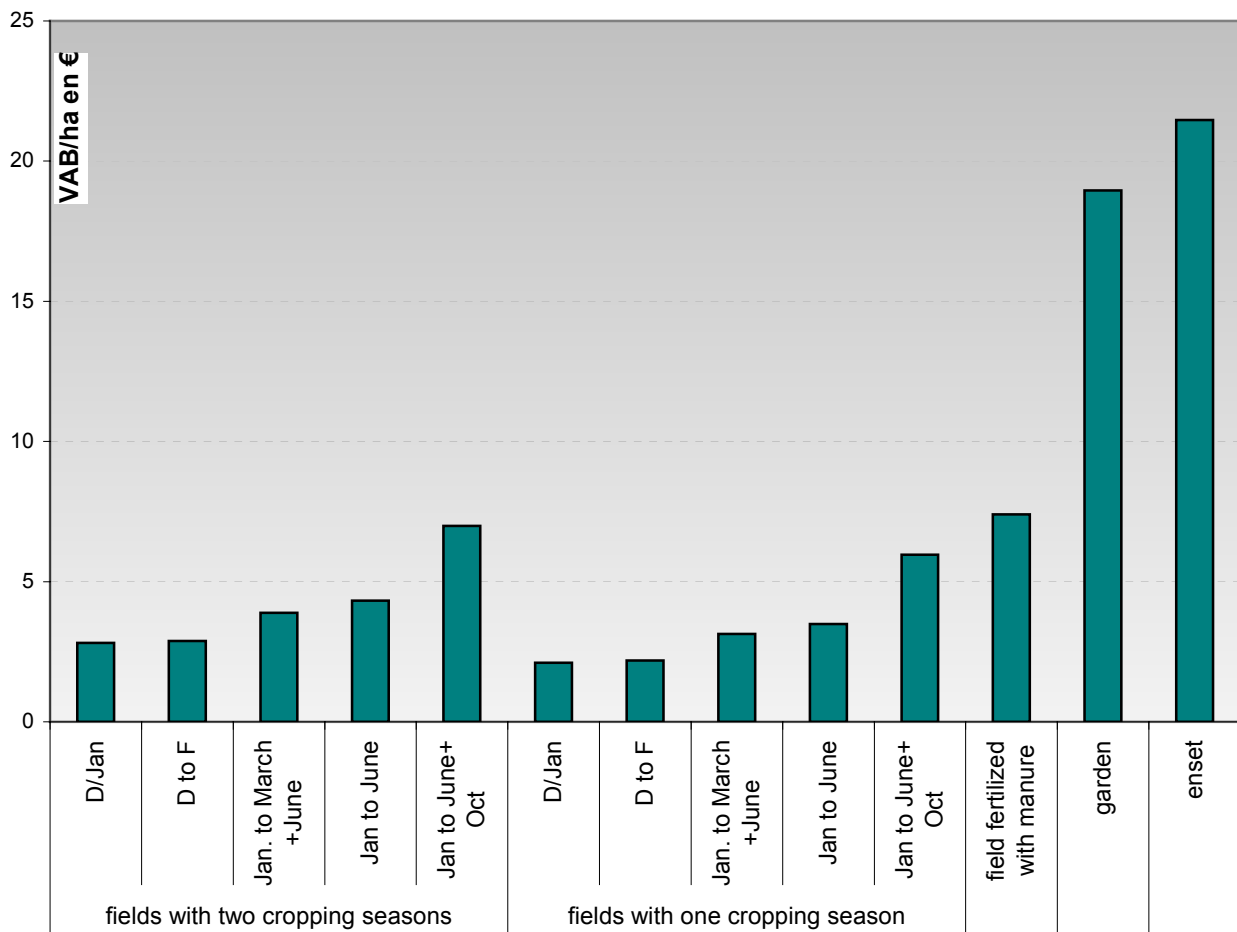
Its harvest starts to intervene two months after planting out the seedlings and generally lasts until January if cabbage is frequently fertilized by manure and hoed. From this date, the peasant must release the field to crop maize. The yield is divided by two between the months of full harvest (from September to the end of November) and January and December. The continuous cultivation of cabbage on the same field is possible providing that peasants hold a plot for this purpose only, therefore for peasants having sufficient garden space.

The garden is a manually cultivated system.

The larger the garden surface increases (ranging between 2,5 and 12 are), correlated with the total surface of the farm, the more a diversification of crops is practised. In a small garden, less than 5 are, the following are generally cropped:

- Maize and cabbage
- One or two coffee trees (generally cultivated for its leaves entering the preparation of infusion with garlic and ginger)
- Two to five plants of chili
- One plant of bean
- One or two plants of sugar cane
- One plant of pumpkin
- Two tobacco plants
- Eventually some plants of onions and tubers (taro, yam)

**COMPARISON OF THE GROWTH ADDED VALUES PER HECTARE
OF SOME CROPPING SYSTEMS**



Source : V. Barthès and N. Boquien, modelization from our interviews with peasants

If the surface goes up, the area cropped in maize and cabbage increases, the number of coffee trees, of plants of sugar cane, of onion, of chili increases and some market garden produces start to be cropped: beetroot, *tikel goman* or white cabbage, garlic, carrot. But the quantities that are harvested for each crop are not enough to satisfy all the familial consumption. Harvests occur at different times of year, and are organized and planned by women in accordance with the family's food requirements, as for the *enset*.

Cabbage is abundantly fertilized, during three months of the year (from July up to the end of September). Maize rotates with cabbage on the same plot so manure is only spread once during the single plough prior to sowing.

1.3 The "fields" cropping systems

1.3.1 Importance of the "fields" cropping systems for the farm

A very clear differentiation between farms is based on the criterion surface of cultivated fields. This surface is highly variable (from 8 ares up to 1.5 hectares) and depends on:

- the total surface of the farm inherited from the peasant's father. As explained previously: a peasant tends to increase his surface of *enset* plantation to the detriment of the surface of fields until he reaches the fertilization threshold. *Enset* plantation can create up to seven times more added value per unity of surface than the "fields" cropping systems (example of a peasant obliged to sell all his grains at the harvesting time, at the lowest price)
- the surface received or given through indirect tenure system (renting, share-cropping). The share-cropping contracts are widely spread throughout the region: each one of the two participating farmers brings in an equal share of inputs, one of them proposes the land, the other the yoke and the labour force. The harvest is shared into two equal parts.
- The surface sold in case of important and sudden problem (funerals, diseases,...) / the surface bought by peasants who have important investment capacity and who have the means of production to cultivate it.

Nevertheless crops cultivated in fields fill numerous functions in the farm:

- self-consumption for the crops of the first rainy season (maize, red bean, potatoes) and for the crops of the second rainy season (cereals and broad bean) to some extent (for the wealthiest peasants)
- cash crops for cereals and broad beans: they represent the first crops sold in January to face the different expenses at this period, we will go into details afterwards.

Moreover, crop residues (straw) and weeds are used as fodder to feed the cattle during the period of scarcity of fodder (dry season). Straw is also widely used to make the roof of houses or for yearly repairs.

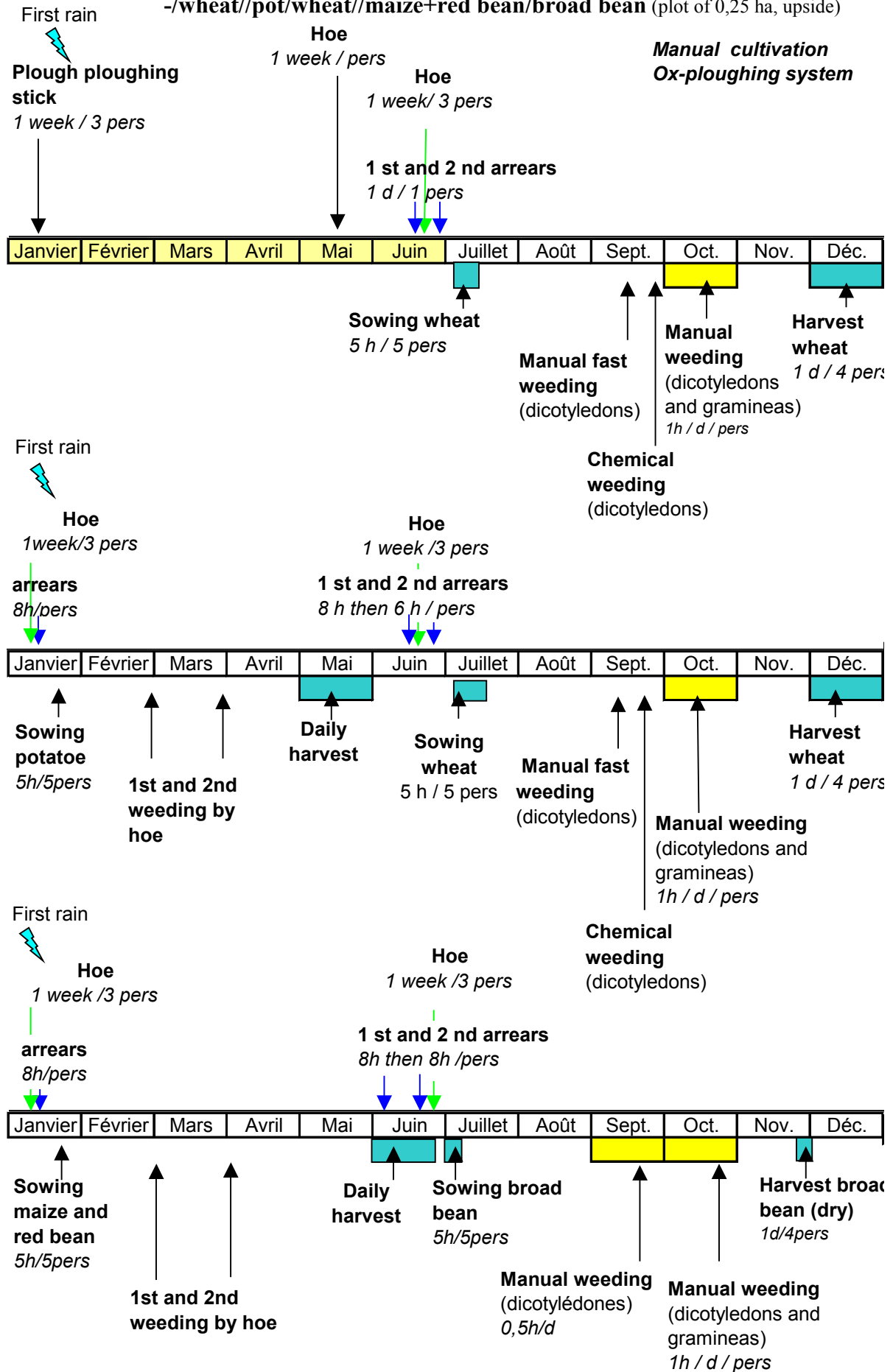
1.3.2 Crop rotation and crop allotment

As explained already, the suppression of the long-term fallow, the apparition during the *Derg* and the globalization during the EPRDF of double cropping season in fields modified crop rotations. Long-term fallow lands have been given up except for some specific situations. Three or four-year crop rotations are thus widespread among all farms.

From now on these crop rotations include two cropping season in fields on upside plots, close

Technical points of the crop rotation:

-/wheat//pot/wheat//maize+red bean/broad bean (plot of 0,25 ha, upside)



to onset, and a single cropping season (from June up to December) on remote or downside fields. Crops on these plots are more often affected by damages caused by pest animals (monkey, porcupine). They are generally on steeper slope, so growth is on eroded soil. The cultivation of tef is possible there.

Types of crop rotations widespread throughout the region are as follows:

- ❑ on upside fields:
 - / wheat // potatoe/ wheat // maize+red bean / broad bean or pea *or*
 - / wheat // potatoe/ barley // maize+red bean / broad bean or pea
- ❑ on downside and remote fields:
 - / wheat // - / wheat // -/ broad bean
 - / wheat // - / tef // -/ broad bean
 - / wheat // - / barley // -/ broad bean

Four-year rotations are also possible, with the rotation of three years of cereals and one year of leguminous plant. The inclusion of one leguminous plant inside crop rotations is essential. It enables an increase in the content of nitrogen inside the soil. Thus the yield of wheat cropped after broad bean is one and half higher than the yield of wheat cropped after a cereal (from 11 up to 16 quintal per hectare).

Inter-cropping crops maize and red bean are generally cropped before broad bean. If maize is late (due to a delay of the first rainfall in January), pea can be sown instead of broad bean by inter-cropping with maize that fills the role of support.

Barley that can break down easily, can be cropped on less fertile soils.

Each of these crop rotations, in manual cultivation or ox-ploughing system, consists in a distinct cropping system.

The crop allotment (annual distribution of crops on the different plots) is rarely linked to the crop rotation performed by the peasant. Lots of farmers attested of their inability to plan their crop rotations and crop allotment, likely because of their lack of cash that prevents them from purchasing the seeds they want at the right period each year. The crop allotment would be more linked to a financial logic (difficulty to buy seeds) rather than a no risks strategy (range of several crops each year, against climatic hazards).

1.3.3 The varieties

Two varieties of maize are cropped in field:

- the local variety whose characteristics are: six-month cycle, long stalk, generally chosen for its high production of fodder
- the variety from Kenya: four-month cycle, short stalk, generally chosen for its high yield of grains

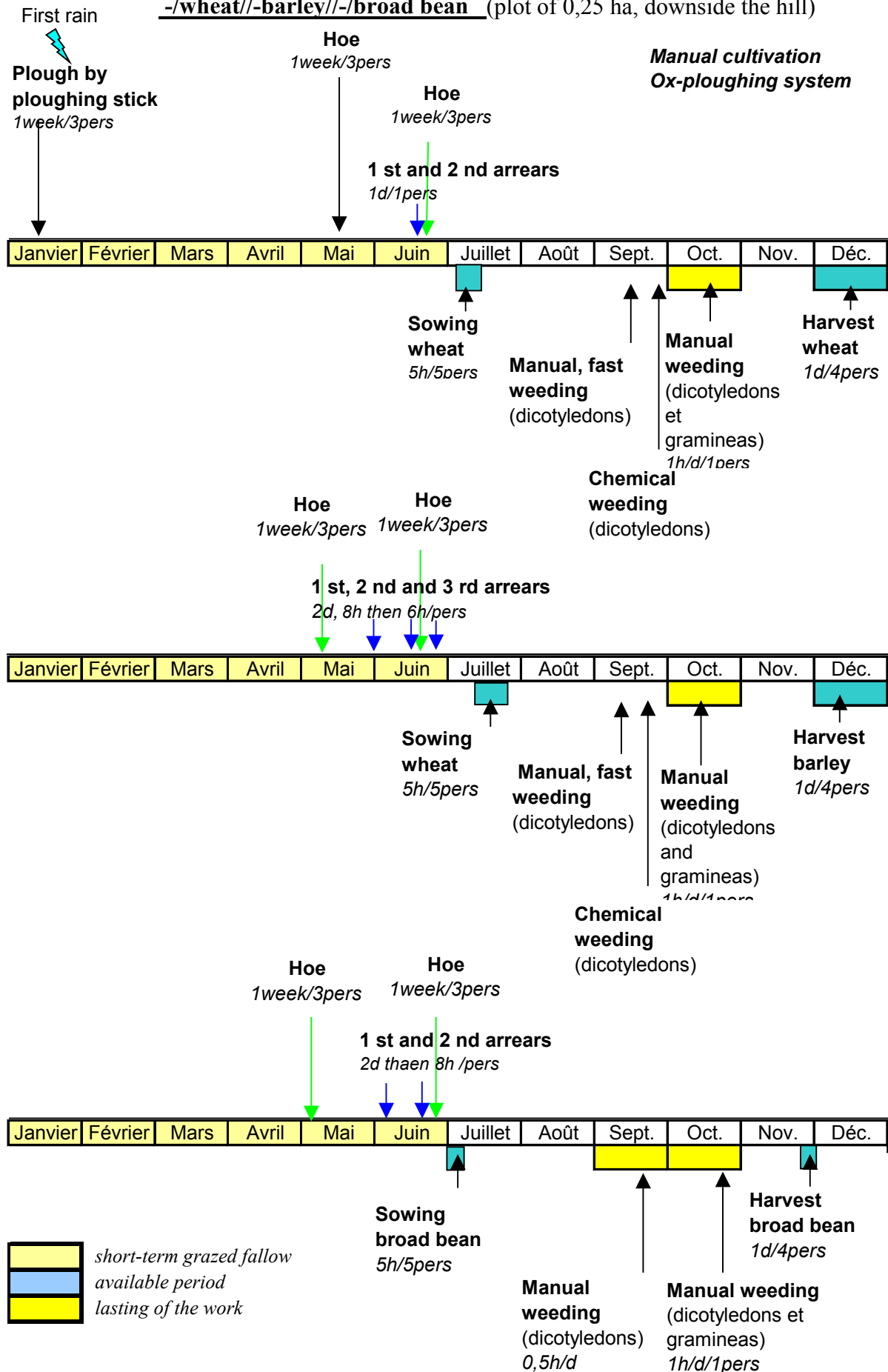
Usually both varieties are cropped on the same farm; this practice enables the family to space the periods of harvesting.

Only one variety of broad bean is cropped in field, the *horse bean*. On the contrary, lots of varieties of pea are cropped: *akouri atter*, *abasha atter*...

The principal variety of wheat cropped is the variety *legamo*. Some new varieties have been distributed by the agricultural office of Shishinsho, but the beneficiaries are not numerous and the surface sown with such variety very small.

Technical points of the rotation:

-/wheat/-barley/-/broad bean (plot of 0,25 ha, downside the hill)



1.3.4 The main technical points

Two levels of equipment - manual and plough - are still current nowadays. The **soil preparation**, an exclusive male activity, is done either by plough if the peasant owns ploughing oxen, or by ploughing stick and hoe.

□ The upside plots :

▪ In ox-ploughing system :

Whatever the crops of the first rain season, only one arrear is done before sowing.

On the contrary, several arrears are executed before sowing the crops of the second rain season - generally one for pea, one or two for broad bean, two for wheat and barley. Its main purpose is to struggle against weeds. Arrears are spaced out by two weeks, the first one takes place after the first growth of weeds and the last one occurs one week before sowing.

Only after a season of leguminous plant and before the arrears preceding the sowing time, a plough by ploughing stick then one work by hoe are usually the rule. The plot is free of crop during the first rain season after a season of leguminous plant. Thus, a short-term fallow of six months comes back into the crop rotations every three or four years.

▪ In manual cultivation:

A single work by hoe is executed before sowing the crops of the first rain season.

After a season of broad bean or pea, a plough by ploughing stick then usually two works by hoe are done. In other years, after harvesting maize or potatoes and before sowing wheat or barley, only one work by hoe is possible owing to the short time available to perform this work (less than one month). Broad beans and peas can be sown directly without any previous soil preparation.

□ The downside plots

On these plots, only one cropping season is possible from June up to September. For six months of the year, these lands remote or down the slope are fallow. After this, all the weeds are destroyed by plough or hoe. This six-month grazed fallow plays a part each year in renewing the fertility of these plots.

▪ In ox-ploughing system :

Arrears are more numerous than those executed just before sowing the crops of the second rain season on upside fields: generally two for peas, broad beans and tef, three for wheat and barley. Two arrears are usually spaced by two weeks, the last one occurs one week before sowing.

The year following the cultivation of leguminous plant, the plot is ploughed by ploughing stick then worked by hoe two months later and lately by ploughing oxen one week before sowing.

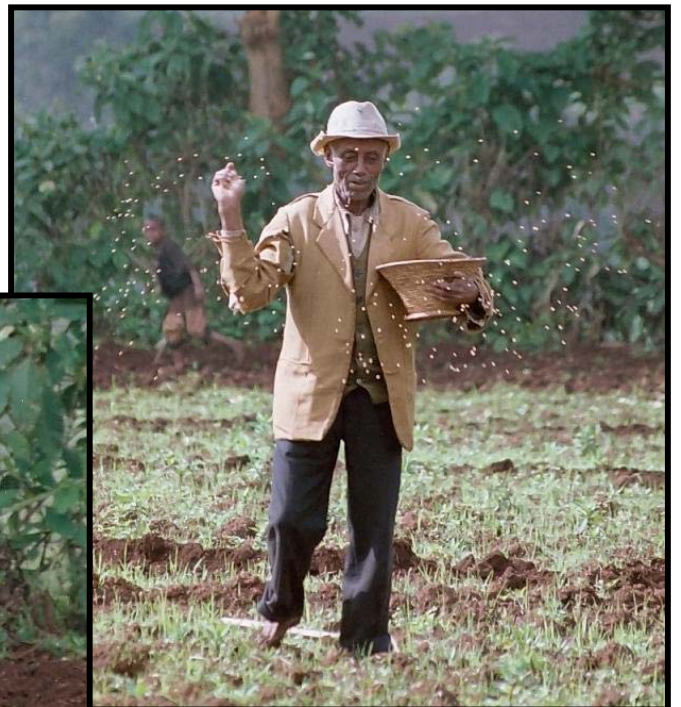
▪ In manual cultivation

The plot is worked once or twice by hoe before sowing wheat or barley in May and June. A plough by ploughing stick in January is the rule after a season of broad beans or peas cultivation.

SOME WORKS IN FIELDS



Arrears



*Above: sowing of wheat
Opposite: young boys working by hoe
or kalta*



Source : V. Barthès and N. Boquien, pictures taken on field

Sowing is a collective work. The persons engaged on this work can be members of the family or peasants who agreed to work together on the same plot and on each of their plot in turns. Sowing usually requires five persons:

- one person ploughing by oxen
- one person throwing the seeds
- one person spreading fertilizer
- two persons working by hoe to cover the seeds sown on the edge of the plot.

Except for maize which is manually covered, grains are covered on the following furrow by oxen and plough.

Dates for sowing the crops of the first rain season depend on rain: sowing is undertaken just after the first and abundant rainfalls, usually from mid-January.

On contrary, periods available for sowing the crops of the second rain season are strict and short: from 29th June up to 7th July for broad bean, then from 5th up to 12th July for wheat, from 14th up to 25th July for barley and early August for tef.

Sowing a 0.25 hectare plot (one *timad*) requires between 4 and 6 hours.

The **fertilization** of fields consists in the spreading of chemical fertilizers (diammonium phosphate), except for peas that do not benefit from any kind of fertilization. Fields do not receive any manure or organic fertilization.

During the first rain season, maize and potatoes are worked plant by plant using a hoe to remove weeds and add some soil around each plant. This work is executed twice for each of these crops after a two-month interval.

The **weeding** of dicotyledons in the cereals fields occurs in September, thanks to a weed-killer (anti-dicotyledonous herbicide). However, peasants unable to afford buying weed-killer may have to weed manually. Other weeds from the Graminea family are manually picked daily after flowering in October. The weeding of leguminous plant is always done manually in September.

Harvesting is usually a family undertaking (adults and children). Mutual assistance can also be practiced. An eight-hour working day is generally necessary to harvest a field of 0.25 hectare.

The harvests of the second rain season occur one after the other from early November. Peas and broad beans can be harvested daily and fresh from early November. Then dry peas and broad beans get ripe from mid-November. Lastly, harvests of wheat, barley and tef take place from early December onwards.

In the same way, the harvests of the first rain season are spaced out. The first to reach maturation is red bean from mid-May, at the end of the bridging period. Just after, the harvest of maize and potatoes occurs. All these crops are daily and progressively harvested, generally by women and according to the family's food requirements.

Threshing and winnowing of cereals and leguminous plants take place on the grassy area in front of the house, or on a grassy and uncropped space saved for this purpose in remote fields.

Threshing is done by the standing out of three or four mules or horses, and eventually oxen. Three peasants that own a horse or mule come to an agreement: each of them in turns gets the three horses together to tresh his crops. A peasant who does not own any horse can get them freely from relatives or can work freely on a horse-owner's land in order to borrow it for one day.

Winnowing is executed by a shovel. The peasant throws grains, glume and glumella on the air then the wind separates them.

The peasants who can store their grains preserve them in a *kafo* or a cylinder made of bamboo stored inside the house. Only when storage in excess of six months is envisaged is an insecticide then added.

The work peaks of these cropping systems are the ploughing with wooden stick, the soil preparation for the second rain saison in May and June, the sowing in June and July and the harvests in November and December. However only the soil preparation limits the surface that a peasants is able to crop.

1.3.5 Differentiation of the farms based on the “fields” cropping system

▪ Ownership of oxen and total cultivated surface

These two criteria of differentiation are strongly correlated. As we have just stressed on, the work peak that limits the total surface of cultivated fields per active is the soil preparation for the second rain season. Thus the ownership of oxen is a fundamental criterion to have access to land and thus is a criteria in the differentiation between the farms.

▪ Crop uses

Wheat, barley and broad bean are totally or partially sold depending on farm. However each family consumes daily roasted grains (*kollo*). Thus some peasants are in the paradoxical situation of being obliged to sell all their crops at harvesting time and of buying grains daily all the year long. The storage of cereals and broad bean tends to be difficult and impossible for a high number of peasants.

Maize and pea are consumed fresh. There is never storage of grains for these crops. Tef is also self-consumed for feasts.

For potatoes, lots of peasants are doing a second cropping season that is an alternative from the storage of seeds (yield harvest/seeds between 1 and 2).

The relative proportions of sold cereals / self-consumed cereals / stored cereals to be used as seeds are a criteria of differentiation between farm, that reflect their financial situation.

▪ Yields

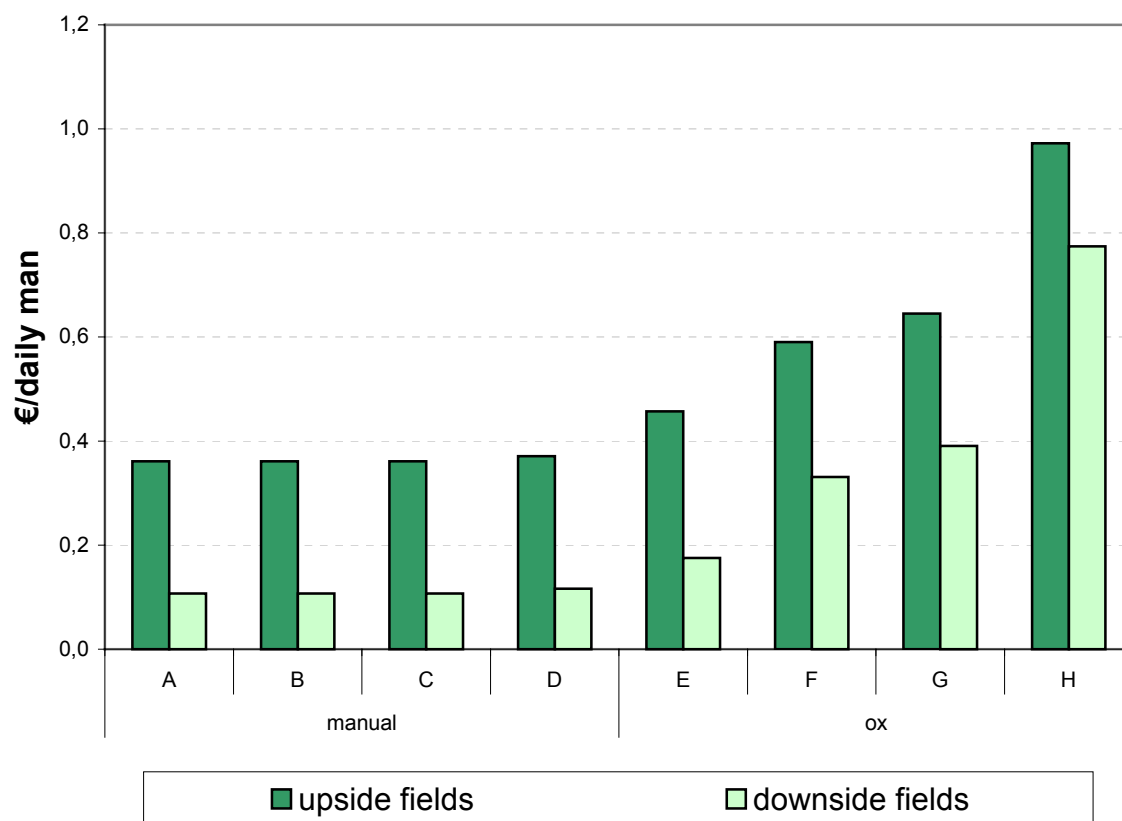
We have faced two difficulties to assess yields.

First of all, it was difficult to estimate precisely the amount of harvested grains because quantities are assessed by local unit of measure or sack of grain (for instance one *shala* or sack of wheat is equivalent to 75 kg and 240 metal glasses).

Moreover, the cultivated surfaces were difficult to measure: they are estimated by peasants in *timad* (0.25 hectare in theory). The *timad* is the work unit as well as the surface unit, it means the surface a pair of oxen can plough within one day. However this unit is obviously variable: the time required to plough a same surface is highly variable between the first and the last arrears (from two days up to 6 hours). This variation depends also on the strength of oxen and the soil texture.

According to these inaccuracies, we have been unable to assess precisely the difference of yields, in manual cultivation or ox-ploughing system, for each “fields” cropping system and for each type of farm pointed out. Nevertheless, it is certain that, depending on the peasants’

COMPARAISON OF THE WORK PRODUCTIVITY
OF THE « FIELD » CROPPING SYSTEMS



Source : V. Barthès and N. Boquien, model realized from our interviews with peasants

investment capacity, each of them does not spread the same quantity of DAP and urea and does not sow the same quantity of seeds. Moreover the type of soil (texture, depth, erosion) play also an act on yields. Consequently yields should be really different. This fact was confirmed by some peasants who told us that they used to spreading less fertilizer that the amount needed in theory.

However due to these difficulties, we have only considered two yields for each crop in our modelization (details in appended): one yield for all crops cultivated on upside plots and a second yield for the one cultivated downside (thinner soil, steeper slope so more eroded land).

▪ **Prices**

Money received by peasants in exchange of their crops varied a lot from one peasant to the other, due to several criteria:

- Sold directly on market/ sold to trader

Selling products directly on markets enables the peasant to get higher prices, but the renting of a donkey or a mule may be necessary when the peasant sells at once an important quantity of grain. In such cases, peasants often prefer to sell to traders.

- selling period, acute seasonal fluctuations of prices on the different markets

Prices at harvesting time, when most peasants sell their grains, are the lowest, then they fluctuate depending on the availability of grains on markets. Prices double between harvesting time (December and January) and sowing time (June and July). Prices of cereals are also high at feast periods, when the population consumes them preferentially (May for Easter, September for *Meskel*, December for Christmas).

- Market place

Prices of wheat, barley and broad bean are higher on markets in lowlands, in Shishinsho for instance, due to reduced production of these crops in these regions.

1.3.6 Some conclusions on the economical achievement of these different cropping systems

The choice of a peasant for one “fields” cropping system is essentially based on the localization of his plot and on the quality of the soil. The GAV/ha of the systems that include two cropping seasons is twice higher than the cropping systems done on downside plots. Thus peasants choose cropping systems with two cropping seasons where possible.

The sale and consumption periods, which are highly variable from one peasant to another, cause acute differences of GAV/ha between peasants for a same cropping system. Let us take the following examples of:

- one peasant obliged to sell all his crops in December and January at the lowest price
- one peasant that only sells 10% of his harvest in January, that self-consumes 30% over 4 months, that stores 50% to renew his seeds and 10% to sell in October at highest price

If we only consider the different allotment of crops, the difference of GAV/ha for the same cropping system is more than double. We will go into details later on, but it is already important to point out that the “fields” cropping systems represent a small part of the total GAV created on the whole farm. Thus, the variations of prices of cereals and leguminous plants do not have many consequences on the economical results of the whole farm (slight difference between the types of farm, cf. 6. *Current typology of farms*)

CALENDAR OF FERTILIZATION:

FREQUENCY OF SPREADING OF MANURE ON THE DIFFERENT CROPS

	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Wese (4/5 y old)	6days/Week											
Sima (1/3 y old)			7days/Week									
Era (3/4 y old)					7days/Week							
Wese (5/8 y old)							5days/Week			7days/W		
Green cabbage							2days/Week					
Maize (garden)	1day/W											

Source : V. Barthès and N. Boquien, from the interviews with the peasants

1.4 The “manure-field” cropping system

According to our interviews, the field fertilized by manure would have appeared at the suppression of the subsidies on chemical fertilizer. The high rise in prices of fertilizer, resulting from that suppression, prevents some peasants from fertilizing their fields chemically so the field fertilized by manure or manure-field appeared.

Nowadays, like the garden, this narrow plot of cereals and leguminous plants is located close to the house and abundantly fertilized by manure. In that case, the available manure is shared between this field, the enset plantation and the garden, to the detriment of the last two. In the farms that do not have any field field, its role is fundamental because it represents the only source of cereals. Two or three-year crop rotations are common:

potatoes / wheat // maize+red bean / broad bean

In the farms that cultivate a more important surface, essentially leguminous plants are cropped in this field and the crop rotation noticed is as follows:

Maize +red bean / pea // maize+red bean / broad bean

The technical points of these cropping system are similar to the “upside fields” cropping systems, in manual cultivation, apart from the fertilization. Manure is generally spread once before working by hoe which improves the mixing with soil. It can be spread a second time at sowing time.

All the crops are self-consumed.

1.5 The eucalyptus plantation and scything meadow cropping systems

Due to the scarcity of forest and common pastoral land, two resources are more and more difficult to find in common places: wood and fodder.

Two cropping systems play nowadays a significant part in the farm:

- ❑ **The scything meadow.** The grass is generally mowed once, then the regrowth of grass is grazed by cattle. Only farms with enough land can allocate some space for this cropping system.
- ❑ **The eucalyptus and bamboo plantation** whose number of trees directly depends on the total surface of the farm. Lots of peasants have their own nursery. However a very widespread problem raised by peasants is the decrease in the fertility of land close to eucalyptus. For this purpose, some peasants tend to stop their plantation. The eucalyptus of a farm is, in the best case, barely sufficient to cover the family’s needs in wood, thus selling eucalyptus in the region is not common.





1.6. Some remarks about transfers of fertility

Most of the organic elements of enset plantation are exported :





- all the enset plant: for animal’s consumption (leaves and roots), for human consumption (root, pseudostem) and for the fabrication of mats and ropes (dried leaves, fibrous products)
weeds

EVOLUTION OF THE RENEWAL OF FERTILITY

CATTLE GRAZING

-  Forest
-  Fields (after the harvest)
-  Long-term fallow land
-  Grassy area close to the house

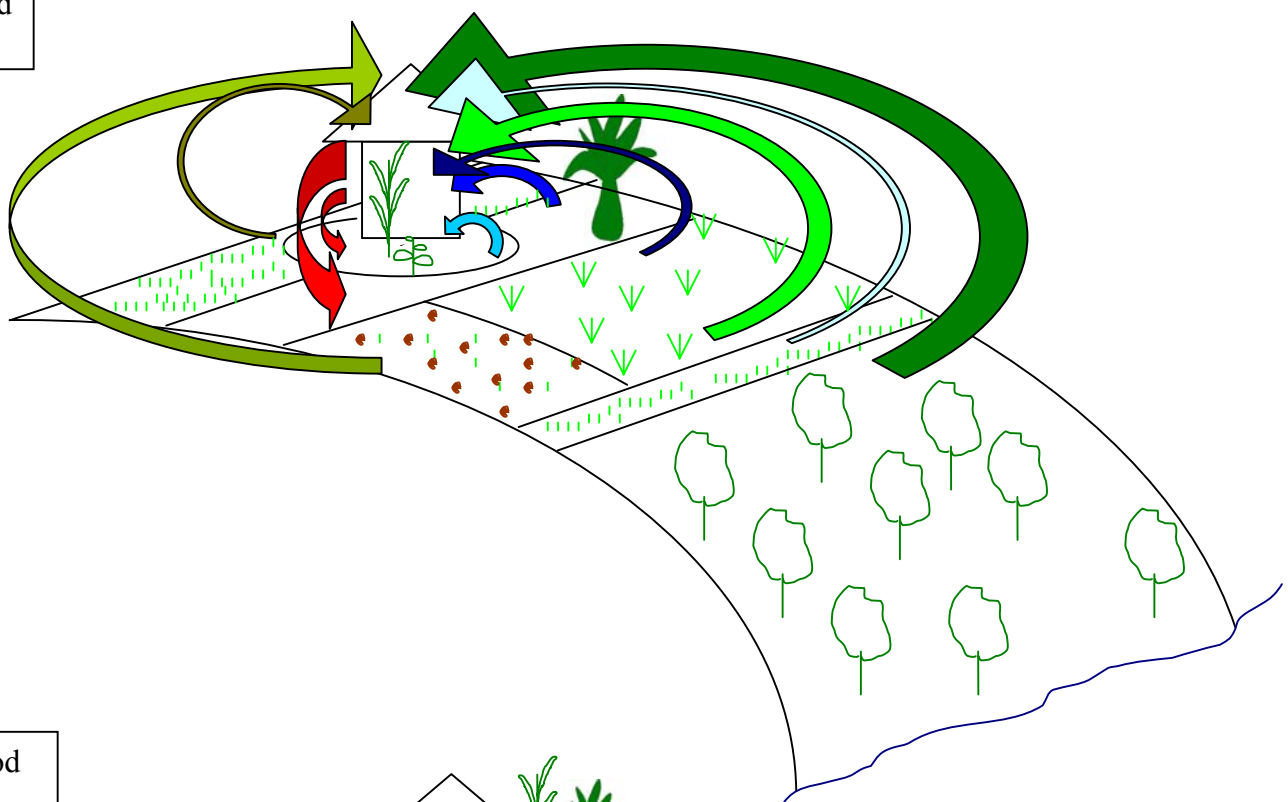
FODDERS CUT BY MEN

-  Straw, weeds from fields
-  Leaves and roots of enset, weeds
-  Leaves of maize, weeds from garden
-  Grass

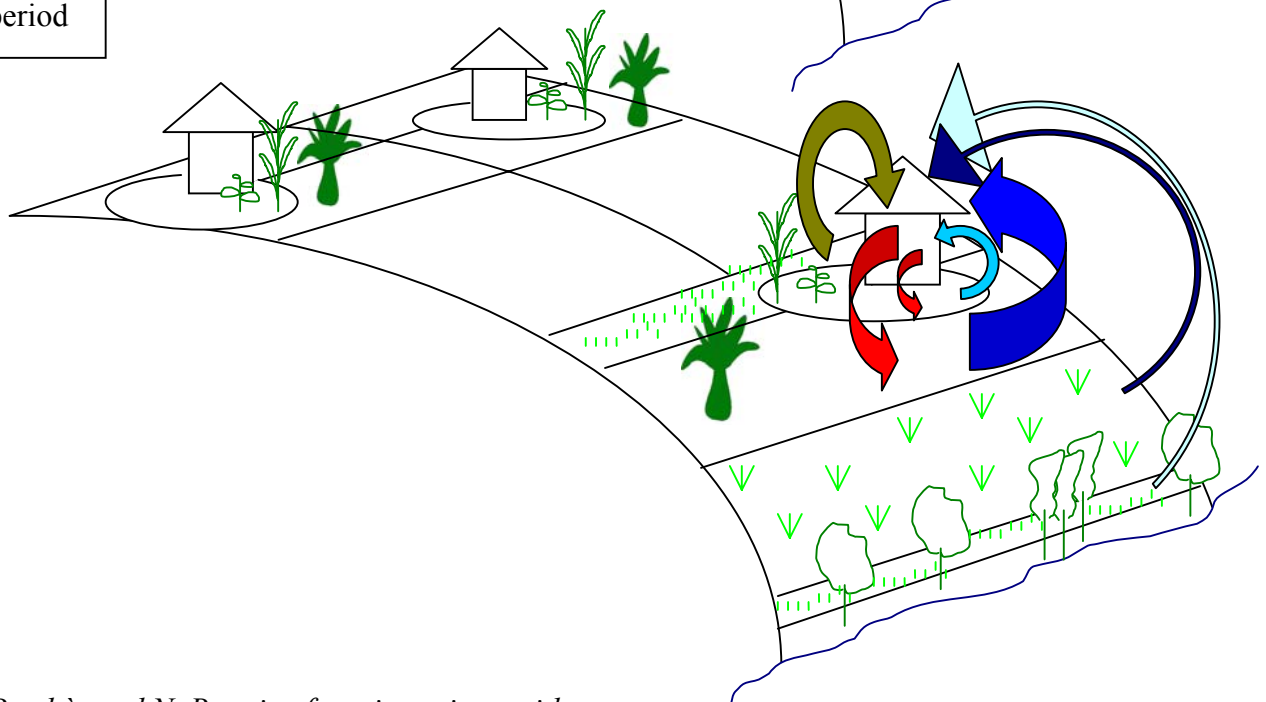


SPREADING OF MANURE

Imperial period



EPRDF period



Only few residues got from the transformation of enset remain on the plantation.

Due to all these exportations, the balance in organic exportations and importations is shaky and its stability is dependant on the frequent spreading of organic matter. That's why enset plantation receives most of the manure (i.e. calendar of fertilization).

Through the foddering of animals and the spreading of manure, transfers of fertility are created inside the farm. Enset plantation benefits from almost all the fertility transfers in the farm to the detriment of:

- fields through weeds and straw exported
- garden through leaves of maize and weeds exported
- scything meadow, through the grass exported

Moreover, a renewal of fertility exists inside the enset plantation through the leaves and roots of enset given as fodder to cattle.

With regards to these transfers of fertility inside the farm, it is important to notice that the organic balance in fields is greatly negative. The weeds and the straw that are cut at about ten centimeters above ground level are exported and no organic return is executed. Only few crop residues are grazed in fields by cattle during the month following the harvest, fields are at this time enriched. But fertilization in fields is globally only mineral.

The analysis of these transfers of fertility stresses the priority that the peasant gives to enset plantation and to garden to some extent. This priority can be explained by the numerous roles the enset fulfills in the farm and the role of self-consumption of the garden.

Thus spreading manure is a fundamental task, exclusively feminine. Several times a week, the frequency depending on the number of heads of cattle owned, the woman picks up one by one all the animals's excrement from the shed and the grassy area in front of the house. She puts them on a stretcher that enables her to carry them outside with the help of her daughter usually. It is a laborious and tedious task but the women executes it with a meticulous care due to the small number of heads of cattle owned and thus the importance taken by each piece of manure.

Historically, these transfers of fertility always benefited to enset plantation and garden. However, until the end of *Derg*, these transfers did not take place exclusively inside the farm like nowadays. They came from forests and common pastoral land. Moreover, the common grazing of crop residues after the harvest and of short and long-term fallow land contributed to renew the fertility of fields. But these transfers intern at the farm have become more and more intensive consequently to the modification in the way to breed and feed animals and to the passing to a "zero grazing" breeding system.

1.7. Breeding systems

As we previously mentioned, all throughout history, breeding has played a primeval role in the current production systems. Indeed, cattle constitutes the farm's capital, which can be sold in case of any problem, cattle assures the fertility transfers, the female reproduction permits to increase or renew the herd and provides regular income thanks to milk products and by-products etc.

Let us go into details of each breeding system.

Food calendar during the imperial period

		Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	
All animals	Common meadows													
	Grazing after harvest													
	Ensete leaves													
	Ensete weeds													
	Maize leaves													
	Fields weeds													
	Strow													
Oxen and milking cows	Maize grains and ensete roots additional food													

Grazing outside the farm:

from 9 a.m. to 6 p.m. during the rainy season

from 8 a.m. to 12 a.m. then from 2 p.m. to 6 p.m. during the dry s

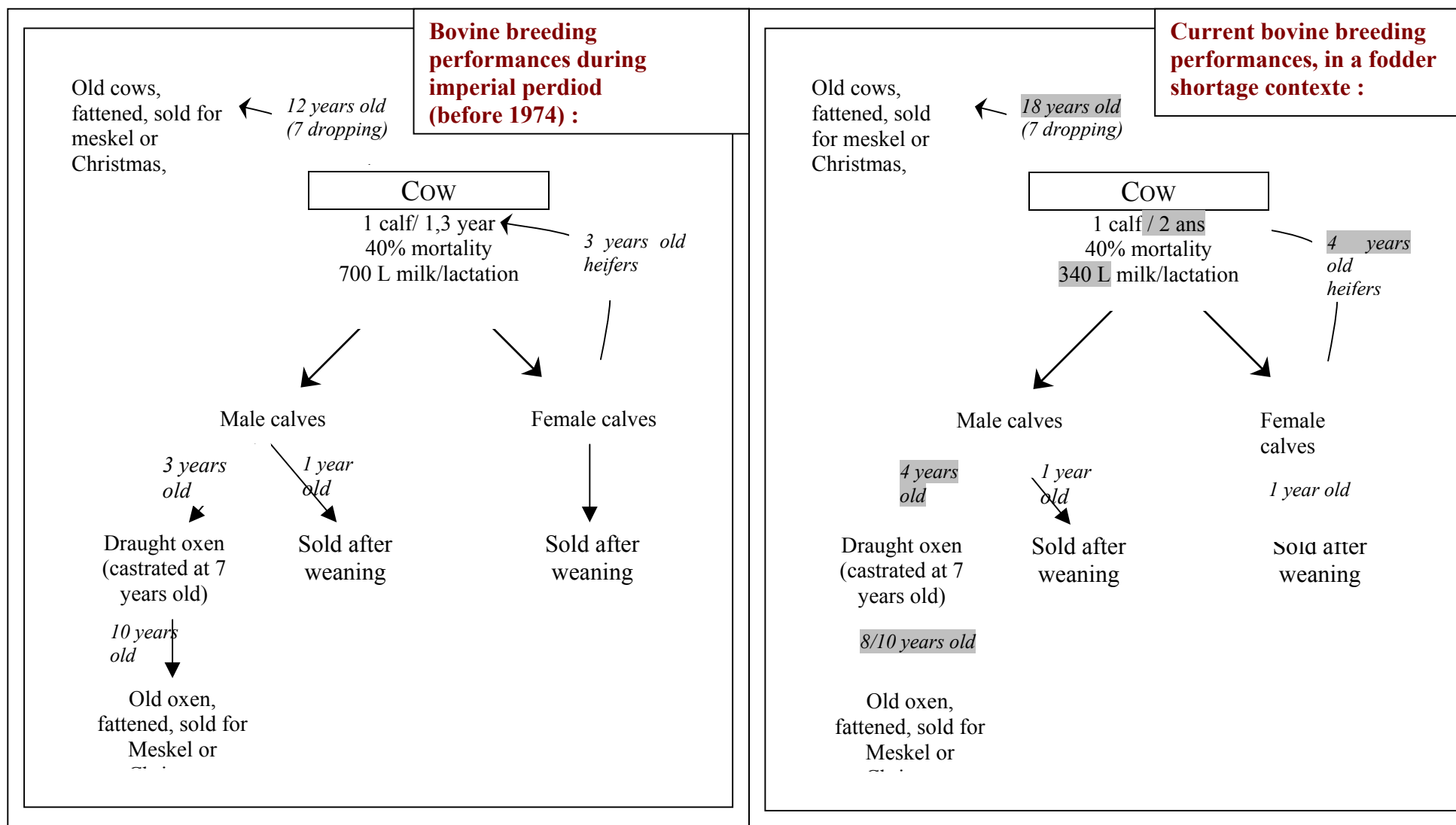
Kept in stable at night

Current food calendar

		Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
All animals	Common meadows												
	Grazing after harvest												
	Ensete leaves												
	Ensete weeds												
	Maize leaves												
	Fields weeds												
Oxen and milking cows	Strow												
	Maize grains and ensete roots additional food												

Principally tethered during day-time in the grassy plot in front of the house

Watering twice a day at the spring

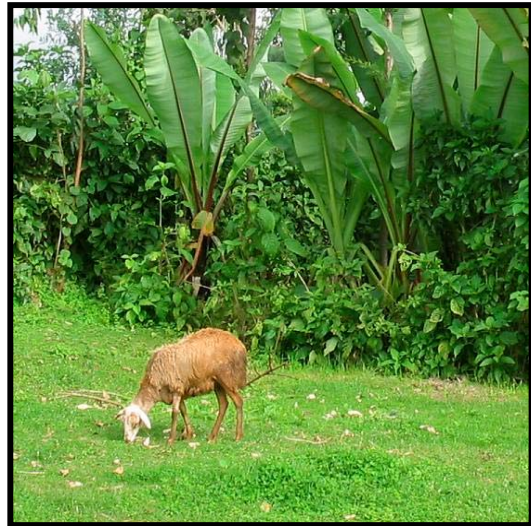


Source : V. Barthès and N. Boquien, according to interviews with farmers

CATTLE GRAZING



Above and on the right: animals' grazing in a witera (private grassy plot)



Below : bovines lead by children



Source : V. Barthès and N. Boquien, pictures taken on the field

2.6 Breeding systems

As we already mention it all along the history, breeding has a primeval role in the current production systems. Indeed, cattle constitutes the farm's capital, which can be sold in case of any problem, cattle assures the fertility transfers, the female reproduction permits to increase or renew the herd and give regular incomes thanks to products such as eggs, milk etc.

Let's come into details of each breeding system.

2.6.1 Bovines breeding systems

The bovines which are present in this region of Ethiopia stem from a cross between genders *bos taurus* and *bos indicus*. Each farmer owns, or keeps as a share-breeding contract, at least one cow. However, the total number of bovines in each farm depends upon the foddering capacity of the farm, and thus the surface of the farm.

In addition to their role in fertility transfers, bovine cattle have many other functions in the farm. Cows give regular incomes to the farmers, through dairy products, and provide the farmer with calves to sell, at more or less regular intervals. The main use of males is ploughing, and threshing of cereals after harvest. They are usually castrated one or two years before being sold, in order to fatten them.

As we already explained it, feeding of bovines is nowadays a « zero grazing » system. Grazing lands or grassy fallow lands are very few (less than 6 hectares, which means less than 1% of the *kebele*'s surface). Animals are lead out of the farm only twice a day for watering. They are lead by children to the nearest springs or streams. The rest of the time, they are tethered in the private grassy place in front of the house. They are kept inside the house during the night.

A part of the house is reserved for them, to avoid thefts and to collect a maximum of manure. Farmers build a little stable in one side of the house, with individual boxes, in which animals are tight by ensete-fibers ropes. The soil is dug in small ditches to allow a part of manure and liquids to flow. These boxes are cleaned each week and can be littered if some strow is available.

They are fed according to the fodder available on the farm : ensete leaves constitute the main fodder in the small surface farms, which have few other forage resources. The harvests, and thus the fodders, are spread over the year: maize and sugar canne, cereals strows, weeds (cf. feeding calendar). When oxen are ploughing and when cows are milking, they receive a complementary food, such as ensete roots and maize spikes.

The cows are milked each day, twice or thrice. Milk is shared with the calves, but it has been difficult to estimate the sharing out. The milking average duration is 240 days, which means 8 months, during which about 340 liters of milk are taken. This milk is kept several days in a pot, then transformed by the woman into butter and cheese.



*On the left : cattle market in Adaro
Below : cattle foddering in the stable*



Source : V. Barthès and N. Boquien, pictures taken on the field

The renewal of adults is usually not handled in the farm. The main reasons are that farmers have to frequently sell cattle that represents an important and immediate source of income. In addition, each farmer owns a small number of animals. Indeed, a farmer can expect to raise from one cow 4 alive calves in 18 years, of which 2 heifers and 2 bull calves. These figures can be divided by two if the farmer owns only half a cow or keeps it as share-breeding contract. Therefore, the animals exchanges are numerous :

- Sale of young animals: heifers between weaning (1 year old) and first dropping (4 years old), and bull calves between 1 and 4 years old.
- Sale of old animals: cows after 7 droppings (18 years old) and oxen from 8 to 10 years old
- Buying young animals: 4 years old heifers before the first dropping, 4 years old bulls.

Animals are exchanged in Adaro or Shishinsho markets, where are present some traders and farmers from Kambatta and nearby regions: Wolayta, Hadiya, regions where breeding is more developed. Prices fluctuate according to seasons.

Older cows and oxen are sold for feasts, to be slaughtered and eaten in cities as well as in countryside, that is why prices are high during these periods. Farmers in general choose to fatten their cows and oxen during the main rain season, during which fodders are in abundance, to sell them in September. Some farmers manage to fatten their animals at the beginning of the dry season (October, November, December). That is why Christmas' prices are especially high. For instance, in September, a fat ox can be sold for 85€, meanwhile in December it would fetch 105€.

As far as young animals are concerned, (calves, heifers, bull calves), their prices are high at the beginning of grass growth, in the early rain season (March and April). They are bought by traders who resell them later in breeding regions such as Wolayta and Hadiya.

And lastly, draught bulls or oxen are particularly in demand in January or February for ploughing, thus their prices are quite high in this period (from 48 to 76 €).

1.7.1 Ovine breeding system

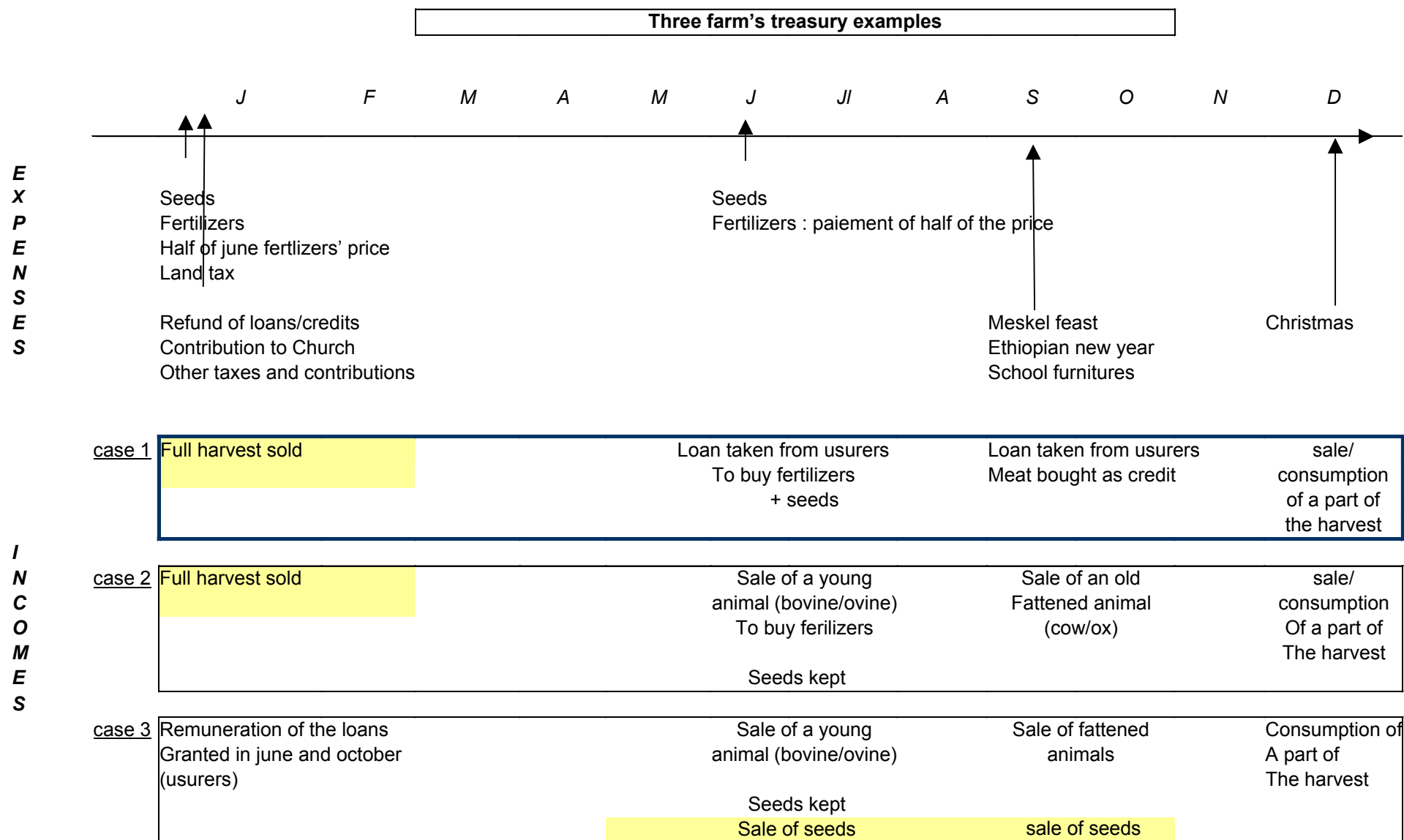
Ovines, as well as bovines, are present in nearly every farms. Each farmer owns or keeps, as share-breeding contract, one or several ewe. The main objective for this breeding is the regular income it brings out. Indeed, the reproduction rhythm is about 1,5 lamb/ewe/year. Lambs are nearly all sold, from 3 month to 1 year old. Contrary to bovines, the renewal is always handled in the farm, as an ewe can give about 15 lambs in its lifecycle.

The majority of lambs is sold in Adaro or Shishinsho markets. However, the best moments to sell them are May, September, and December, for religious and traditional feasts, when the less well-off people consume mutton meat instead of bovine meat.

Ovines are also tethered most of the day-time, and kept in stable inside the house at night. Some boxes are also reserved for them. Their feeding consists of enset leaves and the available fodders depending on the harvests.

1.7.2 Poultry

Some hens are kept in each farm, but in limited numbers (from 1 to 5). In fact, many of them are attacked by predators such as dogs, cats, foxes. Hens are not fed by farmers, but they glean around houses and in gardens. They are kept principally for eggs production, and eggs can be self consumed or sold in the market. Few farmers keep eggs for reproduction, due to a high loss rate.



Source : V. Barthès and N. Boquien according to interviews with the farmers

1.7.3 Pack animals : horses, donkeys, mules

Pack animals (horses, donkeys, mules) are present only in few farms, and especially in traders or merchants' farms. They can be hired to carry goods to market, which brings the farmer a high income but decreases the life expectancy and work of the animal. Moreover, these animals can be used to thresh cereals after harvest, and can be rented for this use.

The prices of these animals are directly linked to harvests, since they are, above all, used to carry them: their price is quite low, as demand is scarce, all the year long. The highest price is at coffee harvest in the lowlands.

2 LIMITING FACTORS OF THE CURRENT AGRARIAN SYSTEM

Now that we have explained the different cropping and breeding systems, let us try to consider them in a dynamic way, in order to understand how the current agrarian system is running. With this aim in view, let us start by taking up the farmer's position to understand his logic. We will start by comparing receipts and expenses calendar. Indeed, the finances of a farm govern and depend on the capital level of the farm and of the combination of breeding and cropping systems.

Each family faces three main types of expenses in a year:

- The « **agricultural** » **expenses**: they consist in buying seeds and fertilizers, and occur twice a year – in January for the first cropping season, and in June for the main rain season.
- The **expenses linked to religious or traditional feasts**: Christmas in December, Easter in May and above all the Ethiopian New Year and *Meskel* in September.
- The **food expenses**, throughout the year : coffee, salt, oil, garlic etc.

Other expenses are added to this main list, such as school expenses, clothes, land tax... Finally, we have to stress on the difficulties the farmers have to face an unexpected expense, such as medical treatment or a funeral, as there is no money to spare in their treasury calendar.

Depending on the farms, different solutions are conceived:

- **The sale of a part/the whole cereals and leguminous harvest**
- **The punctual sale of a part/the whole of a cattle head**
- **The regular sale of other products from the farm:** *kocho*, eggs, cheese, butter
- **Labour force sale**
- **Resort to loan/credits** (money or grains)
- **Land hiring or sale.**

The resort to one or other of these solutions illustrates the differentiation between the farms.

When the total surface of the farm is so small that the agricultural income is close to zero, **salaried work** can represent the main part of the family's income.

The use of cereals and leguminous (proportion of self-consumption, seeds keeping and sale) is also a criterion of differentiation. The majority of farmers sell their whole harvests in January, when prices of cereals and leguminous are at their lowest. They cannot wait for a more opportune moment, as long as they have to pay back credits and other expenses.

The ownership of cattle can fill a treasury gap. Its accumulation illustrates the capital level of a farm. The sale of one head of cattle can quickly lead a farm to decapitalise if the farmer does not own a lot of animals, and does not have sufficient time to build his livestock up again.

The debts in June and September are systematic for many farmers: in June to buy fertilisers and seeds, and in September for the New Year and *Meskel*. These two loans have to be paid back in January, at harvesting time, at usurious rates of 100% for the June credit, and 150% for the September credit. Farmers borrow this money from the wealthiest farmers of the region. **The hiring or sale of land** is the ultimate step of decapitalisation.

This treasury calendar underlines the two limits of this agriculture that we have evoked previously: **access to land** and **access to capital**.

□ Access to capital

The capital of a farm is well represented by the number of heads of cattle owned by the farmer. This number is yet often limited, and the sale of an animal is only a punctual solution. Taking debts in June and September is thus generalised in the region, in spite of very high credit rates (usurious rates). This practice forces nearly all farmers to sell the main part of their harvest in January, at low prices, and further as a complement, to sell an animal. It also prevents many farmers from keeping their seeds, and obliges them to buy again their seeds in June, at high prices.

On the contrary, the only farmers who could limit the amount of their debts, or even avoid taking credits, are those whose harvest is enough to keep a part of the harvest for seeds. The fields superficies of a farm is thus a deciding factor to protect the farmer from decapitalisation.

□ Access to land

The major part of Homa *kebele*'s land is nowadays allocated and cultivated. When a head of family dies, his farm is divided between all his sons. As there is no opportunity of work in the region, the division of farms is yet inevitable at each generation. We can nowadays encounter some farms with less than 1/15 hectare, and the survival of these families, based only on agricultural incomes, is compromised. With the splitting out of farms, there are more and more contracts on land, as everyone tries to maximise the use of his yoke.

Land belongs to the Ethiopian State, so, in theory, land cannot be sold nor exchanged. However, in the current context of farms division, some possibilities exist for the farmers who want to extend their cultivated surfaces. Thus, the « arachi » contract, or share-cropping contract, has been generalised. Moreover, a **land market** has been developed since the beginning of EPRDF government (1991). Mutual agreement contracts are established between farmers **to sell or hire land**. In this case, the buyer or the tenant of the land can keep the whole harvest. The duration of the leases varies from 1 to 3 years, and the whole amount is paid at the beginning of the lease.

We have seen that the maximum superficies that a farmer can cultivate depends on his ownership of a yoke. However, these limits are theoretical as they do not take into consideration this second limiting factor that is the access to land. Actually, even if there is a land market, the supply is not enough to allow each farmer to reach his cropping surface threshold.

After all, a farmer who owns a full yoke has a real comparative advantage, and can thus extend his superficies. But access to a yoke starts to be really limiting, as oxen are rare nowadays, because difficult to feed. The *agazu* contract, which, in the past, was the common way to get access to a yoke for farmers who did not own one, tends to disappear. It is difficult to give a percentage, but more than 60% of the farmers of the region may not own any oxen. The

scarcity of ox can result from two phenomena: the **shortage of fodder** and the **progressive decapitalisation of farms**.

➤ *Progressive farms decapitalisation*

As we already explained, this decapitalisation phase started after the « socialist-leninist watershed » (Gallais, 1989) with multiple levies on peasantry in cash and working time. In this context, only few farmers were able to accumulate capital and to buy oxen. Moreover, farmers who could afford to retain the oxen and cattle they owned were rare.

The oxen rarefaction is visible by the progressive increase in relative animals prices. According to the interviews we carried out, not long after the 1974 revolution, the price of a fattened ox was around the price of 2 to 6 quintals of wheat, whereas today it is the equivalent of 10 quintals of wheat.

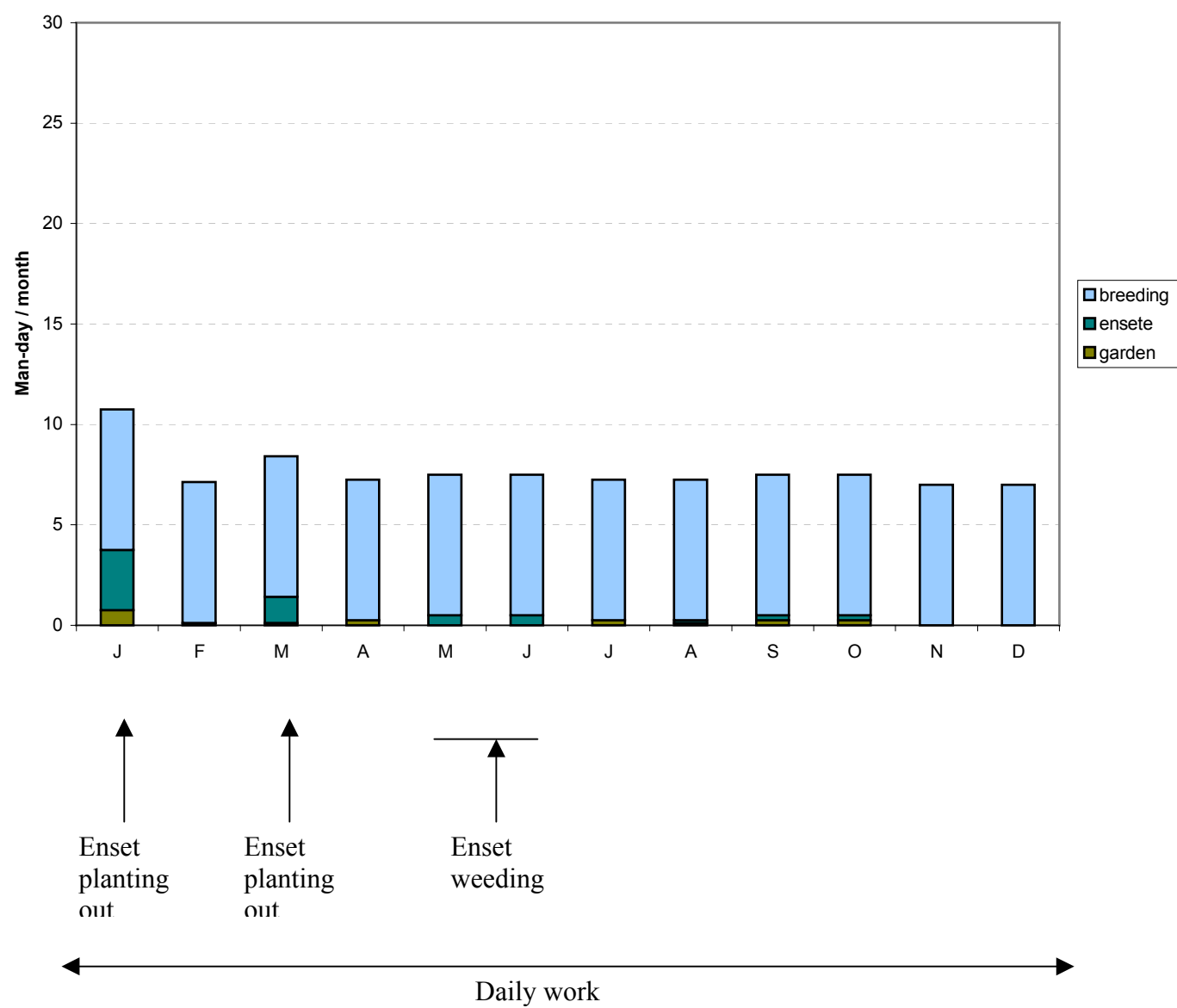
This decapitalisation phase has been accentuated by the removal of subsidies at the Derg collapse, which lead to an explosion of fertilisers prices compared to cereals prices. As a lot of farmers did not have much cattle-capital at the end of the Derg and as they could not have access to any other source of income, they found themselves in a debt spiral, resulting in a decapitalisation spiral. Indeed, we have just seen that the organic balance in field is largely negative since all residues and organic matters are exported for the enset and garden fertilisation. Thus the yields of the fields cannot remain stable if farmers do not use fertilisers. As the price of fertilisers is very high, farmers do not have any other solution than getting into debts with the usurers of the region.

➤ *Fodder's shortage*

Moreover, an ox at ploughing time needs a rich and abundant food. But this period of ploughing for the sowings of the main rain season corresponds with the fodder shortage period: these days, common pasture do not exist hardly anymore, and furthermore the fodder resources of the farm are limited during the dry season, as well as from February to May. Straw is over since the end of January; maize and enset weeds are not grown yet. The main food for cattle during the bridging period is thus enset roots. Feeding an ox, and thus a couple of oxen during this period, as well as in June and July, requires a large enset plantation and maize surfaces, and the presence of a scything meadow. Farmers who own a couple of oxen usually buy or hire one or several scything meadows, in addition to the one they already have, and this investment requires cash. As far as feeding is concerned, owning an ox is conditioned by the surface of the farm (more than half an hectare required to feed one ox), whereas it conditions the access to land as indirect tenure (hired or purchased) and also the ability of the farmer to plough his own land.

The criterion explaining farms differentiation is thus, above all, ownership of ox. Tools, including plough, are not taken into account, but other criteria are considered in order to refine this typology: access to land, social relationships of production, and allotment of harvests. Indeed, in this context of difficult access to land, to traction force and to capital (cattle and cash), it is important to notice the generalisation of the indirect tenure of all the means of production (land, labour, capital), and the diversity of social relationship of production resulting and which nowadays link all farms together:

Work calendar for male actives, A type.



Source : V. Barthès and N. Boquien, according to interviews with farmers

- indirect tenure (share-cropping and hiring)
- sale/purchasing definitively land
- sale of labour force
- cattle share-breeding contracts : cows, oxen, sheep, hens
- loan/credits

History shows us that the 1975 agrarian reform, which witnessed the abolishment of the traditional social classes, brought about the appearance of a more equal society. Since that period, the main trends of history (division of farms, land market, progressive decapitalisation...), have created new inequalities. The complexity of this new society can only be understood through a sharp analysis of the current social relationships of production:

- few landless farmers who survive only through daily work at the lower end
- few « capitalists » farmers at the top end
- between these two types, a mass of farmers at every step of decapitalisation, and whose majority is drawn towards the lower end society, through decapitalisation and division of farms.

Let us look now in details at the different farm categories that we have identified.

3 CURRENT FARMS TYPOLOGY

We have discerned in this typology two main groups of farms.

First of all, the A, B, C-D type farms, in manual cropping: it is the case for all farmers who could not accumulate enough capital to buy an ox, and who have to work manually in their fields, with ploughing stick and hoe. They differ from each others by their access to land: type of tenure, surfaces.

In contrast with them, we have distinguished a second group of farms: types E to H, in yoke-cropping system, and who differ from each others by their degree of ox ownership (from half to 3 oxen).

All these types are strongly linked to each others by a multitude of contracts that we have developed before.

➤ *A type: micro-farms*

These farms have a surface included between 1 and 2,5 ares. Their origin can be: inheritance of a very small piece of land or sell/hire of their land in a decapitalisation process. These farmers do not own any animals, but they keep one cow, one ewe, one hen on a share-breeding contract base. They can thus profit from the manure they need, and from a part of the breeding products (half calves, lambs, milk and eggs). The surface of the farm is divided into the enset plantation, a small garden and a small manure field.

The per hectare added value analysis for the various cropping systems allows us to understand the choice of these farmers who own small superficies and who always favour their enset plantation and their garden, to the prejudice of cereals. Actually, the per hectare added value for the “fields” cropping systems (from 13 €/ha to 74 €/ha) are really lower than the garden and enset ones (respectively 324 €/ha and 333 €/ha). The manure field, the enset plantation and the garden thus receive the whole manure produced on the farm, there is no use of chemical fertilizer.

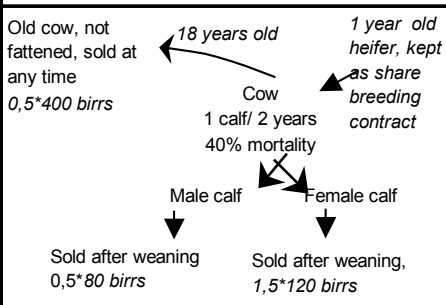
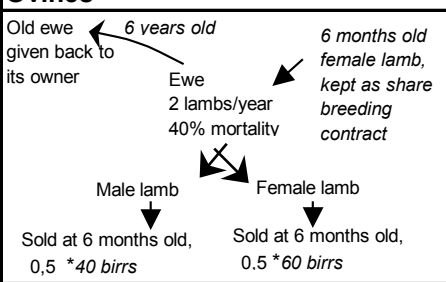
A TYPE

Number of family actives	2,25	Oxen	0
External labour	0	Owned UAS (ha)	[0,075-0,125]
Sale of labour force	160 MD	of which part given up as share-cropping	
Farm capital	plough + (ploughing stick, hoe, sickle,...) / land		
Depreciations (€/active)	tools		3

CROPPING SYSTEMS

Manure field	<i>Maize, red bean, potatoe, broad bean, wheat</i>		
surface (ares)	[2,5-5]	GAV m. field (€)	[7-14]
Ensete plantation	<i>No making of mats nor merero, no sale of kocho</i>		
	<i>Consumption of roots during the bridging period, making of kocho with 6-7 years old ensetes</i>		
Surface (ares)	[2,5-5]	GAV ensete (€)	[8-16]
Garden	<i>cabbage/maize/red bean/tobacco/broad bean/coffee (leaves)/chili/local potatoe/pumpkin...</i>		
Surface (ares)	[2,5-5]	GAV garden (€)	[10-19]
Neither mowing meadow nor wood plantations			

BREEDING SYSTEMS

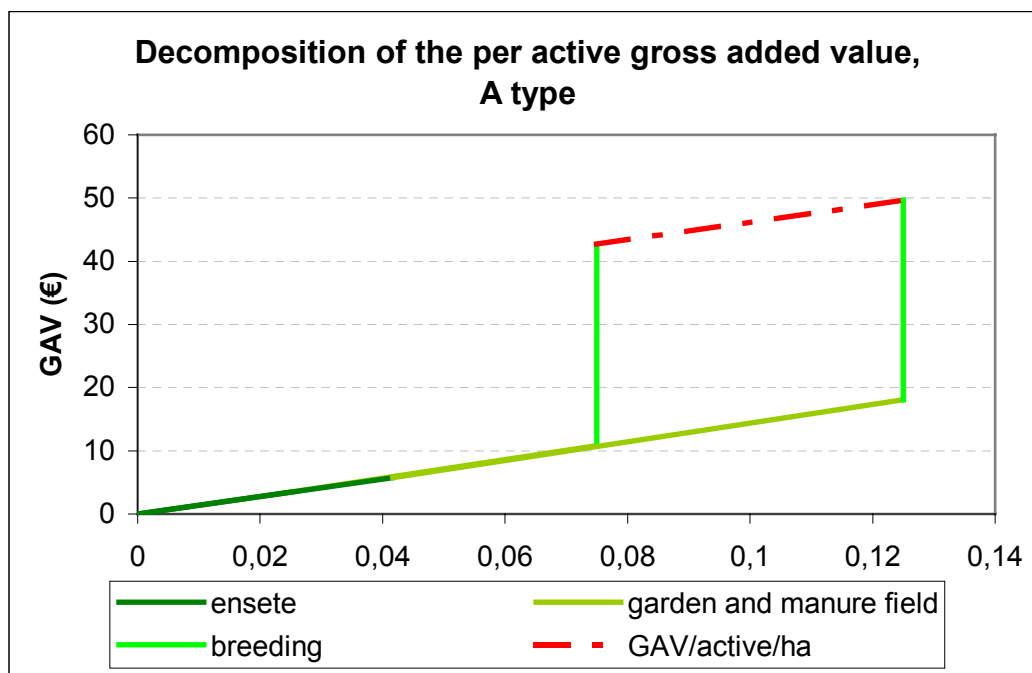
Bovines		<i>Proportional to the farm UAS (0,5 head/t)</i>	
		GP/head	5 kg butter + 12 kg cheese +1 old cow/14 ans+ 4 calves/14 ans
		CE/head	Market fees
		GAV/head (€)	59
		owned	0
		Confided as share-breeding	1
		GAV total bovines (€)	59
		Bovine fattening 1an/5 (€)	
Ovines		<i>Proportional to the farm UAS</i>	
		GP/head	6 lambs/ 6 years
		CE/head	market fees
		GAV/head (€)	8
		owned	0
		confided as share-breeding	1
		GAV total ovines (€)	8
		ovine fattening 1an/10 (€)	
Poultry		Equines / male asines	
GP/head		0	
20 eggs/month during 5 months + 2 chicks+1old hen/2years			
CE/head			
hen purchasing			
GAV/head (€)			
6			
owned			
0			
Confided as share-breeding			
1			
GAV total poultry(€)			
6			

GAV (€/active)	[43-50]	VAN (€/active)	[41-48]
AI (€/active)	[25-32]	TI (€/active)	[68-75]

The manure field, very narrow (less than half an hectare), is cropped in biennial rotation potatoe/wheat // maize+red bean/broad bean. Thanks to this small field, the farmer has a minimum of grains to spare in January.

The agricultural incomes, stemming from the farm, are very low; the main part of the income comes from the sale of the labour force. They find some salaried work as contract during the work peak in the region (harvests, weeding). They leave for neighbouring regions to find work during the slack work periods, like in Meki (Gurage region) for farming work or in Matahara to work in sugarcane plantations. We have assessed that, with the current work opportunities, their daily work reach 160 man-day per year. Given that these farmers own very little land, and cattle as share-breeding contract, only a part of the added value that they create on their farm comes back to them. This part is mainly linked to breeding systems that play a great role in these farms. The per active agricultural income is situated **between 25 and 32 €**, which means that they earn a great deal less than the survival threshold. (76€). External incomes (daily or contract work) do not allow them to reach that threshold. Their total income grades **between 68 and 75 €/year**, thus they are living in a really precarious situation, and cannot afford the basic needs of their families, such as education, health etc.

Farmers in this case are few, but we can imagine that their number will increase with the current demographic growth and the division of farms.



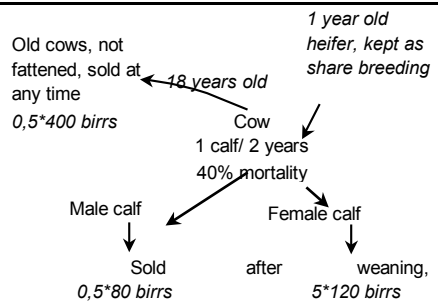
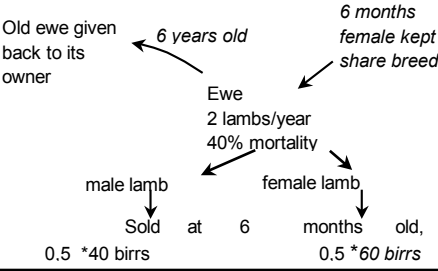
B TYPE

Number of family actives	2,25	Oxen	0
External labour	0	Owned UAS (ha)	[0,25-1]
Sale of labour force	112 HJ	of which part given up as share-cropping	[0,08-0,65]
Farm capital	plough + (ploughing stick, hoe, sickle,...) / land		
Depreciations (€/active)	tools		4

CROPPING SYSTEMS

Fields	100% cereals and leguminous sold at harvest, 100% seeds bought			
	GAV (€/ha)	owned (ares)	in share-cropping contract (ares)	GAV champs (€)
top fields	49	0	[5-42,5]	[2,5-21]
down fields	14	0	[2,5-22,5]	[0,4-3]
Manure field	Maize, red bean, broad bean, pea			
surface (ares)	3,75		GAV m. field (€)	4
Ensete plantation	No making of mats nor merero, no sale of kocho Consumption of roots during the bridging period, making of kocho with 6-7 years old ensetes			
Surface (ares)	[8,7-21]		GAV ensete (€)	[27-66]
Garden	cabbage/maize/red bean/tobacco/broad bean/coffee (leaves)/chili/local potatoe/pumpkin...			
Surface (ares)	[4,5-8,2]		GAV garden (€)	[17-32]
Plantations	Few young eucalyptus on 0,7 to 2,5 ares			GAV plantation (€)
				[9-32]
No mowing meadow				

BREEDING SYSTEMS

bovines	Proportional to the farm UAS (0,5 head/t)			
	GP/head	5 kg butter + 12 kg cheese		
	CE/head	+1 old cow/14 years+ 4 calves/14 years		
	GAV/head (€)	59		
	owned	0	GAV total bovines (€)	
	Confided as share-breeding	[0,5-2]		[29-118]
	Bovine fattening 1an/5 (€)			
Ovines	Proportional to the farm UAS			
	GP/head	6 lambs/6 years		
	CE/head	Market fees		
	GAV/head (€)	8		
	owned	0	GAV total ovines (€)	
	confided as share breeding	[0,5-2]		[4-16]
	ovine fattening 1year/10 (€)			
Poultry	Equines / male asines			
GP/head	20 eggs/month during 5month + 2chicks+1old hen/ 2 years			
CE/head	hen purchasing			
GAV/head (€)	6			
owned	0			
Confided as share-breeding	2			
GAV total poultry (€)	13			

GAV (€/active):	[45-131]	NAV (€/active):	[44-129]
AI (€/active):	[28-80]	TI (€/active):	[58-110]

➤ **B type** : farmers who have let their fields as share-breeding contract

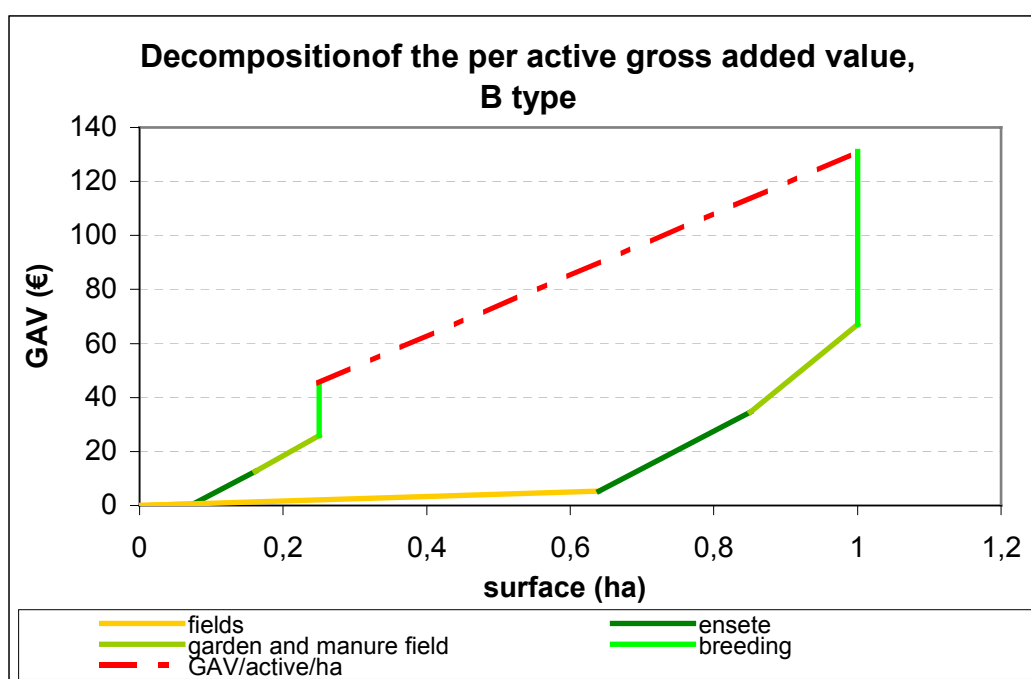
These farmers are from two kinds of origin : people physically unable of working their land (disabled, old people, widows), or people who cannot afford to buy seeds and fertilizers. As a consequence, they let their fields (all or part) as share-cropping contract to another farmer, and benefit from half of the harvest. They keep as direct tenure their enset plantation and their garden.

In general, they have partly decapitalised before reaching this point, that is why they do not own animals anymore, but they keep some as share breeding contract, like the A type. The number of animals is proportional to the farm surface, that means the available fodder on the farm.

These farms have land varying between 0,25 and 1 hectare, depending on the surface inherited.

These farmers' agricultural incomes are situated **between 28 and 80 €/active/year**. The farmers who have let their field as share cropping contract because of cash shortage make up their income with daily agricultural work incomes, which allow them to face the basic needs of their families (total incomes between 58 and 110 €/active/year).

On the other hand, farmers unable to work do not earn any extra income, and can only survive thanks to the their relatives' help.



C-D TYPE

Number of family actives	2,25	Oxen	0
External labour	0	Owned UAS (ha)	[0,25-0,88]
Sale of labour force	[0-112] HJ	of which part given up as share-cropping	0
Other incomes	0	Share-cropping contract (ha)	0
Farm capital	plough + (ploughing stick, hoe, sickle,...) / land		
Depreciations (€/active)	tools		7

CROPPING SYSTEMS

Fields	100% cereals and leguminous sold at harvest, 100% seeds bought except potatoes			
	GAV (€/ha)	owned (ares)	in share-cropping contract (ares)	GAV fields (€)
top fields	49	[5-32,5]	0	[2-16]
down fields	14	[2,5-17,5]	0	[0,4-2,5]
Potatoe "for seeds"	13	[0-4,5]	0	[0-0,6]
Ensete plantation	Making of mats nor merero, sale of kocho weekly Consumption of ensete roots during the bridging period, making of kocho with 7-8 years old ensetes			
Surface (ares)	[10,5-23]		GAV ensete (€)	[37-78]
Garden	cabbage/maize/red bean/tobacco/broad bean/coffee/onion/garlic/chili/local potatoe/pumpkin/taro...			
Surface (ares)	[6,2-9,5]		GAV garden (€)	[28-42]
Plantation	Few youngeucalyptus on 0,75 ares			GAV plantation (€) 9,5
Neither mowing meadow nor manure field				

BREEDING SYSTEMS

Bovines		<i>Proportional to the farm UAS (0,5 head/t)</i>		
<pre>graph TD OC[Old cows, not fattened, sold at any time 400 birrs] -- 18 years old --> C[Cow] H[4 years old heifer, 500 birrs] --> C C -- 1 calf/ 2 years --> MC[Male calf] C -- 1 calf/ 2 years --> FC[Female calf] MC -- 40% mortality --> S[Sold 80 birrs] FC -- 40% mortality --> W[weaning, 120 birrs] FC -- after --> W</pre>	GP/head	5 kg butter + 12 kg cheese +1 old cow/14years+ 4 calves/14 years		
	CE/head	Market fees		
	GAV/head (€)	57		
	owned	[0,5-2]	GAV total bovines (€)	
	Confided as share-breeding	0	[28-114]	
Ovines		<i>Proportional to the farm UAS</i>		
<pre>graph TD OE[Old ewe gsold for Meskel or Easter 120 birrs] -- 6 years old --> E[Ewe] E -- 2 lambs/year --> ML[male lamb] E -- 2 lambs/year --> FL[female lamb] ML -- 40% mortality --> S[Sold at 6 months 40 birrs] FL -- 40% mortality --> O[old, 60 birrs] FL -- Renewal 1 year old female --> E</pre>	GP/head	1 old cow/6 years+ 6 lambs/6 years		
	CE/head	Market fees		
	GAV/head (€)	9		
	owned	[0,5-2]	GAV total ovines (€)	
	Confided as share-breeding	0	[4-17]	
Poultry		Equines / male asines		
GP/head	20 eggs/month during 5month + 2chicks+1old hen/ 2 years	0		
CE/head	hen purchasing			
GAV/head (€)	6			
owned	2			
Confided as share-breeding	0			
GAV total poultry (€)	13			

GAV (€/active): [35-121]

AI (€/active): [22-96]

NAV (€/active): [33-119]

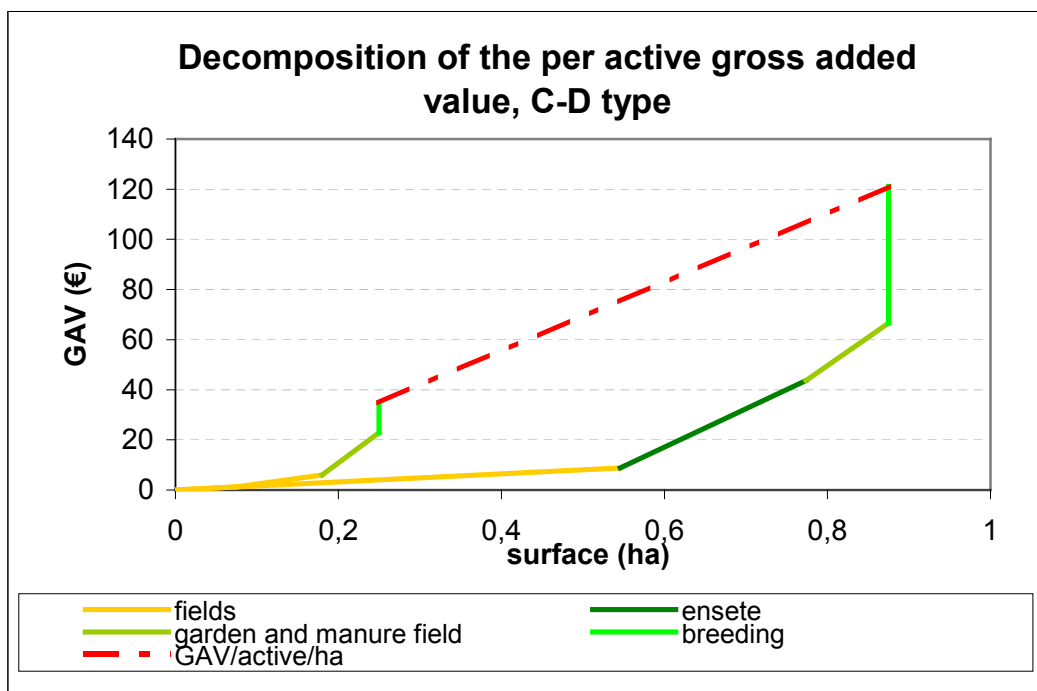
TI (€/active): [61-96]

➤ **C-D type:** farms in manual ploughing system, without oxen.

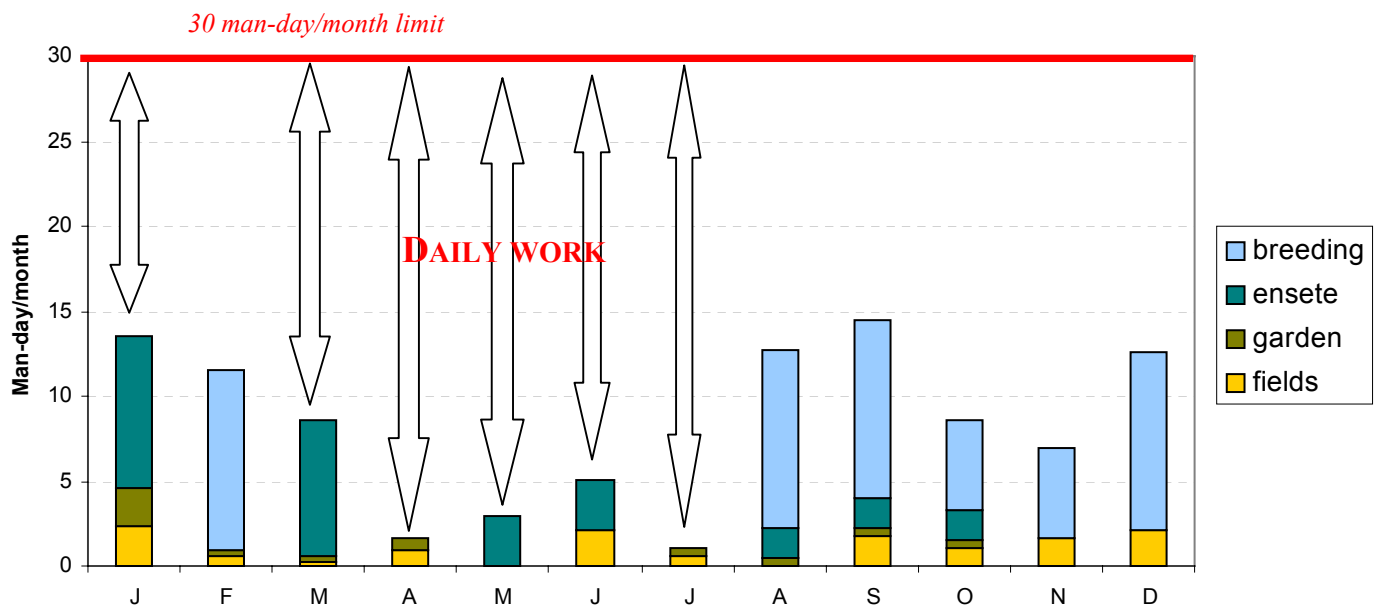
The maximal surfaces of fields that a farmer can plough manually is limited to 0,5 hectare. Consequently, these farms have a maximal size of 0,9 hectare. They are composed of an enset plantation, a garden, some fields and a small eucalyptus plantation. We have distinguished, inside of this type, two “sub-types”, according to the surface owned: farmers who have 0,5 hectare or less, and whose work calendar is not full (sub-type C). These farmers make up their incomes with daily work during the work peaks. However, for the farmers who have larger surfaces (sub-type D), the work calendar is full during the work peaks (ploughing, sowing, harvest), and so the farmer does not have any extra activity.

The number of heads of cattle that they own is proportional to the farm surface, as a larger surface can feed more animals. This number varies between 1/2 cow + 1/2 ewe and 2 cows + 2 ewes. Moreover, the enset and garden surfaces depend on the fertilisation capacity of the farm, and therefore are proportional also to the total surface of the farm.

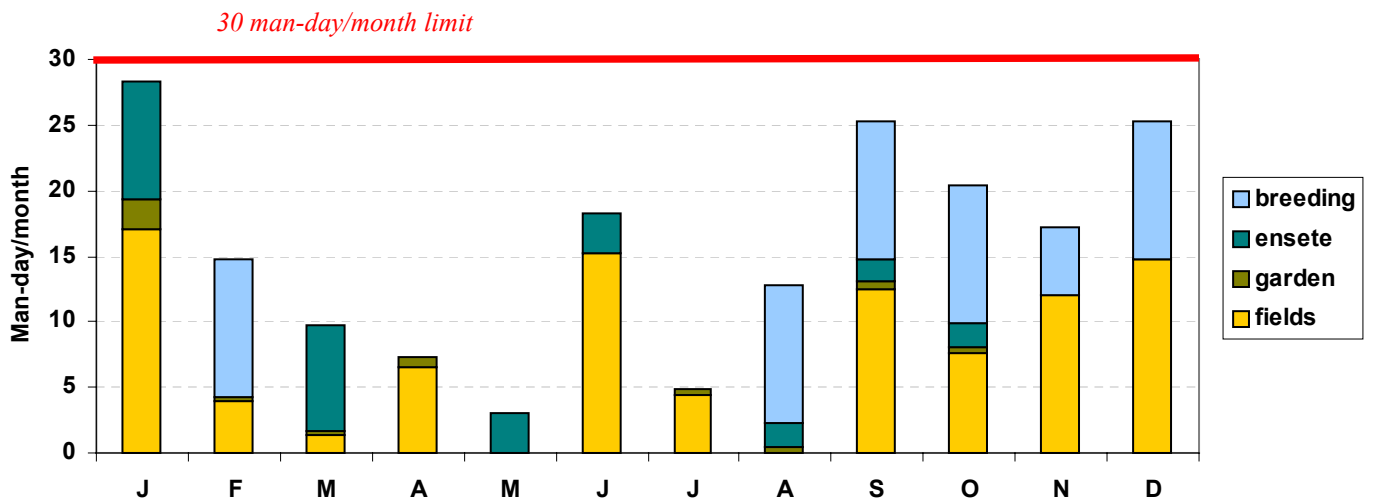
Their agricultural incomes rise **from 22 to 96 €/active/year**. The farmers who have narrow surface of land usually complete their income by daily work, which allow them to reach **61 € minimum/active/year**, which is still under the survival threshold.



Work calendar for male actives, C-D type with 0.25 ha



Work calendar for male actives, C-D type with 1 ha



↑
 Ploughing with
 ploughing stick

↑ ↑
 ploughing Sowing
 with plough

↑
 Weeding

↑
 Harvest

Source : V. Barthès and N. Boquien, according to interviews with farmers

➤ **Assessment for the A, B and C-D types = farms on the way to impoverishment**

Concerning treasury, these farmers are the one who have least room to manoeuvre. They are constrained to get into debts at usurious rates in June (to buy seeds and fertilizers), and in September, and then have paradoxically to sell their whole harvest in January, at harvesting time, when prices are at their lowest. That is why it is really hard for them to accumulate any capital.

The noticed difference between the net added value produced on these farms, and the incomes that farmers earn, is caused by the repartition of this added value:

- cattle kept as share-breeding contract, of which half of the added value is paid to the owner.
- fields in share-cropping contact, of which half of the added value is paid to the tenant farmer.
- interest paid to usurers for June and September credits.
- land tax

All these types, A, B and C-D, do not usually reach the survival threshold. Consequently, **all these types of farms will have to decapitalise when unexpected problems occur.** This can explain the current trend that we noticed during our study: these farms cannot face up to unexpected expenses and become poorer and poorer without being able to recover.

Farmers who have small land surfaces (less than 0,75 ha in manual ploughing) are not fully busy in their farms. They fill up their work calendar with daily work. This allows them to supplement their incomes, and, for some of them, to reach survival threshold.

The overall farmers involved in manual farming represent about 60% of the region's farms.

E TYPE

Number of family actives	2,25	Oxen	0,5
External labour	0	Owned UAS (ha)	[0,25-1]
Sale of labour force	[130-0] HJ	from which bought (ha)	[0,25-0,04]
Other incomes	0	share-cropping contract (ha)	0
Farm capital plough + (ploughing stick, hoe, sickle,...)			
Depreciations (€/active)			
tools	7	0,5 oxen	4

CROPPING SYSTEMS

Fields	90% of cereals and leguminous sold at harvest, seeds bought except potatoes			
	GAV (€/ha)	owned (ares)	in share-cropping contract (ares)	GAV fields (€)
top fields	50	[5-39]	[17,5-2,75]	[11-21]
down fields	15	[2,5-19,5]	[7,5-1,25]	[1,5-3]
Potatoe "for seeds"	13	[0-5,5]	0	[0-0,65]
Ensete plantation	Making of mats nor merero, sale of kocho weekly Consumption of ensete roots during the bridging period, making of kocho with 7-8 years old ensetes			
Surface (ares)	[10,5-25]	GAV ensete (€)		[37-86]
Garden	cabbage/maize/red bean/tobacco/broad bean/coffee/onion/garlic/chili/local potatoe/pumpkin/taro...			
Surface (ares)	[6,25-10]	GAV garden (€)		[28-45]
Plantation	Eucalyptus and bamboo on 0,75 ares		GAV plantation (€) 14	
Mowing meadow but no manure field				

BREEDING SYSTEMS

Bovines		<i>Proportional to the farm UAS (0,5 head/t)</i>		
	GP/head	5 kg butter + 12 kg cheese		
	CE/head	+1 old cow/14 years+ 4 calves/14 years		
	GAV/head (€)	57		
	owned	[0,5-2]	GAV total bovines (€)	[28-114]
	confided as share-breeding	0		
Ovines		<i>Proportional to the farm UAS</i>		
	GP/head	1 old cow/6 years+ 6 lambs/6years		
	CE/head	Market fees		
	GAV/head (€)	9		
	owned	[0,5-2]	GAV total ovines (€)	[4-17]
	confided as share breeding	0		
Poultry		Equines / male asines		
GP/head	20 eggs/month during 5month + 2chicks+1old hen/ 2 years	0		
CE/head	hen purchasing			
GAV/head (€)	6			
owned	2			
Confided as share-breeding	0			
GAV total poultry (€)	13			

GAV (€/active):	[62-151]	NAV (€/active):	[58-146]
AI (€/active):	[25-120]	TI (€/active):	[64-120]

➤ *E type: farms with 1/4 yoke (1/2 ox)*

These farmers differ from the previous one as they own half an ox, which means that this ox is co-owned by two farmers.

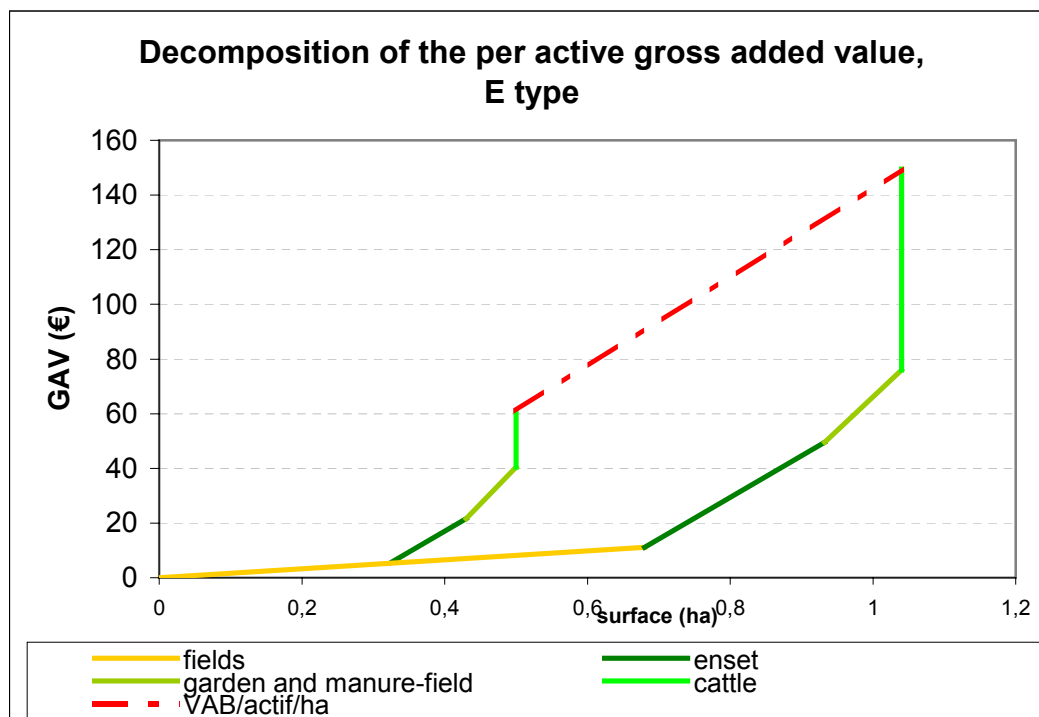
Having access to ploughing oxen allows them to have larger surface of fields to crop than in manual cultivation (until 0,6 hectare). The whole surfaces of these farms, inherited from the farmers' father, are between 0,5 and 1 hectare. As all the farmers do not have inherited from surfaces allowing them to use fully their 1/4 yoke, some of them take land as share-cropping contract. They own few heads of cattle, such as one or two cows, one or two ewes, and few hens.

Like the previous types, these farmers cannot accumulate much capital, and then have to get into debts at usurious rates in June. They are thus constrained to sell the main part of their harvest in January. That is why their fields per hectare added value are always low.

These farmers have a full work calendar during the work peaks, and so do not have any external activity. Therefore, their agricultural income is equal to their total income, and is between **64 and 119 €/active/year**. The farmers of this type who do not have access to share-cropping land contract have still incomes lower than the survival threshold.

As well as the previous types, their net added value is higher than the agricultural income (share cropping contract, interests on credits, land tax).

This type of farms stands in an intermediary situation, with regards to capital, to work organisation, as well as to economical results. They have their own animals, in limited quantity, do not work as daily work nor do they employ external labour, and their incomes are close to the survival threshold. They have the potential to accumulate capital, and thus can evolve towards the next types, but are not yet excluded from falling into the impoverishment spiral.



F TYPE

Number of family actives	2,25	Oxen	1
External labour	0	Owned UAS (ha)	[0,5-1]
Sale of labour force	0	from which bought (ha)	[0,25-0,7]
Other incomes	0	share-cropping contract (ha)	0
farm capital plough + (ploughing stick, hoe, sickle,...)			
depreciations (€/active)			
tools	10		
1 pack animals	4	1 ox	9

CROPPING SYSTEMS

Fields		60% of cereals and leguminous sold at harvest, seeds kept		
	GAV (€/ha)	owned (ares)	in share-cropping contract (ares)	GAV fields (€)
top fields	65	[10-35]	[7,5-37,5]	[11-47]
down fields	29	[2,5-7,5]	[2,5-10]	[1,5-5]
down fields + tef	22	[2,5-7,5]	[1,7-9,2]	[0,9-3,7]
Potatoe "for seeds"	13	[1,7-5,5]	[12,5-15]	[1,8-2,7]
Ensete plantation Making of mats nor merero, sale of kocho weekly				
Consumption of ensete roots during the bridging period, making of kocho with 7-8 years old ensetes				
Surface (ares)	[23,5-27]		GAV ensete (€)	[81-93]
Garden cabbage/maize/red bean/tobacco/broad bean/coffee/onion/garlic/chili/local potatoe/pumpkin/taro...				
Surface (ares)	[10-12,5]		GAV garden (€)	[45-56]
Plantation		Eucalyptus and bamboo on 1,5 to 3 ares		GAV plantation (€)
Mowing meadow but no manure field				

BREEDING SYSTEMS

bovines		Non Proportional to the farm UAS	
		GP/head	4 kg butter + 10 kg cheese +1 old cow/18 years+ 4 calves/18 years
		CE/head	Market fees, fattening
		GAV/head (€)	60
		owned	2
		confided as share-breeding	0
		GAV total bovines (€)	119
ovines		Non Proportional to the farm UAS	
		GP/head	1 old cow/6 years+ 6 lambs/6years
		CE/head	Market fees
		GAV/head (€)	9
		owned	1
		Confiée en contrat	0
		GAV total ovines (€)	9
		Purchasing of 1ovine/2 years to fatten (€)	5
Poultry		Equines / male asines	
GP/head	20 eggs/month during 5month + 2chicks+1old hen/ 2 years	GP/head	hiring 2days/week
CE/head	hen purchasing	CE/head	Market fees
GAV/head (€)	6	GAV/head	9
owned	2	owned	1
Confided as share-breeding	0	GAV total equine (€)	9
GAV total poultry (€)	13		

GAV (€/active): [148-149]

IA (€/active): [121-151]

NAV (€/active):

TI (€/active):

[142-185]

[121-151]

➤ *F type : farms with 1/2 yoke (1 ox)*

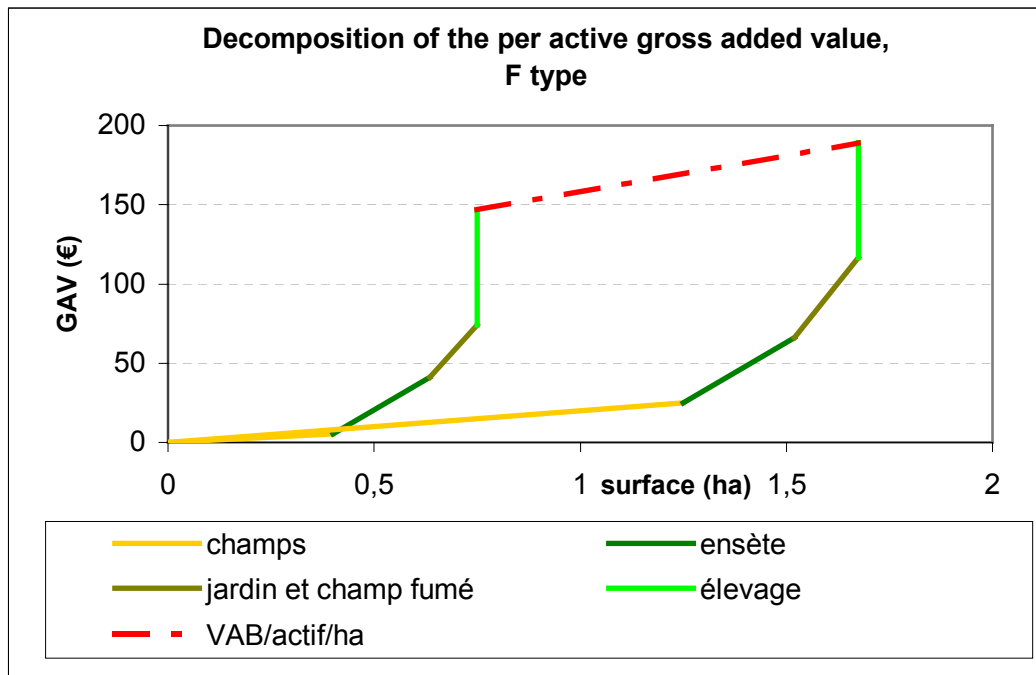
Wealthiest, these farmers have their own cattle. They rarely have enough land to fully use their half yoke. That is why they usually cultivate some land as share-cropping contract: they have inherited between 0,5 and 1 hectare from their fathers, and can plough up to 1,25 hectare of fields.

They get into partnership contracts (*taja*) to complete their yoke.

They still get into debts to pay fertilizers and the *Meskel* feast, but are able to retain part of their seeds.

As they are fully busy during the work peaks, these farmers do not have any external activity.

Their agricultural incomes put them beyond threats of decapitalising in case of hardship: **between 121 and 151€/active/year** (agricultural and total incomes are the same as these farmers do not have any external income).



G TYPE

Number of family actives	2,25	Oxen	2
External labour	0	Owned UAS (ha)	[0,8-1,3]
Sale of labour force	0	from which bought (ha)	0,3
Other incomes	0	share-cropping contract (ha)	[0,25-0,5]
Farm capital plough + (ploughing stick, hoe, sickle,...) / land			
Depreciations (€/active)			
tools	12	land	8
2 pack animals	4	2 oxen	18

CROPPING SYSTEMS

Fields <i>55% cereals and leguminous sold at harvest, seeds kept</i>				
	GAV (€/ha)	owned (ares)	in share-cropping contract (ares)	GAV fields (€)
top fields	71	[20-45]	[7,5-22,5]	[19-48]
down fields	67	[5-10]	[2,5-5]	[5-10]
down fields + tef	49	[5-10]	[2,5-5]	[3,5-7]
Potatoe "for seeds"	13	[10-17,5]	15	[3-4]
Ensete plantation <i>Making of mats nor merero, sale of kocho weekly</i>				
<i>Less consumption of ensete roots, making kocho with 7-8 years old ensetes</i>				
Surface (ares)	25	GAV ensete (€)		86
Garden <i>cabbage/maize/red bean/tobacco/broad bean/coffee/onion/garlic/chili/local potatoe/pumpkin/taro...</i>				
Surface (ares)	[10-12,5]	GAV garden (€)		[45-56]
Plantation	<i>Eucalyptus and bambou on 2,5 to 4 ares</i>		GAV plantation (€) [48-76]	
Mowing meadow but no manure field				

BREEDING SYSTEMS

Bovines		<i>Non Proportional to the farm UAS</i>		
<p>Old cows, fattened, sold for Meskel or Christmas 600 birrs</p> <p>← 18 years old</p> <p>Renewal 4 years old heifer</p> <p>Cow → 1 calf/ 2 years</p> <p>40% mortality</p> <p>Male calf → Sold at 3 years old 170 birrs 1/3 confided as share breeding 2/3 sold at 3 years old, 250 birrs</p> <p>Female calf → Sold at 3 years old 120 birrs</p>	GP/head	4 kg butter + 10 kg cheese +1 old cow/18 years+ 4 calves/18 years		
	CE/head	Market fees, fattening		
	GAV/head (€)	60		
	owned	2	GAV total bovines (€)	
	confided as share-breeding	1	119	
	Purchasing of 1bovine/2 years to fatten (€)	9		
Ovines		<i>Non Proportional to the farm UAS</i>		
<p>Old ewe sold for Meskel or Easter 120 birrs</p> <p>← 6 years old</p> <p>Renewal 1 year old female</p> <p>Ewe → 2 lambs/year</p> <p>40% mortality</p> <p>male lamb → Sold at 1 year old 150 birrs</p> <p>female lamb → Sold at 1 year old 120 birrs</p>	GP/head	1 old cow/6 years+ 6 lambs/6 years		
	CE/head	Market fees		
	GAV/head (€)	9		
	owned	1	GAV total ovines (€)	
	confided as share breeding	0	9	
	Purchasing of 1ovine/2 years to fatten (€)	5		
Poultry		Equines / male asines		
GP/head	20 eggs/month during 5month + 2chicks+1old hen/ 2 years	GP/head	hiring 2 days/week	
CE/head	hen purchasing	CE/head	Market fees	
GAV/head (€)	6	GAV/head	9	
owned	2	owned	1	
confided as share-breeding	6	GAV total equine (€)	9	
GAV total poultry (€)	13			

GAV (€/active):	[168-170]	NAV (€/active):	[161-202]
AI (€/active):	[175-190]	TI (€/active):	[175-190]

➤ **G type: farms with a full yoke (2 oxen)**

The capital level of these farms is far higher than the previous types' one.

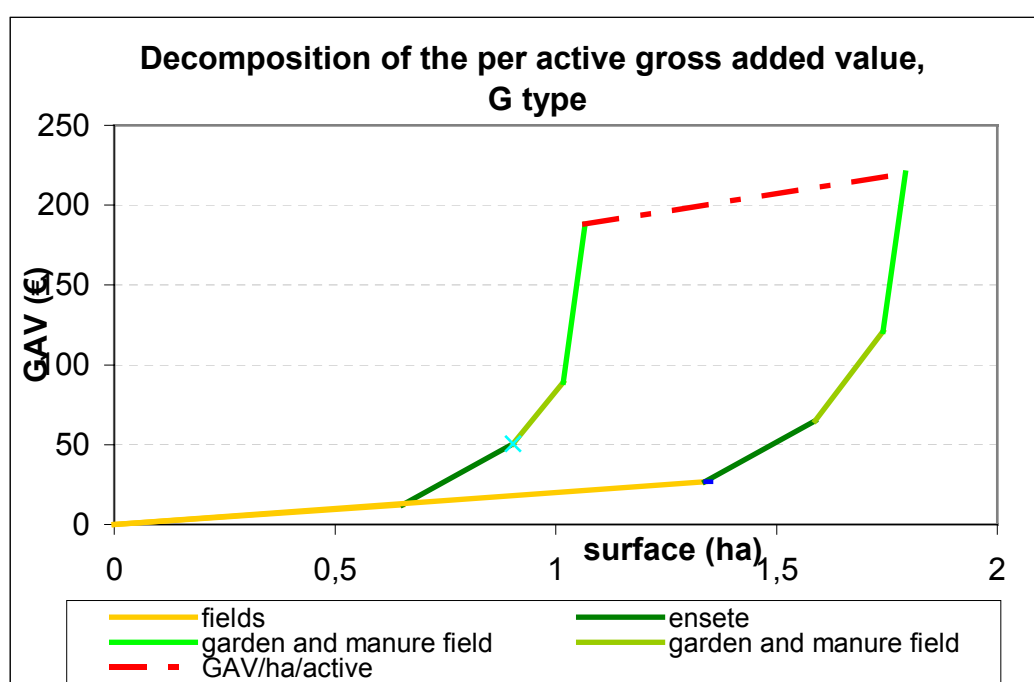
They own more cattle (2 cows, one ewe, one pack animal, few hens). As they also own a full yoke, they can have access to more land than the one they inherited. Therefore they cultivate one or several plots as share-cropping contract, and have bought or hired extra plots.

They resort to external labour for the work peaks in fields.

These farmers usually keep their seeds, and do not need to resort to credits for important expenses.

Their income is partly composed of added value created outside the farm, by share-breeding contracts.

Their agricultural and total incomes are situated **between 175 and 190 €/active/year**.



H TYPE

Number of family actives	2,25	Oxen	3	
External labour	[60-90] MD	Owened UAS (ha)	[1-1,5]	
Sale of labour force	0	from which bought (ha)	0,5	
Other incomes	Usurers	share-cropping contract (ha)	[0,25-0,5]	
Farm capital	plough + (ploughing stick, hoe, sickle,...) / land			
Depreciations (€/active)				
	tools	14	land	13
	2 pack animals	8	3 oxen	31

CROPPING SYSTEMS

Fields	10% dcereals and leguminous sold at harvest + seeds kept			
	GAV (€/ha)	owned (ares)	in share-cropping contract (ares)	GAV fields (€)
top fields	107	[22-45]	[12,5-22,5]	[37-72]
down fields	67	[5-10]	[2,5-5]	[5-10]
down fields + tef	49	[5-10]	[2,5-5]	[3,7-7]
Potatoe "for seeds"	13	[17,5-30]	[7,5-15]	[3-6]
Ensete plantation	Making of mats nor merero, sale of kocho weekly Less consumption of ensete roots, making kocho with 7-8 years old ensetes			
Surface (ares)	25		GAV ensete (€)	86
Garden	cabbage/maize/red bean/tobacco/broad bean/coffea/onion/garlic/chili/local potatoe/pumpkin/taro...			
Surface (ares)	12,5		GAV garden (€)	56
Plantation	Eucalyptus and bamboo on 6 to 9 ares		GAV plantation (€)	[114-171]
Mowing meadow but no manure field				

BREEDING SYSTEMS

Bovines		Non Proportional to the farm UAS		
<pre>graph TD A[Old cows, 18 years old, sold for Meskel or Christmas, 600 birrs] -- Renewal 4 years old heifer --> B[Cow] B -- "1 calf/ 2 years, 40% mortality" --> C[Male calf] B -- "1 calf/ 2 years, 40% mortality" --> D[Female calf] C -- "Sold at 3 years old, 170 birrs" --> E[] D -- "confided as share" --> F[]</pre>	GP/head	4 kg butter + 10 kg cheese +1 old cow/18 years+ 4 calves/18 years		
	CE/head	Market fees, fattening		
	GAV/head (€)	60		
	owned	2V	GAV total bovines (€)	
	confided as share-breeding	5V+1B	119	
	Purchasing of 1bovine/2 years to fatten (€)		9	
Ovines		Non Proportional to the farm UAS		
<pre>graph TD A[Old ewe sold for Meskel or Easter, 120 birrs] -- Renewal 1 year old female --> B[Ewe] B -- "2 lambs/year, 40% mortality" --> C[male lamb] B -- "2 lambs/year, 40% mortality" --> D[female lamb] C -- "Sold at 1 year old, 150 birrs" --> E[] D -- "confided as share" --> F[]</pre>	GP/head	1 old cow/6 ans+ 6 lambs/6ans		
	CE/head	Market fees		
	GAV/head (€)	9		
	owned	1	GAV total ovines (€)	
	Confiée en contrat	5	9	
	Purchasing of 1ovine/2 years to fatten (€)		5	
Poultry		Equines / male asines		
GP/head	20 eggs/month during 5month + 2chicks+1old hen/ 2 years	GP/head	hiring 2 days/week	
CE/head	hen purchasing	CE/head	Market fees	
GAV/head (€)	6	GAV/head	9	
owned	2	owned	2	
confided as share-breeding	6	GAV total equine (€)	17	
GAV total poultry (€)	13			

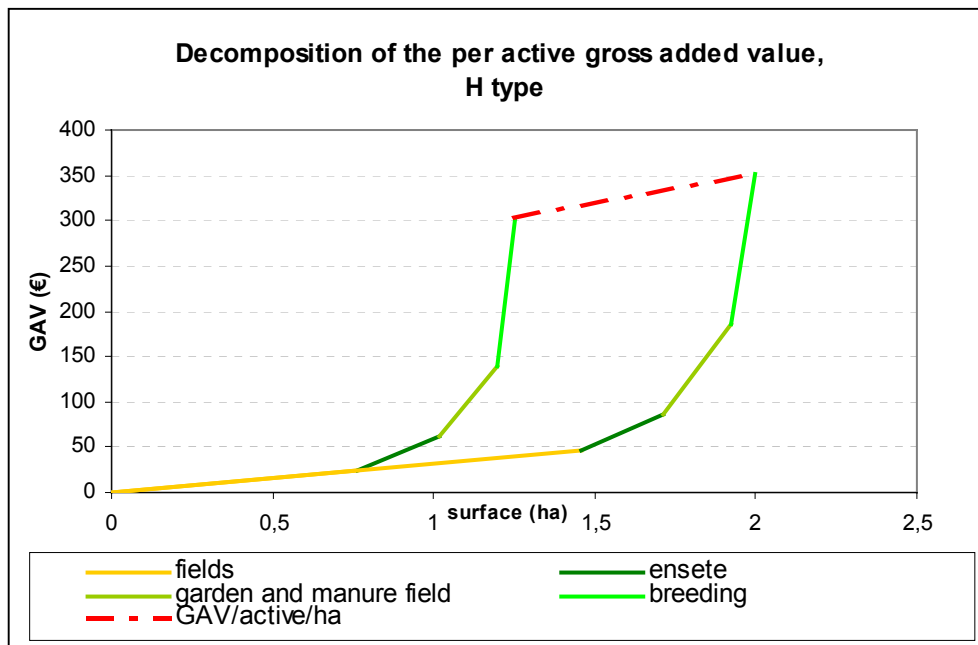
GAV (€/active):	[220-267]	NAV (€/active):	[189-236]
AI (€/active):	[250-296]	TI (€/active):	[334-380]

➤ *H type : farms with 1,5 yoke (3 oxen)*

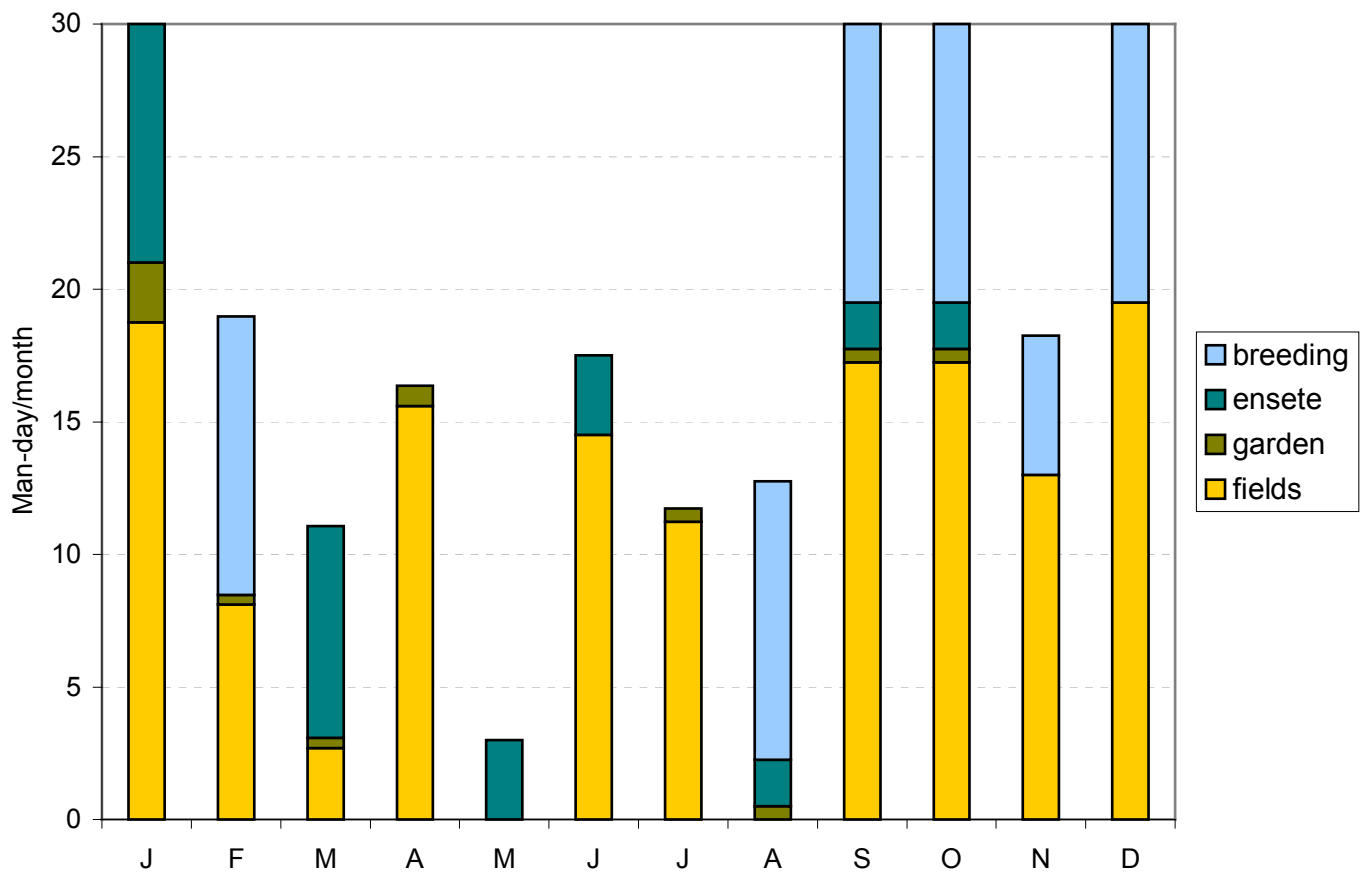
Even if they represent a small proportion of the region's population, it is essential to quote them in order to understand the current social relationships of production. They employ external labour, confide a part of their cattle as share-breeding contract to other farmers, buy or hire land, and award credits in cash or in kind (seeds and meat).

Their incomes are far in excess of that of other farmers (from 3 to 4 times the survival threshold): **from 250 to 296 €/active/year**. Moreover, the income stemming from credits interest gives them a really high regular income: **from 334 to 381€/active/year**.

According to our interviews, the farmers who could reach this level had, in the past, very high incomes stemming from external activities, such as coffee smuggling during the *Derg* period, or channelling of cash coming from other family members (usually coming from Church, or government).



Work calendar for male actives, G type



Source : V. Barthès and N. Boquien, according to interviews with farmers

➤ **Assessment for the F, G, H types = farms in an process of capital accumulation**

These three types of farms represent only a small part of the population (about 30%). Because their incomes are far above the survival threshold, these farmers can accumulate capital (i.e. cattle) and, for the wealthiest, take part in some speculation activities (grains, credits, animals).

The land they cultivate - owned, hired or in share-cropping contract - allows them to fill their work calendar. Those who have the largest surfaces even have to employ daily workers in order to work in fields at work peak periods.

The G and H farmers are the only ones to have an agricultural income higher than the added value created on their farms. Actually, these farmers confide a part of their cattle as share-breeding contracts to other farmers. That is why part of the added value constituting their incomes is created outside their farms.

➤ **General assessment on this typology**

Finally, let us take note that this typology is dynamic, each farm can very quickly pass from one type to the other, with its passing decapitalisations (unexpected problems in the family) and its -rare- accumulations.

We have modelised 7 different types of farms, but all the intermediary steps of decapitalisation exist between these models.

The G and H types are free from decapitalisation. Therefore, they will not evolve towards the previous types.

On the other side, A to E types, who have no safety margin, can easily be obliged to sell their cattle and land. This process is progressive, farmers start to sell half a head of cattle, and then end up selling their land.

Let us quote the example of a farmer of the E type, who owns half an ox, 0,5 hectare of land, and 0,4 additional hectare of land as share-cropping contract.

If any important and sudden problem occurs (death, low harvest, disease), he will be obliged to sell his half-ox. Consequently, as he will have lost his means of production allowing him to have land as share-cropping contract, he will have to leave this contract. That will decrease his incomes accordingly.

This farmer would then be in the situation of the C-D types, and would become really vulnerable towards new problems.

All the emergency steps of decapitalisation can then occur very quickly: progressive sale of all the animals, land let -partly then entirely- as share-cropping contract, then hiring and sale of the land inherited from his father.

For categories from A to F, it is really hard to accumulate capital as soon as they are placed in a vulnerable situation. In the case of a momentary decapitalisation, these farmers would be able to build up again their livestock from the cattle that still in ownership. Since the zootechnical performances of these breeding systems are quite low, the renewal of the livestock takes a long time. Only an exceptional harvest will allow the farmer to buy new heads of cattle to increase his livestock.

ECONOMICAL RESULTS :

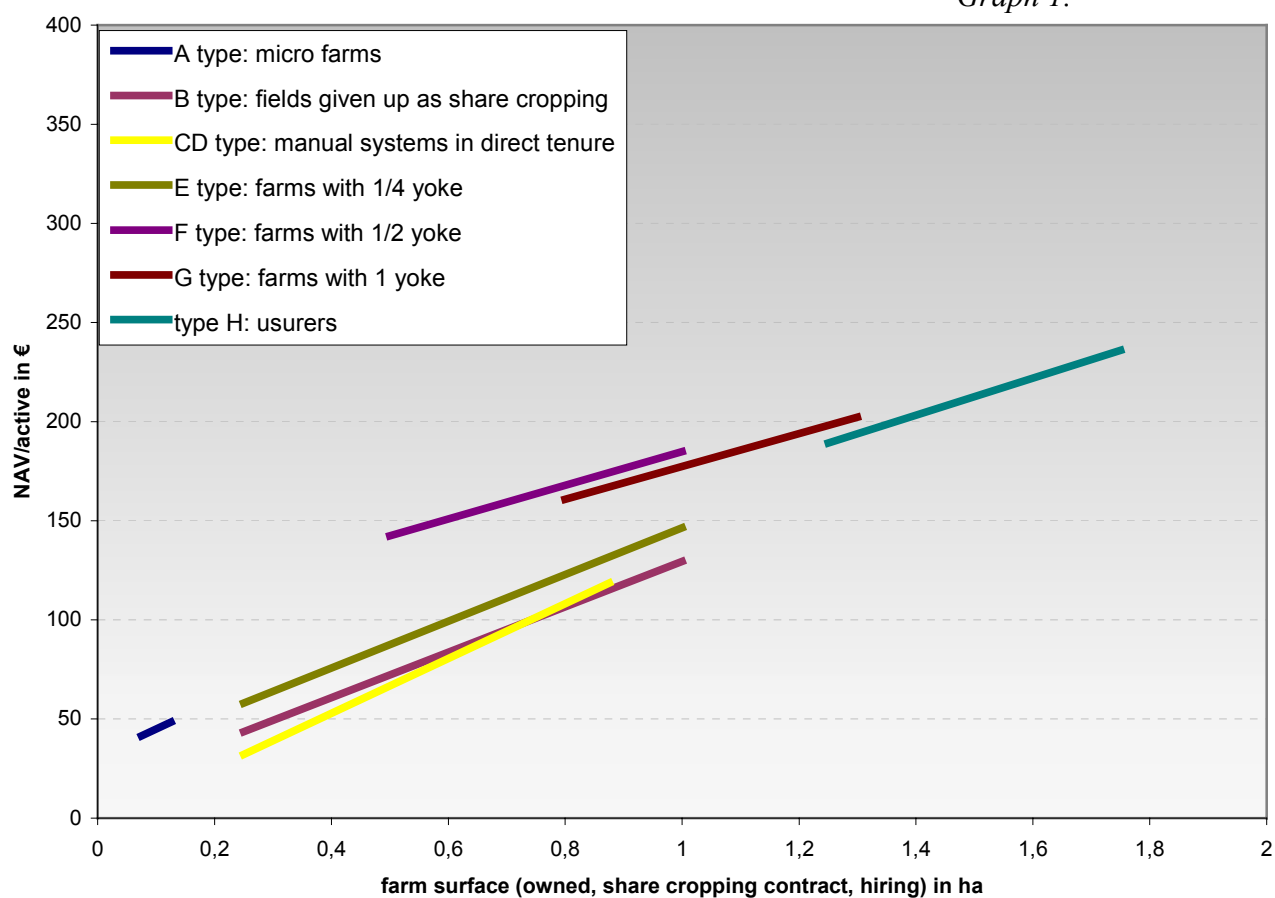
MODELIZATION OF THE NETT ADDED VALUE, THE AGRICULTURAL INCOME AND THE TOTAL INCOME FOR EACH FARM TYPE .

The graph 1. illustrates the **net added value** created by each type of farm, that means the net added value created on the whole farm surface. In the case of contracts - share-cropping and share-breeding- the entire added value is counted, provided that the farmer participate in the production process (lands let for hire are not counted)

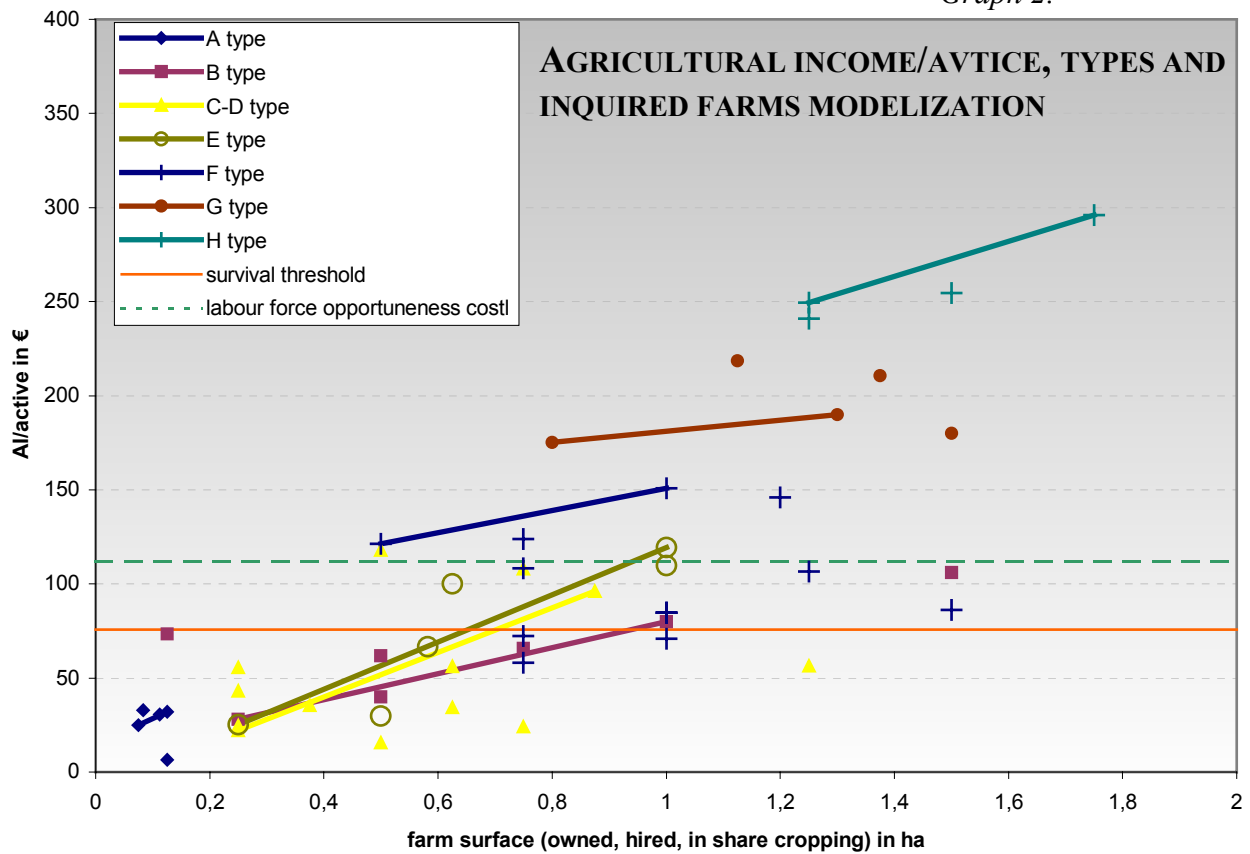
The comparison of the **agricultural income** -represented on graph 2.- with the added value, emphasize the redistribution of the added value due to contract on cattle and land. The lines of the slope of B, CD, and E types incomes are very sharp: for these types, the cattle herd size is proportional to the surface. Indeed, if one of these farmers receive a new piece of land, he will increase his enset plantation which is currently insufficient for his family needs. This additional enset surface will then allow him to breed more cattle.

And last, the graph 3. illustrates the **total incomes** of all the farmers types. It represents the summ of agricultural incomes and external incomes: daily work for A, B, C-D types and interests receipts for usurers (H type). These incomes allow the poorests to approach the survival threshold, meanwhile usurers greatly increase their incomes.

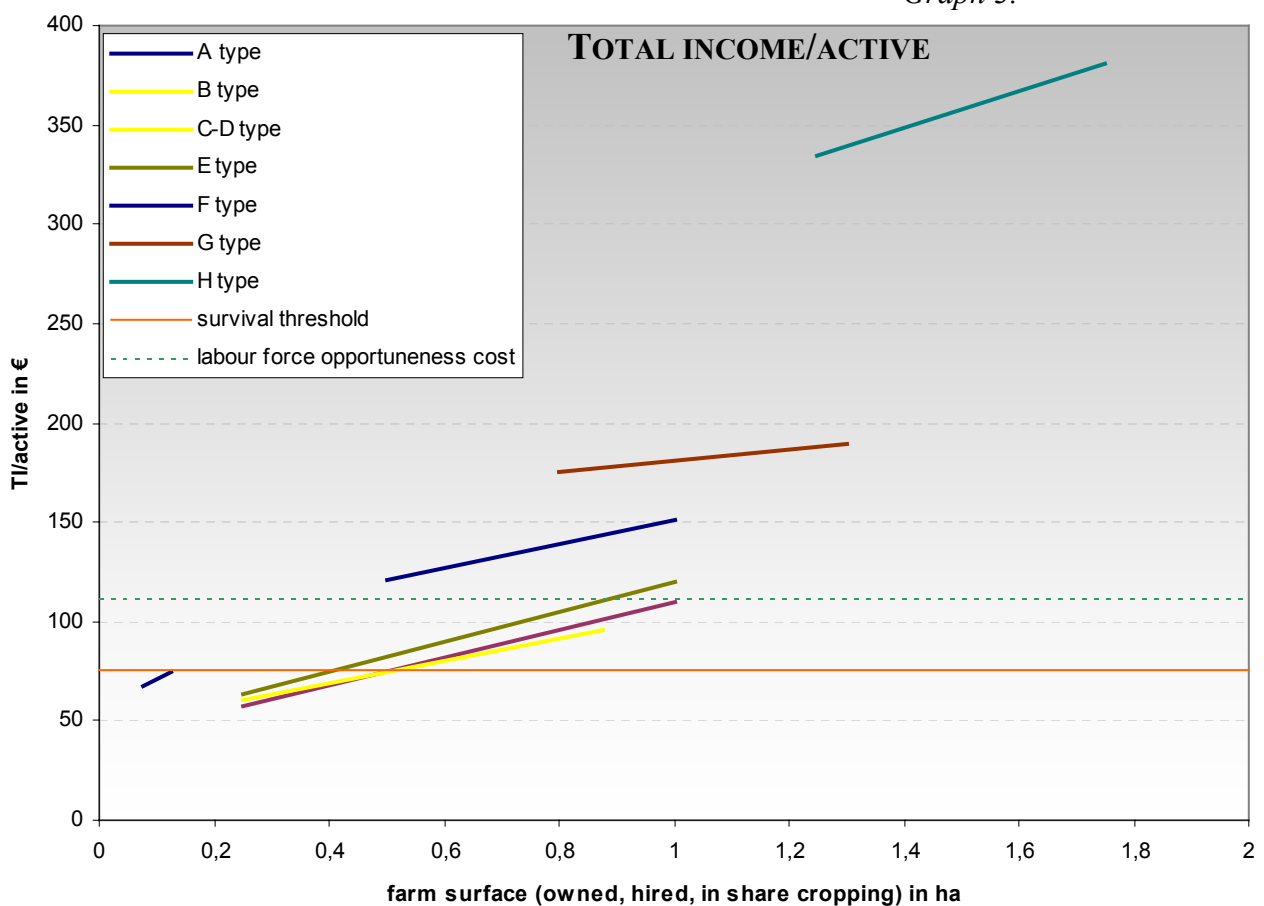
Graph 1.



Graph 2.



Graph 3.



IV. PROSPECTS

At present, the average farms surface of the region is about 0,5 hectare, and this surface does not provide the families with the survival threshold. The total income that can earn the main part of the population is between 140 and 200 euros, which places this population in an extremely precarious situation.

The precariousness of the farmers' income prevents them from any long-term project in the management of their farm: some of them cannot plan their rotations, or decide their allotment year by year, probably because they do not have enough cash to buy the seeds they want at the sowing time.

This precariousness is also expressed by the fact that cereals and leguminous have become nowadays cash crops. Although most farmers do not crop enough to feed their families, they have to use these cereals as cash crops and to buy afterwards cereals for their daily food. The A to E types, whose total surfaces are restricted, find themselves in a chronic situation of food insecurity: the food assessment that we have realised, following our economical modelization, shows that these farms fill only 20 to 60% of their nutritional needs (respectively for surfaces of 0,1 to 0,25 hectare).

The region does not currently benefit from any food aid. However, a program has just been launched by the government to help with the struggle against chronic food insecurity: the *Safety Net* program. The families chosen by the *kebele* to benefit from this project have to participate in common works and receive for this work a monthly income supposed to help them get out of this situation. This project started in Homa in March 2005. A person who works for the Safety Net earns about 3 euros per month, and several persons from the same family can be beneficiaries. This cash provision in the family's income should allow the poorest families to increase notably their incomes. Nevertheless, we noticed that the selection of families seems to have been corrupted (many of the beneficiaries are from the E, F and G types).

□ *Our typology evolution's perspectives*

Let us look at the near future evolution of the different types of farms that we have identified. Until today, the proportion of landless farmers is still small. Daily work opportunities are still sufficient to meet this supply. These farmers can provide a living for their families thanks to the daily work incomes, which means more than half of these families' incomes.

However, with the demographic growth and thus with the division of farms, the limits of this agrarian system should be reached quickly (in one generation if demographic growth remains similar).

Indeed, more and more farmers will inherit very small pieces of land, and will only be able to live thanks to daily work. This majority of microfarmers will no longer find local daily jobs, as they are in short supply. The rural exodus towards cities seems unavoidable to relieve this over populated countryside where job opportunities are non-existent.

If the limiting factors that we have identified (lack of fodder, credits at usurious rates, no birth-control) remain the same and if the land market is still there, the criteria on which our typology are based should not be called into question. Only the relative proportions of each type should be modified:

- Farms from F, G and H types, in a capitalization process (far above the survival threshold), will still represent a small part of the population. These farms will be able to increase their surface by buying land.
- The intermediaries C-D and E types, whose capital level is restricted, will not be able to reproduce the same, and will slowly slide towards the A type.
- Farms from A types should maintain the same numbers. Even if the number of landless farmers were to increase, the lack of work opportunities will lead to a rural exodus.

❑ *Interventions proposals*

To help farmers to get out of this decapitalisation spiral, it is necessary to remove the limiting factors that we have identified: cattle foddering, seeds keeping, access to credit.

There are no microfinance organisms in the region, and such organisms could exempt farmers from taking credits at usurious rates. Moreover, one of the reasons why farmers take credits is to buy seeds in June. That is why creating a seeds-storage bank would limit the amounts borrowed.

On the other side, introducing some fodder with a high foddering value per surface unit in fences (to replace or in association with local species) and in private scything meadows (currently not sowed) would increase fodder availability on the farm.

We have seen that the low zootechnical performances were partly linked to the foddering difficulties. Increasing cattle foddering should increase these performances.

These interventions main lines appear to us to have priority: these projects should have an important impact on incomes and in a relatively short term.

Other types of projects seemed to us conceivable.

Access to regular veterinary services (currently only once a year for vaccinations) should complement the improvement of zootechnical performances.

Maximizing the per hectare added value, particularly in the “fields” cropping systems, could have a significant impact on the farm incomes. The economical analysis has underlined that these cropping systems have a low per hectare added value, compared with the enset or the garden. However, a cropping system based only on enset and garden is not possible as they need manure, and currently the manure availability is limited.

Nowadays, cereals yields are low (less than 12 quintals per hectare). Introducing new varieties, more adapted to climatic conditions, could greatly increase yields.

It is also important to notice that some NGOs, as well as the Shishinsho agricultural office, try to develop market garden productions (onions, garlic, beetroot, cabbage, cauliflower, carrot). It is too early for the moment to draw conclusions about these projects, as they started less than three years ago. The limits that we could still identify are that farmers do not seem well supported, and that no research about distribution possibilities has been done.

Currently the Hossana-Shishinsho road is being renovated and asphalt being laid. This road will link Wolayta region (Sodo) to Addis Ababa. It should open new distribution opportunities to the region (road traffic development close to Homa and in the whole Kambatta).

Lastly, an agronomic research on the enset disease or *Aloya* seems to be priority, since the enset plays such an important role in the farms. A research centre specialised on enset exists in Areka (Wolayta), but for the present they do not seem to have found any solution.

V. APPENDIXES

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2. VOCABULARY KAMBATINIA/AMHARIC/ENGLISH

KAMBATINIA	AMHARIC	ENGLISH
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THE FARM		
	<i>Tukul</i>	Hut
<i>Witera</i>		Grassy plot near to the hut
<i>Gaté</i>		Garden
<i>Kalo</i>		Mowing meadow

ENSÈTE		
<i>Dubo</i>		One year old enset
<i>Lama</i>		Two years old enset
<i>Botcho</i>		Three years old enset
<i>Sima</i>		<i>Lamas</i> and <i>botchos</i> planted together in the same plot
<i>Era</i>		Four years old enset
<i>Wese</i>		Adult enset (from 5 years old on)
<i>Kocho</i>		Fermented dough made from enset pulp
<i>Bulla</i>		Solid part obtained after decantation of the enset juice
<i>Merero</i>		Fermented dough made from the top of the enset
<i>Amitcho</i>		Enset root

FIELDS		
<i>Gulalo</i>		Early barley
<i>Tef</i>		Ethiopia's endemic cereal
<i>Injera</i>		Fermented pancake made of tef or wheat
<i>Kollo</i>		Roasted grains
<i>Wonitcho</i>		Ploughing stick
<i>Kalta</i>		Little hoe
<i>Baché</i>		Sickle
<i>Kafo</i>		Bamboo cylinder to keep grains
<i>Gésima</i>		Mutual help system to work in fields or enset plantation

MEASUREMENT UNITS		
<i>Shala</i>		sak
<i>Ankafo</i>		volume included in the space delimited when fingers touch the shoulder.
<i>Hogogo</i>		a pack animal burden
<i>Yina</i>		a man burden
<i>Tucka</i>		volume included between all the fingers of both hands
<i>Tato</i>		volume included between the thumb and the forefinger
<i>Timad</i>		Surface that an ox can plough in one day

VOCABULARY UNDER HAILE SELASSIE		
<i>Chissana</i>		Paysan under a noble's supervision
<i>Aguiza</i>		Slave
<i>Balanta</i>		Noble, brother of <i>wanna</i>
<i>Wanna</i>		Noble
<i>Chika-shum</i>		Noble
<i>Sangakoro</i>		Noble
<i>Balabat</i>		Chief of the territory under amhara's supervision
<i>Asrata</i>		Tax in kind, 1/10th of the harvest
<i>Gasha</i>		Territory under amhara's supervision, but left under traditional chief's control.
<i>Gimita</i>		Territory entirely under amhara's control.

VOCABULARY UNDER DERG REGIME		
	<i>Derg</i>	Comitee, socialo-léninist regime from 1974 to 1991
	<i>Zématcha</i>	Students coming from Addis Abeba to help to create the peasants associations
<i>Gatera</i>		Common meadows

ADMINISTRATIVE DIVISION OF ETHIOPIA		
<i>Kébélé</i>		Administrative unity equivalent to a town
<i>Woreda</i>		Administrative unity equivalent to a district

ECOLOGICAL STEPS		
	<i>Kola</i>	Low lands under 1500 meters
	<i>Woïna-dega</i>	« vine - mountain » from 1500 to 2500 meters
	<i>Dega</i>	Mountain between 2500 and 3500 meters

SAISONS DES PLUIES		
	<i>Belg</i>	Little rainy season
	<i>Keremt</i>	Main rainy season

3. CALCULATION OF MAXIMAL SURFACES

IN MANUAL AND YOKE PLOUGHING

- Limiting work peak = ploughing before sowing
- Interval = 2 weeks between each ploughing
- Time needed to plough $\frac{1}{4}$ hectare :

1 week in manual ploughing	1,2 days in yoke ploughing :
	1,4 days for the first ploughing(11h)
	1,25 days for the second ploughing (10h)
	1 day for the last ploughing(8h))

		Ploughing : days/ha		Surface possible to plough during 2 weeks: ha
Yoke ploughing	2 oxen	4,8		2,5
	1 ox	4,8	<i>Yoke sharing : available $\frac{1}{2}$ of the time</i>	1,3
	$\frac{1}{2}$ ox	4,8	<i>Yoke sharing : available $\frac{1}{4}$ of the time</i>	0,6
Manual ploughing	0 ox	24	<i>Ploughing with hoe and ploughing stick</i>	0,5

4. THE CURRENT CONTRACTS ABUNDANCE

▪ MUTUAL HELP CONTRACTS

Dawa : mutual help system for work which demands a lot of labour
the beneficiary offers a meal and drink to each farmer who participated to the work, but does not necessarily work in exchange on their lands.

Gézima : organisation between three farmers, who work their three plots one after the other

▪ LAND CONTRACTS

FARM OUT CONTRACT <i>Godaba</i>		SHARE-CROPPING CONTRACT <i>arachi</i>		SALE	
<i>1 to 3 years</i>		<i>1 year</i>		<i>définitive</i>	
<i>Land</i>	<i>Rent</i>	<i>Land</i>	<i>Work and production means</i>	<i>Land</i>	<i>Cash</i>
		<i>½ seeds and fertilizers or ½ fertilizers</i>	<i>½ seeds and fertilizers or ½ fertilizers + 100% seeds (less fertile lands)</i>		
		<i>½ harvest</i>	<i>½ harvest</i>		

▪ BREEDING CONTRACTS

SHARE-BREEDING CONTRACT 1/3 <i>sisso</i> Cow/ewe		SHARE-BREEDING CONTRACT 1/2 <i>bakané</i> Cow / Ewe / Mare / Hen		ENGRAISSEMENT 1/2 Cow / Ox		GARDIENNAGE Ox	
<i>Animal purchase</i>	<i>Food</i>	<i>Animal purchase</i>	<i>Food</i>	<i>Animal purchase</i>	<i>Food</i>	<i>Animal purchase</i>	<i>Food</i>
<i>2/3 descend ance</i>	<i>1/3 descend ance</i>	<i>½ descend ance</i>	<i>½ descend ance</i>	<i>Price set at the beginning of the contract</i>		<i>½ traction force</i>	<i>½ traction force</i>
<i>2/3 cow</i>	<i>1/3 cow</i>	<i>COW</i>	<i>-</i>	<i>Half of the difference set price/ saling price</i>	<i>Half of the difference set price/ saling price</i>		
<i>½ milk</i>	<i>½ milk</i>	<i>½ milk/eggs</i>	<i>½ milk/eggs</i>				
<i>1/4 manure *</i>	<i>3/4 manure</i>	<i>¼ manure</i>	<i>¾ manure</i>	<i>-</i>	<i>manure</i>		

* The owner keeps the milking cow during two weeks each month, that means one year over two.
Thus he can profit by 1/4 of manure.

▪ □

YOKE CONTRACTS

AGAZU		TAJA	
2 oxen	3 days of work/ day of boroughing the yoke	1 ox	1 ox
		Work on the land of the two owners, in turn.	

▪ PACK ANIMALS CONTRACTS

Hiring out of an asine or equine to transport goods to market, at fixed price (according to the destination).

Hiring out of horses to thresh cereals : the tenant has to feed the horses and to work one day on the owner's land for each horse hired.

▪ NURSERY CONTRACTS

When a farmer has too many seeds (of cabbage, eucalyptus etc) to sow in nursery by himself, he can confide some of them to another farmer. In this case, the two farmers share the seedlings at the planting out (in equal proportions).

▪ LABOUR CONTRACTS

There are many kinds of daily work.

- payment according to the number of days worked, in cash (2 to 3 birrs for each half day)
- payment according to the number of days worked , in kind (evening meal for the whole family)
- payment as a part of the harvest (especially for the potatoes harvest)
- payment according to the surface worked
- special work such as winnowing : the worker can keep the remaining grains after the winnowing

Source : V. Barthès and N. Boquien, according to interviews with farmers

5. LAND REFORM PROCLAMATION TEXT :

<p>PROCLAMATION TO PROVIDE FOR THE NATIONALIZATION OF RURAL LAND. YEKATIT 25, 1967 (MARCH 4TH, 1975).</p>

- 1) All agricultural land is the collective property of the Ethiopian people. It cannot be sold, mortgaged or otherwise transferred except to direct heirs. Land cannot serve as a security for loans or otherwise be subject to restrictions or private contracts.
- 2) All rental payments, labour obligations or other duties attached to land or its use are abolished.
- 3) All forms of tenancy are banned. Land may not be given to others against payment, nor cultivated through paid work. The use of the fruit of the land is the exclusive right of those who work on the land. An exception is made for widows, orphans, the sick, the aged and the disabled who cannot cultivate on their own.
- 4) Every Ethiopian man or woman willing to till land with his or her own labour has right to sufficient land for his or her family's livelihood.
- 5) Tenants may keep all the land they tilled prior to land reform without paying compensation to the landowner. Ploughs and oxen and other agricultural implements belonging to the landowner go to the tenant who used them previously.
- 6) All debts of tenants to landlords are waived.
- 7) As far as local conditions allow, land shall be equally distributed, taking into consideration differences in soil fertility. As long as redistribution has not been effected, everyone is guaranteed the use of the land he tilled before, up to a maximum of 10 ha. This right of cultivation is transferable to direct heirs.
- 8) The land of the nomads is reserved for them.
- 9) Peasants within an area of approximately 20 gasha (800 ha) as far as practicable demarcated along traditional boundaries should form a peasant association. All resident peasants, former tenants, land labourers, landless labourers and landless villagers may become members.
- 10) A landowner resident on his land who intends to cultivate himself may share his land with his former tenants on an equal basis and reclaim one pair of oxen and one set of implements. Landlords who owned more than 10 ha of land are excluded from membership in peasants associations until the final redistribution of land is completed.

- 11) Peasants, especially those in risk areas, are urged, though not compelled, to farm cooperatively. Practical steps to this end are left to the peasant association. Large commercial farms are depending on local conditions to be run either as collective farms or as state farms or to be divided among their workers.
- 12) All pending court cases on land are void. Disputes on the distribution of land after the proclamation of land reform have to be settled by local committees to be elected by the peasants. Appeals may be made to corresponding committee on woreda (district) or awraja (provincial) level

6. ECONOMICAL CALCULATION DETAILS :

▪ **Gross Added Value :**

$$\text{GAV} = \text{Gross Product} - \text{Crops and Cattle Expenditures}$$

GP for cropping systems = harvest and crops residues.

CE for cropping systems = fertilizers, weeds killers, seeds.

GP for breeding systems = young animals, milk/eggs, old cows.

CE for breeding systems = *edir** contributions, market fees.

*contribution paid to *Edirs* (local organisations) for each farmer -member of the organisation - whose animal die → kind of local insurance on cattle

▪ **Net Added Value :**

$$\text{NAV} = \text{GAV} - \text{Depreciations (land, tools, oxen)}$$

▪ **Agricultural Income :**

$$\text{AI} = \text{NAV} - \text{LT} - \text{I} - \text{S} - \text{SCC} - \text{SBC}$$

LT = land tax, 1,90 €/ha.

I = interests on borrowed capital, estimated on the amount borrowed by farmers in June (to buy seeds and fertilizers) and in September (for Meskel and New Year feasts), and paid back in January, at 50% and 100% interest rates.

S = external labour salaries, in kind and cash

SCC = share-cropping contracts, part of the added value paid to the partner of the contract.

SBC = share-breeding contracts, part of the added value paid to the partner of the contract.

▪ **Total Family Income :**

$$\text{TFI} = \text{AI} + \text{External incomes}$$

External incomes : incomes stemming from the sale of the labour force (such as daily works), other non agricultural incomes (handicraft, trading etc), and loans and credits interests for users.

7. ECONOMIC CALCULATION HYPOTHESIS :

Actives number estimation

We have estimated that each family is composed of 2,25 actives :

- The *head of the family* is always present in the farm for the work peaks. For these peaks, he can be helped by his family or work by mutual help system. If the farmer owns a large superficies of land, or if the work requires too much time to be realized by mutual help system, we have counted external daily labour.
- The *woman* is also always present in the farm, for enset and garden works, and for the work peak in fields (sowing, harvest).
- A *child* is at least needed to watch cattle, that means nowadays to take cattle to springs for watering (about 2 hours a day). We have counted only 1/4 active for children, because they are indispensable only for this work.

Survival threshold

We have estimated the survival threshold in the *kebele*, that is the basic needs of a family in addition to the hard blows (funerals, diseases, low harvest etc.) which occur nearly every 3 years.

Here is the detail :

- Food needs : 52 €/active/year
- Clothes needs : 4 €/active/year
- School expenses : 4 €/active/year
- Edir (traditionnal mutual help for funerals) : 2 €/active/year
- Contributions (Red cross, associations etc.) : 1 €/active/year
- *Tukul* recouping and maintenance: 4 € /active/year
- Other expenses (soap, kerozene, etc.) : 2,5 €/active/year
- « hard blows » recouping : 5,6 €/active/year

In total, this threshold amounts to 76 €/active/year.

The expense called « hard blow » means often the death of one of the members of the family (old people, children). In that case, the family has to offer a meal to all the friends and relatives coming to visit them for the funerals. It can be more or less expensive, according to the family means, but in most of the cases the farmer has to sell one or several animals, or even to sell a part of his land.

The other unexpected expenses can be an illness, a theft, a low harvest etc.

Opportuneness cost for labour force

It has been difficult to estimate a opportuneness cost for labour force in the region. Actually, work opportunities are very few. If we make the hypothesis that work opportunities are abundant, (that is not the case nowadays in the region), the reproduction threshold would be equivalent to what a farmer could earn if he was working everyday as daily worker during the work peaks.

In that case, he would have given up his fields to another farmer (hired for 3 years or definitively sold), but would have kept his garden and enset plantation. He could therefore earn about 112€/active each year.

8. TOOLS : USE, PRICE AND USE DURATION

Kambatinia name	French name	Use duration	Price	Maintenance	Use
<i>Wonicho</i>	Ploughing stick	3 years	25 birrs	once a year 2 birrs	Fields and enset ploughing
<i>Wujé kalta</i>	Little local hoe	2 years	10 birrs	once a year 1 birr	Fields ploughing, weeding and hoeing
<i>Konshora</i>	Large knife	3 years	50 birrs	once a year 1 birr	Grass cutting
<i>Zaba</i>	Large hoe	2 years	6 birrs		Grass cutting
<i>Wolla</i>	Local scythe	5 years	5 birrs	once a year 1 birr	Grass cutting
<i>Albena</i>	Traditional sickle	5 years	27 birrs		Cereals harvest
<i>Baché</i>	Industrial sickle	1 year	3 birrs	once a year 1 birr	Cereals harvest
<i>Moko</i>	Wooden shovel		Fait maison		Cereals winnowing
<i>Mansha</i>	Wooden fork		Fait maison		Strow harvest
<i>Wallo</i>	Wooden piece of the plough		Fait maison		Ploughing
<i>Wogallo</i>	Wooden piece of the plough	4 years	5 birrs		Ploughing
<i>Maresha</i>	Ploughshare of the plough	6 years	20 birrs	once a year 2 birrs	Ploughing
<i>Messahané</i>	Large local axe	5 years	25 birrs	once a year 3 birrs	Trees cutting
<i>Fass</i>	Industrial axe	10 years	25 birrs	once a year 1 birr	
<i>Haké/ Chabaro kalta</i>	Little local axe	4 years	8 birrs	once a year 2 birrs	Wood cutting up
<i>Wessé billawa</i>	Knife	1 year	4 birrs	once every 6 months, 1 birr	Enset cutting
<i>Kéo</i>	Pestle	1 year	2 birrs		Enset pulp grinding
<i>Kunshullé</i>	Little knife	1 year	1,5 birrs		Enset pulp cutting
<i>Hakafa</i>	Spade	4 years	20 birrs	once every 2 years, 1 birr	Enset root harvest, enset planting out
<i>Forka</i>	Fork	10 years	30 birrs		manure spreading
<i>Moradé</i>	sharpener	5 years	12 birrs		Tools maintenance

Source : V. Barthès and N. Boquien according to interviews with farmers

Garden crop yields

	Unit	Seeds	Gross yield
green cabbage	<i>ankafo</i> /ha	nursery	2160
maize	ql/ha	0,2	5,6
red bean	ql/ha	0,1	2,4
tobacco	sak/plant/year	0	0,15
sugar cane	canes/plant/year	0	4
broad bean	gl/plant/year	0	42
pumpkin	fruits/plant	0	15
coffea leaves	sak/tree/year	0	0,2
coffea grains	cups/tree/year	0	3
chili	fruits/plant/year	nursery	10

Ensete yields

Ensete

	Unit	Yield
<i>kocho</i>	<i>hogogo/ensete</i>	0,18
<i>bullā</i>	<i>yina/ensete</i>	0,03
<i>merero</i>	<i>hogogo/ensete</i>	0,06

By-products

	Unit	Yield
fibres	<i>tato/ensete</i>	1
mats	mat/ensete	0,5

Manure field crops yields

maize+red bean/pea//maize+red bean/broad bean

	Unit	Seeds	Gross yield
maize	ql/ha	0,2	2,5
red bean	ql/ha	0,1	1,1
pea	ql/ha	0,6	2,8
broad bean	ql/ha	1,1	7,0

potatoe/wheat//maize+red bean/broad bean

	Unit	Seeds	Gross yield
potatoe	ql/ha	4,8	21,6
wheat	ql/ha	2,5	18,0
maize	ql/ha	0,2	2,5
red bean	ql/ha	0,1	1,1
broad bean	ql/ha	1,1	7,0

Local units of measure definition

<i>ankafo</i>	volume included in the space delimited when fingers touch the shoulder.
<i>tato</i>	volume included between the thumb and the forefinger
<i>yina</i>	a man burden
<i>hogogo</i>	a pack animal burden
<i>cup</i>	volume of a coffea cup

Fields crops yields

Top slope fields

-/wheat // potatoe/wheat // maize+red bean/broad bean or pea

-/wheat // potatoe/barley // maize+red bean/broad bean or pea

	Seeds		DAP		Urea		Adafine		Gross yield	
	unité	qty	unité	qty	unité	qty	unité	qty	unité	qty
wheat 1st year	ql/ha	2,5	ql/ha	0,9	ql/ha	0,4	L/ha	0,6	ql/ha	16,5
wheat 2nd year	ql/ha	3,0	ql/ha	0,9	ql/ha	0,4	L/ha	0,6	ql/ha	12,0
barley	ql/ha	2,5	ql/ha	0,9	ql/ha	0,4	L/ha	0,8	ql/ha	12,0
broad bean	ql/ha	1,3	ql/ha	0,5	ql/ha	0,2		0	ql/ha	7,0
pea	ql/ha	0,8		0		0		0	ql/ha	2,8
potatoe	ql/ha	4,8	ql/ha	0,6	ql/ha	0,3		0	ql/ha	19,2
maize	ql/ha	0,2	ql/ha	0,2	ql/ha	0,1		0	ql/ha	2,8
red bean	kg/ha	5,1							ql/ha	1,2

Down slope fields

-/wheat // -/wheat // -/broad bean or pea

-/wheat // -//tef//-/broad bean or pea

-/wheat // -/barley // -/broad bean or pea

	Seeds		DAP		Urea		Adafine		Gross yield	
	unité	qty	unité	qty	unité	qty	unité	qty	unité	qty
wheat 1st year	ql/ha	2,8	ql/ha	0,9	ql/ha	0,4	L/ha	0,6	ql/ha	15,0
wheat 2nd year	ql/ha	2,8	ql/ha	0,9	ql/ha	0,4	L/ha	0,6	ql/ha	10,5
barley	ql/ha	2,8	ql/ha	0,9	ql/ha	0,4	L/ha	0,6	ql/ha	10,8
tef	ql/ha	0,5	ql/ha	1,1	ql/ha	0,6	L/ha	0,6	ql/ha	8,0
broad bean	ql/ha	1,4	ql/ha	0,5	ql/ha	0,2		0	ql/ha	5,6
pea	ql/ha	0,9		0		0		0	ql/ha	2,2

potatoe 2nd cropping season

	Seeds		DAP		Urea		Insecticide		Gross yield	
	unité	qty	unité	qty	unité	qty	unité	qty	unité	qty
potatoe 2	ql/ha	4,8	ql/ha	0,9	ql/ha	0,4	L/ha	0,4	ql/ha	7,2

Price hypothesis for economical modelization

Fields	Unit		Price					
			Jan.	May	June	July	Nov.	Dec.
wheat	€/qtl	LH	8		15	15	19	7
		HH	13		22	22	32	11
barley	€/qtl	LH	6		13			4
		HH	10		19			8
broad bean	€/qtl	LH	10		14		8	8
		HH	24		20		24	24
pea	€/qtl		27	27	27	27	34	27
maize	€/qtl		19	19	11	11	14	15
red bean	€/qtl		30	15	15			
potatoe	€/qtl	red	13	2	2	6		
	€/qtl	white	17	3	3			

Bovines and by-products			Unit	Price				
				Jan.	March	Sept	Déc	Averga price
female calves	1 year		€/anl		11			10
	2 years		€/anl		14			12
	3 years		€/anl		24			21
cows	heifers		€/anl					28 - 47
	3-4 droppings	lean	€/anl					24
	old	lean	€/anl					14 - 24
	old	fattened	€/anl			38-57		
male calves	1 year		€/anl		9			7
	2 years		€/anl		11			10
	3 years		€/anl		19			16
bull	4 years	ready to plough	€/anl	71				47,6 - 76
ox	8-10 years	lean	€/anl					28 - 57
ox	8-10 years	fattened	€/anl			76-95	95	
butter			€/kg					
cheese			€/shati					

			Price			
Ovines		Unit	May	Sept.	Dec.	Average price
Ewe	3 months	€/anl				5
	6 months	€/anl				9
	1 year	€/anl				11
	old	€/anl				7
Ram	3 months	€/anl				7
	6 months	€/anl				10
	1 year	€/anl				14
	3 years fattened	€/anl	43	48	43	33

Poultry and by-products			Unit	Price
hen	young		€/anl	0,76
	>2 years		€/anl	0,57
cock	2 years		€/anl	1,33
eggs			€/egg	0,04

Pack animals		Unit	Price
Donkey	young	€/anl	67
	old	€/anl	29
Horse	young	€/anl	48
	old	€/anl	29

LH = Low hypothesis
HH = High Hypothesis

Trees	Age	Unit	Price
Eucalyptus	young seedlings	€/10 turca	1,0
	4-5 years old	€/tree	1,0
	10 years old	€/tree	1,9
Bamboo	3-4 years old	€/10 trees	1,0

Ensèteraie		Unit	Price
kocho		€/yina	0,4
bullla		€/yina	1,9
merero		€/hogogo	2,9
root		€/piece	0,4
mat		€/piece	0,7
rope		€/10 tato	1,0

Garden	Nature	Unit	Price
Green cabbage	seedlings	€/10 turca	1,0
	fresh leaves	€/10 ankafo	1,0
Chili	seedlings	€/100 seedling	0,6
	fruits	€/10 glass	0,5
Tobacco	seedlings	€/100 seedling	1,9
	dry leaves	€/sak	7,6
Coffea	fresh leaves	€/sak	0,5
	grains	€/10 cups	0,5
Tchatt	fresh leaves	€/ankafo	0,5
Broad bean	grains	€/10 glasses	1,0
Pumpkin	fruits	€/10 fruits	0,6
Taro	root	€/sak	1,0
Local potatoe	root	€/sak	0,8
Garlic	seeds	€/100 cups	2,4
	bulbe	€/turca	0,5
Onion	bulbe	€/100 bulbs	0,9
Carrott	root	€/sak	1,1
Beetroot	root	€/sak	5,7
Sugar cane	cane	€/10 yina	0,3
Banana	fruits	€/bunch	0,2
Avocado	fruits	€/100 fruits	0,5

Inputs	Unit	Price			
		January	June	July	August
Urea	€/qtl	33	24		
DAP bought at market	€/qtl	38	27		
DAP bought at <i>kebele</i>	€/qtl		26		
Chemical weed killer	€/L				6
Others for potatoe	€/L			10	

Labour		Unit	Salary	
			cash	kind
Contract work	Ploughing with stick	€/pers/0,25 ha	0,57	
	Harvest	€/pers/0,25 ha	0,95	
	kocho making	€/pers/ensete	0,05	daily food
Daily work		€/pers/day	0,29	

9. FOOD ASSESSMENT

A TYPE	total surface	Production				%self-consumption
		energy in kcal		proteins in g/kg		
ensete	0,10 à 0,17	220179	366964	1506	2510	100%
garden	0,1 à 0,17	116250	193750	3447,8	5746	100%
manure field	0,1 à 0,17	291057,5	485095,8333	15304,5	25507,5	75%
dairy products	0,5	462315	462315	29095,5	29095,5	33%
poultry	1	4200	4200	354	354	0%
TOTAL		1094001	1512325,119	49708	63212,86	

% needs supplied

22%

29,97%

46%

58,26%

Nb of adults who can live from the farm

1

2

B TYPE	total surface	Production				%self-consumption
		energy in kcal		proteins in g/kg		
2 cropping seasons fields	0,1 à 0,85	149 011	1 271 566	5 636	48 098	5%
1 cropping season fields	0,05 à 0,43	67 711	577 802	3 637	31 038	5%
ensete	0,35 à 0,84	759 616	1 860 508	5 194	12 723	60%
garden	0,18 à 0,32	203 437	377 812	6 033	11 205	100%
manure field	0,15 à 0,15	173 516	173 516	10 464	10 464	100%
dairy products	0,50 à 1	462 315	924 630	29 095	58 191	33%
eggs	1 à 1	4 200	4 200	354	354	0%
TOTAL		1 819 807	5 190 036	60 416	172 075	

% needs supplied

36%

103%

56%

159%

Nb of adults who can live from the farm

2

6

C-D TYPE	total surface	Production				%self-consumption
		energy in kcal		proteins in g/kg		
2 cropping seasons fields	0,2 à 1,33	298023	1986822	11273	75154	5%
1 cropping season fields	0,1 à 0,67	135423	902817	7275	48497	5%
potatoe (seeds)	0 à 0,18	0	27060	0,18	561	0%
ensete	0,42 à 0,91	924750	2007295	6324	13727	60%
garden	0,25 à 0,38	290625	435937,5	8619,5	12929,25	100%
dairy products	0,5 à 2	462315	1849260	29095,5	116382	33%
eggs	2 à 2	8400	8400	708	708	0%
TOTAL		2119536	7217591	63295	267959	

% needs supplied

42%

143%

58%

247%

Nb of adults who can live from the farm

2

8

E TYPE	total surface	Production				%self-consumption
		energy in kcal		proteins in g/kg		
2 cropping seasons fields	0,5 à 1,61	794729	2404055	30062	90937	35%
1 cropping season fields	0,266667 à 0,80	361127	1092408	19399	58681	35%
potatoe (seeds)	à 0,22		32472		673	0%
ensete	0,42 à 1,01	924750	2223804	6324	15208	80%
garden	0,25 à 0,40	290625	465000	8619,5	13791,2	100%
dairy products	0,5 à 2	462315	1849260	29095,5	116382	50%
eggs	2	8400	8400	708	708	0%
TOTAL		2841946	8075399	94208	296380	

% needs supplied

56%

160%

87%

273%

Nb of adults who can live from the farm

3

9

F TYPE	total surface	Production				%self-consumption
		energy in kcal		proteins in g/kg		
2 cropping seasons fields	0,48 à 2,12	721879	3159047	27306	119496	40%
1 cropping season fields	0,12 à 0,53	164012	717739	8810	38555	40%
1 cropping season fields+tef	0,12 à 0,53	87591	383311	2938	12857	40%
potatoe (seeds)	0,37 à 0,47	55104	69372	1142	1438	0%
ensete	0,94 à 1,08	2069679	2377929	14154	16262	90%
garden	0,40 à 0,4	465000	465000	13791,2	13791,2	100%
dairy products	2,00	1849260	1849260	116382	116382	50%
eggs	2,00	8400	8400	708	708	50%
TOTAL		5420924	9030058	185232	319489	
% needs supplied		107%	179%	171%	294%	
Nb of adults who can live from the farm		6	10			

G TYPE	total surface	Production				%self- consumption
		energy in kcal		proteins in g/kg		
2 cropping seasons fields	0,9 à 2,26	1335145	3361703	50504	127161	35%
1 cropping season fields	0,24 à 0,56	325917	752498	17507	40422	35%
1 cropping season fields+tef	0,24 à 0,56	174057	401874	5838	13480	35%
potatoe (seeds)	0,70 à 1	103320	147600	2142	3060	0%
ensete	1,00	2201786	2201786	15057	15057	100%
garden	0,36 à 0,46	418500	534750	12412,08	15859,88	100%
dairy products	2,5	2311575	2311575	145477,5	145477,5	75%
eggs	5	21000	21000	1770	1770	75%
TOTAL		6891299	9732785	250708	362288	
% needs supplied		137%	193%	231%	334%	
Nb of adults who can live from the farm		7	10			

H TYPE	total surface	Production				%self- consumption
		energy in kcal		proteins in g/kg		
2 cropping seasons fields	1,14 à 2,23	1698733	3317993	64257	125508	25%
1 cropping season fields	0,29 à 0,56	385954	753852	20733	40495	25%
1 cropping season fields+tef	0,29 à 0,56	206120	402597	6914	13504	25%
potatoe (seeds)	0,85 à 1,5	125460	221400	2601	4590	0%
ensete	1,00	2201786	2201786	15057	15057	100%
garden	0,50	581250	581250	17239	17239	100%
dairy products	4,50	4160835	4160835	261859,5	261859,5	100%
eggs	5,00	21000	21000	1770	1770	100%
TOTAL		9381138	11660713	390430	480022	
% needs supplied		186%	231%	360%	442%	
Nb of adults who can live from the farm		10	13			

RESUME

Nous avons réalisé un diagnostic agraire d'une petite région agricole du sud éthiopien (région du Kambatta), dont nous présentons ici les résultats. Cette étude a consisté en un travail de terrain de quatre mois (entretiens avec les paysans de la région), suivi d'un travail d'analyse et de modélisation économique.

La population de la région est exclusivement agricole, mais les faibles surfaces détenues par les paysans (exploitation de l'ordre d'un demi-hectare) ne permettent pas d'assurer leur sécurité alimentaire. Du fait de l'altitude, l'agriculture est basée sur la culture de l'ensète, « faux bananier » jouant un rôle majeur dans l'alimentation humaine et animale, des céréales, et d'un petit jardin vivrier. Alors que les produits issus de l'ensète et du jardin vivrier sont essentiellement autoconsommés, les céréales, quant-à elles, constituent surtout une culture de rente. L'association de ces systèmes de culture à un petit élevage est indispensable pour assurer le renouvellement de la fertilité, mais est aujourd'hui rendue difficile par la faible disponibilité du fourrage.

Les paysans se trouvent aujourd'hui dans une situation d'extrême précarité (seuil de survie de l'ordre de 170 euros/famille), comme en témoigne la multiplicité des rapports sociaux de production : les exploitations sont liées les unes aux autres par un foisonnement de contrats sur le bétail, le foncier, la force de travail. Cette précarité s'explique en partie par l'incapacité de la majeure partie des paysans à accumuler du capital, et trouve ses origines dans l'histoire (surtaxation de la paysannerie). Elle est aujourd'hui accentuée par l'endettement massif des paysans auprès d'usuriers, qui les entraîne dans une spirale de décapitalisation. Alors que les limites de ce système agraire nous sembleraient être atteintes dans un avenir proche, les axes d'intervention possibles, et pouvant avoir un impact à court terme sont : faciliter l'accès au capital (micro-finance et banque de stockage de semences), à l'affouragement du bétail, maximiser les rendements en céréales.

ABSTRACT

We carried out an agrarian diagnosis of an agricultural region in South Ethiopia (Kambatta region), which results are explained in this report. This study consisted in a four months fieldwork (interviews with the peasants of the region), followed by an analysis and economical modelisation work.

The population of the region is exclusively agricultural, but the narrow surfaces owned by each peasant (about half an hectare) do not enable them to reach food security. Because of the altitude, the agriculture is based on the cultivation of the enset, the "false banana", that takes a fundamental place in human and animal food, on cereals and on a small garden. Whereas the products coming from enset and garden are mostly self-consumed, the cereals are mostly used as cash crops. The association of the cropping systems with a small breeding system is needed to renew the fertility of the soil, but becomes nowadays a challenge due to the scarcity of fodder.

Peasants face nowadays a situation of extreme precariousness (survival threshold around 170 euros/family), as the abundance of contracts on cattle, land and labour force shows us.

This precariousness can be partly explained by the inability of the greatest number of farmers to accumulate capital, and has its origins in the history (overtaxation of the peasants). It is nowadays reinforced by the debts that peasants have to take from usurers, which lead them to decapitalise. Whereas the limits of this agrarian system seems to be reached in the near future, the possible interventions which can give some short term results are: to facilitate access to capital (micro finance and seeds-storage bank), to fodder for cattle, to maximise cereals yields.