

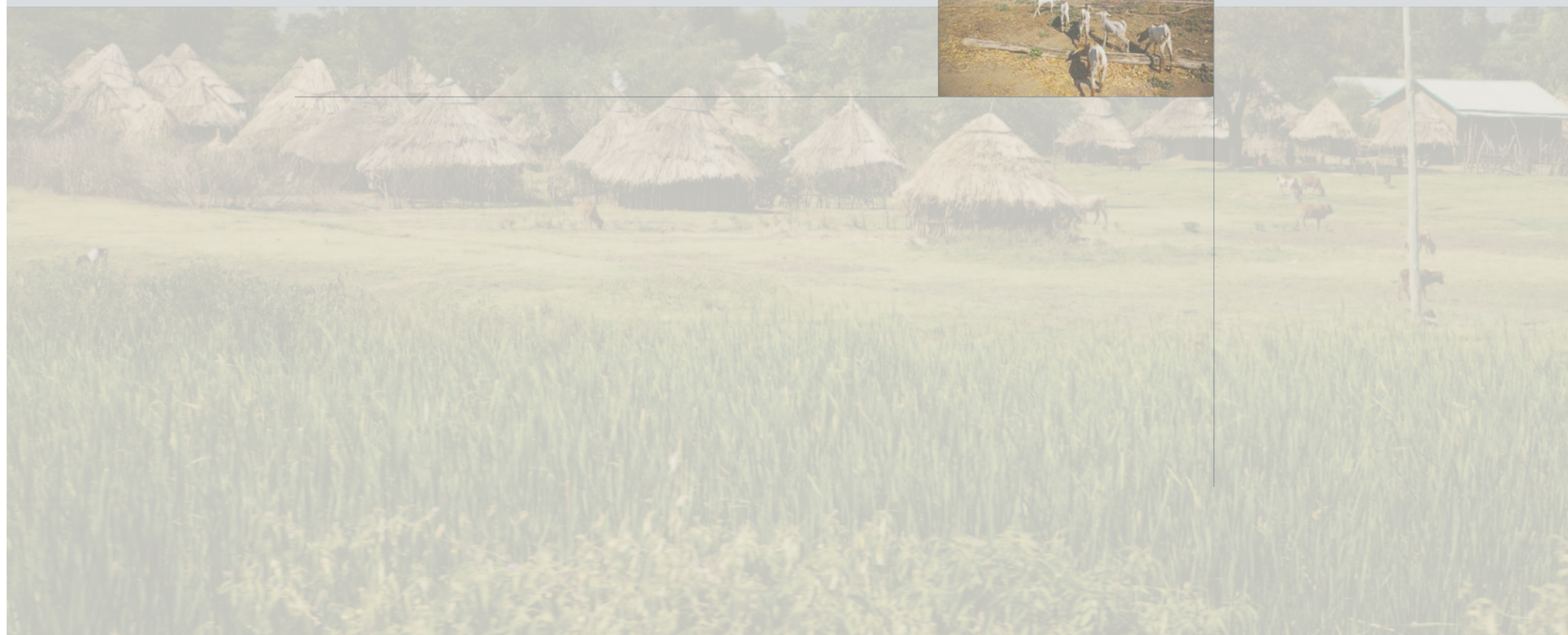
An Atlas of Ethiopian Livelihoods

The Livelihoods Integration Unit



An Atlas of Ethiopian Livelihoods

The Livelihoods Integration Unit



Contents

ii	Acknowledgements
iii	Glossary of terms
v	Introduction

Geography and Livelihoods

2	Where do people live?
---	-----------------------

Seasonality and Livelihoods

12	Can someone please explain the rains in Ethiopia?
14	How do rainfall patterns translate into seasonal production patterns?
16	What does it mean when the 'belg' rains fail?
18	Do all people have the same hunger season?
20	When should seasonal assessments occur?

Crop Production and Livelihoods

25	What dominates people's economy?
28	Where are the main cereal crops grown?
30	Which crops are especially important during the hunger seasons?
32	How do people grow what they grow?
34	Is there an absolute shortage of oxen?
35	How do the poor cope with their shortage of oxen?
36	Where are tractors used?

Livestock and Livelihoods

40	Which livestock do people have?
42	How many livestock do households have?
43	How much does livestock income contribute to the household economy?
44	Where is the dependence on livestock greatest?
46	What do livestock mean for food purchasing power?
48	How important are different livestock and their products?

Pastoralist Livelihoods

52	Where do pastoralists live?
----	-----------------------------

53	How much of the population is pastoralist or agropastoralist?
54	How 'wealthy' are different herders?
55	Are all herders the same?
58	How dependent on the market are pastoralists vs agropastoralists?
59	What are the most important cash sources for poor pastoralists?
60	What are the seasonal patterns of production and hunger in pastoralist areas?

Differences in Wealth

64	Which areas of the country are the wealthiest & poorest?
66	What variations in wealth do we see between different livelihood modes?
67	What makes cropping areas wealthier or poorer?
68	What variations in wealth do we see within different areas of the country?
74	How skewed is the distribution of wealth in the form of land and livestock?
75	Is there a relationship between better-off and poor household income?

The Market and Livelihoods

78	Where are the food surplus and deficit zones?
79	How much do different households depend on the market for food?
80	Where are poorer households able to purchase extra protein?
81	What proportion of household income comes from market-related activities?
84	Special focus on labor and livelihoods
87	What proportion of household income comes from market-related activities?

Environmental Products and Livelihoods

92	What role do environmental products play?
----	---

Diet

98	How much do different foods contribute to the annual diet?
----	--

The Cost of Maintaining Livelihoods

102	What is the cost of living in rural Ethiopia?
104	What do people spend on production?
106	What do people spend on 'social services'?
108	Where do people pay for water?

Hazards, Coping Strategies and Livelihoods

112	Which hazards affect people most?
116	What do people turn to in bad years?

Annex 1: The Livelihood Zones

122	AFAR REGION
123	AMHARA REGION
124	OROMIA REGION (WESTERN)
125	OROMIA REGION (EASTERN)
126	SOUTHERN NATIONS, NATIONALITIES & PEOPLES REGION (SNNPR)
128	BENISHANGUL GUMUZ & GAMBELLA REGIONS
129	TIGRAY REGION
130	SOMALI REGION

Annex 2: Monitoring Livelihoods

134	CROPS
136	LIVESTOCK
138	LABOR

Acknowledgements

USAID provided the funds for the work on the Atlas, having over five years funded all of the fieldwork on which the Atlas is based. In both projects the support and encouragement of Suzanne Poland and Tigest Yifru has been unstinting.

The Atlas is issued under the auspices of the Livelihood Integration Unit of the Disaster Risk Management and Food Security Sector of the Ministry of Agriculture. We thank its head, Ato Mathewos Hunde, and his officers for their constant support of the work of the Unit, of which this Atlas is simply a reflection.

The Atlas has been produced principally by members of FEG Consulting. It was the brain-child of Mark Lawrence, and he and Lorraine Coulter created the maps, an often experimental process during which, in the nature of these things, many more maps were developed than are shown here. The task was assisted by Stephen Browne, and by Addisu Dereje who helped set up the base maps and produced the topography map. All color schemes in this atlas were developed using the Brewer templates (<http://colorbrewer2.org/>)

Tanya Boudreau was the editor of the Atlas, and was responsible for its design, with support from Michele Shortley,

and for putting together the whole document. Julius Holt provided the text for all but the Seasonality section, written by Mark Lawrence. Zerihun Mekuria compiled the data for the Atlas, and worked on its uptake in Ethiopia.

Save the Children UK provided that data for Afar and Somali regions, and we are also grateful to them for reviewing the Pastoralist Livelihoods section. We thank Sue Lautze for initial consultations on the idea of the Atlas. Finally we must pay tribute to the work of Jane MacAskill, the Chief of Party of the Livelihoods Integration Unit for three years, during which time she achieved the extraordinary task of developing and managing the fieldwork for six out of seven of the country's agricultural Regions, and of making operational the livelihoods information covering the whole of Ethiopia.

The editorial team, April 2010

Glossary of terms

Belg	Short rains between February and May, in southern, north-eastern, eastern and north central parts of the country; also used to describe the secondary agricultural season	Livelihood zones	Areas within which households (on average) share similar livelihood patterns, i.e. they have access to the same set of food and cash income sources and to the same markets
Chat	A shrub (<i>Catha edulis</i>) whose leaves, when chewed, provide a stimulant drug	Meher	The primary agricultural season, or main growing season, associated with the kiremt rains but including long-cycle crops (sorghum, maize) which may be sown in the belg season. Meher is one of the words for 'harvest' in the Amharic language.
Deyr (Deyir)	The lighter of two rainy seasons in the south-east of the country, mainly between October and November	Nomadic	Herding households, usually in groups, who move between pastures during all the year and live in portable dwellings. Movement is often within a limited circuit – 'restricted nomadism'.
Enset	The 'false banana' tree (<i>Ensete ventricosum</i>) whose corm and stem provide a starch-based food	Teff	A very fine-sized grain (<i>Eragrostis tef</i>) with a grass-like stem, unique to Ethiopia as a staple
Ethiopian Animal Income Unit (EAIU)	This is a unit based upon an analysis of total income derived from each species nationally. EAIU calculation: 1 camel = 6 shoats; 1 cow/ox = 4 shoats.	Shiro	A very common sauce made from ground pulses, mainly field peas or beans, sometimes chick-peas
Gesho	'Hops' for traditional beer and mead: the leaf and twigs of a species of buckthorn (<i>Rhamnus prinoides</i>)	Shoats	Sheep and goats taken together
Gu (Gana)	The heavier of two rainy seasons in the south-east of the country, mainly April-May	Total income	The sum of a household's annual food income and cash income, converted to calorie equivalents, and expressed in relation to the household's annual calorie requirement.
Income	In this Atlas 'income' means any gain by the household: this includes crops or other items produced by the household and consumed directly as food = <i>food income</i> ; and cash earned from the sale of produce, or from employment, or coming from gifts etc. = <i>cash income</i> .	Transhumant	Herders who move seasonally to far grazing with the main livestock, but who have a permanent home base or village with usually fixed houses where several or most members of the household stay during the movement of the livestock
Injera	The main form in which staple cereals are eaten across most of Ethiopia: a pancake-like bread made from fermented flour (usually teff, barley, sorghum, maize, or mixtures of these)	Wealth group	In this atlas, data is sometimes presented by wealth group. Distinctions were made among very poor, poor, middle, and better-off households during the field work, and the field data is organized accordingly. These are locally-determined groupings which reflect common access to livelihood capital (land, labor, livestock, etc.). For more on this, please refer to the Practitioners Guide to HEA, which can be found at: http://www.feg-consulting.com/resource/practitioners-guide-to-hea
Kebele	'Locality': the smallest administrative unit, rural or urban	Woreda	Administrative district. There are 677 woredas in Ethiopia.
Kiremt (kiremt, kiremti)	The long rains between June and September throughout the cropping areas of the country		

Introduction

Why an Atlas of Ethiopian Livelihoods?

Our understanding of rural livelihoods in Ethiopia has developed greatly over the last two decades. The challenge has come from information needs on both the emergency and the development sides, in the quest for better-founded decisions on action and investment. One relatively recent government initiative, assisted by USAID, has been to put livelihoods analysis at the center of Ethiopia's official early warning system.

As a result, there has been an intensive field effort over a period of just under five years (2005 - 2009) to gather livelihoods information from every corner of rural Ethiopia, covering cultivators and herders in each of the country's many contrasting environments¹. The resulting data is tied to a framework of analysis which rests on a rounded view of livelihoods, seen from the point of view of household operations: because in the end, the rural economy functions through the daily decisions and actions of millions of households.

The other element of the framework is its geographical basis, which has required a zoning of each region by livelihood types. Such a unique combination of livelihoods analysis and

¹ This effort was carried out under the direction of the Livelihoods Integration Unit, which operates from within the Disaster Risk Management and Food Security Sector of the MOARD; and with Save the Children UK in Afar and Somali regions.

geography for the whole country seemed to call for an Atlas, as one good way to share the results with interested people both in and beyond the sphere of early warning. Here we should pay tribute to the IFPRI Atlas of the Ethiopian Rural Economy², which prompted us to think of using the present, separate set of data to offer a quite different, but we hope complementary, production.

The problem was how to select and shape data from this huge information resource in order to present as clearly as possible, in a geographical sense, what drives livelihoods and what distinguishes them from each other. And included in the mix, the differences recorded between poorer and wealthier households had to be presented, because not only are some areas better-favored than others, but within any community some households are better off than others.

What is in the atlas?

As can be seen from the table of contents, we have opted for what we hope is a logical sequence of presentation. The data is put together to tell a story in maps.

² International Food Policy Research Institute, Washington DC. / Central Statistical Agency / Ethiopian Development Research Institute: Atlas of the Ethiopian Rural Economy. Published in Addis Ababa 2006

We begin with some basic geography, showing how topography, altitude, rainfall, and population density come together to form the environments in which households live. The most basic division is between pastoralists, agropastoralists and the majority population of farmers. But within each of these general categories, local factors make for further livelihood distinctions, so that we end up with a mosaic map of 175 livelihood zones.

After this summary of the context of livelihoods, we launch into what people do to survive in their environments, and what differences in prosperity and poverty result. We begin with an account of seasonality, including an original analysis of USGS data, because the seasons rule rural life and are therefore fundamental to any system which monitors rural conditions. And seasonality in Ethiopia has its complications.

We then consider people's assets in land, their production of both food and cash crops and how much they depend on either. After that comes a separate account of livestock, because these are so important that nearly every rural household has some, even if it is only a couple of chickens. The section on livestock is followed by a closer look at pastoralists

and agropastoralists, limited populations who nevertheless take up a large part of the Ethiopian map. Throughout we look at what part of their production people consume and what part they sell, these being fundamental livelihood decisions.

We then take a geographical look at wealth differences, both comparing geographical areas and exemplifying for given livelihood zones the food and cash budgets of poorer and wealthier households. Then comes a good look at the market - in the sense of the exchange of both goods and services through cash, including crop and livestock sales and purchases, and paid labor - with a special focus on the importance of paid labor in Ethiopia's rural economy. Today the market is crucial to just about every household.

Two smaller sections follow: the first showing how much households rely on environmental products, such as trees, wild foods and gums/resins; and the second presenting information on rural diets, to the extent that the livelihood databases cover this subject.

Next we look at household expenditure and note that beyond staple cereals, a very large proportion - especially of poorer people's budgets - must go on the most ordinary daily items:

pulses and vegetables and condiments to accompany the staple, and numbers of 'non-food' items, from soap to matches, whose cost mounts up surprisingly. This completes the basic household economy picture of where people get their food from, and where they get their cash from and how they spend it.

This Atlas offers the 'normal' picture of livelihoods, rather than an account of rural life under drought or other severe stress.

But it is by understanding in detail how people normally make ends meet that we can most accurately judge the likely effect of shocks. We end with a summary geography of which **hazards** people perceive to be the most important around the country, and which **coping strategies** they most employ in bad years, whether or not they are in receipt of official aid.

What new knowledge does the atlas add?

The *Atlas of Ethiopian Livelihoods* is an attempt to summarize a host of information usefully on the basis of a livelihoods-grounded framework of analysis. It is not designed to pursue one or other economic theory or to reach grand conclusions. Nevertheless, certain themes shine out from the information. One, already evident in this introduction, is the role of cash: *the rural economy is monetized even in its remotest reaches*. An

account of rural life which dealt only with production and direct consumption could hardly begin to explain food security, let alone livelihoods in the round. This is most acute in the case of pastoralists: amongst them today only the minority of better-off stock-owners have enough animals to be able to live principally from milk; the rest live principally on cereals they buy through selling animals.

But the case of farmers is not as different as one might expect. In most areas, given the ownership of land and oxen and other productive assets, it is only wealthier farmers who can basically eat fully from their harvest, and in some areas not even these. Otherwise, in a nutshell, the poorer that farmers are, the more they depend on cash for their very survival, beginning with the purchase of a good part - if not the greater part - of the staple food they consume in any year.

Linked to this, another outstanding subject is paid labor, because this is chief amongst the ways that poorer farmers manage to find the cash for food and other of life's necessities. On the geographical level, it is interesting to look at the country in terms of those areas which are productive enough for this crucial employment to be mainly offered locally by wealthier

farmers; those which are so unfavorable as to be unable to offer much employment locally; and those areas - often with major cash-crops - which are so productive that they attract many workers from the unfavorable localities. Apart from selling their labor, poorer people also look to 'free' natural resources to sell, and we see that first amongst these is collected firewood. This is largely destined for town markets, which are also major customers for grain, especially *teff*, and the chief customers for livestock for slaughter.

Thus the picture we see around the country today is very far from the subsistence farming (or herding) sometimes assumed in the usual sense of most families producing enough food to feed themselves, although without surplus. There are millions of households that *do* feed themselves and produce some surplus; but there are millions more that do not. It is the exchange between the one and the other group, in the market sense described, which as much as anything defines the rural economy.

Over several decades Ethiopia has seen substantial food and cash aid for food insecure people, mainly in the more drought-prone eastern half of the country. Today most of this

is channeled through the Productive Safety Nets Programme. It is worth saying that one message which ought to come out of this Atlas is that in not a single one of the 175 livelihood zones, from the harsh semi-desert to the barest mountain top, does this food and cash aid constitute the greater part of livelihoods. This is true even if we look at the poorest groups of households anywhere, except for the small minority who are economically inactive. Official support is important; but everywhere in Ethiopia the rural population live overwhelmingly by their own efforts.



Geography and Livelihoods

There are many ways to look at the geography of Ethiopia, and in our minds we usually combine several elements. There is the administrative geography of regions and *woredas* and *kebeles*. There is the urban geography of bigger and smaller settlements, and the physical communications geography: the road network that links not only the towns to each other, but also increasingly the rural areas to the towns. But behind all this lies the topography of mountains and plains and river gorges, and the ecology of temperatures and rainfall, soils and natural vegetation; and it is these that present the factors which most shape rural activities, especially crop and livestock production. And so we come to rural livelihoods: what people do to survive in their particular environments - what they produce, what they consume, what they sell and where, who they work for, what food and non-food essentials they need to buy, what services they need to pay for. In this section we focus on the physical elements of altitude, rainfall and population density which in their different patterns are fundamental to determining the livelihood zones.

Where do people live?

The administrative boundaries

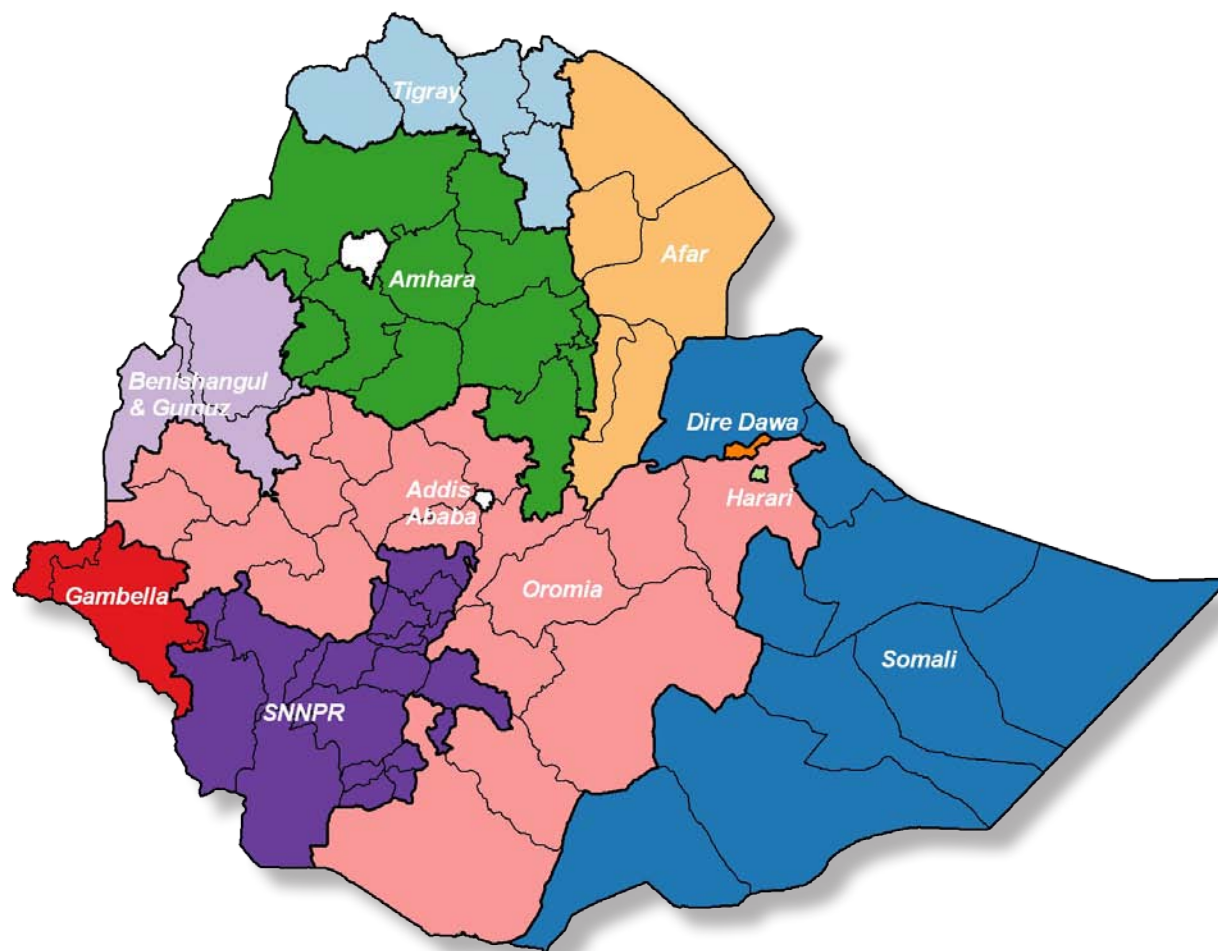
The primary purpose of the livelihoods database upon which this atlas is constructed is to serve the government's early warning system. The system itself is run on regional lines, and so it was natural to distinguish the livelihood zones and undertake the fieldwork on a regional basis, with regional teams.

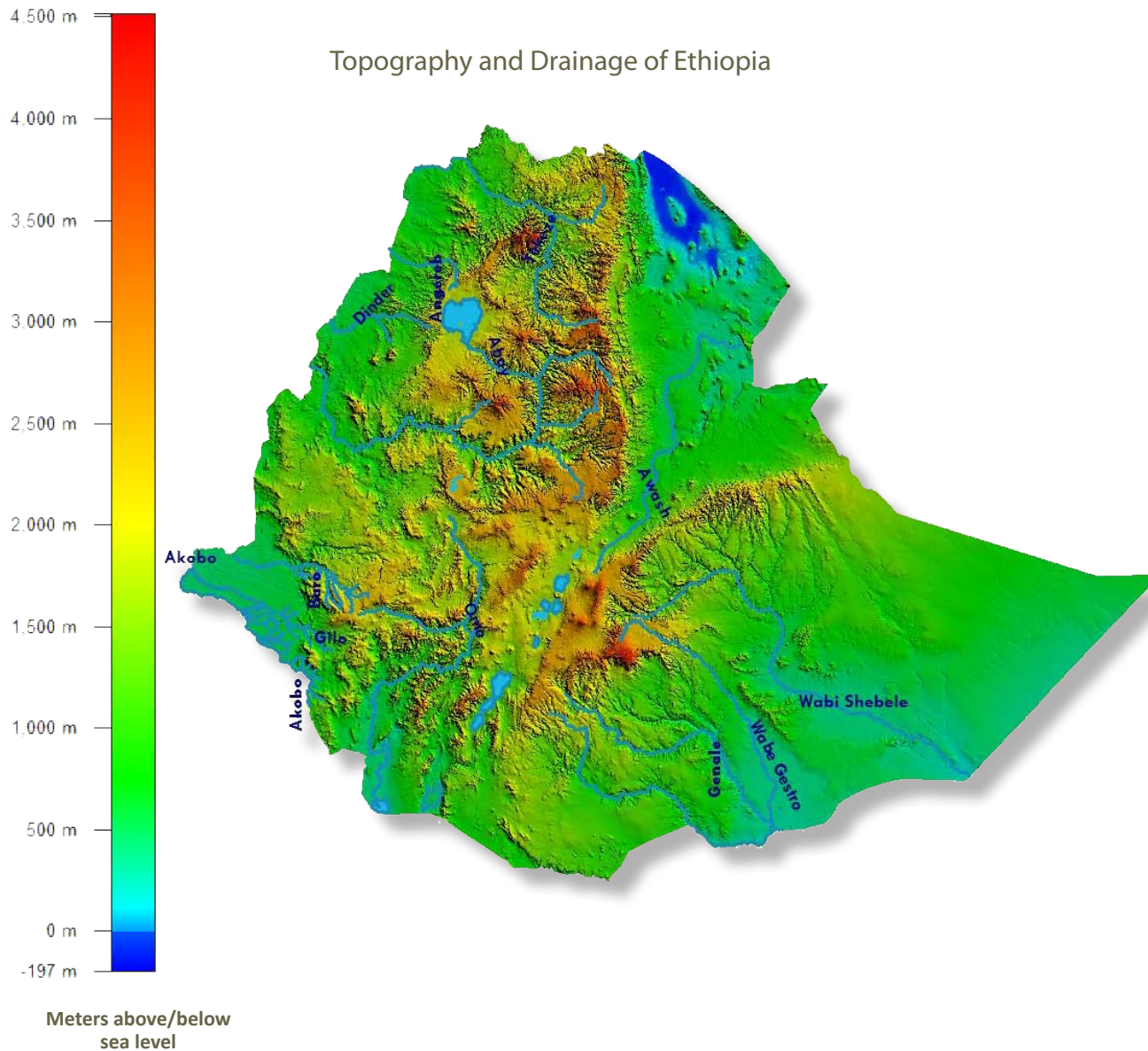
Within the regions, however, the livelihood zones are based on economic geography rather than administrative divisions. It is true that *woreda* boundaries are sometimes marked by mountain ridges, escarpments or river gorges, but on the whole they do not follow along ecological or economic boundaries. Therefore most of the livelihood zones cross *woreda* boundaries, and often enough administrative zone boundaries too¹.

In the maps which follow, the data is both sourced and expressed on the basis of livelihood zones, singly or in combination. However, we usually need to see information against the template of administrative divisions, and on each map therefore the outlines of both the regions and the administrative zones are also shown.

¹ The livelihood zones were defined with *kebeles* as the reference administrative unit, i.e. livelihood zone boundaries do not divide single *kebeles*.

Regions of Ethiopia





Topography and Drainage

The map presents a vivid image of Africa's greatest highland massif rising out of Ethiopia's vast lowlands. The different watersheds initiate major rivers, notably the Awash in the Rift Valley; the Abay (Blue Nile) and Tekeze rivers in the center and north; the Wabi Shebelle and Genale rivers of Somali Region; and in SNNPR the Omo River running into Lake Turkana.

Topography and ecology are intimately linked. Grass and bush pastures grow in areas where rainfall is too low to support any crops, and most of the lowest-lying areas of the east and far south of the country are purely used for **pastoralism**. Where slightly higher elevations get more rainfall or where rivers and seasonal water-courses allow 'flood-retreat' cultivation, people do grow crops but mix the risk and the profit with a major dependence on herding - **agropastoralism**. The great majority of Ethiopians inhabit the high massif as cultivators in what we term the **cropping** areas - although anybody who *can* keeps animals too. This area includes the actually very low-lying areas in the far west of the country where rainfall nevertheless favors agriculture, as well as irrigated areas along the main rivers in Somali Region.

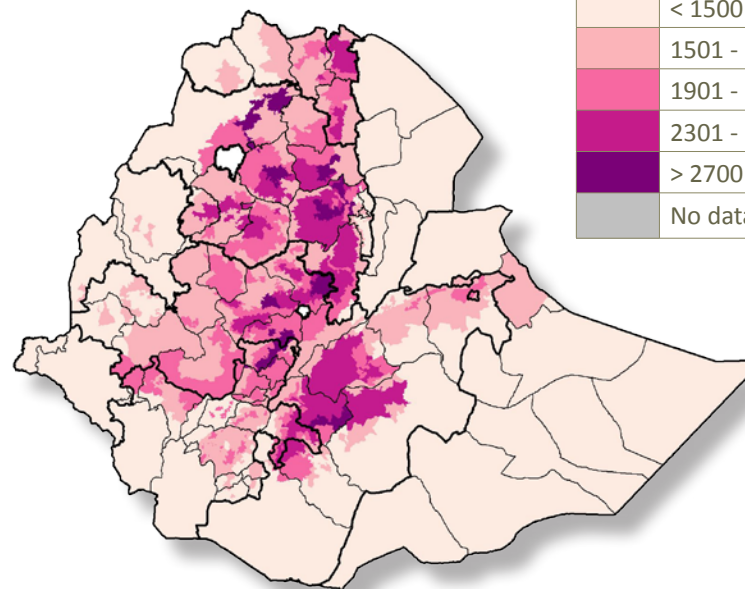
Where do people live?

Altitude

Different crops and livestock thrive at different altitudes. Altitude determines so much about rural life that it is the first thing Ethiopians tend to refer to when identifying a given area. Essentially, low elevation makes for hotter temperatures and less rainfall; higher elevations are cooler and wetter. This distinguishes the three main, traditional Ethiopian ecological/altitude divisions: the relatively hot and dry agricultural lowlands – Amh. *qolla* – below some 1500 meters above sea level (m.a.s.); the temperate middle highlands – Amh. *woyna dega* – between about 1500 and 2300 m.a.s., often subdivided into 'dry', up to about 1900 m.a.s., and 'wet' from 1900 to 2300 m.a.s.; and then upwards of 2300 the highlands – Amh. *dega* – which tend also to have the highest precipitation in addition to cool temperatures. The great majority of rural Ethiopians live in the middle-highlands and highlands. The very highest elevations, upwards of some 3500 m.a.s., are a tougher option, with very cold temperatures in season, high winds and frequent frosts – Amh. *werch* – after which these elevations are traditionally named. At the opposite extreme are the elevations under 1000 m.a.s. in the east and south where crops may sometimes be grown, but which are mainly rangelands (Amh. *bereha*). These are the pastoral and agropastoral areas.

Altitude

Meters above sea level	
	< 1500
	1501 - 1900
	1901 - 2300
	2301 - 2700
	> 2700
	No data

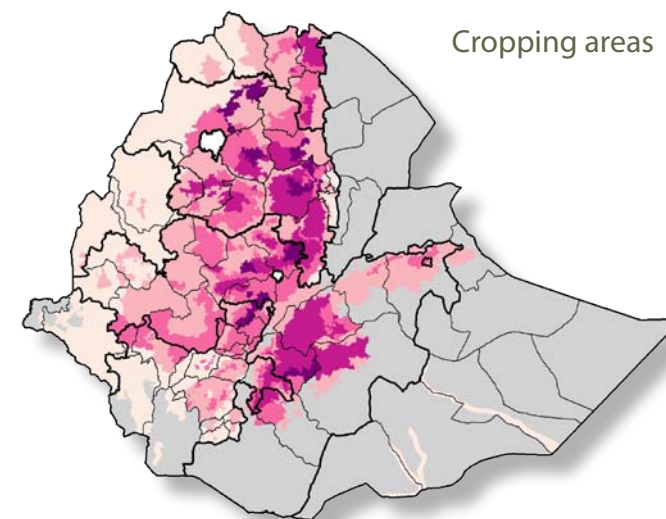


Altitude is a major determinant of livelihoods in Ethiopia because it sets out the boundaries of what can be grown or raised.

Agro-pastoral & pastoral areas



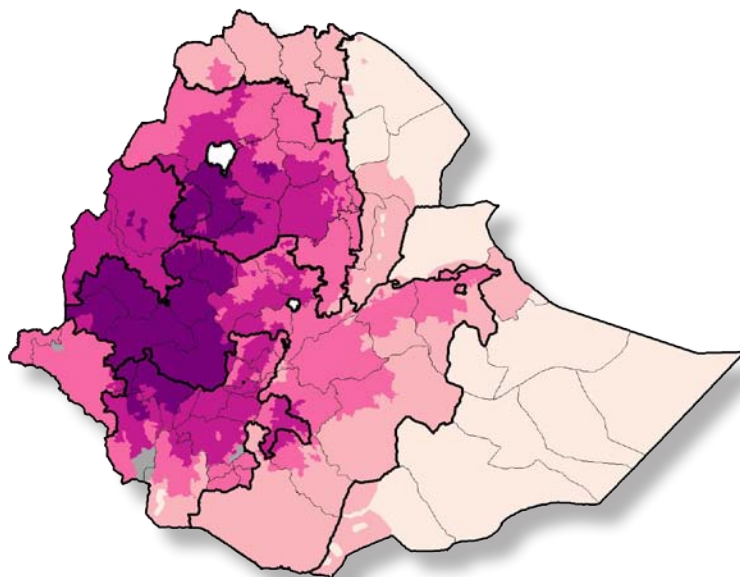
Cropping areas



Rainfall (mm)	
	< 400
	401 - 700
	701 - 1000
	1001 - 1300
	> 1300
	No data

Rainfall determines not just what can be grown or raised, but how productive different livelihood zones can be.

Rainfall



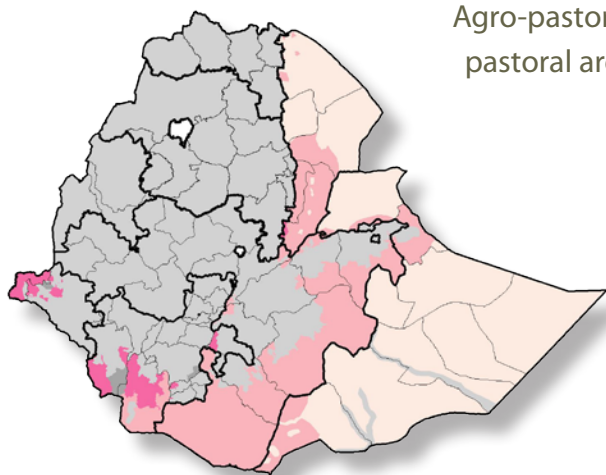
Rainfall

Altitude is the most obvious factor in rainfall volume, but this is not an exact association. The seasonality, length and regularity of rains varies greatly by longitude and latitude. The west of the country is generally better-favored with rainfall from year to year than the east, so that, for instance, the mountain areas of eastern Oromia (Arsi-Bale) receive less rainfall than the middle-highlands of western Oromia or even the lowlands which characterize Benishangul Region. There is also a marked north/south contrast. In the far north the single main rainy season is notably shorter than further south, and annual precipitation is less: the middle-highlands of Tigray Region are considerably drier than, for instance, the middle-highlands of western Amhara or of Harerge in the far east of Oromia; and the bimodal *belg/kremt* (short rains/long

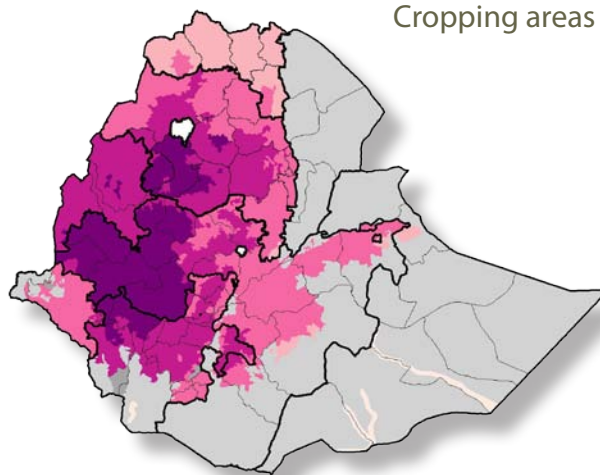
rains) pattern is most pronounced in the southern half of the country, giving more rainy months in all. (See the *Seasonality & Livelihoods* section for more on rainfall patterns.)

Outright drought has been largely a phenomenon of the eastern half of the country in the last half-century. But it is the far more frequent, though less dramatic, rainfall irregularities in this half of the country that have continued to threaten food security amongst both cultivators and herders.

Agro-pastoral & pastoral areas



Cropping areas



Where do people live?

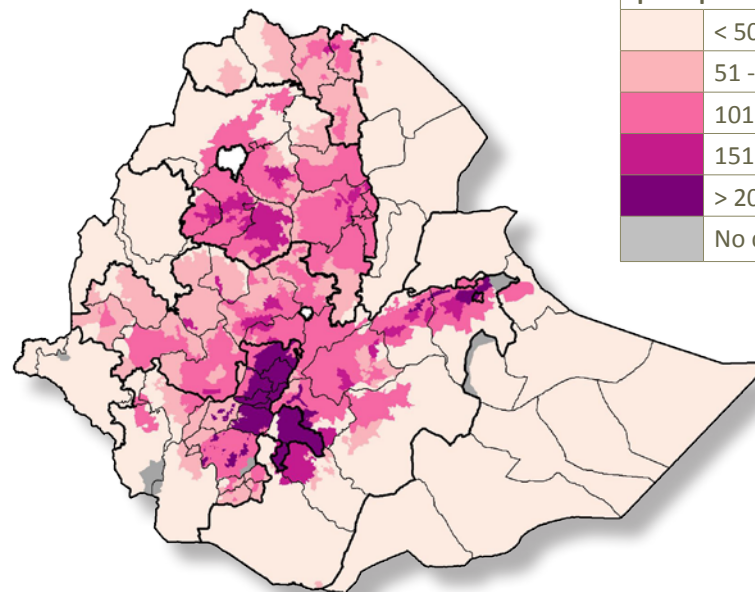
Population Density

Rural population density is related to the use people make of the land for primary production. The great majority of the country's rural population inhabits the highlands and middle-highlands, which comprise less than one-third of the inhabited surface area. At the extreme, in some parts of SNNPR densities rise well above 300 people per square km. The lowest density areas, down to under 10 people per square km, are mainly those with pastoralist economies. The limiting factor here is the carrying capacity of the rangelands for livestock – and in turn how many people can live off that livestock. There is also very low population density in the remaining areas of original rain forest in north-west SNNPR and western Oromia, where the indigenous population practices shifting cultivation and also depends heavily on honey production and gathering forest products. Then there are the extensive lowlands of north-west Amhara and west Tigray, relatively recently exploited by settled cultivators and still with a relatively low population density, but hosting the country's major sesame growing industry. Taking all these lower-lying areas together, some 66% of Ethiopia's inhabited land area holds just 17% of the country's rural population.

Source of data: National Population Census 2007

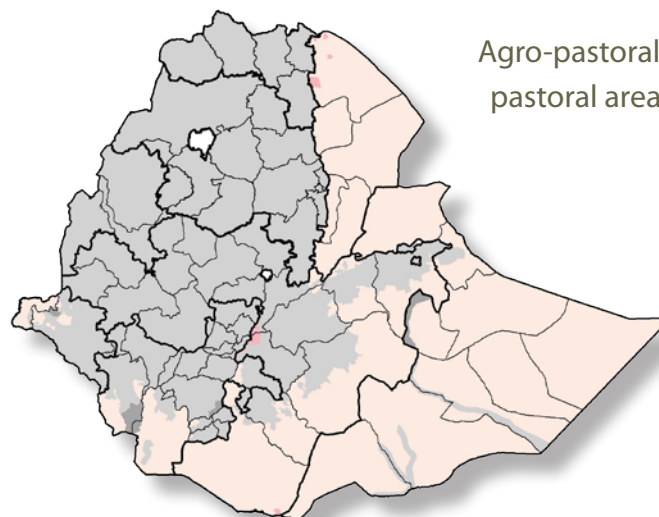
Population Density

Number of people per square kilometer	
< 50	
51 - 100	
101 - 150	
151 - 200	
> 200	
No data	

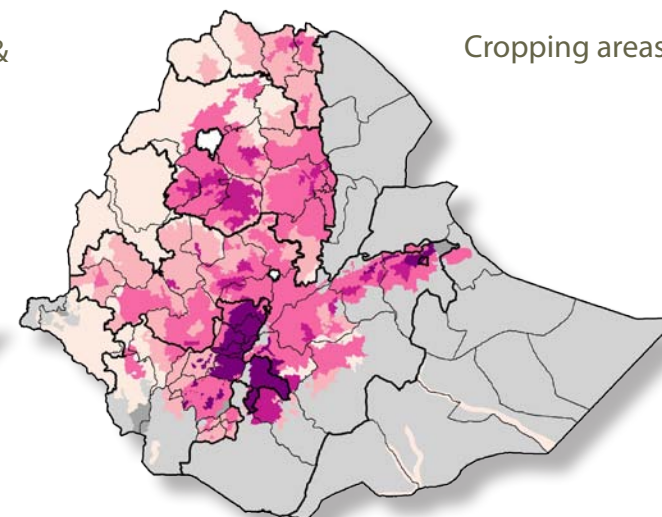


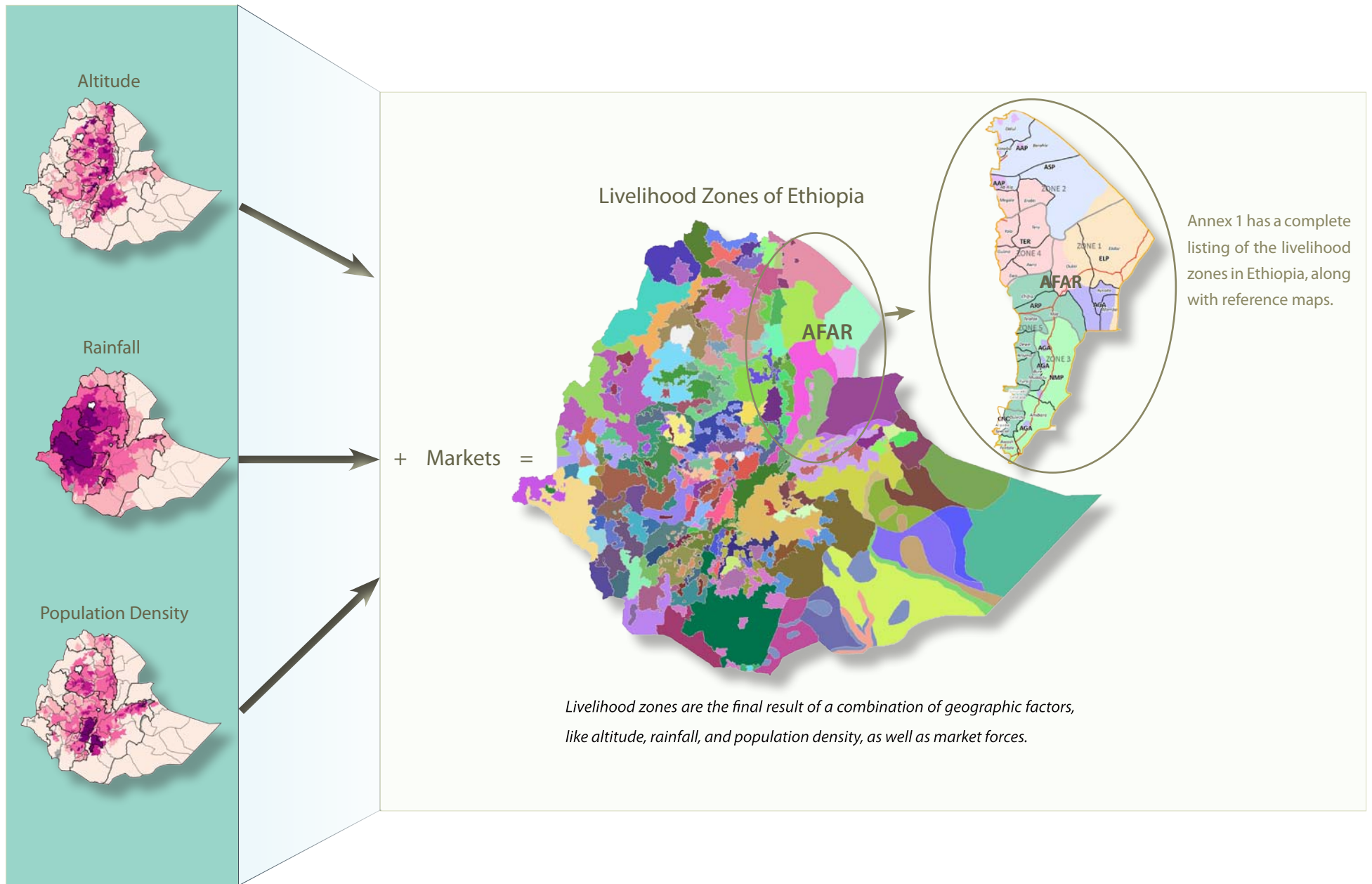
Population density
determines the degree to which available resources must be shared. This is reflected in the relative wealth of an area.

Agro-pastoral & pastoral areas



Cropping areas





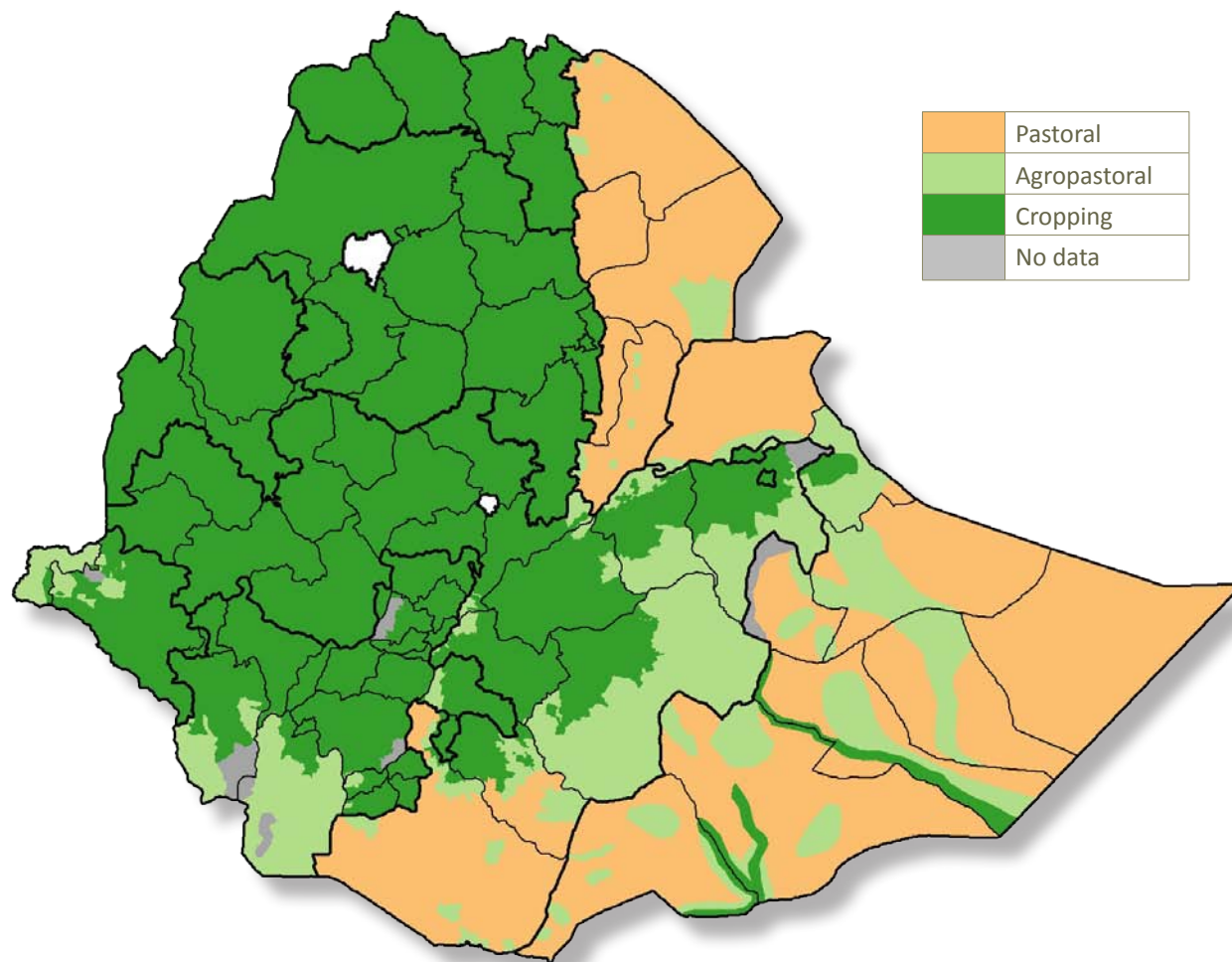
Where do people live?

Livelihood zones of Ethiopia

The map on Page 7 serves to show how much of a complex mosaic the different livelihood zones make. The mountainous or hilly nature of more than half of this big country tends to multiply the variety of areas in terms of production conditions, and influences the network of roads and markets. If we add the major north-south and east-west differences in rainfall, then the picture becomes still more divided, even without seeking to represent localized detail. By the same token, the great plains of the pastoral rangelands offer a less divided picture; yet there are sufficient, major local differences to warrant, for instance, 8 livelihood zones in Afar Region and 17 in Somali Region. This has to do chiefly with the relative availability and quality of pastures and watering points, and in some cases factors such as extreme isolation from markets, or the presence of a salt-mining industry. The agropastoral areas on the foothills or along rivers add to the mosaic.

Despite the complexity, we can gain a broad perspective by simply looking at the division between pastoral, agropastoral and cropping livelihood zones, shown in the map to the right, which clusters zones into these three basic categories.

Livelihood Zone Types



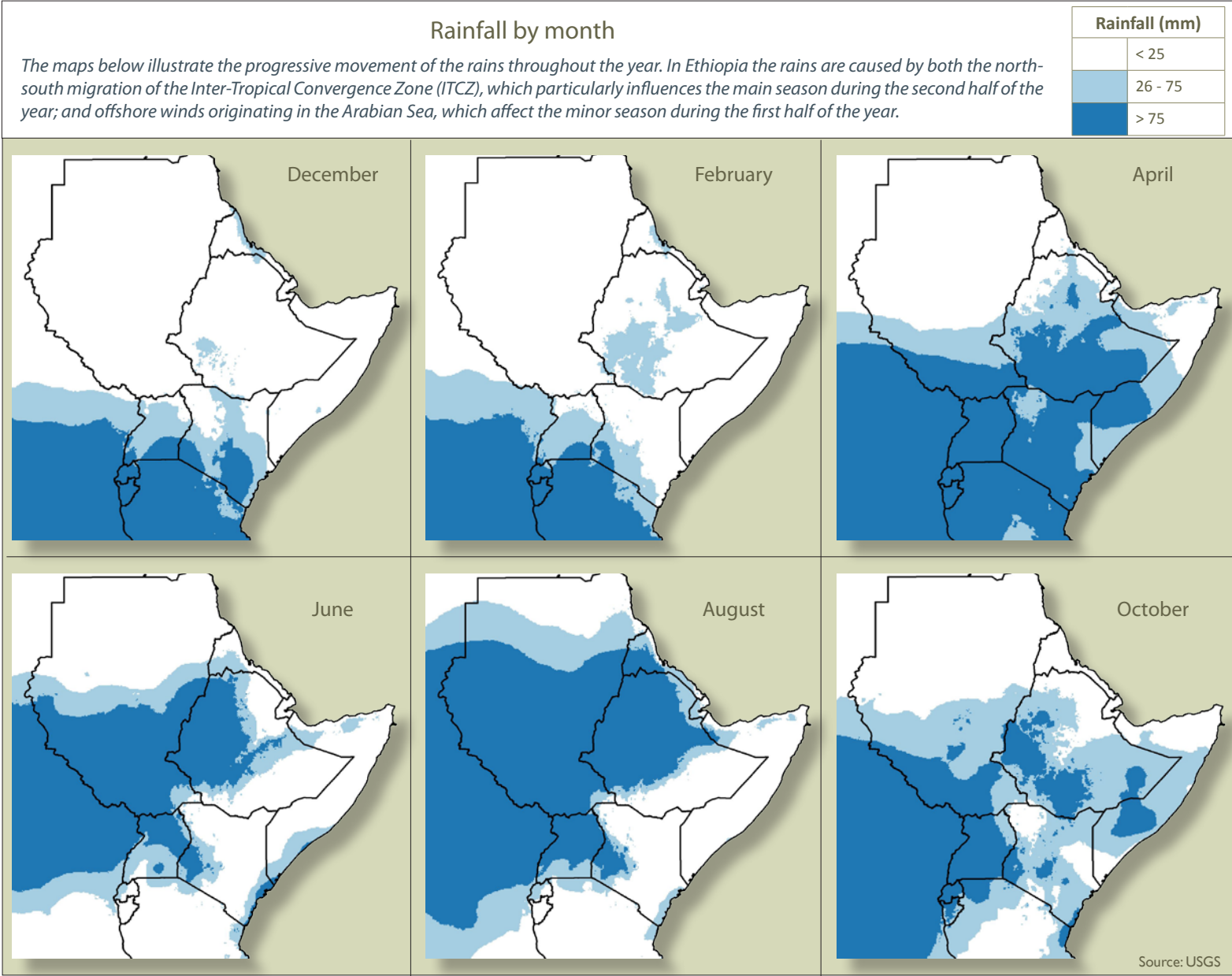


Seasonality and Livelihoods

Rural households in Ethiopia are deeply linked to the cycles of seasonal change. The onset of the rains, the peak of the rains, the end of the rains - each signals a new set of activities, and each translates into varied degrees of reliance on different food and income sources. Annual patterns of livelihood are an amalgamation of these seasonal variations. Ethiopia is particularly complex when it comes to seasonal variability. The following chapter helps untangle this complexity. We learn what forces create the distinct rainfall patterns in Ethiopia, and how these rainfall patterns translate into seasonal production patterns. We find out when the hunger seasons occur and where; and we investigate why it is that seasonal paid labor is so critical for poor households when it comes to making it through the hunger season. Finally, new light is shed on the most appropriate time to conduct seasonal assessments in Ethiopia, and just how much lead time is required in different livelihood zones for a timely response.

Can someone please explain the rains in Ethiopia?

Note: All rainfall maps in this chapter are based upon an analysis of satellite-derived estimates of long-term mean rainfall (Source of data: USGS) The analysis of the data was conducted by Mark Lawrence of FEG



Some basic meteorology

Kremt (June-October)

These are the main season rains for all except the south-east of the country. They are caused by warm wet south-westerly winds from mainland Africa blowing into the Inter-Tropical Convergence Zone (ITCZ)¹. The ITCZ moves progressively north across Africa between December and August, before retreating south again in the second half of the year. The seasonal movement of the ITCZ can be seen most clearly by comparing the December and August maps. In December the ITCZ (roughly indicated by the 75 mm rainfall line) lies to the south of the Ethiopian border. By August it has reached into northern Sudan and Eritrea.

¹ The heat of the northern hemisphere summer creates a belt of low pressure across Africa that draws in winds from both the north (the north-east trade winds) and the south (the south-east and south-west trade winds). The two sets of winds converge in the Inter-Tropical Convergence Zone (ITCZ), creating an up-thrust of air and causing heavy rainfall as the moist air from the south rises, cools and condenses to form rain.

The north-easterly movement of the ICTZ across Ethiopia means that the *kremt* season is longest in the south-west of the country and shortest in the north-east.

Belg (Mar-May)

The *belg* rains result from a weather system that develops to the north of the ITCZ between

January and May.

These rains are associated with offshore winds originating in the Arabian Sea. *Belg* rainfall peaks in April. The map for April clearly shows the *belg* rains falling on the north-east and Harerge Highlands.

Rainfall in January and February (which can be thought of as

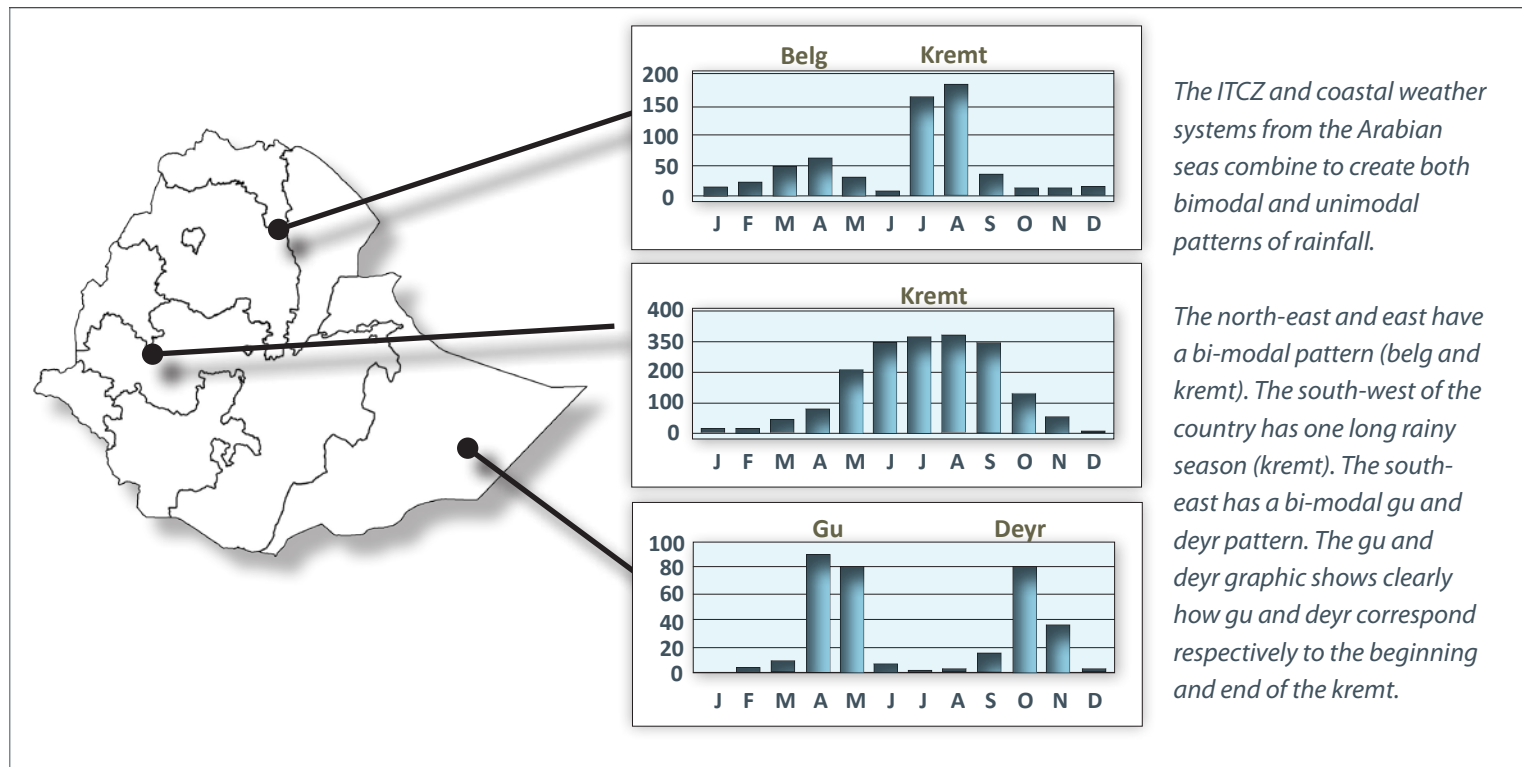
early *belg* rainfall) is important in certain parts of the country. Coastal rains in these months are important for pastoral areas bordering northern Somalia, Djibouti and Eritrea (*heys* rains in Somali, *dadac* in Afar). In SNNPR rainfall in January-February (the *sapia* rains) is important for

the successful cultivation of *belg* season sweet potatoes – a key hunger season crop.

Gu (April-May) & *Deyr* (October-November)²

These are the main season rains for the pastoral areas in the south and south-east of the country.

In terms of weather system they can be thought of as early and late *kremt* rains respectively.



The ITCZ and coastal weather systems from the Arabian seas combine to create both bimodal and unimodal patterns of rainfall.

The north-east and east have a bi-modal pattern (belg and kremt). The south-west of the country has one long rainy season (kremt). The south-east has a bi-modal gu and deyr pattern. The gu and deyr graphic shows clearly how gu and deyr correspond respectively to the beginning and end of the kremt.

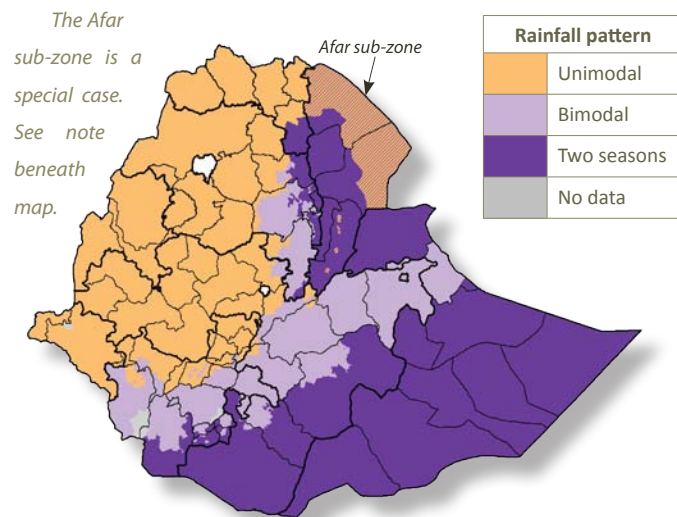
The *gu* rains start as the ITCZ passes over southern Ethiopia, and are brought to an end by relatively dry winds blowing north-east along the African coast from May onwards (see map for June, which shows a 'corridor' of dryness along the coast)³. The southward movement of the

ITCZ in the second half of the year brings renewed rainfall (*deyr* rains) between October and November.

² Amharic and Somali names are used to describe the seasons in this graphic. The Afar and Oromifa names are given in the text box on page 15.

³ These winds are associated with low pressure over Asia created by the heat of the northern hemisphere summer. They blow from May-September.

How do rainfall patterns translate into seasonal production patterns?



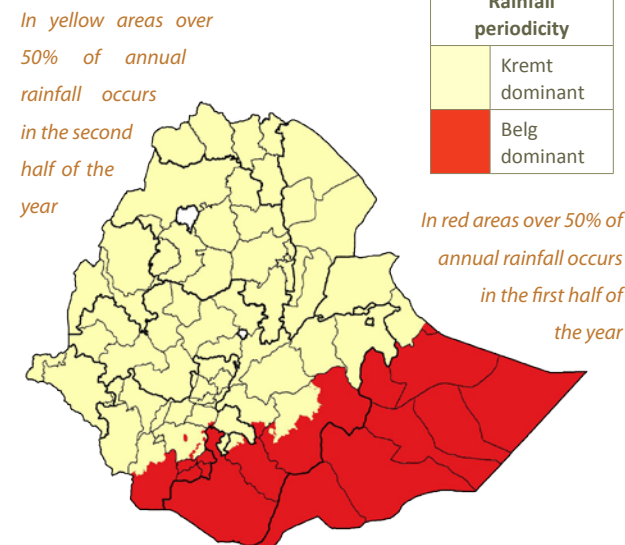
Notes: Bimodal means there has to be a drop of $\geq 20\%$ in rainfall between the two peaks and no dekads with < 15 mm rain between the peaks. Two separate seasons means there are one or more dekads with < 15 mm rain between the seasons. For this analysis a rainy season is defined as starting with the first 10 day period (dekad) that has more than 15 mm rain. Or, in the case of northern Afar, the first dekad with more than 5 mm rain. Northern Afar is something of a special case; there is on average very little rain during the second (**belg**) season. However, the rain that does fall is very important for the area's pastoral population. (see page 60)

The map to the left illustrates the three main rainfall patterns found in Ethiopia.

Unimodal areas, with one distinct rainy season and one peak, are found in the north and west. Areas with **two distinct rainy seasons** are found in the south and in north-eastern parts of the country. **Bimodal** areas, which have one continuous season of rain, but with two peaks, are found in a transitional band between the two systems.

The map to the right shows when the majority of rains fall.

The red areas are those in which the majority of rain falls in the first half of the year, commonly referred to as **belg** areas. The yellow areas are those in which the majority of rain falls in the second half of the year, known as **meher** or **kremt**-dependent areas.



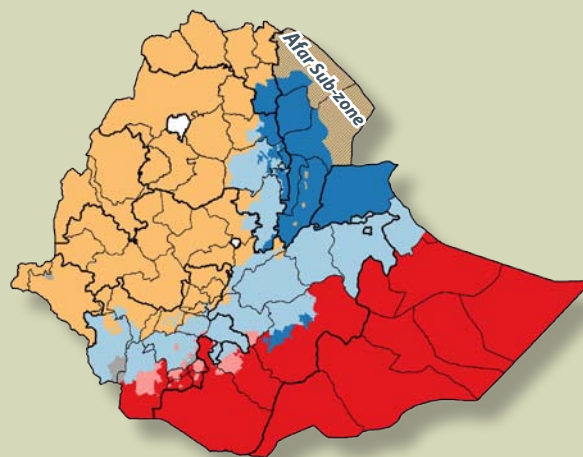
Note: **Kremt** dominant: means 50% or more of total annual rainfall occurs in the second half of the year (i.e. from 20 June – 19 December). **Belg** dominant means 50% or more of total annual rainfall occurs in the first half of the year (i.e. from 20 December-19 June).

The specific patterns and periodicity of rainfall shown in the maps above combine to form four main (and one very minor) seasonal production patterns in Ethiopia:

1) **Unimodal:** Areas with one significant rainy season, with one peak in rainfall

2) **Kremt dominant – bimodal:** These areas have one rainy season, but within this season there are two

Seasonal production pattern	
Light blue	Kremt dominant - bimodal
Dark blue	Kremt dominant - 2 seasons
Pink	Belg dominant - bimodal
Red	Belg dominant - 2 seasons
Orange	Unimodal
Grey	No data



peaks in rainfall. The first half of the season is known as **belg**, the second half as **kremt**.

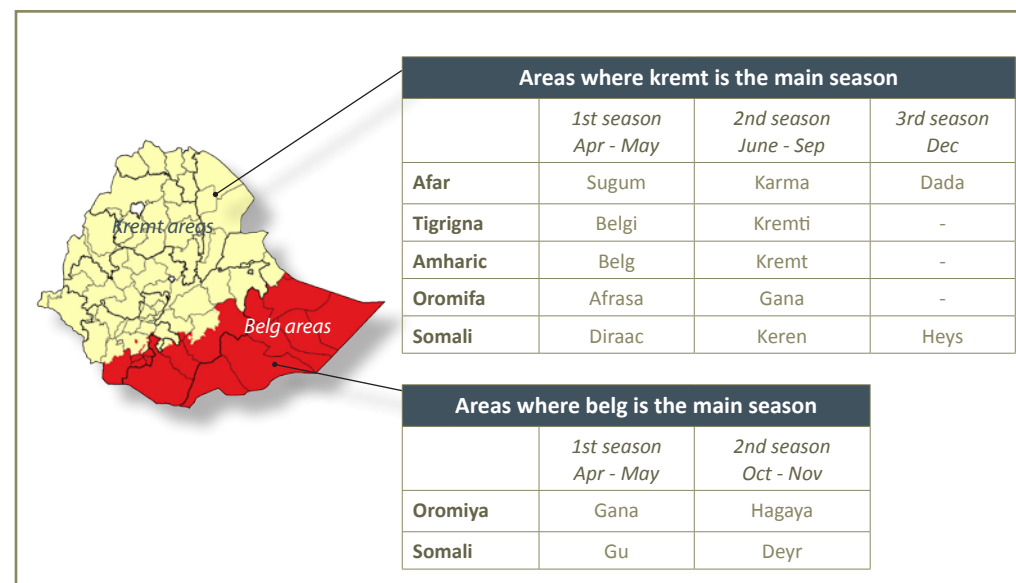
3) **Kremt dominant – two seasons:** These areas have two distinct rainy seasons separated by a dry season of varying duration. More rain falls in the **kremt** than the **belg**.

4) **Belg dominant – two seasons:** These areas have two seasons, of which **belg** is the most important. This includes most of the pastoral areas in the south-east of the country.

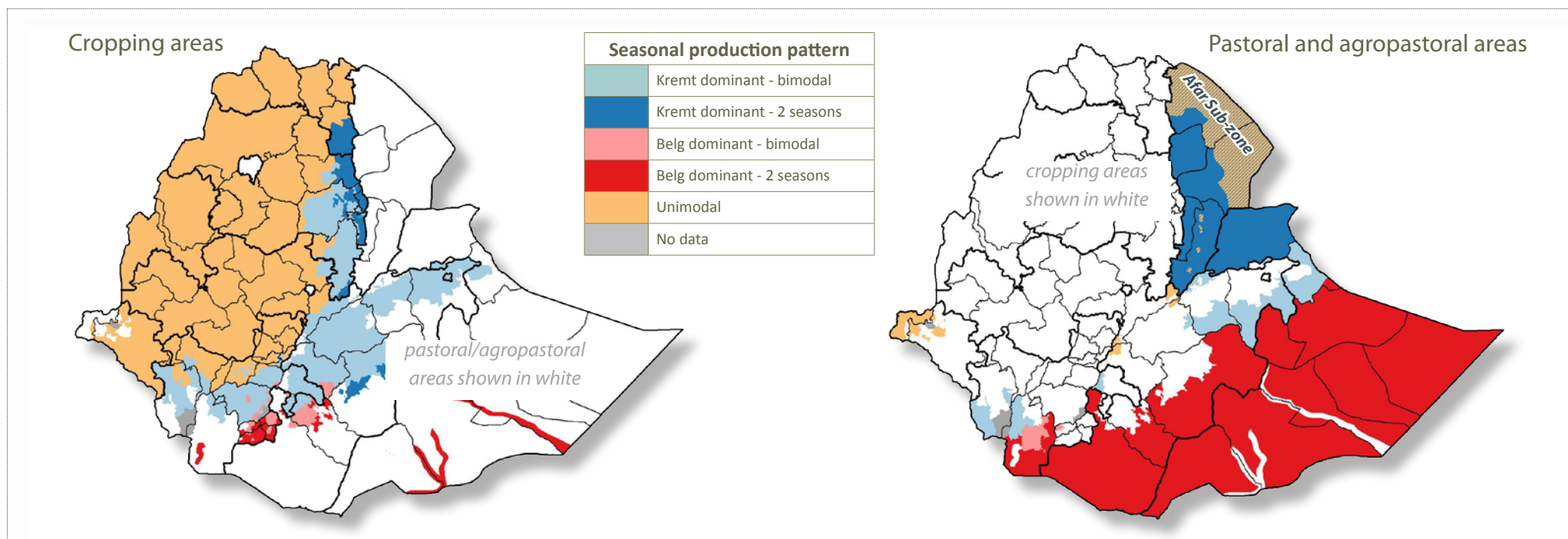
There is a 5th pattern (**belg** dominant, bimodal), but this is found in only limited areas in southern Oromiya and southern SNNPR.

Naming the seasons

Almost all the cropping areas of the country receive more rain in the *kremt* than the *belg* season. In contrast, *belg* rainfall dominates in the southern pastoral and agropastoral lowlands. Further east, the *kremt* rains become dominant as one approaches the foothills of the Hararge Highlands, and it is at this point that Somali speakers begin to talk about the *keren* (*kremt*) rains as the most important rather than the *gu* (*belg*) rains further south. The *kremt* dominant pattern extends into Afar, where the main rains are known as *karma* and the secondary rains as *sugum*. Somewhat confusingly, in Oromifa, the word *gana* is used for the *kremt* rains in the north and for the *belg* rains in the south.



Note: In Amharic, **kremt** is the name give to the rains that fall from Jun-Sep, but **meher** is the name given to the harvest (Oct- Dec).



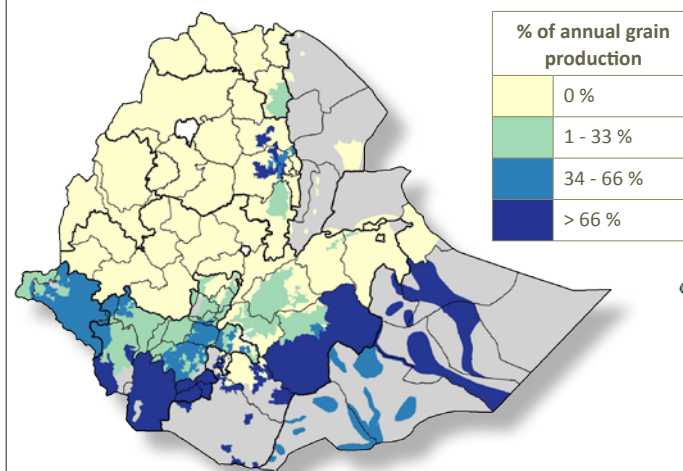
What does it mean when the 'belg' rains fail?

Southern and eastern Ethiopia depend on *belg* rains

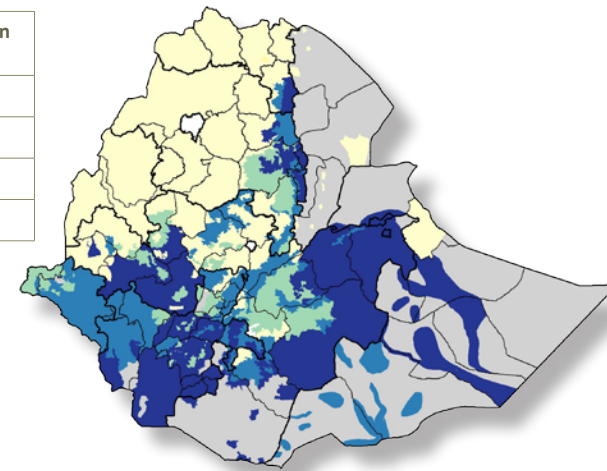
The *belg* rains are notoriously unreliable. Their late arrival or failure typically generates a flurry of activity among early warning analysts and humanitarian agency planning staff, who want to know what the consequences will be on the ground. These next maps aim to speed up that process.

The importance of *belg* rains for grain production fairly closely follows the pattern of rainfall. Not surprisingly, a large percentage of total production is harvested in the *belg* in those areas with two separate seasons, and where more rain falls in *belg* than *kremt* (the dark red areas in the 'rainfall patterns' map). In those areas with a bimodal rainfall pattern, but more rain in *kremt* (light blue on the 'rainfall patterns' map), advantage is taken of the *belg* rains to plant higher yielding long cycle crops that will mature during the *kremt* season. In those areas with a single rainy season (orange on the 'rainfall patterns' map), the timing of planting of long-cycle crops is earlier in the south than the north (since the rains start later in the north). In the north, therefore, there is no planting during the *belg* (i.e. between February and April). Further south, there is some planting of long cycle crops before May, in line with the earlier start to the main *kremt* rains in these areas.

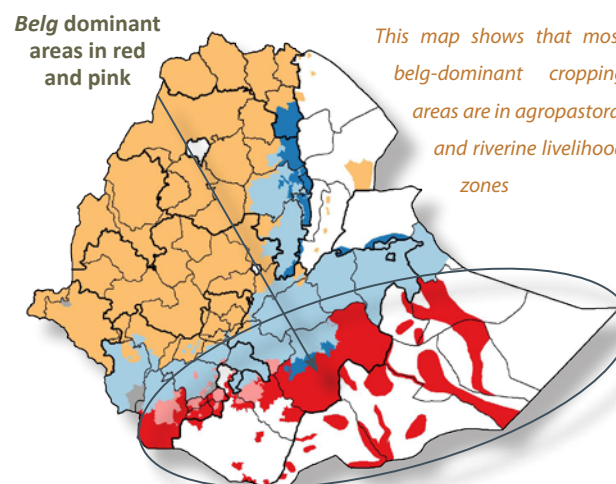
Percent of grain production **harvested** in *belg*



Percent of grain production **planted** in *belg*



Rainfall patterns: cropping & agropastoral areas



Notes: Legend for this map is found on page 15. This map is different from the cropping area rainfall pattern map found there in that it includes agropastoral areas as well as traditional cropping areas.

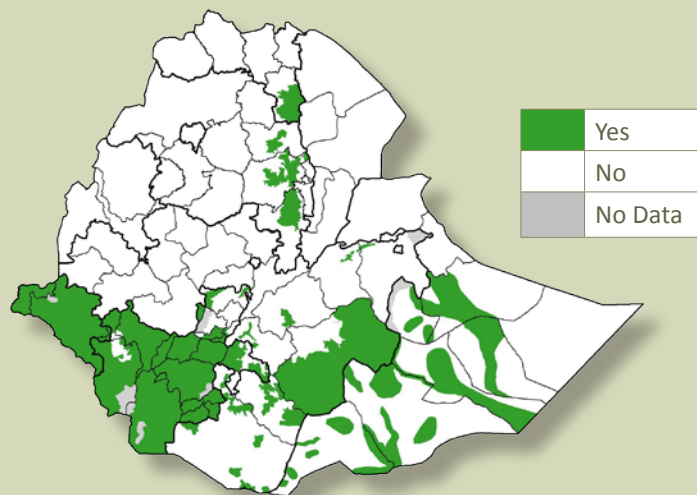
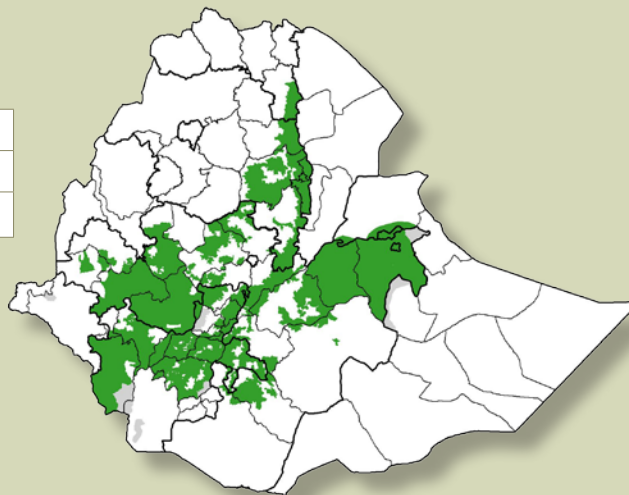
Notes: 'Grain' production means total production of cereals and pulses. Oilseeds, roots, tubers and perennial crops (e.g. enset) are excluded.

Crops were classified as follows for the **harvest** analysis:

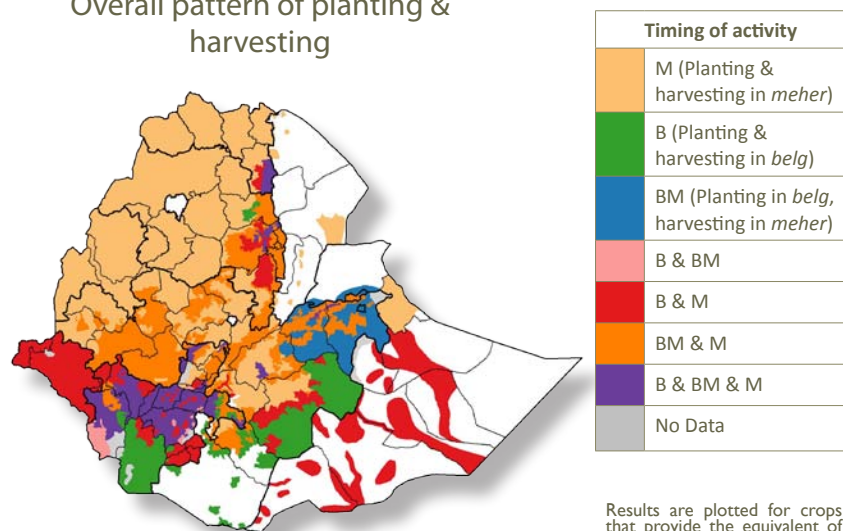
1) Crops harvested between February and August were categorised as **belg crops**. 2) Crops harvested from September to January were classified as **meher crops**. 3) Green maize (especially important in SNNPR) has been analysed separately from dry maize (e.g. maize harvested green in August is counted as a belg crop, maize harvested dry in October is treated as a meher crop).

Crops were classified as follows for the **planting** analysis:

1) In general, crops harvested in **belg** are planted between February and April, while crops harvested in **meher** are planted between June & September (and rarely in May). April was taken as the cut-off for defining a crop as planted in the **belg**.

Planting & harvesting in *belg*

Planting in *belg* & harvesting in *meher*

Planting & harvesting in *meher*


Overall pattern of planting & harvesting



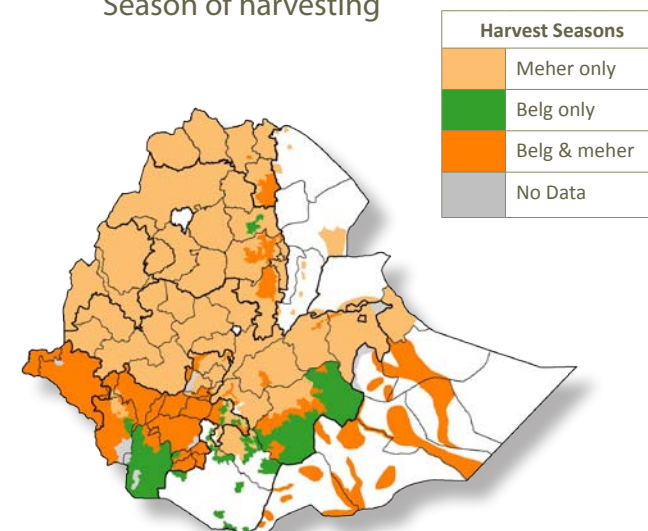
Results are plotted for crops that provide the equivalent of ≥ 1 months food consumption (calculated on the basis of total income, food+cash).

Seasonal patterns of crop production are very complicated. Individual crops can be classified in one of three ways:

1. planted and harvested in *meher*;
2. planted and harvested in *belg*;
3. planted in *belg* and harvested in *meher*. (See maps above.)

Farmers in a single livelihood zone may grow crops from one, two or all of these categories, giving rise to six possible seasonal patterns of production, each of which is represented somewhere in the country (left-hand map). The greatest seasonal complexity is found in the south and the east of the country. This parallels the complexity of rainfall patterns in these areas.

Season of harvesting



Note: Months of harvest for *belg* are Feb-Aug; and for *meher* are Sep-Jan

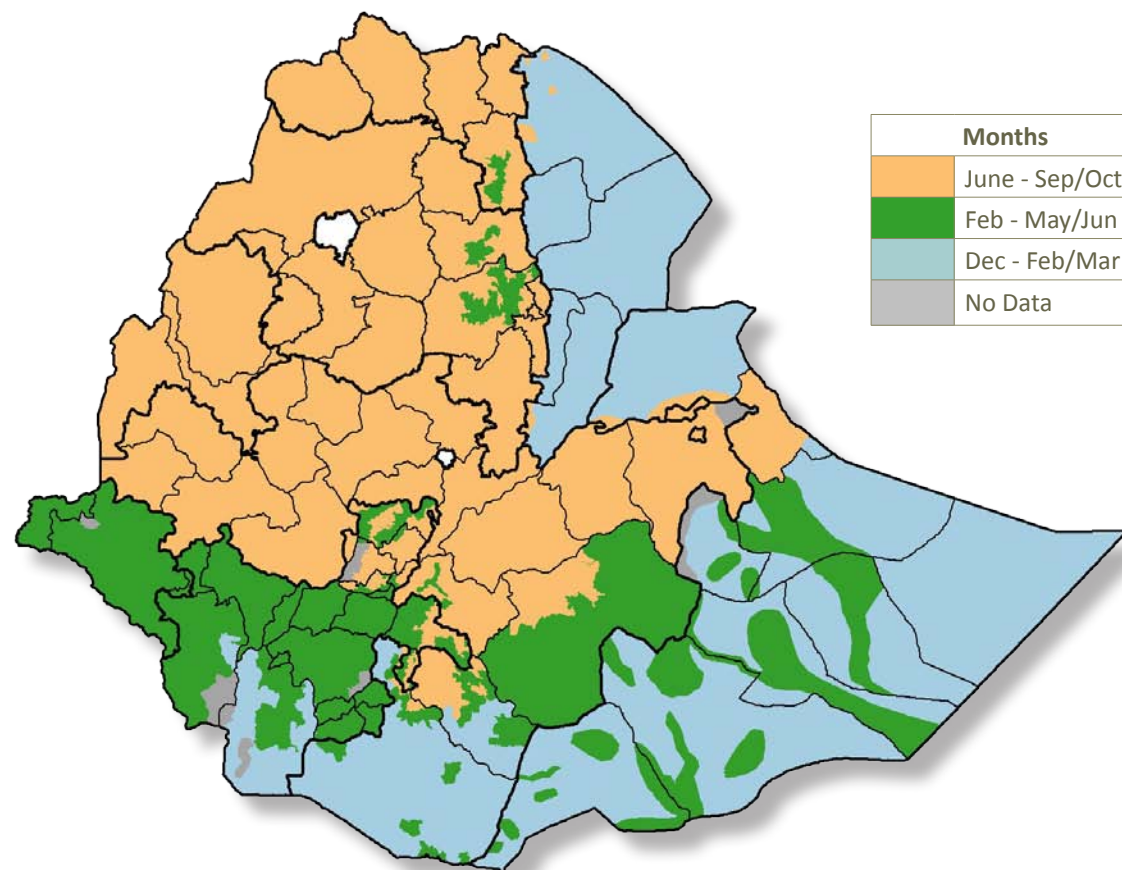
Do all people have the same hunger season?

Broadly speaking there are three seasonal patterns of hunger in the country. For the cropping areas of the country, seasonal hunger is a pre-harvest phenomenon. Where *meher* production dominates (the north, center and east of the country), the main hunger season is typically from June-September/October.

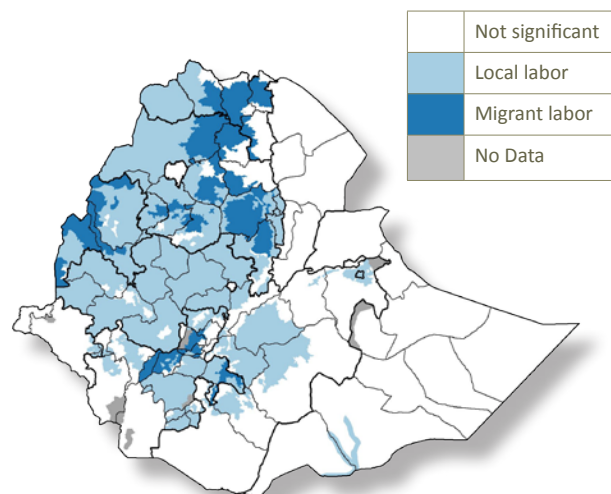
In the *belg*-producing areas (mainly in the south), the main hunger season occurs earlier in the year, from February-May/June. This is true even for areas that have less *belg* than *meher* production. This is because *belg* production is usually sufficient to cover the 3-4 month interval between the *belg* and *meher* harvests.

The seasonal pattern of hunger is similar for all pastoral livelihood zones. Here, the main hunger season, from December-February/March, is brought to an end by the arrival of the *belg* rains in March and April. This is because livestock generally give birth twice a year in pastoral areas, at the beginning of the *kremt* and again at the beginning of the *belg* rains. The increase in milk supply and improved condition (and price) of animals at the start of the *belg* therefore signals the end of the main annual hunger season. This is true even for northern Afar, which receives the most irregular and unreliable *belg* rains.

The timing of the hunger seasons



Main types of paid labor during the hunger season



Where do problems emerge before a failed harvest?

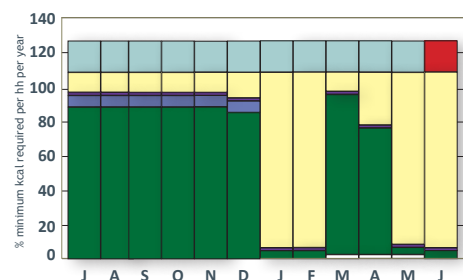
We usually think that problems develop after the harvest has failed and people start to run out of food. However, problems can also develop before the harvest in areas where the poor depend to a significant extent upon agricultural labor as a source of income during the hunger season. Rain failure can result in reductions in area cultivated and therefore reduced demand for laborers to cultivate land and to weed crops. Together with rising food prices, this loss of agricultural labor income can result in more severe seasonal hunger than normal, even before the harvest has actually failed. The map to the left shows the areas in which poor households earn significant

amounts of income from agricultural labor in the hunger season. For each livelihood zone, the most important type of labor (local or migrant) is also identified. The analysis below shows the increasingly severe deficit (in red) that results from

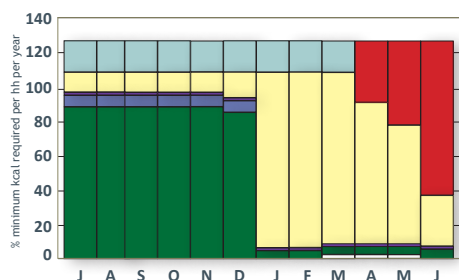
1. a failure of the *belg* season sweet potato crop (second graph from the left)
2. a failure of the *belg* sweet potato crop plus a reduction in *belg* season agricultural labor (third from left); and
3. finally, a doubling of maize prices in addition to the labor and crop problems (last graph on far right). This analysis helps explain why a failure of the *belg* rains can lead to rapid declines in nutritional status between January and June, which is what happened in SNNPR in 2008.

Seasonal Analysis Showing the Effects of Severe Belg Rain Failure on Poor Households in the Wolayita Maize & Root Crop Livelihood Zone in SNNPR

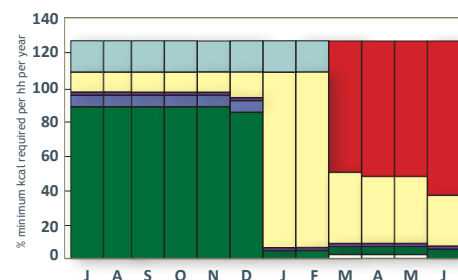
This graph illustrates seasonal consumption patterns in the reference year. The red in June shows that poor households can not cover livelihood protection costs.



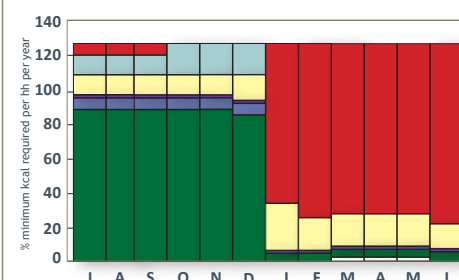
This graph shows the effects of a *belg* sweet potato failure. The livelihood protection deficit has expanded into a survival deficit in April, May and June.



In this graph we see the deficit caused by the combined effects of a *belg* season sweet potato failure and a reduction in *belg* season agricultural labor.



The compounded effects of a failure of the *belg* sweet potato crop, a reduction in *belg* season agricultural labor and a doubling of maize prices is seen here.



own milk own crops labor migration other food food purchase - survival deficit livelihoods protection

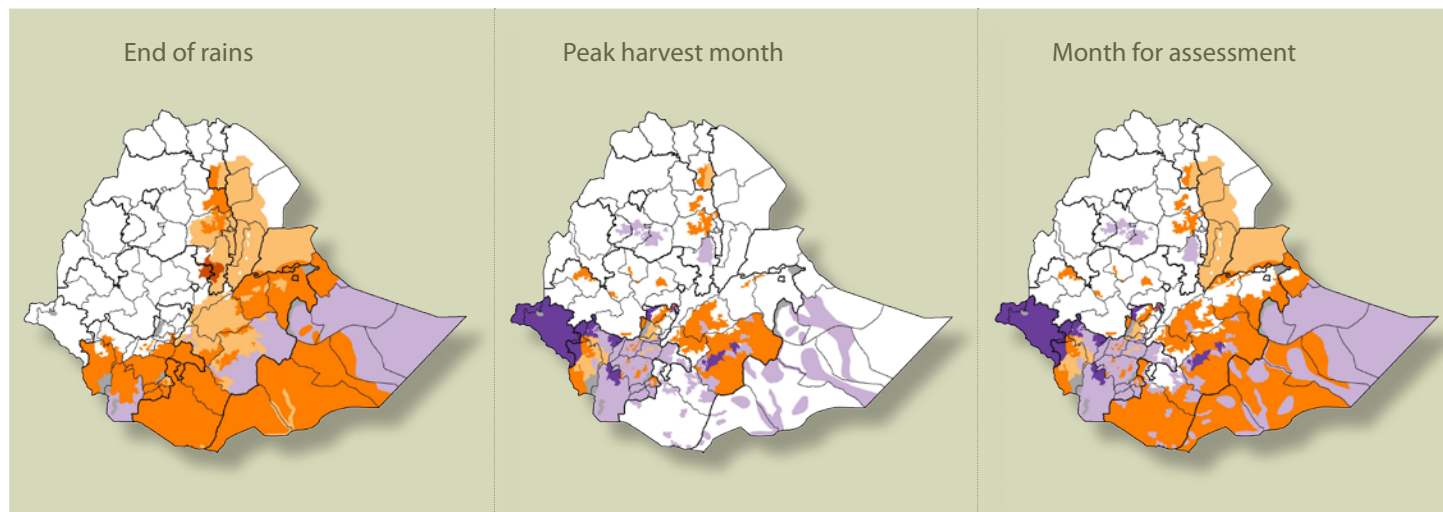
Note: The graphs show seasonal patterns of consumption, compared to two thresholds – the survival threshold and the livelihood protection threshold. Sources of food are shown by month (crops in green, purchase in yellow, etc.). Expenditure on livelihoods protection is shown in light blue.

When should seasonal assessments occur?

Seasonal assessments in Ethiopia are carried out twice a year: in June/July and in November. The June/July assessment checks on the status of the *belg* harvest; the November assessment evaluates the *meher* harvest. Based on the assumption that assessments should be carried out in cropping and agro-pastoral areas in the peak harvest month, and in pastoral areas towards the end of the month in which the rains end, the maps to the right provide a more refined seasonal assessment schedule. Note that it is assumed that a *belg* assessment is not required in cropping areas that receive *belg* rain but do not harvest *belg* crops (e.g. the highlands of Harerge).

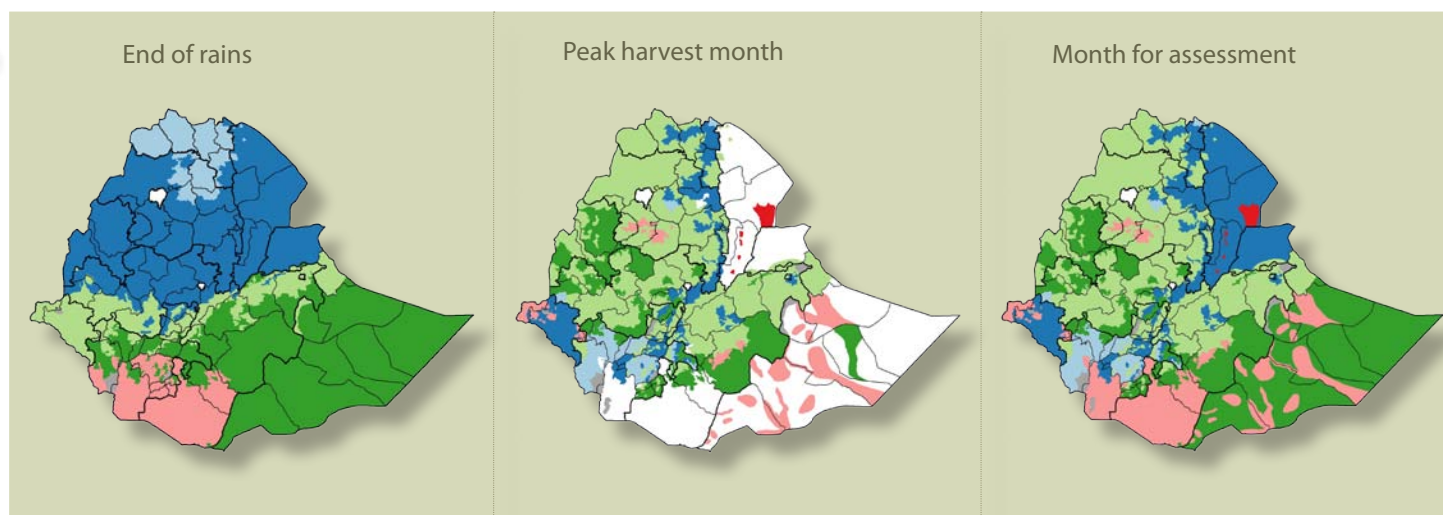
Belg Season

Month
None
April
May
June
July
August
No data



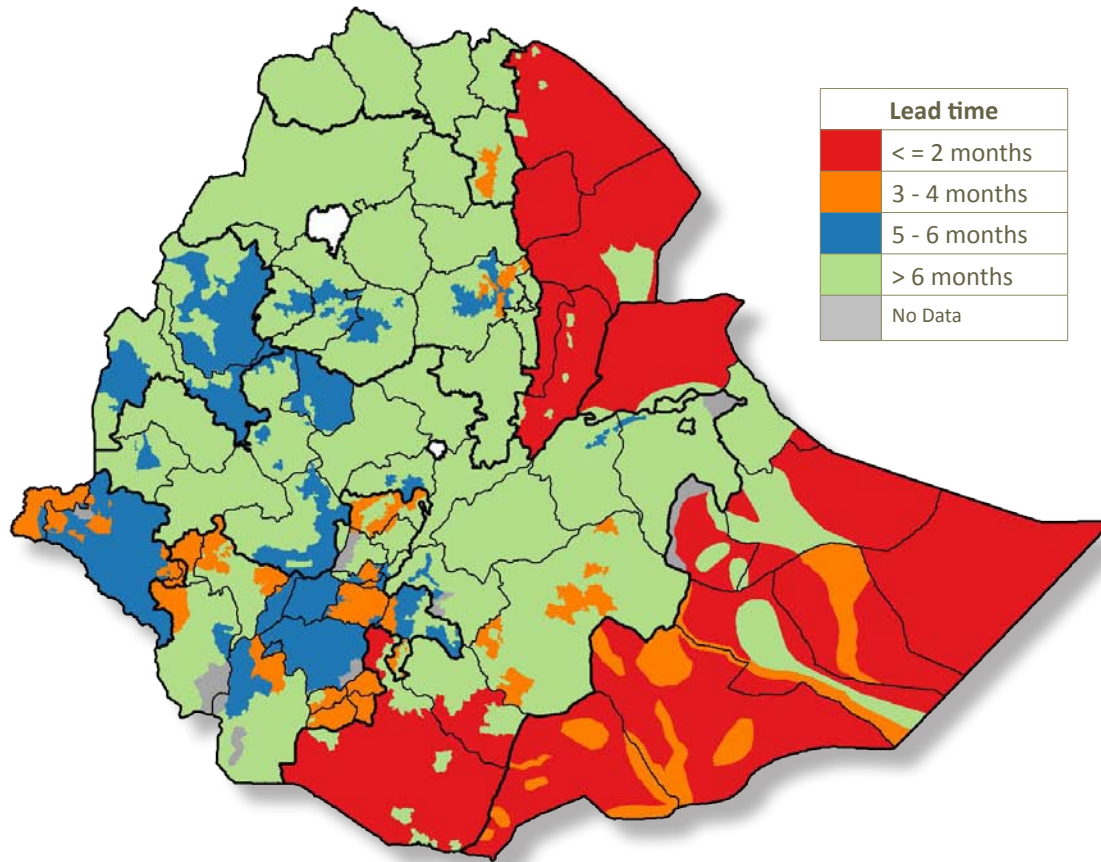
Kremt Season

Month
None
Sept
Oct
Nov
Dec
Jan
Feb
No data



Notes: 1) End of rains analysis. Result mapped is 'month in which 90% of seasonal rainfall has fallen in 11 (85%) of the last 13 years'. 2) Peak harvest month is the month in which the largest proportion of seasonal food crop production is harvested (food crops = cereals, pulses plus root crops). **Belg** crops are those harvested May-August. **Meher** crops are those harvested September to February.

Lead time between assessment and onset of the hunger season



Note: For pastoral areas, the lead-time is equal to the interval between the end of the rains preceding the hunger season and the start of the hunger season. For cropping and agropastoral areas, the lead time is the interval between the peak of the harvest preceding the hunger season and the start of the hunger season. An exception to this rule is when the harvest preceding the hunger season is minor (i.e. it provided less than 2 months of food consumption in the reference year), in which case this harvest was excluded from the calculation.

Lead time for response

The longest lead times between assessment and the start of the hunger season are observed in areas that harvest once a year, generally in *meher* areas. The typical picture in these areas is for the harvest to be gathered in November and for the hunger season to start the following June (giving a lead-time of 7 months). Shorter lead-times are observed where the harvest is gathered later (e.g. parts of western Oromia and Benishangul) or where there are two harvests in the year (e.g. much of SNNPR and agropastoral areas of southern Somali Region). The shortest lead times are found for pastoral areas in Afar, Somali and southern Oromia Regions. The main reason for the longer lead times in cropping areas is that crops can be stored and consumed for several months after harvest. In pastoral areas the opportunities for storing seasonal production (milk) are limited and the hunger season therefore typically starts soon after the rains stop and animals lose condition. The only way to increase the lead time for pastoral areas is to undertake the assessment earlier in the season, before the outcome of the rains can be known for certain.

Note that lead times for cropping areas will be shorter in years of crop failure.



Crop Production and Livelihoods

The vast majority of Ethiopia's rural population live as smallholders in cropping areas. Insofar as their land and their market connections allow, farmers cultivate not only to eat but to sell - however little - because today, cash is essential to agricultural livelihoods. Therefore, in this section we look at both the food crops and the cash crops grown and their relative importance to farmers around the cultivated areas. We show which crops are most important to food security in different areas. And finally we take a look at how households grow what they grow. Given that oxen are critical for crop production in all parts of the country, we investigate the issue of whether there is an absolute shortage of oxen, and how poorer households cope with their lack of oxen.

What do people grow for consumption?

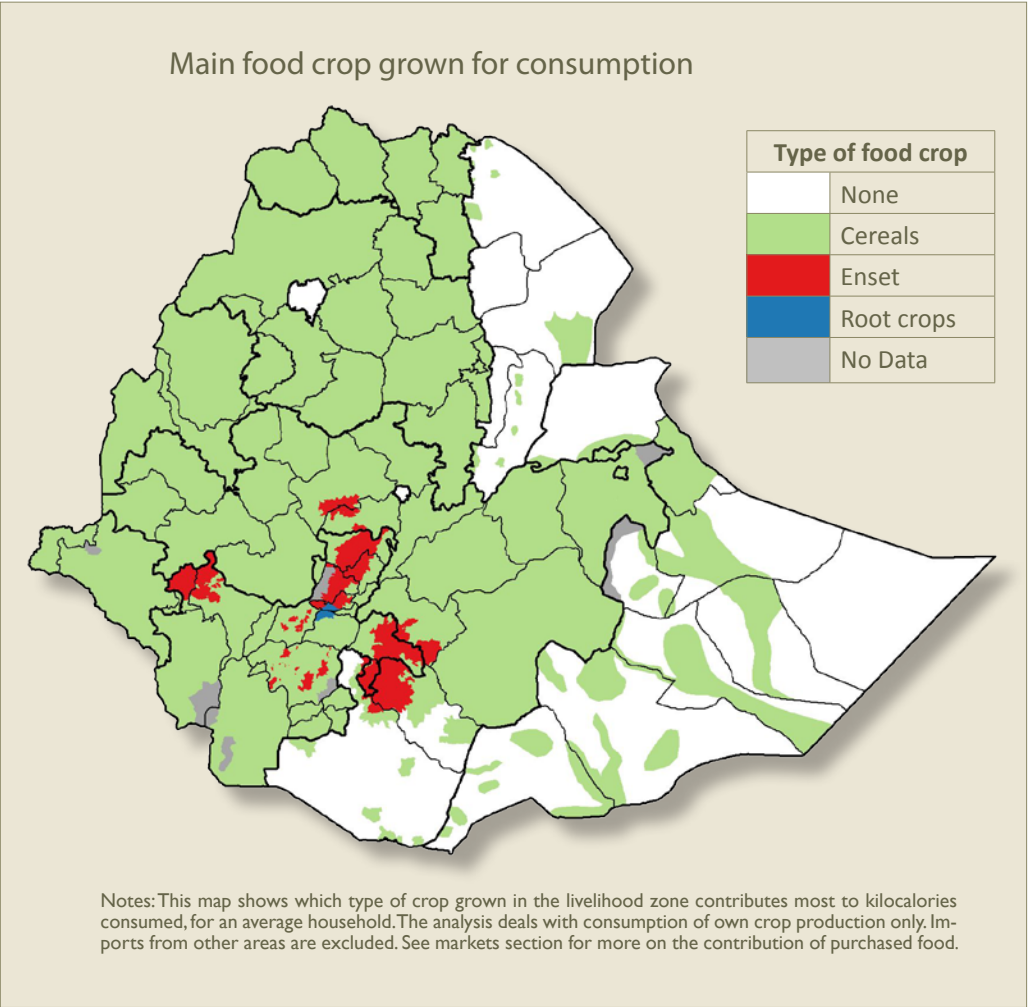
Cereals are primary

The left-hand map serves to show just how cereals-based Ethiopia is. Enset is the only substantial non-cereal main staple, and then

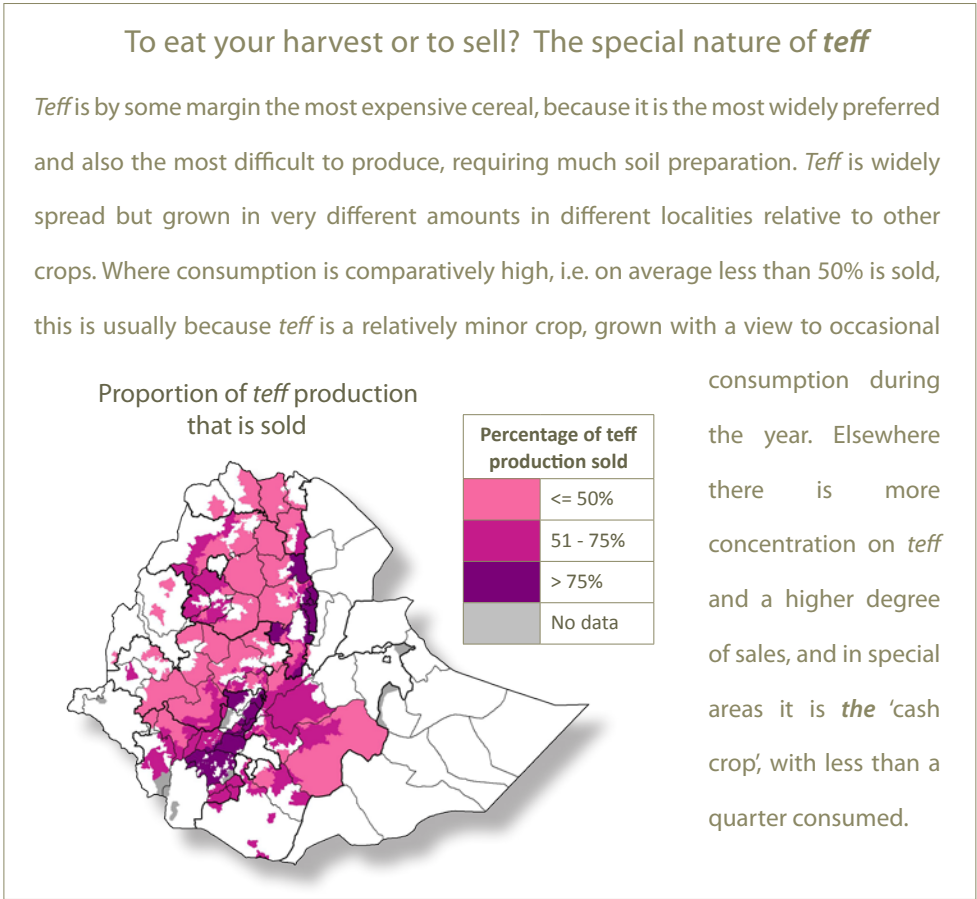
only in particular niches in SNNPR and Oromia Regions. Even here, cereals run enset a close second as a food source. On the other hand, enset is an important secondary staple in a wider area, and so are sweet potatoes. The right-hand map shows

of *teff* is relatively limited, with most *teff* sold in order to generate cash for purchase of cheaper cereals and other necessities.

Where herders grow no crops (white areas of the main map) it is still cereals - bought on the market - that are the basis of the diet, more than milk. (See *Diet* section for more on what people eat.)



- perhaps surprisingly - that rural consumption



What dominates people's economy?

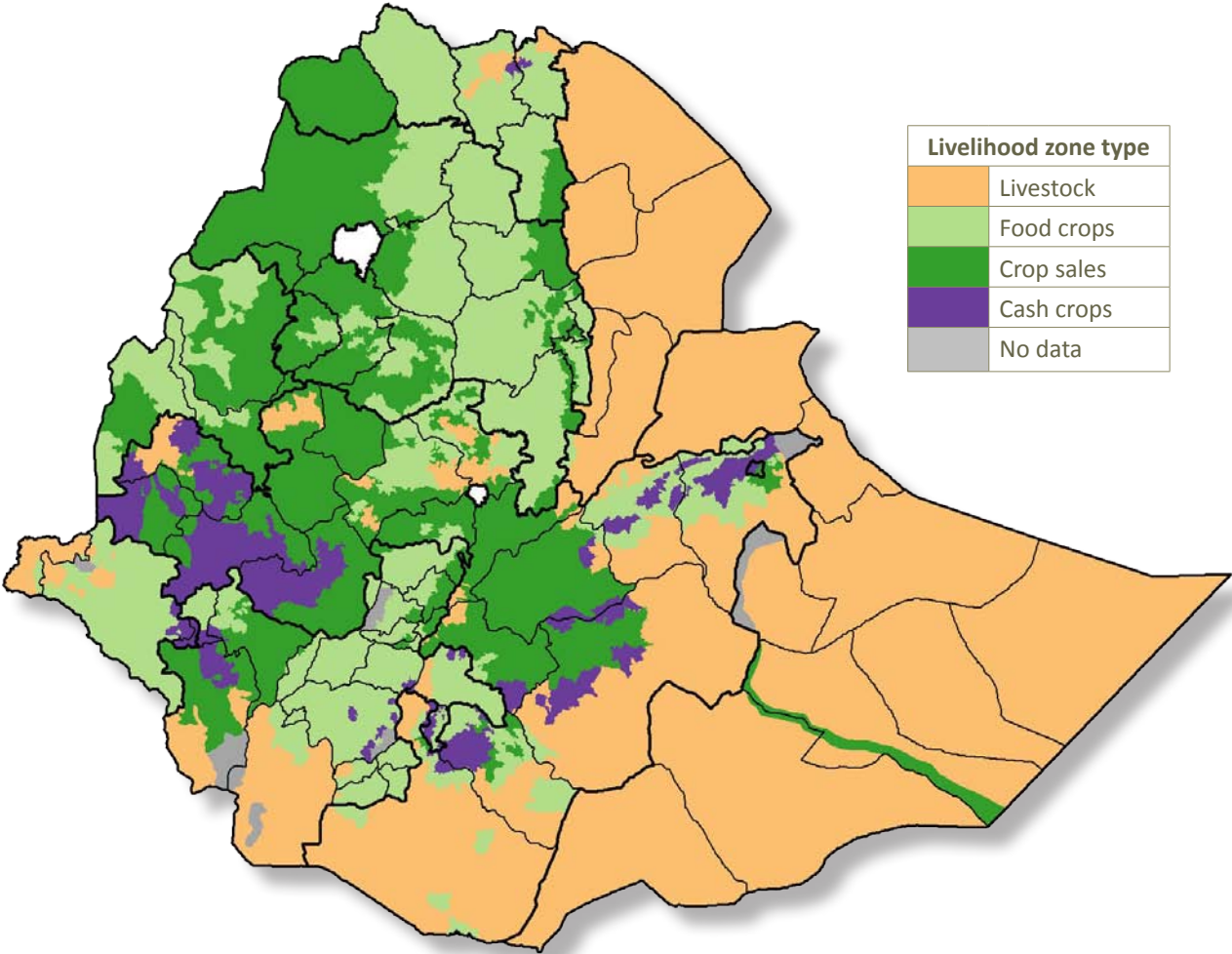
This map shows whether people grow crops mainly for consumption or for sale. It also shows where people rely more on livestock than on crops for their total income.

The table below shows that 42% of the rural population lives in livelihood zones that are food crop dominant, i.e. where more than 50% of food crops are consumed rather than sold.

Population by category of livelihood zone		
Dominance <i>(see note under map)</i>	population	% of total population
Livestock	7,772,750	13%
Cash crop	7,117,190	12%
Crop sales	20,278,855	34%
Food crop	25,302,326	42%
Total	60,471,112	100%

Livestock sales constitute more of the total household income on average than crop consumption and sales in all pastoral and agropastoral zones. Surprisingly, livestock sales dominate in some of the agricultural zones as well, whether because of poor crop production or market advantage. The big cash crops are coffee in the west and *chat* in the east, while chilies or ginger or other spices dominate in a few niche areas.

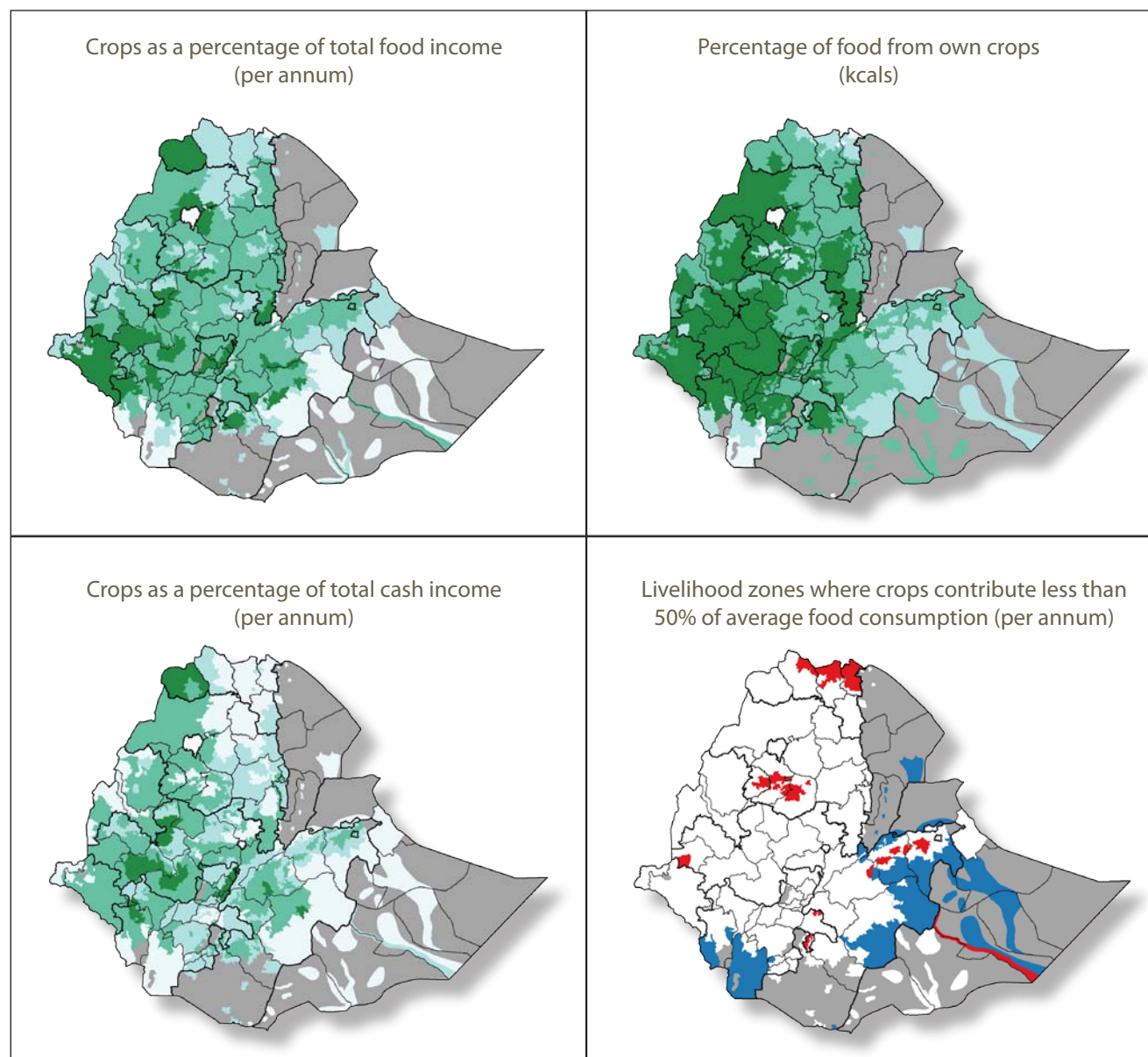
Most dominant type of production
(by livelihood zone)



Livelihood zone type	
Orange	Livestock
Light green	Food crops
Dark green	Crop sales
Purple	Cash crops
Grey	No data

Notes: *Livestock dominant* means that the total income from livestock (food+cash) is greater than the total income from crops. In the remaining categories total income (food+cash) from crops is greater than from livestock. *Cash crop dominant* means that cash income from cash crops is greater than 50% of total crop income (food+cash). *Crop sales dominant* means that cash income from crop sales is greater than 50% of total crop income. *Food crop dominant* means that more than 50% of food crops is consumed rather than sold. The following crops are defined as cash crops for the purposes of this analysis (i.e. only the traditional cash crops): bananas, fruit, vegetables, chat, coffee, ginger, peppers, spices, and *gesho* (hops). Trees and cactus fruit are excluded from crops for this analysis (for the atlas they are classified as environmental products).

Dependence on crops for food and crops for cash



Legend for first three maps to the left

	≤ 25 %
	26 - 50 %
	51 - 75 %
	> 75 %
	No data/pastoral

This page looks at both the consumption and sale of crops. All maps present data for a weighted average of all households. The top left-hand map is a combination, showing the value of all food and cash

crops in relation to total household income (i.e. food and cash from all sources). The values are expressed in terms of calories from own crops plus calories available if the cash from crop sales *all* went to buy cereals. The top right-hand map shows the degree of self-sufficiency in food - high scores being mostly a western phenomenon.

Livelihood zone type

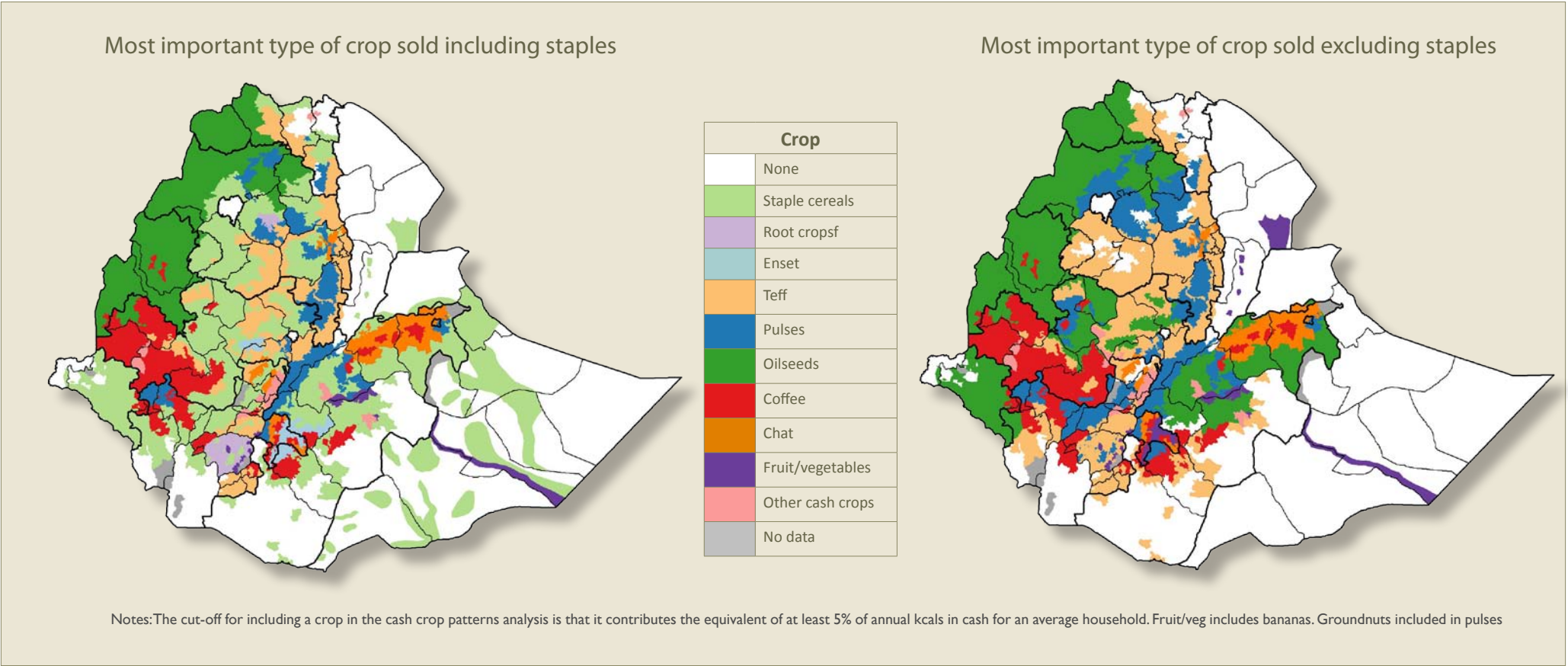
	Agro-pastoral
	Cropping
	No data/pastoral

The bottom left-hand map shows that north-east farmers and south-east agropastoralists earn very little

on average from crop sales, since they essentially grow cereals for home consumption. In the bottom right-hand map the northern two red areas (in Tigray and Amhara) indicate very low productivity; the other red areas (in Oromia and SNNPR) result from a very high concentration on cash crops.

What do people grow for sale?

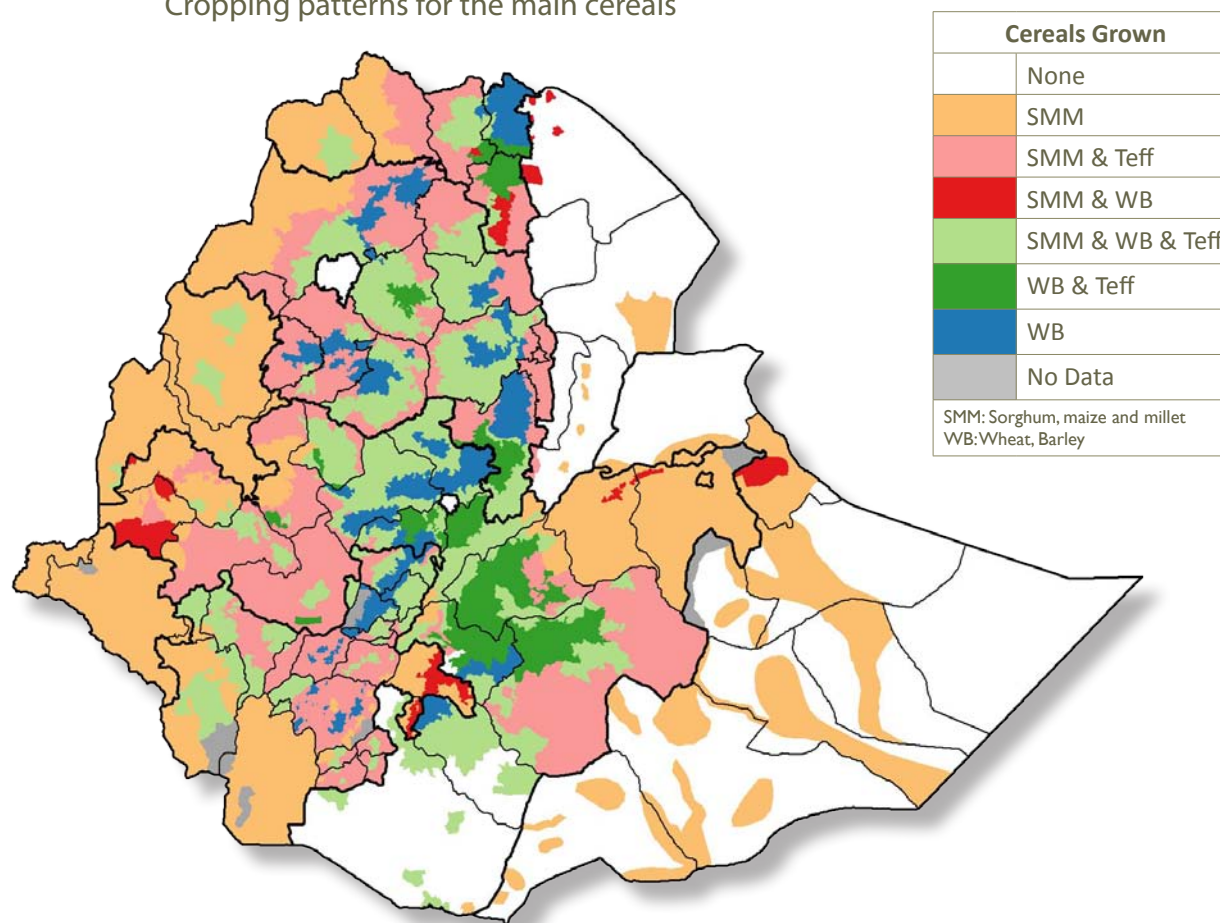
The map below on the left shows which areas generate the most cash income from staple cereal sales (i.e. all cereals except enset), and which areas rely upon cash income from other crops. Apart from staple cereals (excluding *teff*), the sesame industry in the far north-west stands out, as do the famous coffee areas of western Oromia, parts of SNNPR and Harerge, and *chat* again in Harerge. But the importance of *teff* all along the eastern edge of Amhara is striking, as is the prominence of pulses in the northern highlands as well as in the Rift Valley in Oromia, where the special crop is haricot beans. For households on average, areas that generate insignificant amounts of cash income from crops (i.e. cash equivalent to less than 5% of annual food needs) are shaded in white, and here the whiteness of northeastern Tigray is notable, since this is a cropping area. Once staple food sales (cereals, root crops and enset) are excluded (the right-hand map) the importance of *teff* and pulses expands considerably.



Where are the main cereal crops grown?

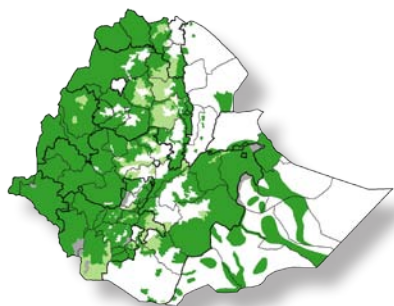
Although altitude is not the sole determinant of what is grown, the map on this page does evidence the progression of main cereals mixes from low altitude to high altitude; it also suggests that farmers tend to grow as many varieties as they can. It is usually only at the extremes of altitude that the cereals mix is really restricted - to sorghum and maize (with some finger-millet) in low lowlands, and to barley with some wheat (and occasional oats) in high highlands. In terms of volume of national annual production, maize normally comes first, followed by wheat, sorghum, *teff*, barley and finger-millet in that order. At the most general level, in the north of the country it is field annuals – cereals, pulses, oilseeds – which predominate and are most sold. In the south there is a greater variety of produce, including the perennials enset, coffee and *chat*, and root crop annuals: largely sweet and Irish potatoes. Peppers, spices and ginger are dominant in relatively small localities. Pulses, especially field beans and the valuable lentils, are more grown at the higher altitudes than lower down – where chickpeas do succeed (especially around Lake Tana). Oilseeds are highly produced in a few major localities including the far western lowlands of Tigray and Amhara and in Benishangul (sesame), and the Arsi-Bale Highlands of Oromia (flax and rapeseed).

Cropping patterns for the main cereals

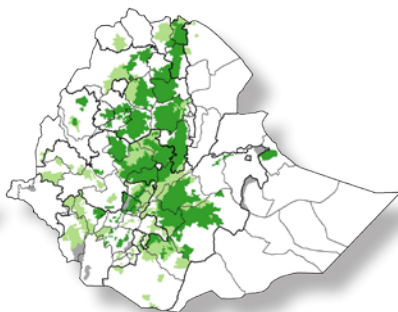


Notes: The cut-off for including a crop in the crop patterns analysis is that it should contribute the equivalent of at least 5% of annual kcals (either in food or cash) for an average household.

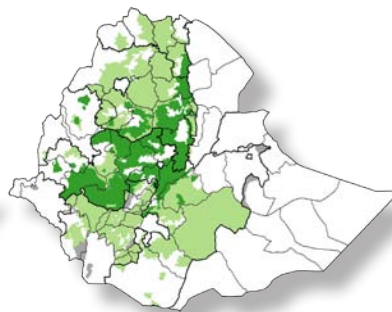
Sorghum, maize, and/or millet



Wheat and/or barley



Teff



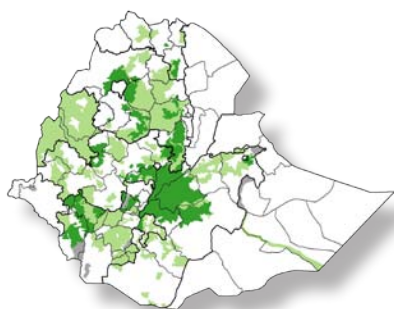
Root crops



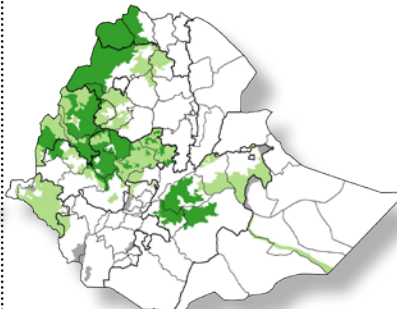
Enset



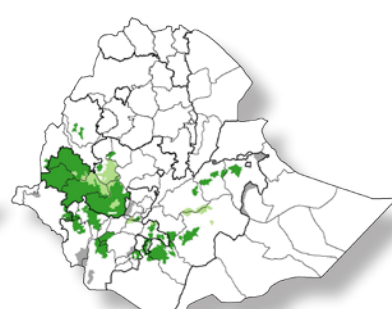
Pulses



Oilseeds



Coffee



Chat



Peppers



Spices



Ginger



Fruit and Vegetables



Cotton



Percentage of minimum calories required per hh per year

	< 5 %
	5 - 25 %
	> 25 %
	No data

Notes: the maps show the value of the total production of each crop as expressed in minimum food energy requirements for an average household. "Cotton" refers to household production, not commercial plantations.

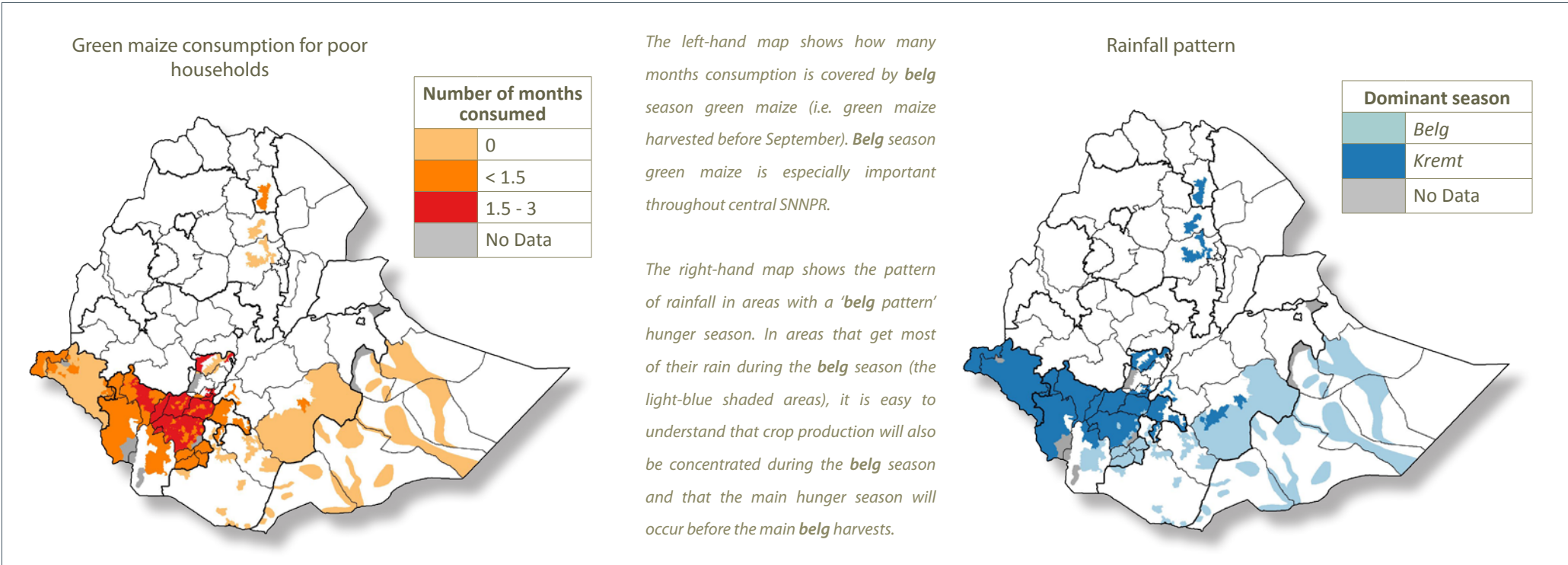
Which crops are especially important during the hunger seasons?

Green Maize

'Green' maize here refers to maize that is nearing maturity but is harvested for immediate consumption before it has thoroughly dried. It is not the same as 'corn-on-the-cob', which is very immature and has a relatively low calorie content. Green maize is cut in order to break the hunger season before the harvest-proper. These maps provide an analysis of the role of green maize in areas with a 'belg pattern' hunger season, i.e. a hunger

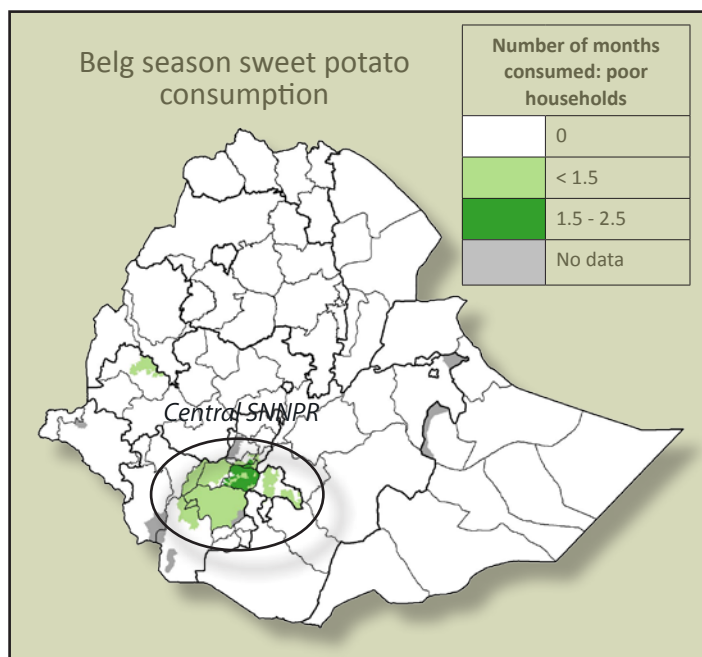
season that lasts from February-May/June and is brought to an end with the harvesting of *belg* crops in June/July. But how is it that some areas that have a *belg* 'pattern' hunger season have a *kremt* dominant rainfall pattern? (See map on right.) For SNNPR the answer is closely linked to the pattern of maize production and the early harvesting of green maize on a relatively large scale. As the map on the left shows, green maize typically provides about 2 months consumption across central

and northern SNNPR. The effect of this is to bring the harvest forwards, to end the hunger season early and to create a '*belg*' rather than a '*meher*' pattern of hunger season. In central SNNPR the performance of the *belg* rains is especially important for food security. If the *belg* rains are delayed or fail completely, the planting and therefore harvesting of maize is delayed, resulting in a prolonged and more severe hunger season compared to normal.

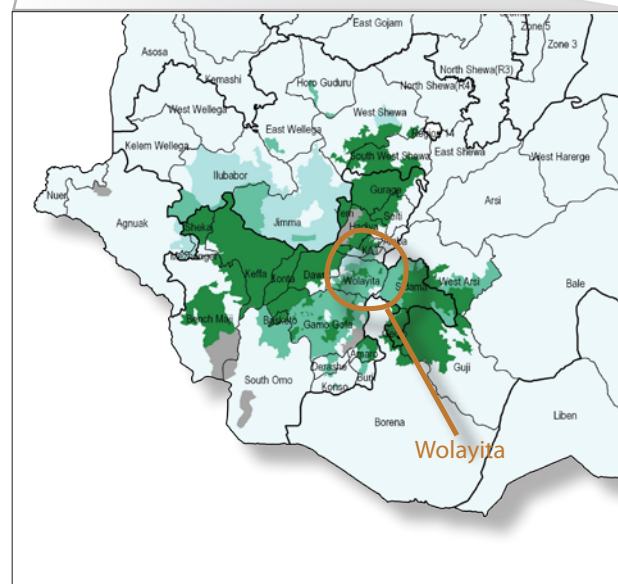
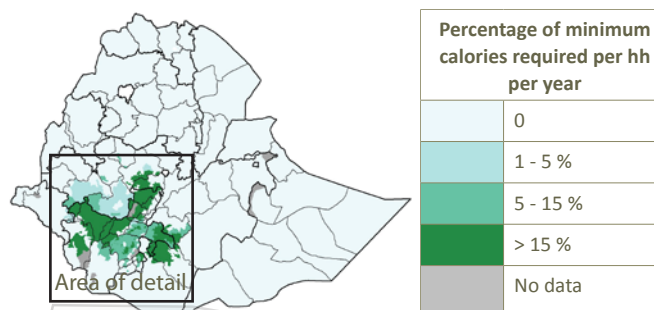


Belg season sweet potatoes

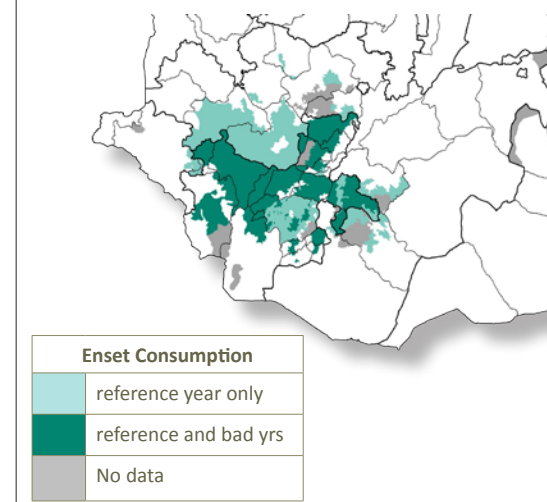
In highly-populated central SNNPR there are two sweet potato harvests, in the *belg* and *meher* seasons respectively. The *belg* sweet potatoes are especially important for food security. Typically the crop is harvested in the months March-May, right in the middle of the hunger season. Failure of *belg* season sweet potatoes therefore significantly increases hunger in these areas. The most common causes are a failure of the '*sapia*' rains (i.e. the light rains normally expected in these areas in winter), and infestation by sweet potato butterfly (*Acraea acerata*).



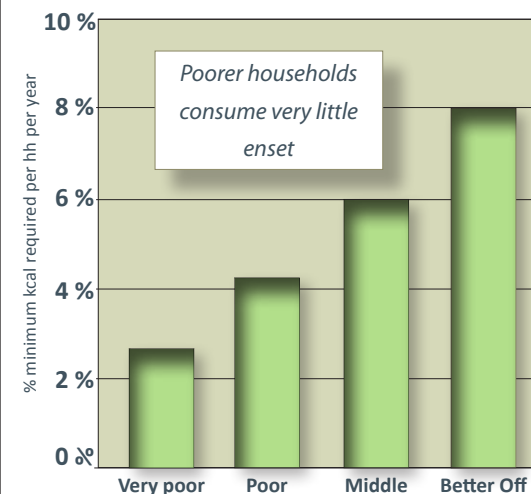
Enset The maps below show enset consumption in calorie equivalents for all enset growing areas of the country. Enset provides in excess of 2 months consumption in parts of northern, western and eastern SNNPR and neighboring areas of Oromia, but far less in central SNNPR, including Wolayita.



Areas where enset is a coping strategy for the poor



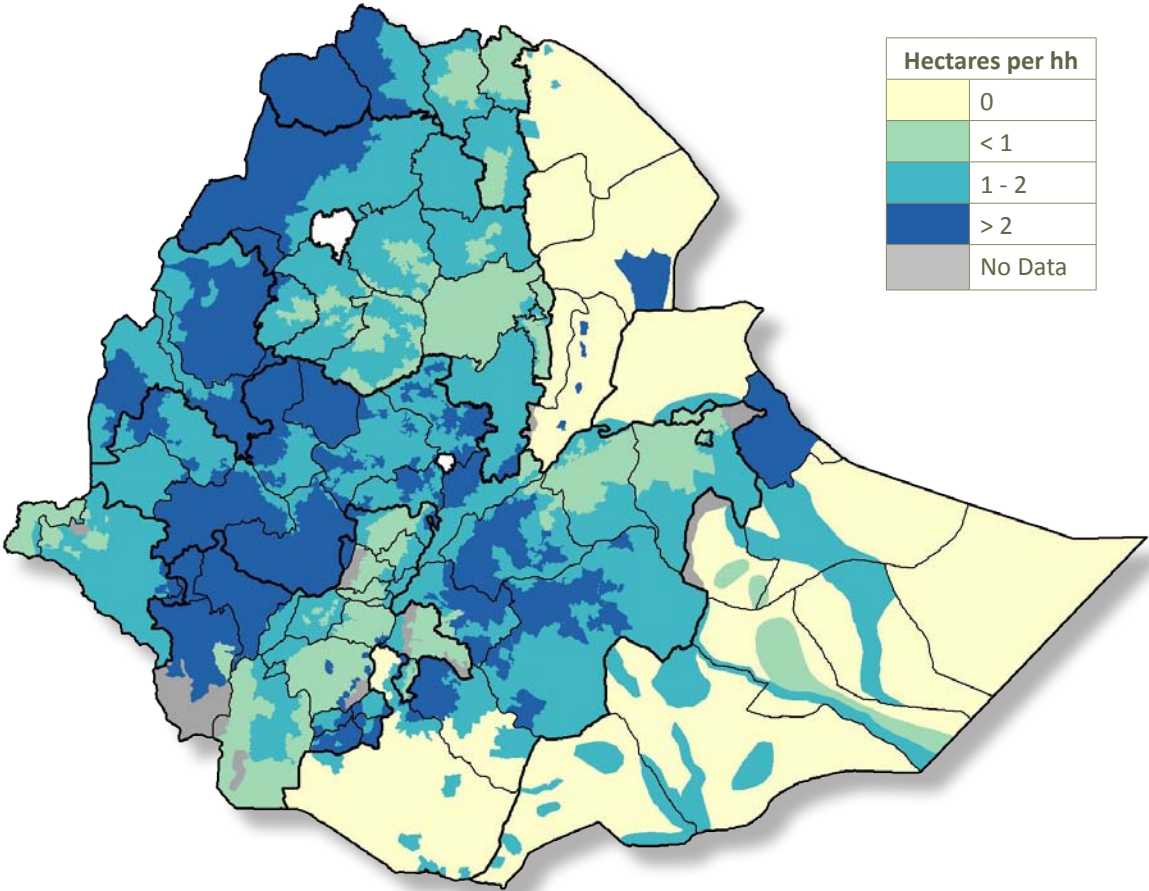
Enset consumption by wealth group: Wolayita
Maize and Root Crop Livelihood Zone



How do people grow what they grow?

There are many factors that affect what and how much households are able to produce, but the most fundamental ones are the size of their land and the quality of plowing they are able to secure. These two subjects are illustrated geographically in the following pages. Other considerations are more specific to individual households within any given area, e.g. the fertility of their land, their ability to provide organic or chemical fertilizers, the labor available within the household and/or their ability to hire workers.

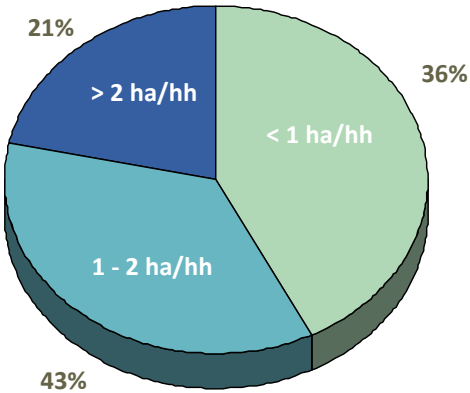
Hectares cultivated per household



How much can people cultivate?

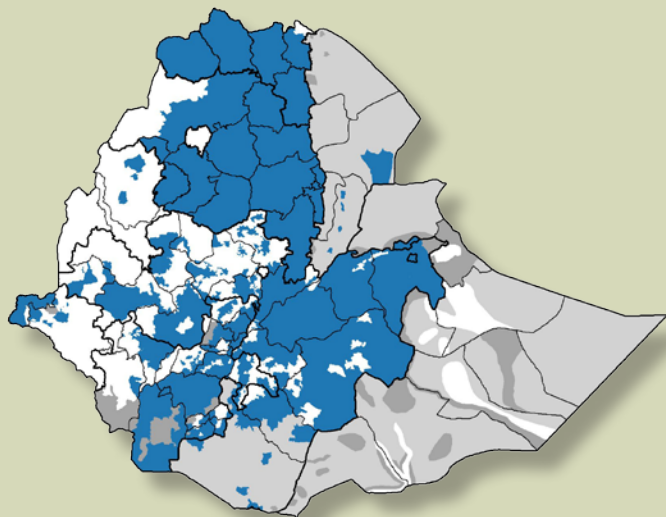
As a rule-of-thumb, an average household of 4 - 5 people needs at least one hectare of land in most cereals-based areas of the country to provide enough basic food plus the cash from produce sales to pay for the bare essentials of life. More than one-third of the population in the cropping areas fails to meet this minimum: this means that they must rely heavily on the market for food, with cash most often earned by working for others. The surplus that they and the urban populations buy is grown to a good extent in the western half of the country, where average landholdings are comparatively high.

% of population by average area cultivated per hh



Note: This pie chart shows the % of the cropping/agropastoral population that lives in LZs with different amounts of cultivated land per household.

Where people cultivate all their land

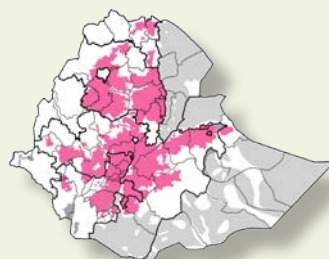


Blue = all land owned is cultivated according to wealth group interview data.
White = not all land cultivated, either because of fallowing or grazing
Light grey = pastoral
Dark grey = no data

Do farmers cultivate all their land?

Farmers across much of agricultural Ethiopia tell us that land shortage has made fallowing a thing of the past, and crop rotation and fertilizers must suffice. Most high population density areas of the country are also the areas where we see that people cultivate all available land. (See both maps above.) This does mainly point to the pressure on land, but it is not always the case: there are still some limited areas where fertile land is available and people clear just as much as they can cultivate with their available labor.

Population Density



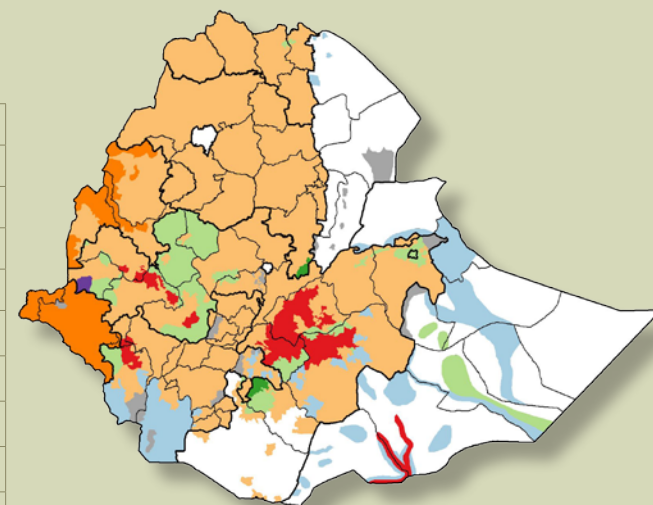
Pink = >100 people per sq km
Light grey = pastoral
Dark grey = no data

What limits crop production for poor households?

Any farmer can point to multiple constraints, and it is possible that some are not always brought up simply because there seems no solution: lack of rain, shortage of land. But it is instructive to see what *does* come top of the expressed list. The lack of oxen is keenly felt by poor households, because they must borrow them at a price. But in parts of western Oromia land is in a sense in shorter supply than oxen. In the extensive Arsi-Bale Highlands of south-central Oromia crop sales are so important even for poor people that pest damage is a particularly great worry. It is wild animal damage that is a particular problem in the far western lowlands (Gambella and Benishangul).

Most important perceived constraints for poor households

Constraint	
White	Pastoral zones
Light green	Land
Light blue	Rain
Orange	Draft animals
Dark green	Inputs
Red	Pests/diseases
Dark orange	Labor
Purple	Wild animals
Pink	Extension services
Dark grey	No data



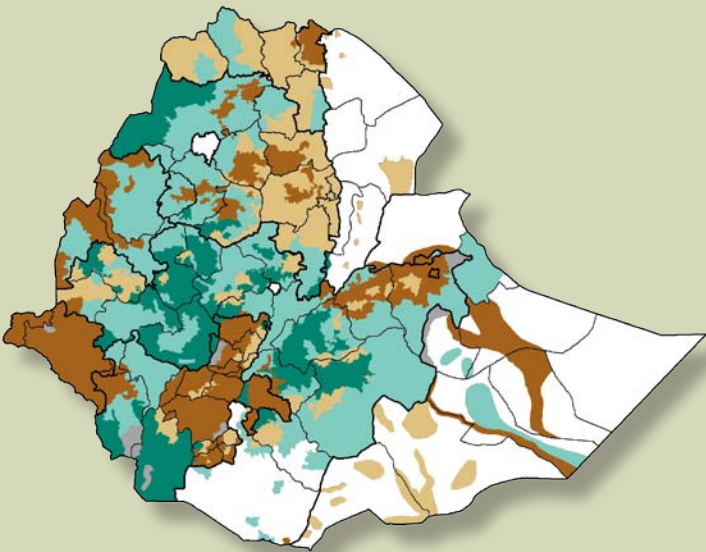
Is there an absolute shortage of oxen?

Oxen are the engines of Ethiopian agriculture, but they are hard to maintain with the required grazing and fodder. In most of Ethiopia, anybody who cultivates field crops uses oxen, *whether or not he actually possesses them*. It takes two oxen to form a plow-team. The upper map shows that in the greater part of the cropping areas most farmers do not own a team of oxen. But it is very rare to find land untilled for lack of draft-power. (See *Where people cultivate all their land* map on page 33.) This is firstly because a well-maintained ox-team can plow several hectares in a season. Secondly, people with a single ox partner with their fellows. Thirdly, people with no oxen borrow a team from a better-off neighbor at the price of an agreed part of their harvest, including the fodder, or in return for an agreed amount of labor on the lender's absolute shortage of oxen.

But even if virtually all land gets plowed, there is arguably a shortage of oxen in terms of *productivity*. The borrower is unlikely to get his plowing done at the optimal moment for sowing; and he is unlikely to achieve the optimal number of passes for the soil conditions and crop-type (*teff* in particular requires four to five passes for good results). There are increasing signs of fodder stress in oxen-keeping around the cropping areas, with farmers buying trained oxen for the growing season and then selling them off at the end to avoid having to maintain the oxen during the off season. Nevertheless, the lower map suggests that better off farmers are generally more concerned with pest damage and with the cost of fertilizers and other inputs than with an absolute shortage of oxen.

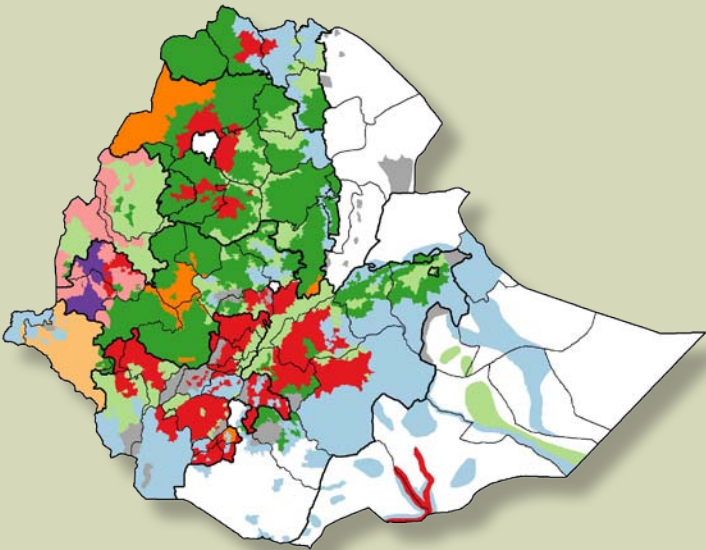
Oxen per household	
<= 1	
1.1 - 1.5	
1.51 - 2	
> 2	
Pastoral areas	
No data	

Number of oxen per households

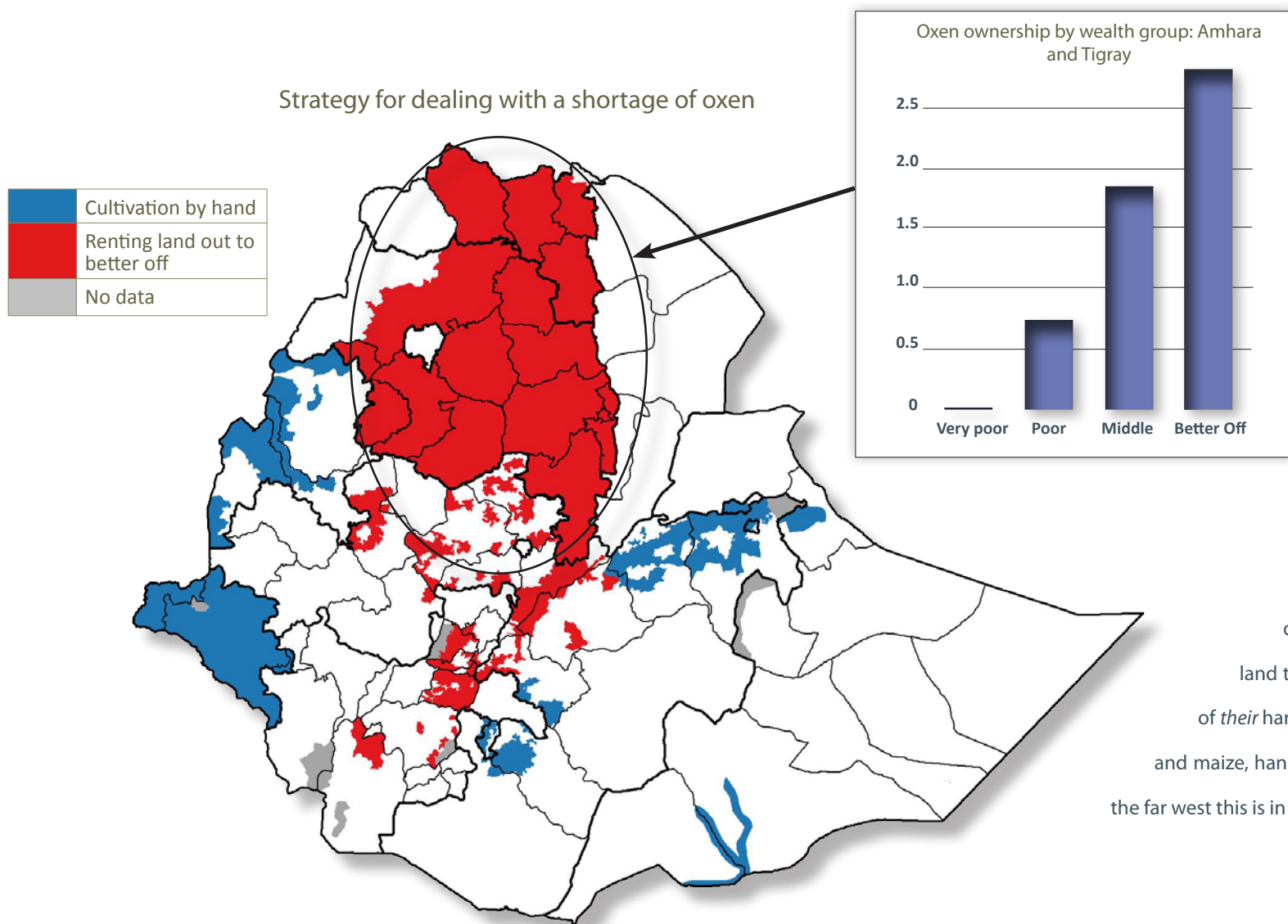


Most important perceived constraints for better off households

Constraint	
Pastoral zones	
Land	
Rain	
Draft animals	
Inputs	
Pests/diseases	
Labor	
Wild animals	
Extension services	
No data	



How do the poor cope with their shortage of oxen?



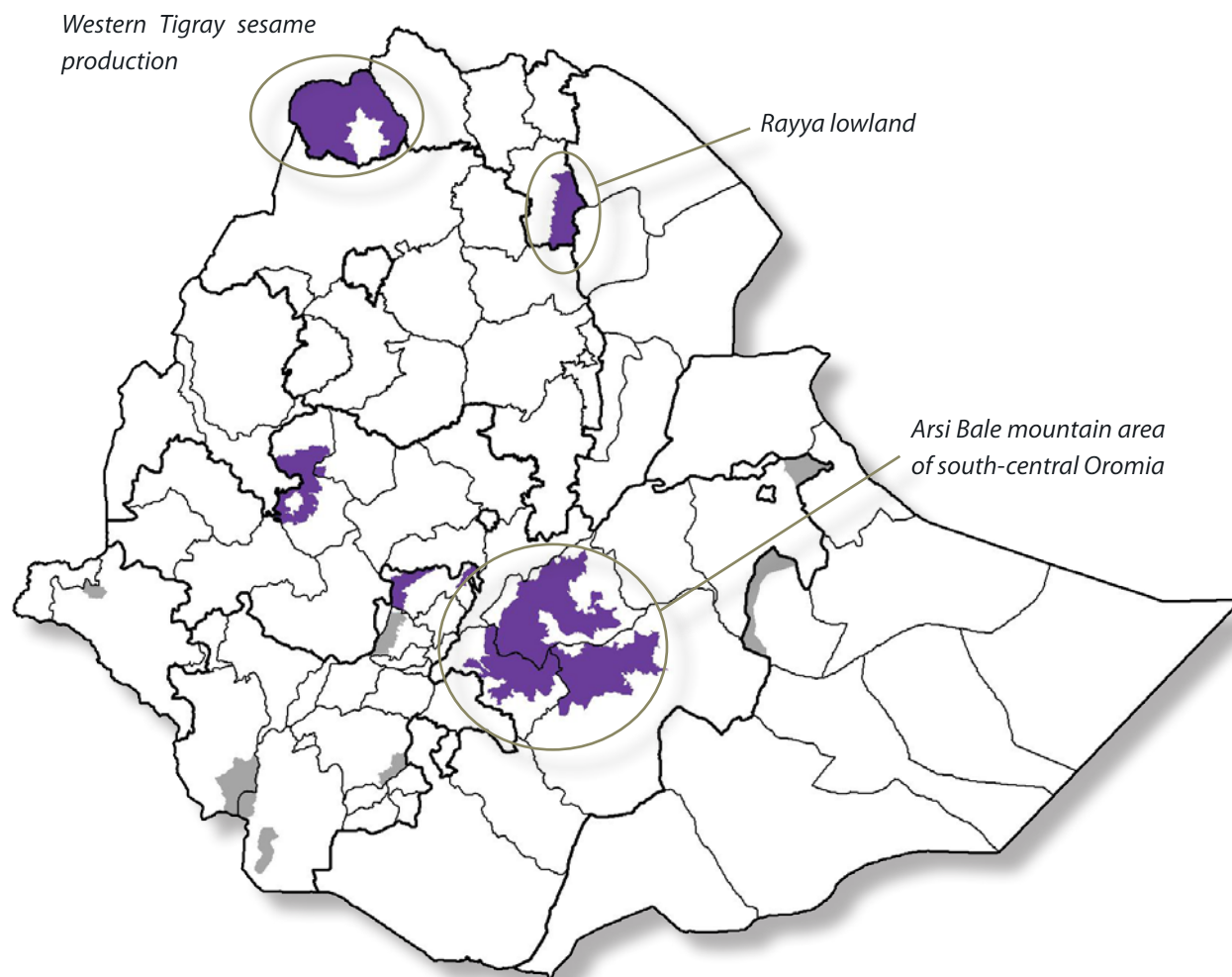
The lack of oxen amongst poor farmers is particularly marked in most of the northern cropping areas. Although they frequently borrow oxen from wealthier owners, the price they pay in harvest share, if not in labor, is felt to be heavy. Poorer farmers have to take account of their own lack of inputs for their crops, and the potential alternative use of such household labor as they have, including working for others for a direct wage. In many instances the decision is to simply rent out part of their land to better-off neighbors in return for a share of *their* harvest from the land. Elsewhere, for sorghum and maize, hand tilling is resorted to, although in parts of the far west this is in fact traditional.

Where are tractors used?

Historically in Ethiopia tractors have been limited mainly to use by state-run farms and by a small number of private investors. Today their use is still extremely limited, partly because of very low capitalization in the agricultural sector, partly because much of the terrain is rugged and unsuitable, and to a large extent because nationally nearly all of the roughly 12 million hectares is still cultivated by smallholders, and smallholdings are indeed small.

Even in the areas shown on the map where tractor use is significant it is still at least rivaled by ox-plowing. In Tigray, the western area shown is the sesame industry, where some investors have hundreds of hectares but even some smallholders, including resettled farmers, hire tractors for their few hectares. In south-east Tigray the Rayya lowland is a new area for extensive cultivation, with high maize and *teff* production. By contrast, the Arsi-Bale mountain area of south-central Oromia, is, very unusually, a highland area where tractor use is significant. Here the wheat and barley production is voluminous and market-oriented, including a link to the country's modern brewing industry. Tractor use has been supported by local government services.

Livelihood zones where tractors are used by some smallholders





Livestock and Livelihoods

Livestock are the near-absolute basis of pastoralist livelihoods, and they are also crucial to agropastoralists for whom cultivation gives greater or lesser rewards depending on the local rainfall conditions. Crop cultivators, by contrast, might be thought to have only a mild interest in livestock. But this is an assumption which is challenged by some of the maps which follow. The importance of livestock to farmers goes far beyond the need for draft-oxen: cash from livestock and butter sales is sought everywhere, and is essential in areas of relatively low food and cash crop production, where households depend especially heavily on buying grain to make up their harvest deficit. Cattle are the great prize, but often require substantial harvest residues. Poorer households are usually able to raise a few sheep or goats on communal grass and bush land, as well as a handful of scavenging poultry. The maps also challenge any assumption that pastoralists simply drink milk for their sustenance. Most, in fact, depend fundamentally on buying grain and therefore on raising livestock for sale.

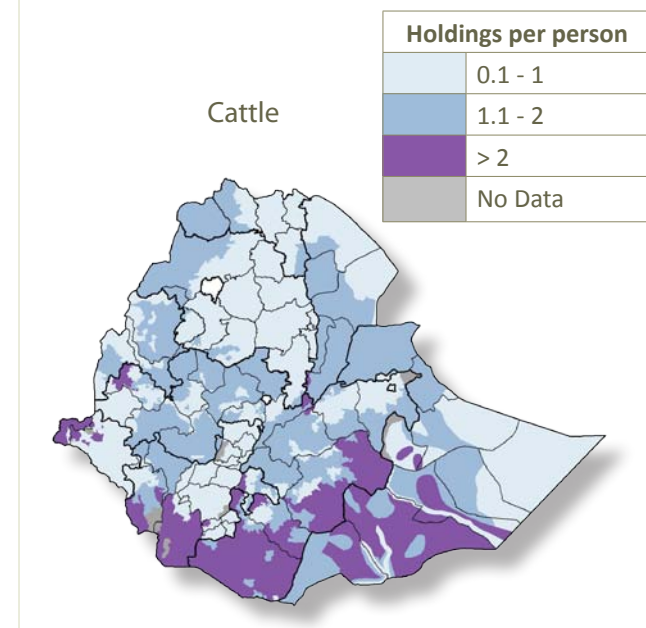
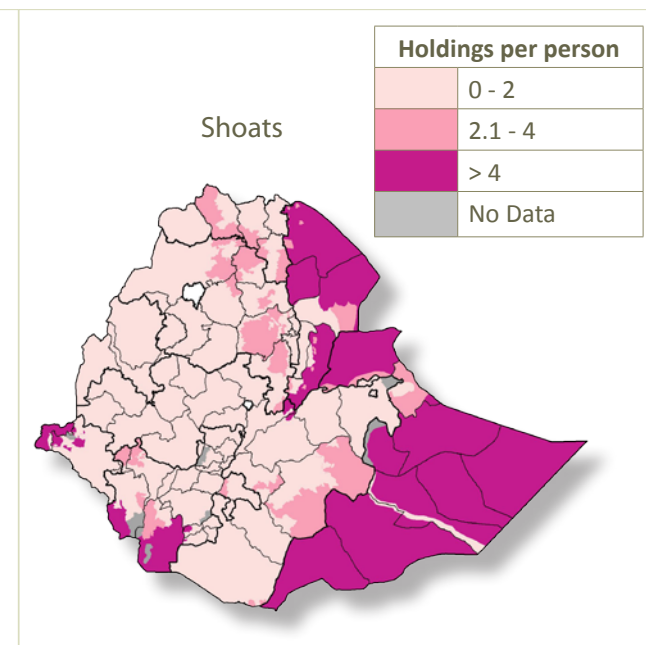
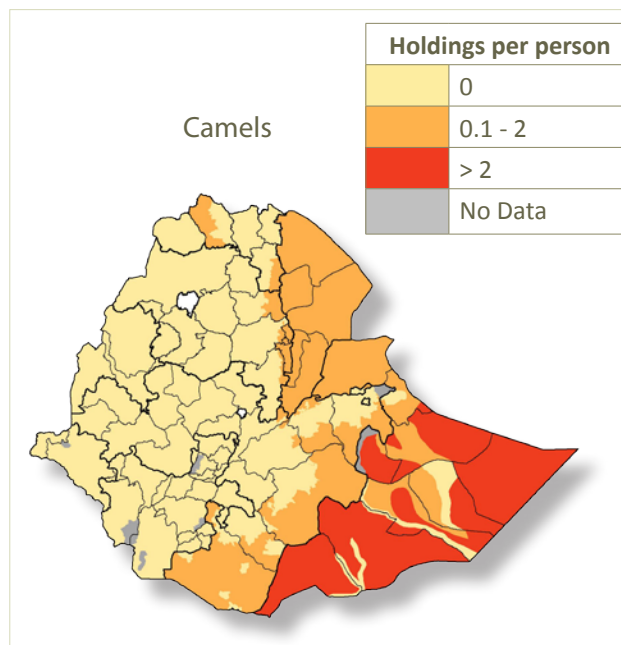
Which livestock do people have?

Cattle, shoats and camels predominate

Ethiopia's three most numerous types of ruminant livestock – cattle, sheep and goats – are all kept in widely different types of environment, from cool highlands upwards of 3,000 meters above sea level to hot pastoral rangelands. Donkeys as well as the far less numerous horses and mules can also be found everywhere but the rangelands. Poultry are kept wherever there is a settled population, and along with eggs, they often give the poorest households nearly all of their livestock earnings. We can deal first with the exception - **camels**. These are adapted to hot temperatures and to browse (eating leaves), and so lowland bush terrain, especially the rangelands, is where they are found in Ethiopia – and then only in the eastern half of the country. **Camels** are also sometimes kept as pack animals in the eastern cropping lowlands of Amhara and Tigray, bought from the neighboring Afar herders. **Cattle** are found almost throughout the pastoral and agropastoral areas, often rivaling **camels** in numbers, and far outnumbering them in southern Oromia. In the far west of the country they often even outnumber sheep and goats, although *trypanosomiasis* takes its toll. Their ideal habitat is in the cropping elevations, although not at the highest or lowest (coldest or hottest) limits. In the

highest mountain areas **sheep**¹ are the only ruminants, and where farming land is most degraded there is virtually **sheep** pastoralism. **Goats**, as hardy browsers, are most successful at lower altitudes where bush cover predominates. The relatively large number of livestock *per person* in the sparsely populated rangelands simply means that herding is the only economic use that can be made of the terrain. But it is the much more densely populated cropping areas, with their vegetation and crop residues, which contain by far the largest *absolute* number of livestock.

¹ Sheep and goats are grouped together as 'shoats' in the map on this page.



What explains the difference in goat and sheep holdings?

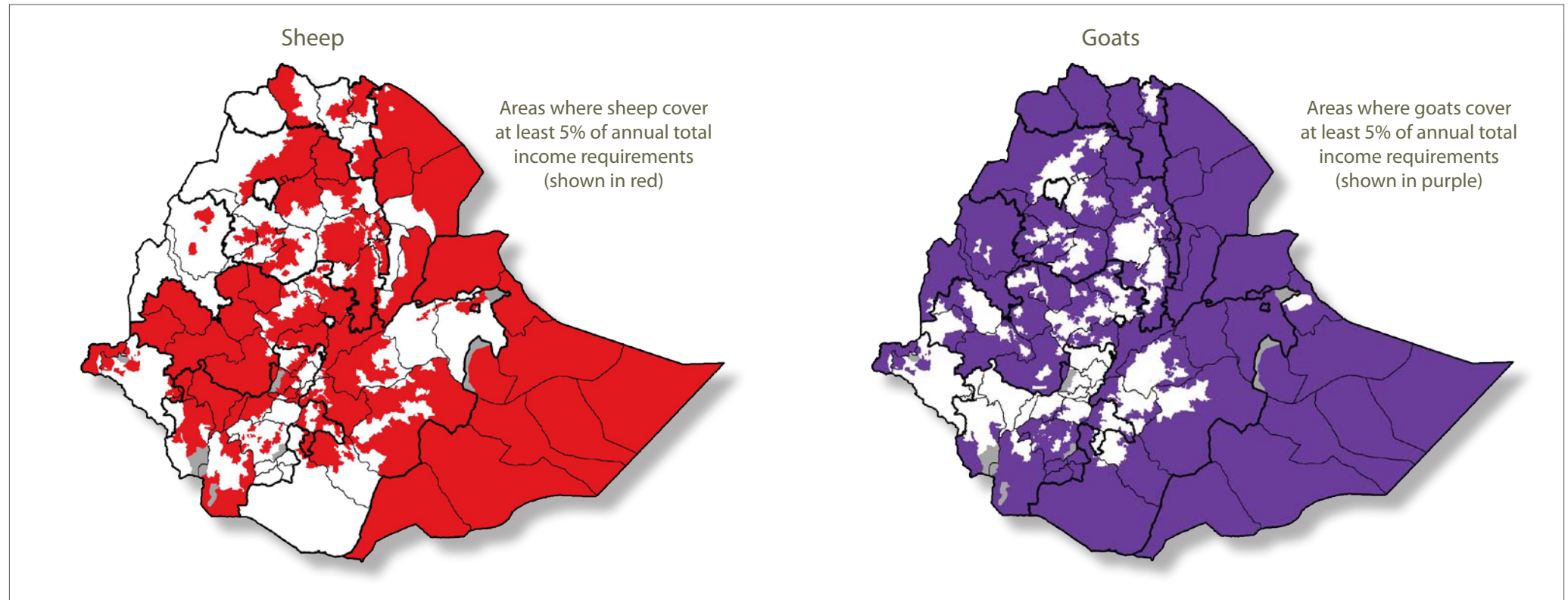
The market counts as well as the habitat

In terms of ideal habitat, sheep are grazing animals of temperate to cool areas, while goats are essentially browsers of bushes and low trees and do well in the warmer and drier lowland environments. Of the two maps below, it is therefore the goat map that makes most sense on first viewing: they are kept almost everywhere in some numbers except in the highest

elevations. There are a few anomalies, notably in the cropping areas of Gambella where both goats and sheep are kept only in small numbers.

The sheep map is more problematic. They do predominate in the high areas, but why are they also numerous in lowlands – especially the Somali and Afar rangelands – which are not the best environment for them, even given species adaptation?

The big reason is their market value: sheep meat is generally preferred amongst townspeople, and urban demand dominates the market (even though there is some new interest in goat-meat amongst urban middle classes for health reasons). But a big factor in the eastern rangelands is the high export demand, mainly from the Gulf countries, in particular for the blackhead variety of sheep. This is worth the extra work and risk of sheep-raising in these less suitable areas.

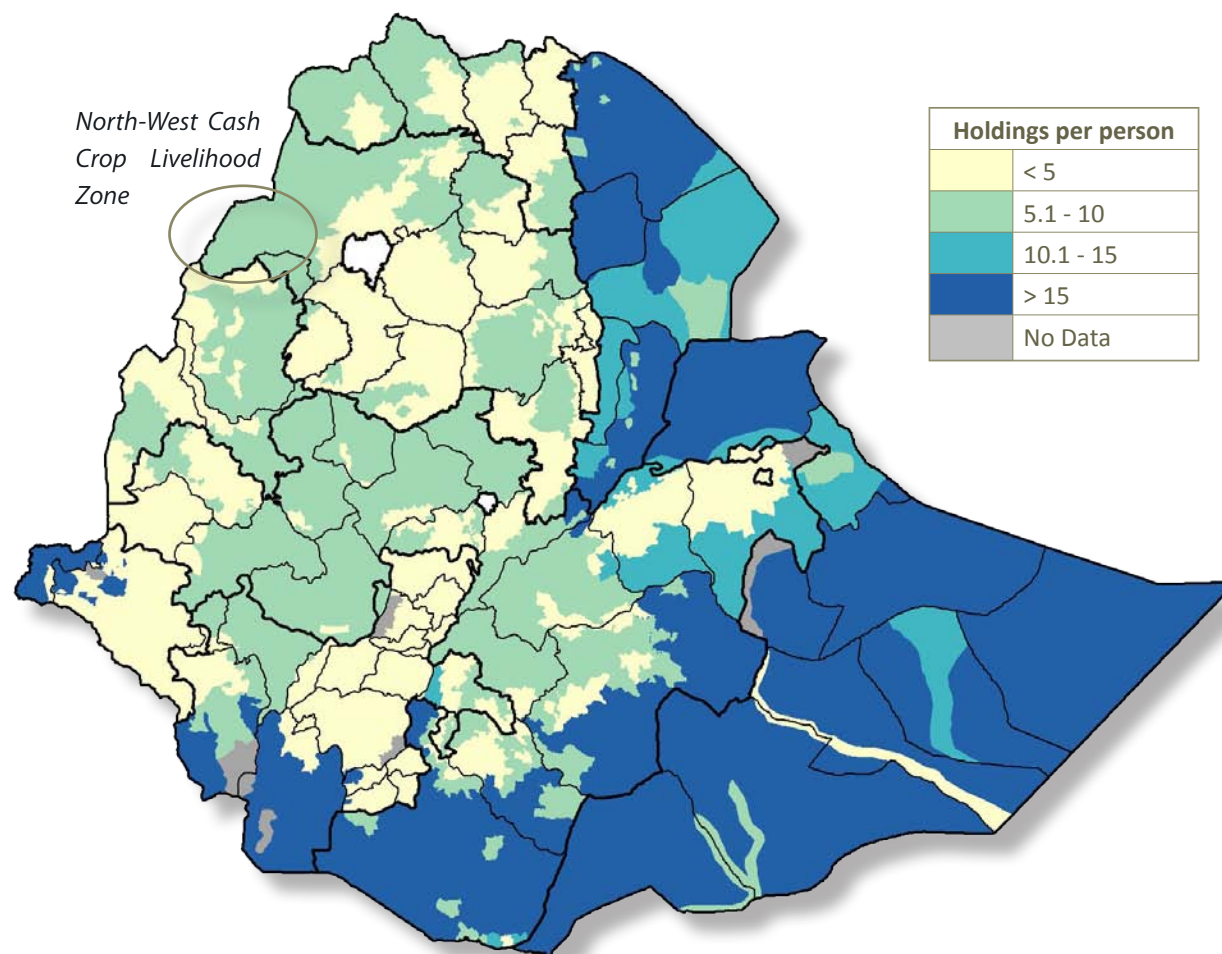


How many livestock do households have?

Differences *across* zones and *within* them.

Generally speaking, a viable pastoralist community needs to hold above 15 shoat-equivalents per person, as is the case here. Agropastoralists are not very far from this level with at least 10, and in some areas, such as southern Oromia or western Gambella, they also hold more than 15. Cropping communities need oxen for plowing, and therefore just enough cows to produce them. But in fact cropping households aspire to hold as many livestock as possible: they are seen as a crucial asset. However, success is varied. We see wide areas where there are under 5 shoat-equivalents per person, notably in large parts of Amhara and Tigray. Where shoat-equivalents are higher this often represents a concentration on cattle. But *within* communities also there are great differences in holdings. (See page 74 for more on this.) For instance, the **North-West Cash Crop Livelihood Zone** (see map) is relatively rich in livestock, but poorer *households* hold on average some 3 shoats, maybe one ox and a couple of other cattle, while wealthier households on average hold around 12 shoats, 3-4 oxen and 13-14 other cattle. Within pastoral communities too there are big differences: wealthier herders hold approximately five times more cattle or camels than their poorer neighbors.

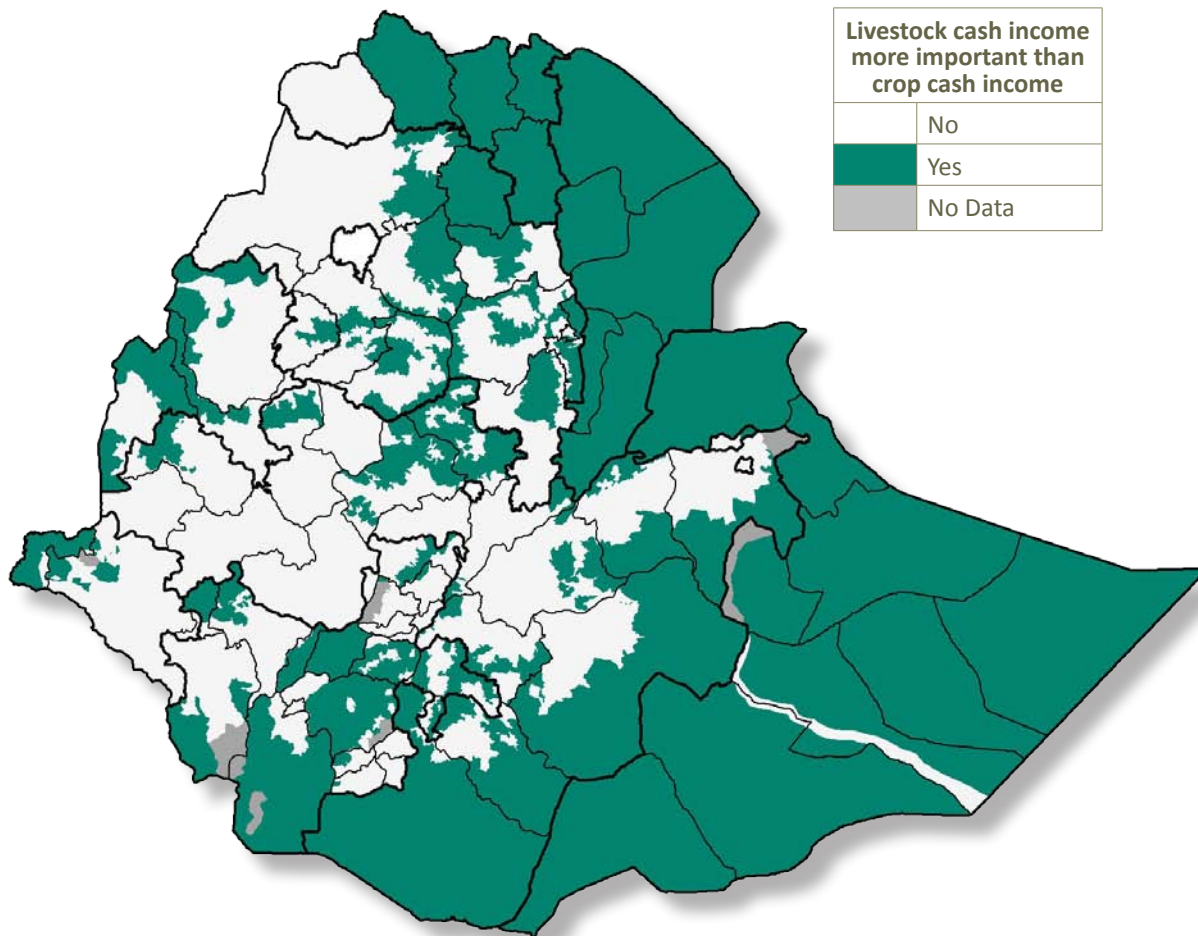
Number of livestock per person



Notes: 'Livestock' here is calculated in shoat equivalents.

How much does livestock income contribute to the household economy?

Areas where cash income from livestock sales is more important than cash income from crop sales



Notes: Data are plotted for average households. Cash from livestock credit schemes is not included in livestock income.

Livestock are critical - even for farmers

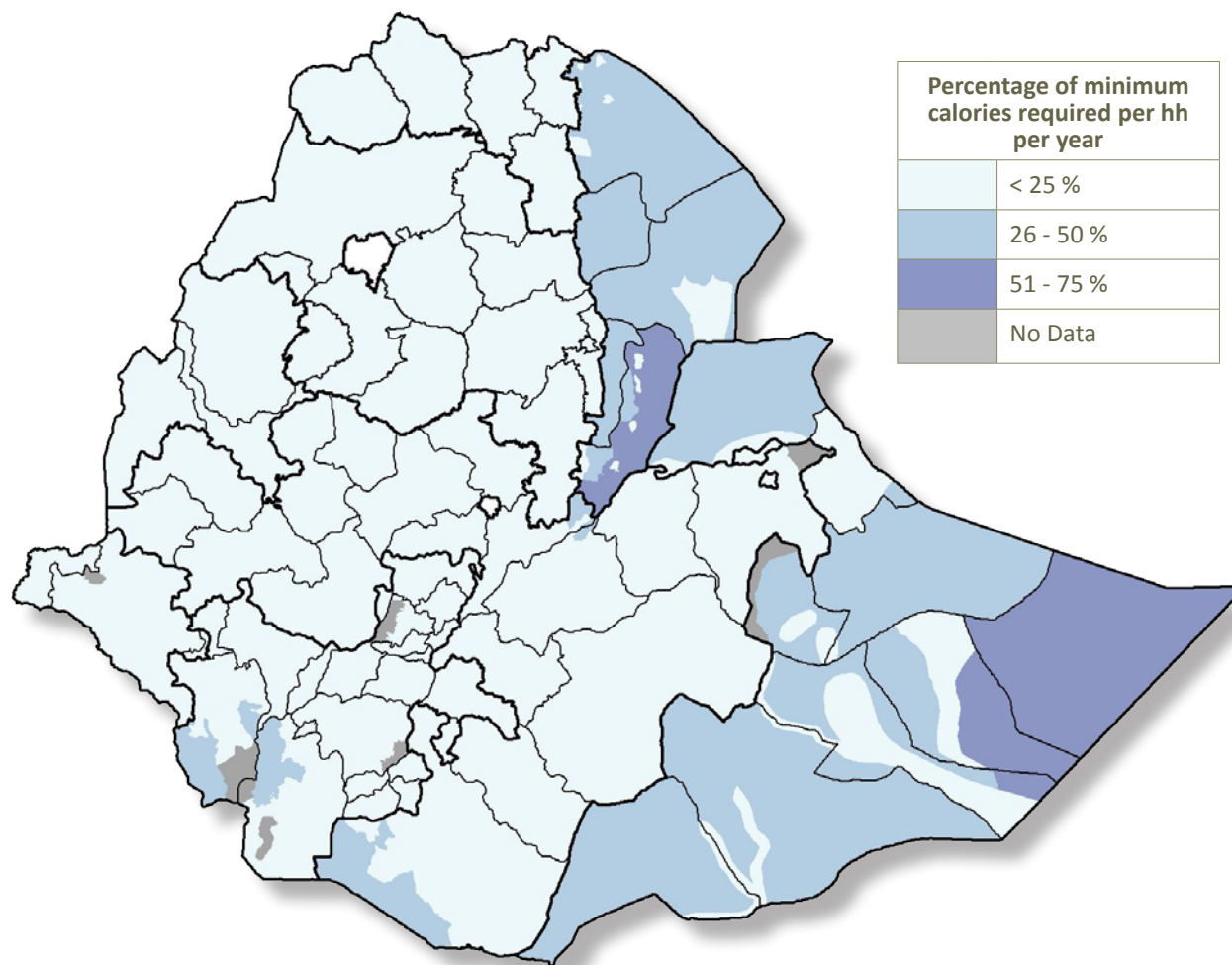
This map represents one of the more remarkable findings of the livelihood studies. We expect the pastoral and agropastoral areas to be highlighted. But in quite substantial parts of the cropping area of the country, millions of people today get more cash from livestock than from crops. The data concern income averaged across the wealth groups, so this doesn't only relate to the wealthy minority who hold larger herds, although they influence the values. Nor are these cropping areas all amongst the most wealthy in the country, investing crop profits in livestock. On the contrary, on balance they are poorer areas, including degraded mountain localities and river gorges in Amhara, unproductive areas of east and north Tigray, and densely populated parts of SNNPR. The growing market demand for butter and meat makes livestock rearing today possibly more profitable than ever before. But livestock require feeding, and with reduced common grazing in agricultural areas it is farmers with more land, giving both peripheral grazing and crop residues, who can maintain more cattle. Poorer people may be able to keep only a handful of poultry and two or three sheep or goats, but even for them livestock can earn crucial money to cover life's essentials.

Where is the dependence on livestock greatest?

The food from livestock

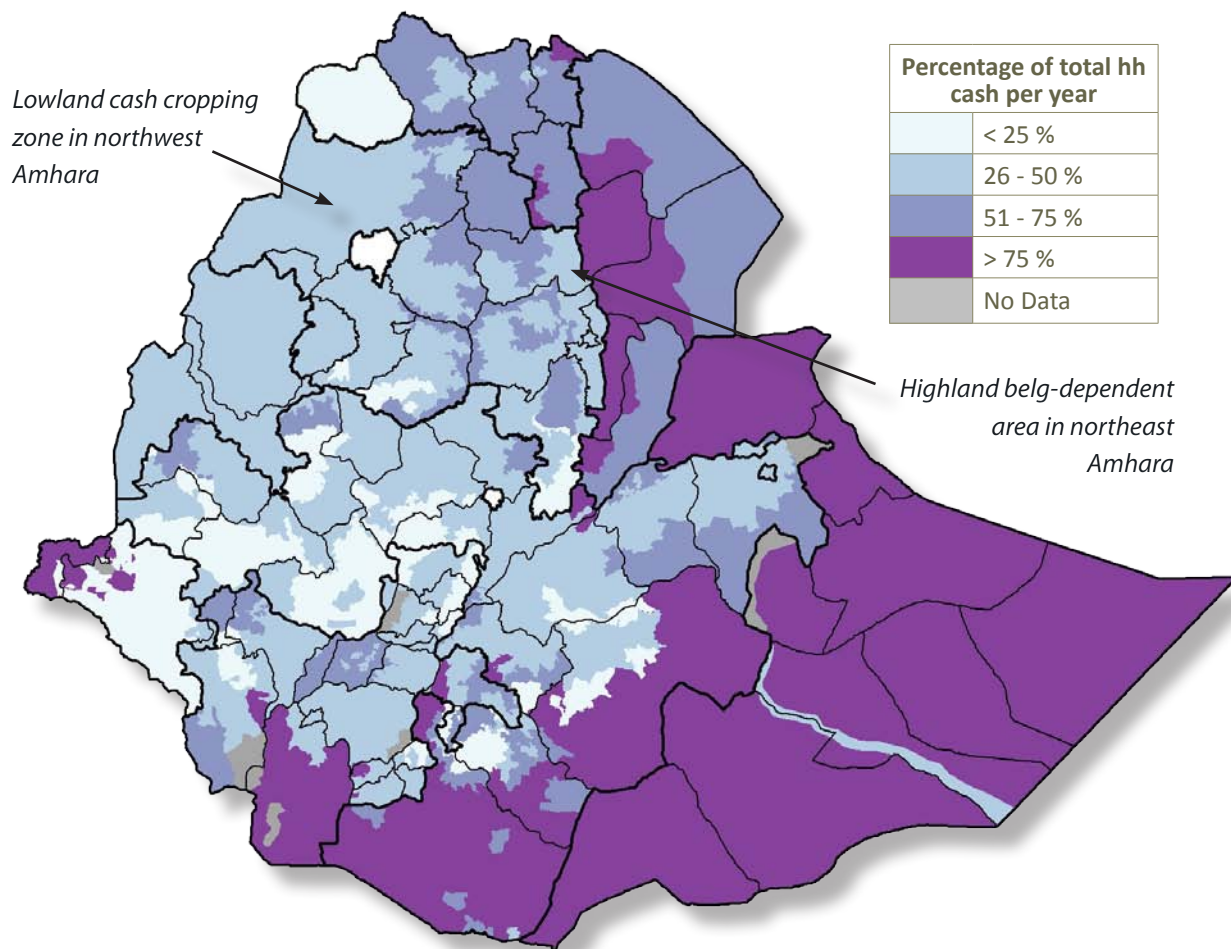
In both pastoral and cropping areas, by far the greater part of the food energy derived directly from livestock by households is from milk. However, although it is an excellent addition to the quality of diet, milk contains relatively few calories per unit volume. To obtain even one-quarter of their food-energy needs across the year from milk, a household of five members would need to drink a daily average of not less than 16 liters of whole milk, i.e. without butter production. At a generous average estimate of 2 liters per day produced per cow, this would require the household to have on average 8 cows in milk and therefore a herd of 20 or more cattle. This is more than the wealthiest households tend to possess in cropping zones, and so it is clear why these levels and above are only reached in pastoral and a few agropastoral areas (see page 52 for a map of pastoral and agropastoral zones), where milk from the numerous goats may contribute considerably alongside cow's and/or camel milk. Even here it is rare to find localities where milk provides more than half of household calories on average: the wealthier herd-owners may achieve above 75% of food energy from milk, but their poorer neighbors often cannot ever achieve 25% and so depend heavily on purchasing cereals.

Percentage of food energy (kcal) from livestock



Notes: This map shows the contribution of livestock to direct food consumption. In other words, it shows the degree to which households' own milk and meat contribute to a households' minimum food requirements (in kcal terms). Cash from livestock credit schemes is not included in livestock income.

Livestock income as a percentage of annual cash income



Notes: This map shows the contribution of livestock to total cash income. The percentage here is in relation to total cash, as opposed to total food and cash income, shown in the previous map. Cash from livestock credit schemes is not included in livestock income.

The cash from livestock

In terms of cash income, what is remarkable is the extent of the cropping areas where between one-quarter and one-half of household income averaged across all wealth groups is from livestock and livestock products. But is this because of high livestock holdings? Or is it because crop income is so low that any livestock holdings become relatively valuable?

In fact, both are true depending on specific local conditions. Ethiopia covers a wide range of average household livestock holdings and income as well as big differences in crop production and income – in sum a wide range in average *absolute* income. For instance, if we compare in Amhara Region the lowland cash-cropping zone in far north-west and a high mountain *belg*-dependent area in the north-east, both are in the band of 26-50% of total cash income from livestock. But average household cash income in the north-west is more than three times that in the north-east. (See pages 64 and 65.) The former is rich in sesame and cattle, whilst the latter has so little to sell of the barley, flax and lentils it produces that the modest sales of sheep, together with the butter made from most of the cow's milk, figure large in the annual budget.

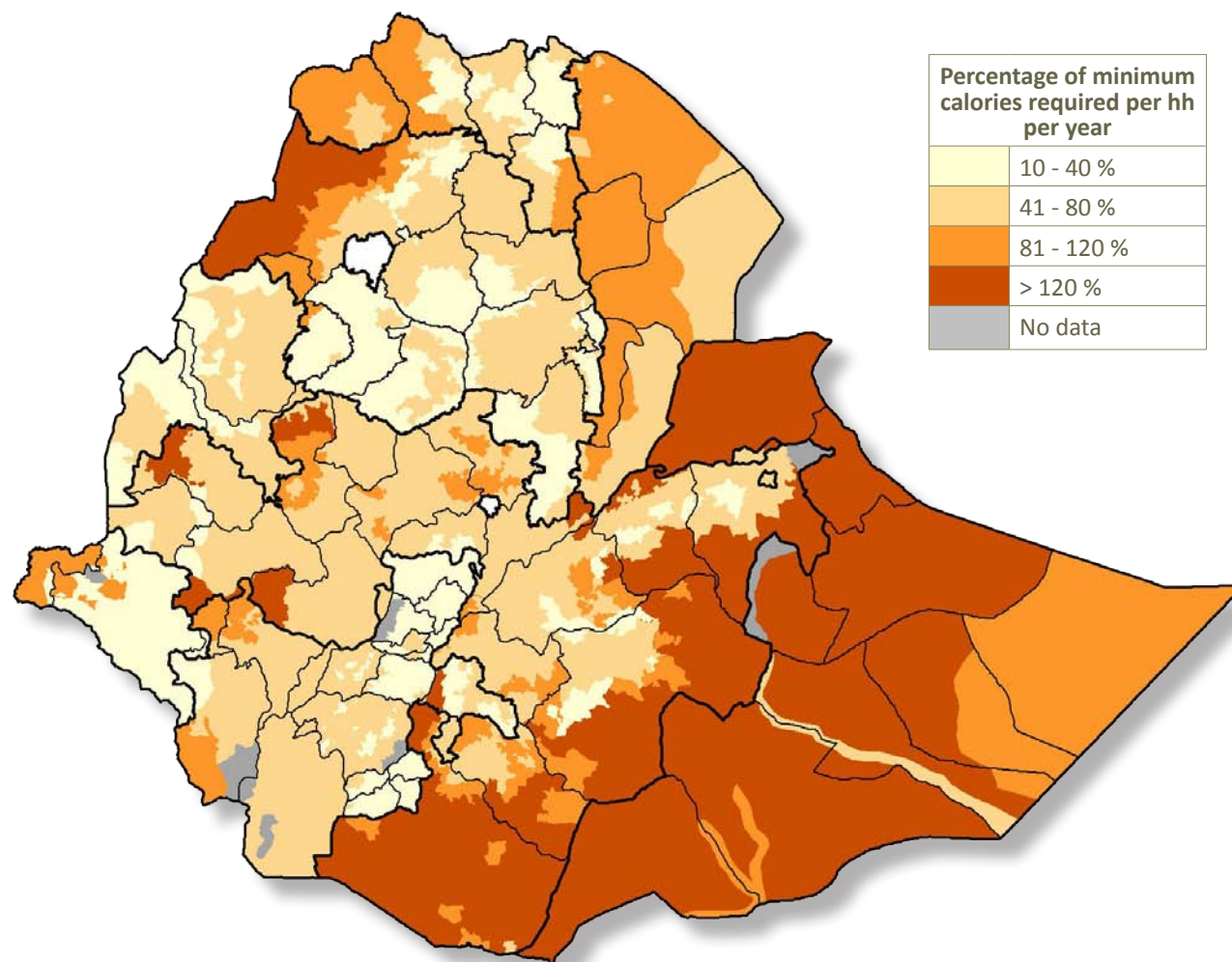
What do livestock mean for food purchasing power?

Livestock buy a year of food in pastoralist areas

This map complements the previous two by showing the value of livestock to households in a different way. The question here is: what proportion of their calorie requirement could populations cover if they spent all of their livestock earnings just on basic food?

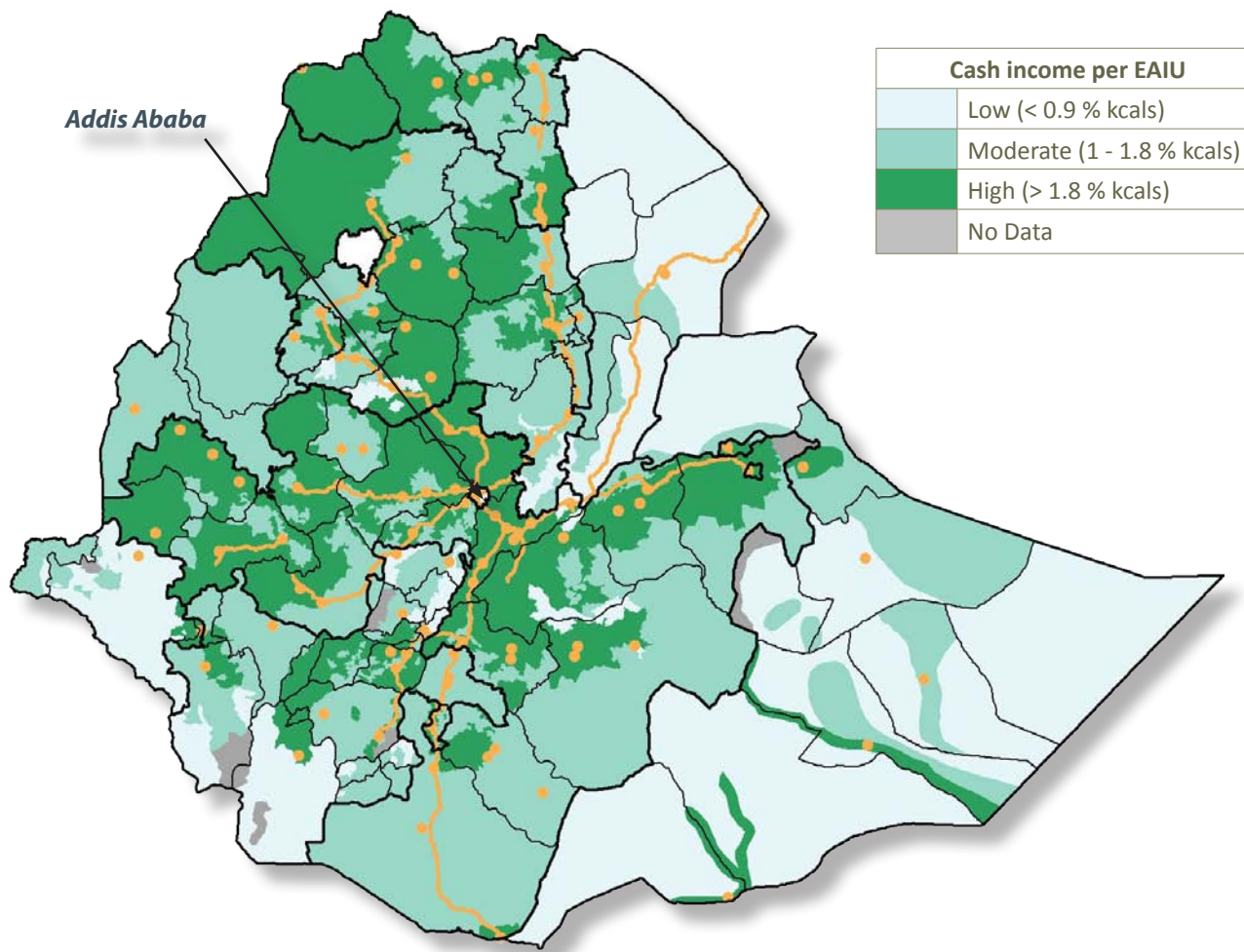
The need to purchase cereals is paramount in pastoral areas, and so for survival they must, and do, fall around the 100% mark for calories they can purchase. The high scores in certain cropping areas tend to be associated with high cattle holdings, notably in north-west Amhara and western Oromia, where livestock and milk/butter sales add substantially to earnings from cash crops – variously sesame, coffee and *teff*. If the cattle-rich agropastoral areas in western Gambella and western SNNPR do not show quite so high a score, this is at least partly because livestock income there is affected by the area's considerable distance from major markets. Although the story is not always clear to see, market access must affect other localities as well. Western Benishangul and central Gambella may be cases in point, but they actually have relatively few livestock altogether. There is also a tendency for highland areas, where cattle numbers in particular are limited, to show the lower scores.

Total cash income from livestock expressed in food terms



Notes: Cash from livestock credit schemes is not included in livestock income.

Total cash income per Ethiopian Animal Income Unit (EAIU)



Notes: 'Total cash income means cash income from milk/butter sales and livestock sales. EAIU calculation: 1 camel = 6 shoats; 1 cow/ox = 4 shoats. This is based upon an analysis of total income derived from each species nationally

Market access determines the value of your livestock

Here we expand on a subject broached in the previous page: the influence on the value of livestock of proximity to main town markets or to main roads leading to them.

The demand of the huge Addis Ababa market draws livestock not only on-the-hoof from the distance of several days' droving, but also by truck from markets remarkably far away, including in Harerge in eastern Oromia, the Bale highlands of south-central Oromia, and far western Oromia too, even if the formal 'main-roads' map does not always stretch to these. Major regional town demand also increases prices, e.g. around Dessie in southern Amhara, or in northern Tigray the line of Adigrat, Adwa, Aksum and Inda Selassie. The regional capital, Mekele, in the east-center, perhaps draws from so wide a hinterland that the price effect is diluted locally. Elsewhere in the north-east highlands it seems the main road runs through relatively poorer areas where local demand does not add to animal values as it does elsewhere. Finally there is the positive price-effect of cross-border livestock trade: in the far north-west of the country the trade with Sudan, and in the south of Somali Region the trade with southern Somalia served by the roads following the rivers across the border.

How important are different livestock and their products?

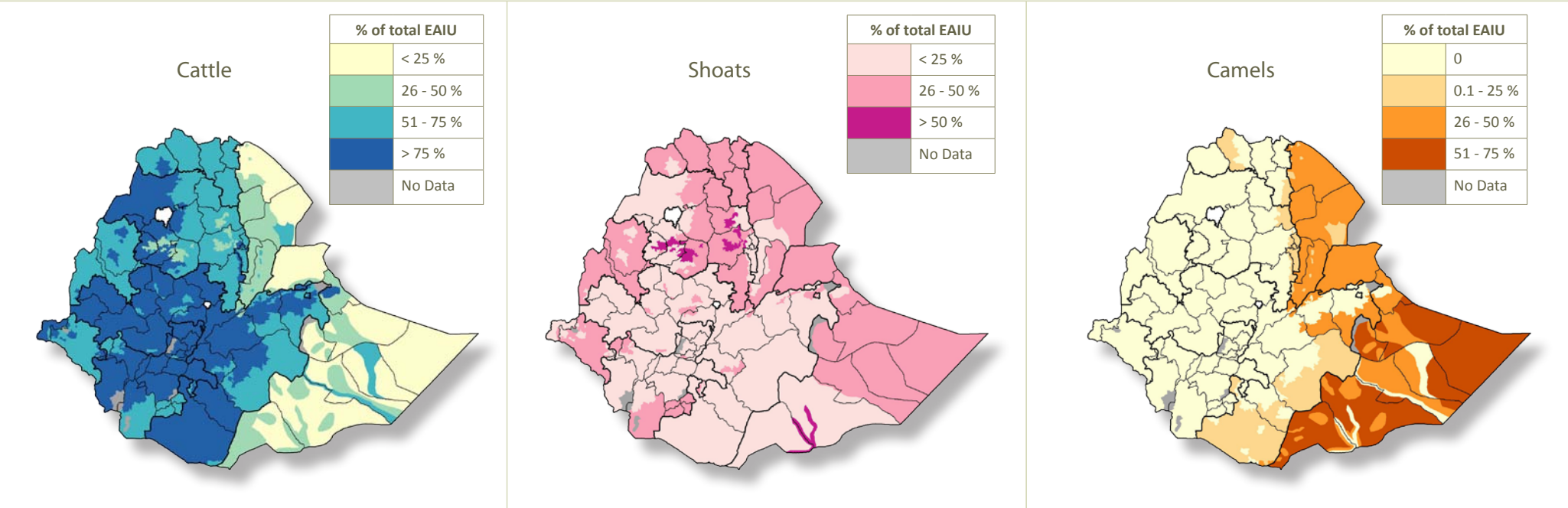
Cattle are the key livestock of virtually the whole of Ethiopia's cropping area, and not only because draft-oxen are needed. The high value of beef, as well as of butter, is a major incentive. Grazing, cut grasses and crop residues are all crucial for holding numbers of cattle, and the high contribution of livestock in much of western Oromia and western Amhara reflects a combination of better crop production and higher land-holdings on average. But their high contribution in densely

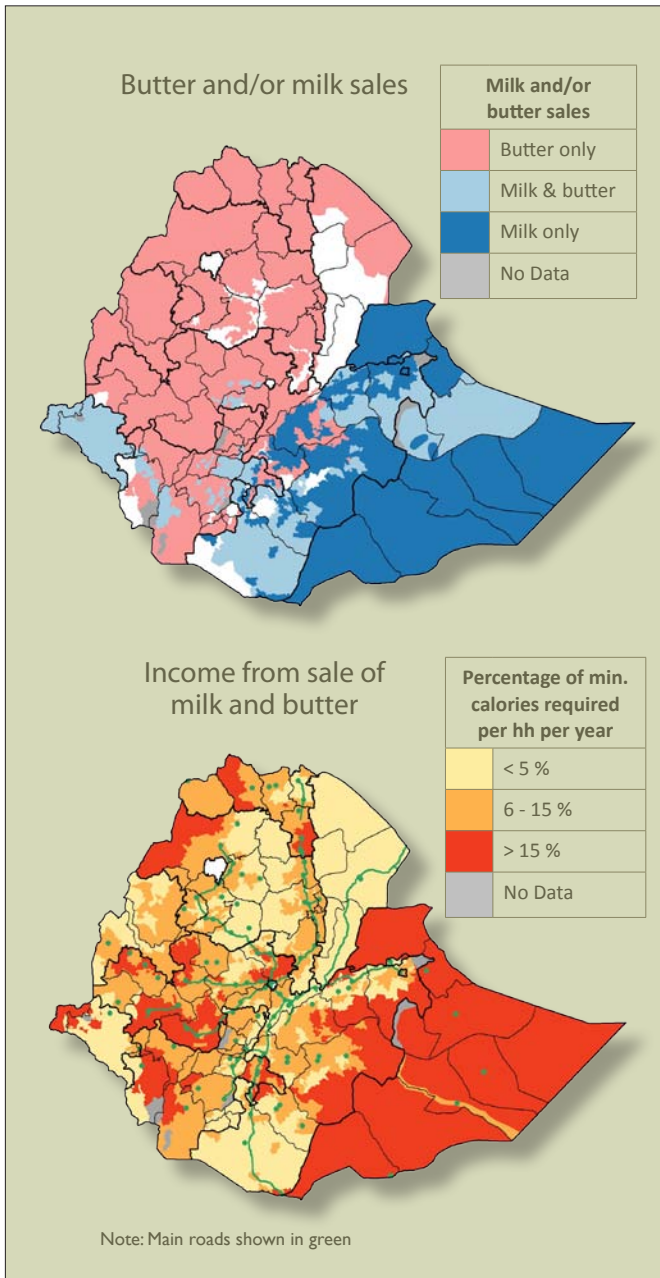
populated parts of SNNPR as well as the Harerge highlands (eastern Oromia) indicates not large numbers, but relatively small livestock holdings in general amongst which cattle are given extra value by stall feeding and fattening for sale, or else for milking for butter production – much aimed at Addis Ababa, around which cattle values are particularly high. Sheep are crucial in the high highland areas showing deep pink in Amhara, while both sheep and goats are more prominent in

the north-east highlands in general, where cattle are hard to keep in numbers, and again in the Genale riverine area in south Somali, destined for the cross-border markets of both Somalia and Kenya. Otherwise in the rangelands there is a clear division between the Boran and Guji cattle pastoralists of southern Oromia and the camel pastoralists of Somali.

The contribution of specific livestock as a percentage of Ethiopian Animal Income Units (EAIU)

Note: See note under map on page 47 for explanation of EAIU



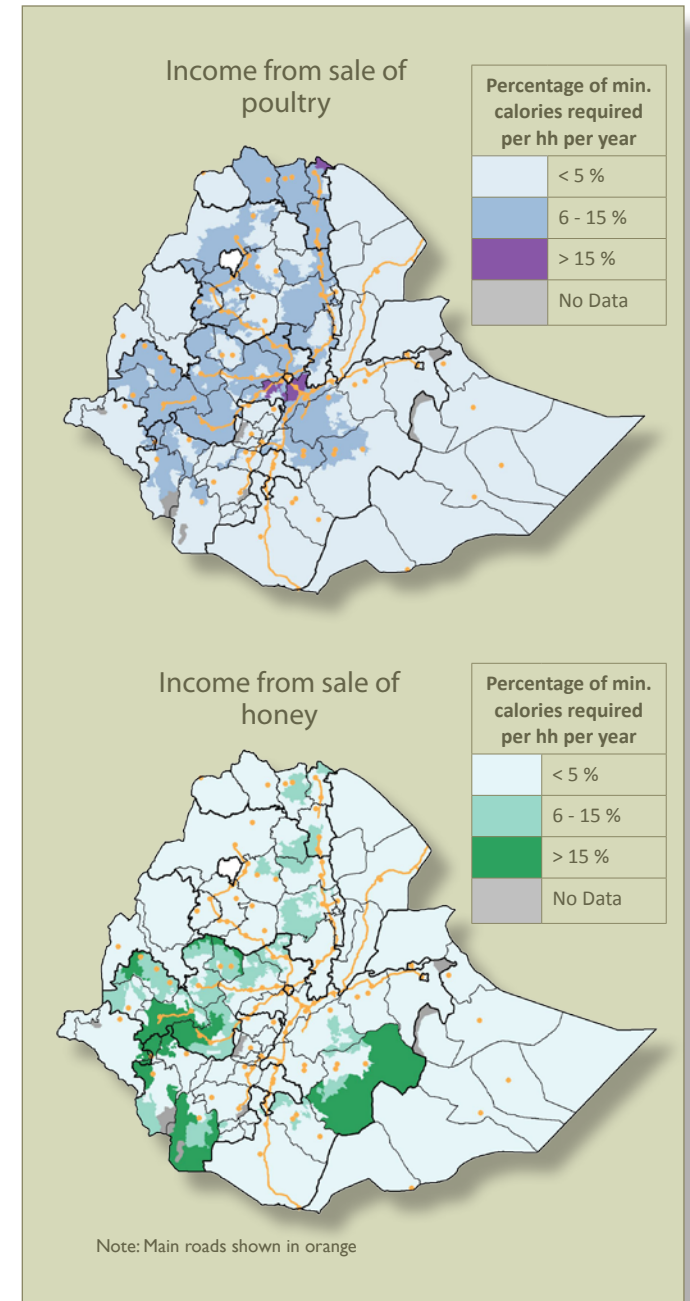


Milk and butter sales predominate

Why is butter so dominant in the cropping areas? Aside from vestiges of traditional shame associated with selling milk, a major reason must be that milk is far more perishable than butter, so that most farmers would have to seek only local customers for milk. On the other hand there is a strong urban demand for butter, and prices have risen considerably over the years, so that producers concentrate on it for urban markets.

Pastoralists do not usually buy butter, and so it is milk that is sold locally, while markets for butter are usually too distant to be feasible. In Afar milk sales are uncommon, and sales of butter in the north actually form a very small part of overall income and are chiefly associated with customers in the salt trade.

For poultry the urban demand is again great, and so incomes are higher for those who live nearer to roads. Honey is sold in small amounts in many localities but is especially abundant in forested or dense-bush areas of the west and south.



Pastoralist Livelihoods

Although they only form 6% of the country's rural population, pastoralists inhabit a great part of the east and far south of the country. This is because only they can make a living out of the otherwise unpromising semi-arid environments where the rainfall will not support any crops. Although pastoralists consume far more milk than the cropping population, even than their agropastoral neighbors, only the better off minority of herders manages to live *primarily* on milk and meat. For the rest, the household economy centers on getting the cash to buy the grain that makes up the better part of their diet. In the main it is the sale of animals and their products, destined chiefly for distant urban consumption, that brings in the money. But poorer pastoralists with fewer animals to sell must usually supplement this by selling collected firewood or gums or bush products, or by paid work for others. Seasonal change means great fluctuations in milk availability and in animal condition and therefore sale prices. The annual hunger season is keenly felt by the majority of pastoralists, and they are particularly at risk if the rains that bring this period to an end fail.

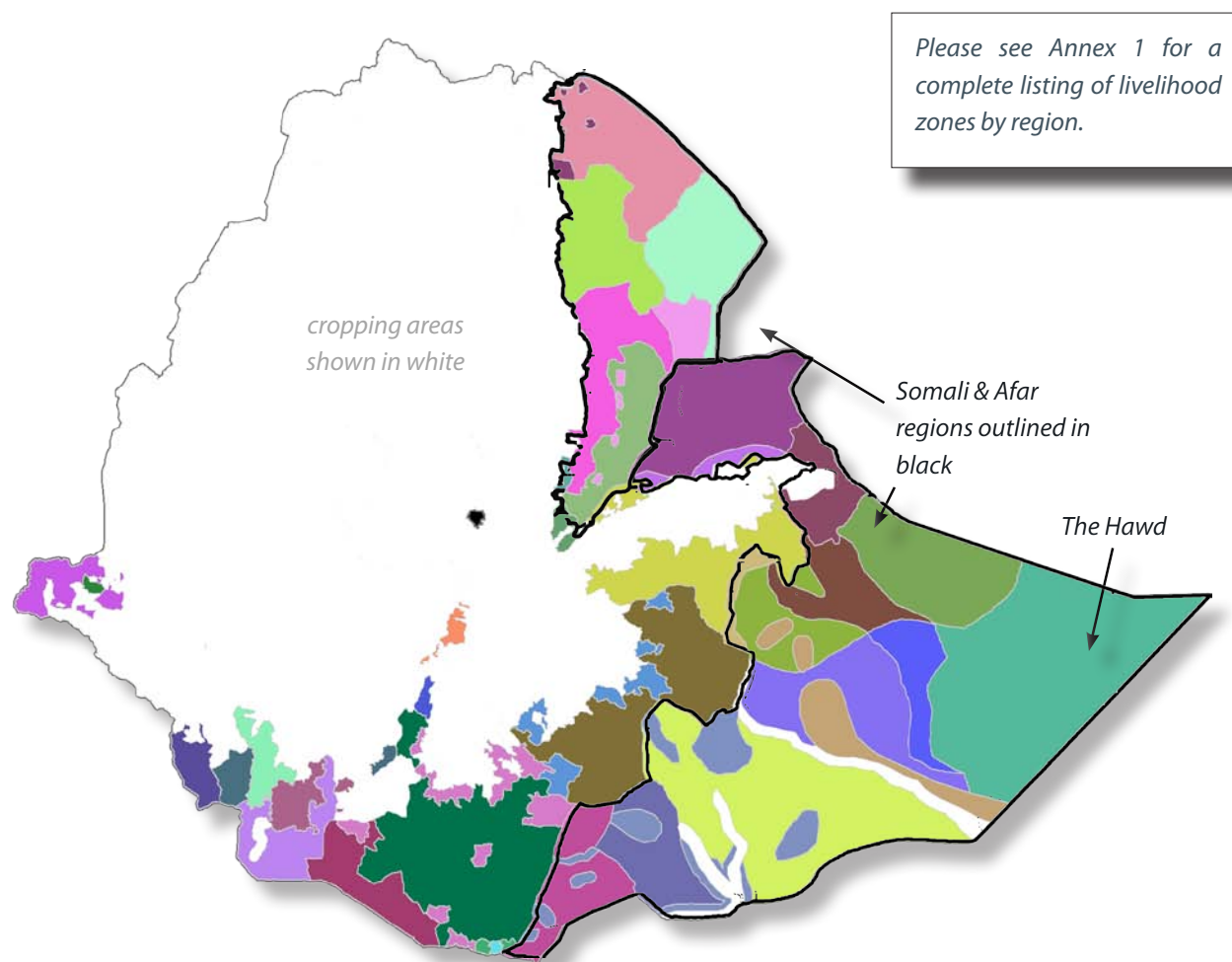


Where do pastoralists live?

Pastoralism is a lowland phenomenon

Pastoralists today use lowland environments where rainfall is insufficient to support cultivation. This was not always the case, for some areas which today are firmly within the cropping zone of Ethiopia were originally pastoralist areas, since then progressively settled by people from the highlands as well as by ex-pastoralists. Today, wide-spread localities between the cropping and the pastoral zones are occupied by agropastoralists, who balance the cropping potential and the herding potential. This is the case right around the low foothills of the high massif, from Somali and far eastern Oromia (Harerge) to the west of SNNPR and Gambella. The patchwork of livelihood zones on the map reflects the many variations in altitude, terrain, rainfall and vegetation. In Afar Region, for instance, there are major differences between the low-lying near-desert of the far north and the other (often still harsh) terrains where grasses and bush-cover and water are more available. Similarly in Somali Region there are considerable variations in the density and quality of bush and grass cover, while in the Hawd in the far east the lack of a water-table for wells means that rainfall run-off must be collected in ground 'tanks'.

Livelihood zones in pastoral and agro-pastoral areas



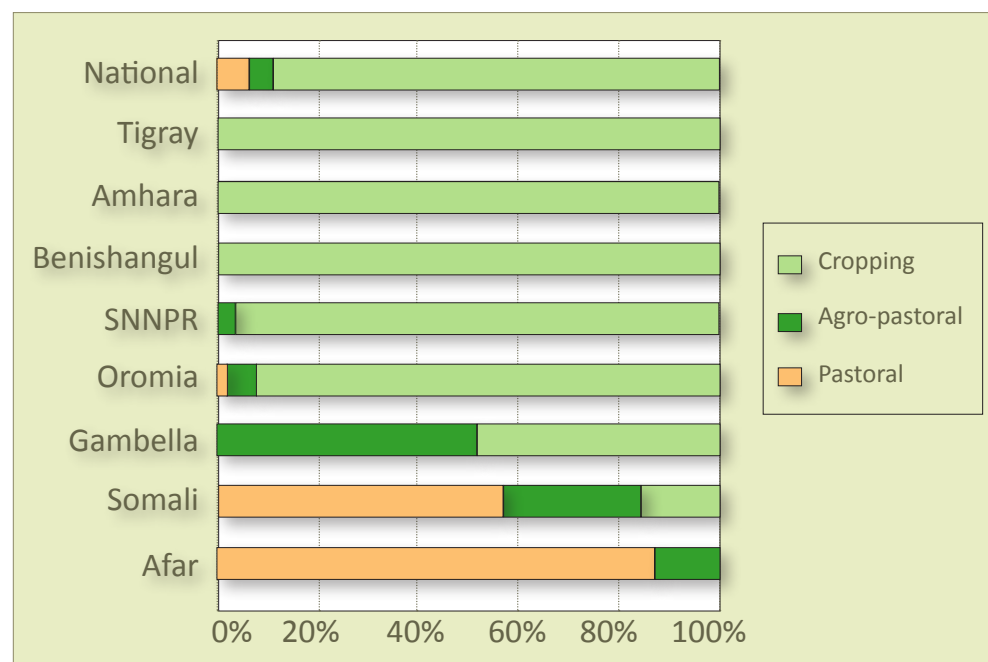
How much of the population is pastoralist or agropastoralist?

It all depends on what can be done with the land

Pastoralism is based on the capacity of the biomass to support livestock. Apart from localized water-spreading or other fodder-generating schemes, there is a strict limit to any expansion of this capacity. Insofar as human populations depend on their livestock alone, their numbers will always be limited. Cultivators can be thought of as increasing the useful biomass by growing crops. Thus pastoralism makes for very sparse populations and agriculture for much denser populations. And it is the 'agro' in agropastoralism that allows their number to reach almost 80% of the number of pastoralists even though their territory is far smaller. In rural Ethiopia as a whole, on the basis of the livelihood zones, at the time of the 2007 census pastoralists were 6% of the population, agropastoralists just under 5%, and farmers just over 89%. The value of livestock to pastoralists is not simply in the direct consumption of milk and meat. Herders today rely heavily on selling livestock and milk products in order to buy the grain on which all but the wealthiest primarily live (see pages 56/57). It follows that if the terms of trade between livestock and grain rise in favor of livestock over a period of time, then this will allow some limited expansion of the pastoral population, even if the livestock numbers remain the same.

Rural population by type of livelihood zone (2007 Census)

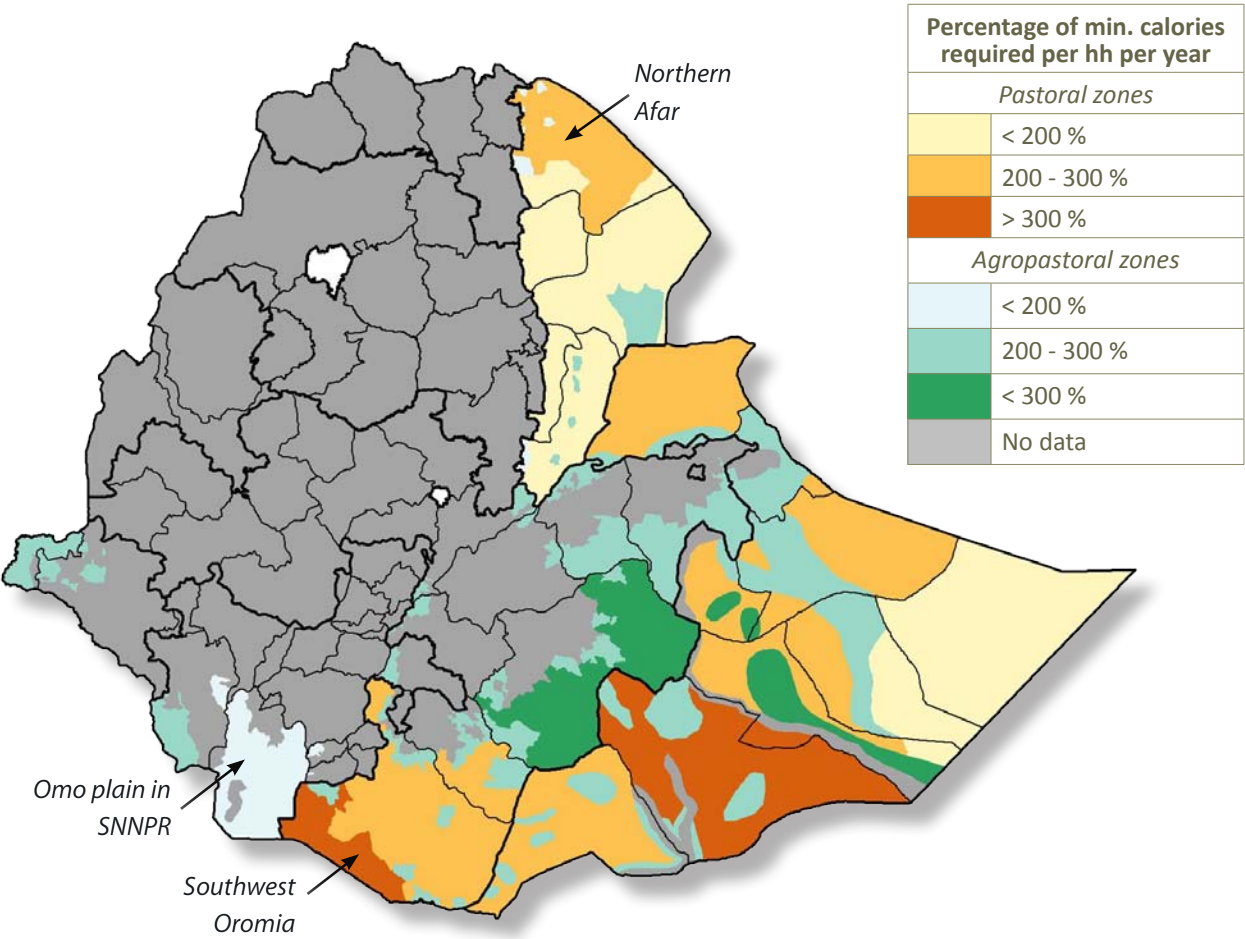
Region	Type of Livelihood			Total
	Cropping	Agro-pastoral	Pastoral	
Tigray	3,471,733	0	0	3,471,733
Amhara	15,003,844	0	0	15,003,844
Benishangul	572,882	0	0	572,882
SNNPR	13,021,540	374,491	0	13,396,031
Oromia	22,011,592	1,289,805	484,806	23,786,203
Gambella	110,113	118,925	0	229,038
Somali	584,929	998,792	2,177,992	3,761,713
Afar	0	148,897	1,051,432	1,200,329
National	54,776,634	2,930,909	3,714,230	61,421,773



How 'wealthy' are different herders?

This map is one way of looking at the comparative wealth of different areas. We should not pretend that we can always explain differences which are dependent on the detail of local conditions, but here we can make one or two general points. So far from being failed pastoralists, agropastoralists seem to do better than pastoralists in the sense that there is only one area where they are comparatively poor in income. This is in the Omo plain of the far south of SNNPR, a harsh environment isolated in terms of major national or cross-border trade routes. Environment and market isolation also help to explain the relative poverty of much of Afar and of the far west of Somali Region. Otherwise we have to look for localized clues. For instance, in the far north of Afar it is the salt industry that makes the difference for both local traders and workers. In the far north of Somali Region pastoralists gain from a mix of livestock trade with, and remittances from Djibouti, and from renting out pack-camels for the trade into the highlands. And the pastoralists of the far south-west of Oromia are comparatively wealthy in their mix of cattle and smallstock; they manage to overcome their market isolation by strategic movements of livestock, and it is only in drought that they suffer because they cannot move weak animals far enough and fast enough to market.

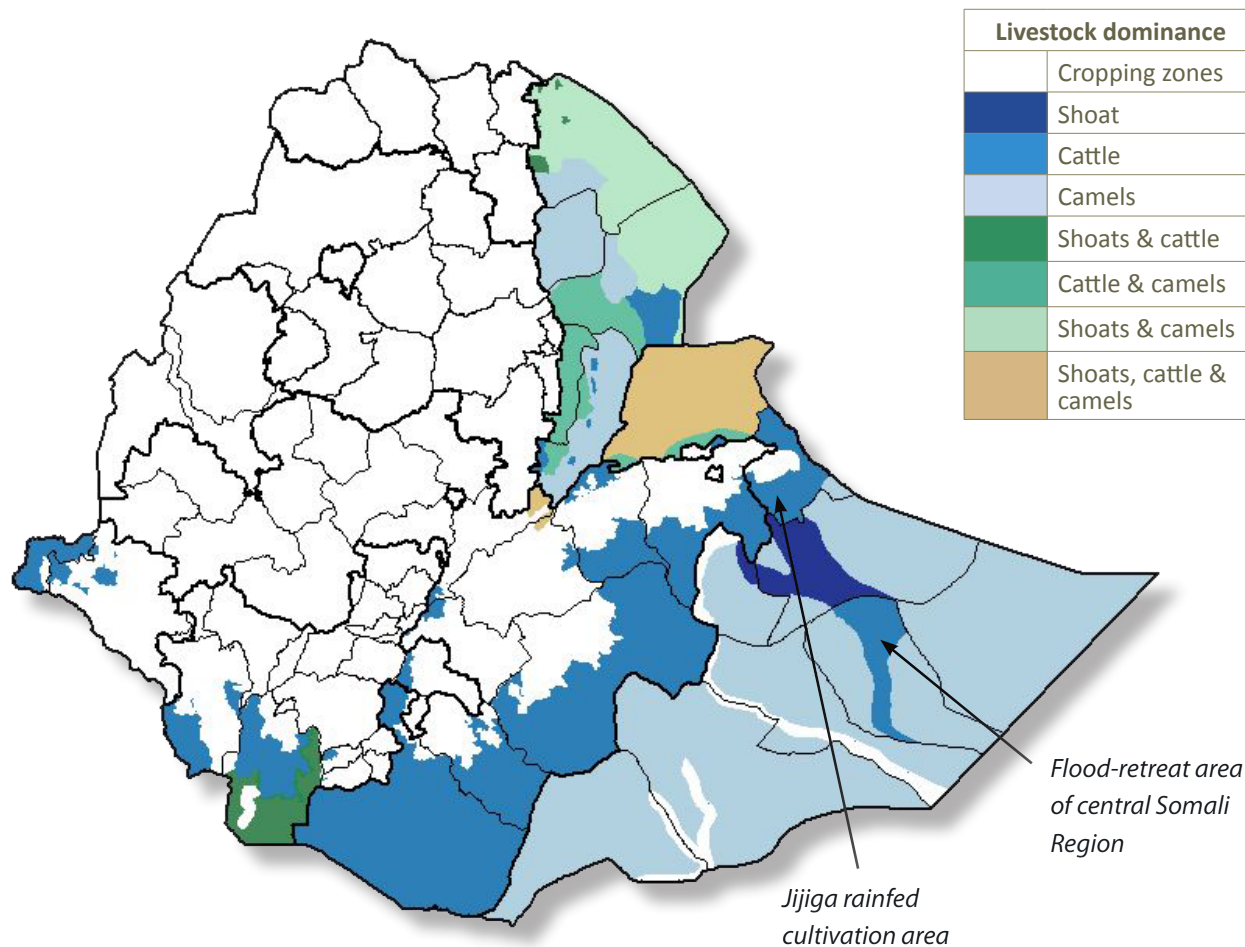
Total income (food & cash) by type of livelihood zone



Notes: "Total income" is the total amount of food and cash income generated by a household, converted into kilocalorie equivalents and then compared to a household's annual kilocalorie requirements. Cash income is converted into kilocalorie equivalents by estimating the total amount of food that the cash could purchase, assuming the cheapest staple and the average price of that staple in the reference year. In essence, the map above shows how much of a households' minimum annual kilocalorie needs are covered by livestock's contribution if that contribution is in both direct food and cash terms.

Are all herders the same?

Dominant livestock type in pastoral and agro-pastoral areas by livelihood zone



Notes: The map above depicts dominant livestock types in pastoral and agro-pastoral areas by livelihood zone. Livestock type dominance is defined for the purposes of these maps according to total income generated by each livestock type. The following definitions apply to each category: a. **Single livestock type dominance:** Livestock type generating the highest level of total income (%kcal), and which is at least 25% of its value above any other total income from another livestock type; b. **Multiple livestock type dominance:** Total income generated by more than one livestock falling within 25% of the highest total income livestock source. E.g. shoats & cattle would be dual-dominant if total income was 50% and 38%, respectively.

There are differences in the types of livestock held

The greatest divide is between camels and cattle in the south-east and south/south-west respectively. The reason is mainly environmental but with some interplay of long-standing historical and cultural factors differentiating the cattle herders of Oromia from the neighboring Somali camel herders.

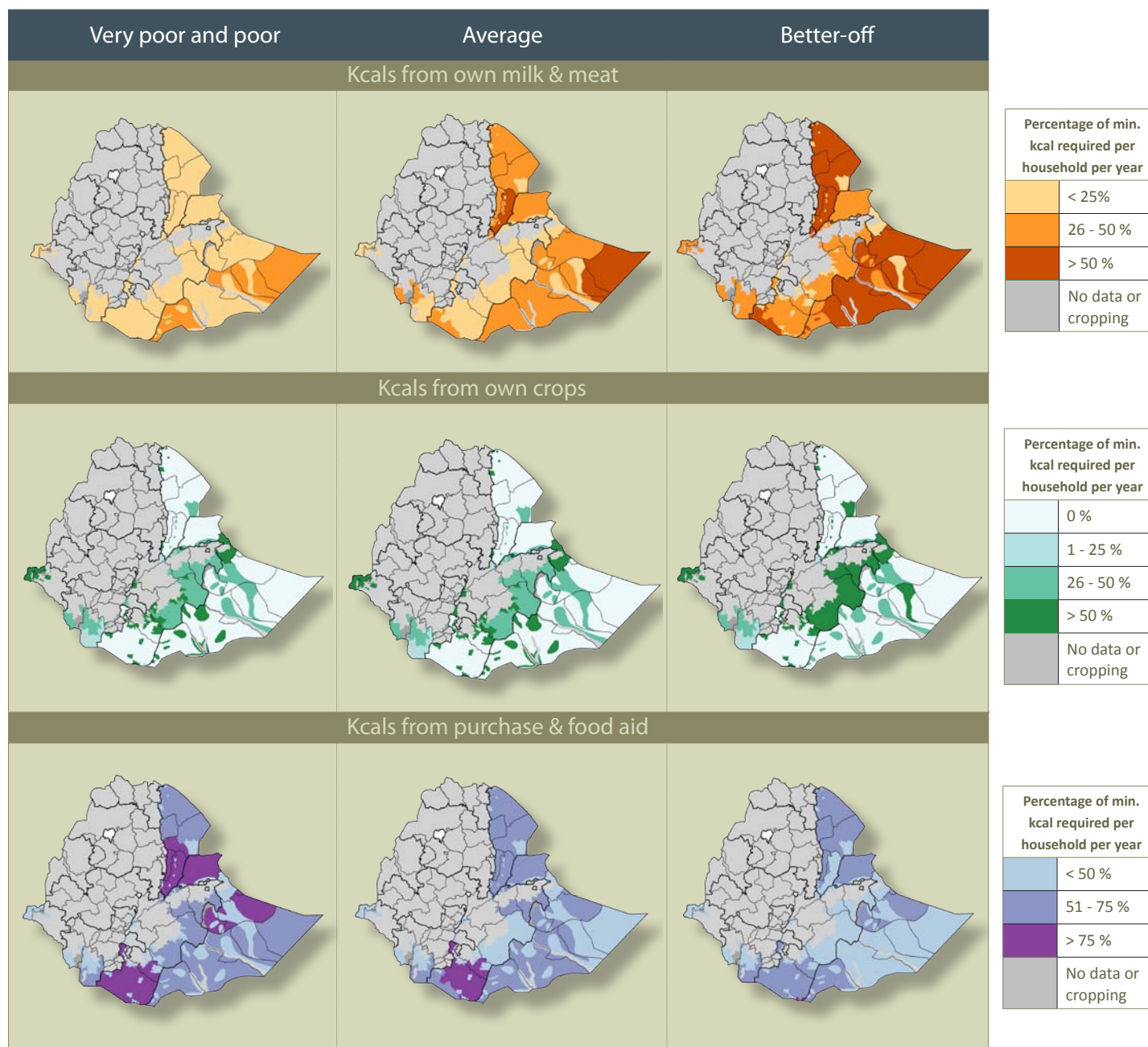
Where cattle do predominate in Somali Region is in agropastoral areas: in the Jijiga rainfed cultivation area beyond the Harerge foothills, and in the flood-retreat area in central Somali Region where camels are not raised at all. Next door to this northwards, in a further agropastoral setting, sheep and goats predominate partly because they were quicker to regenerate than cattle after losses during the droughts at the turn of the decade.

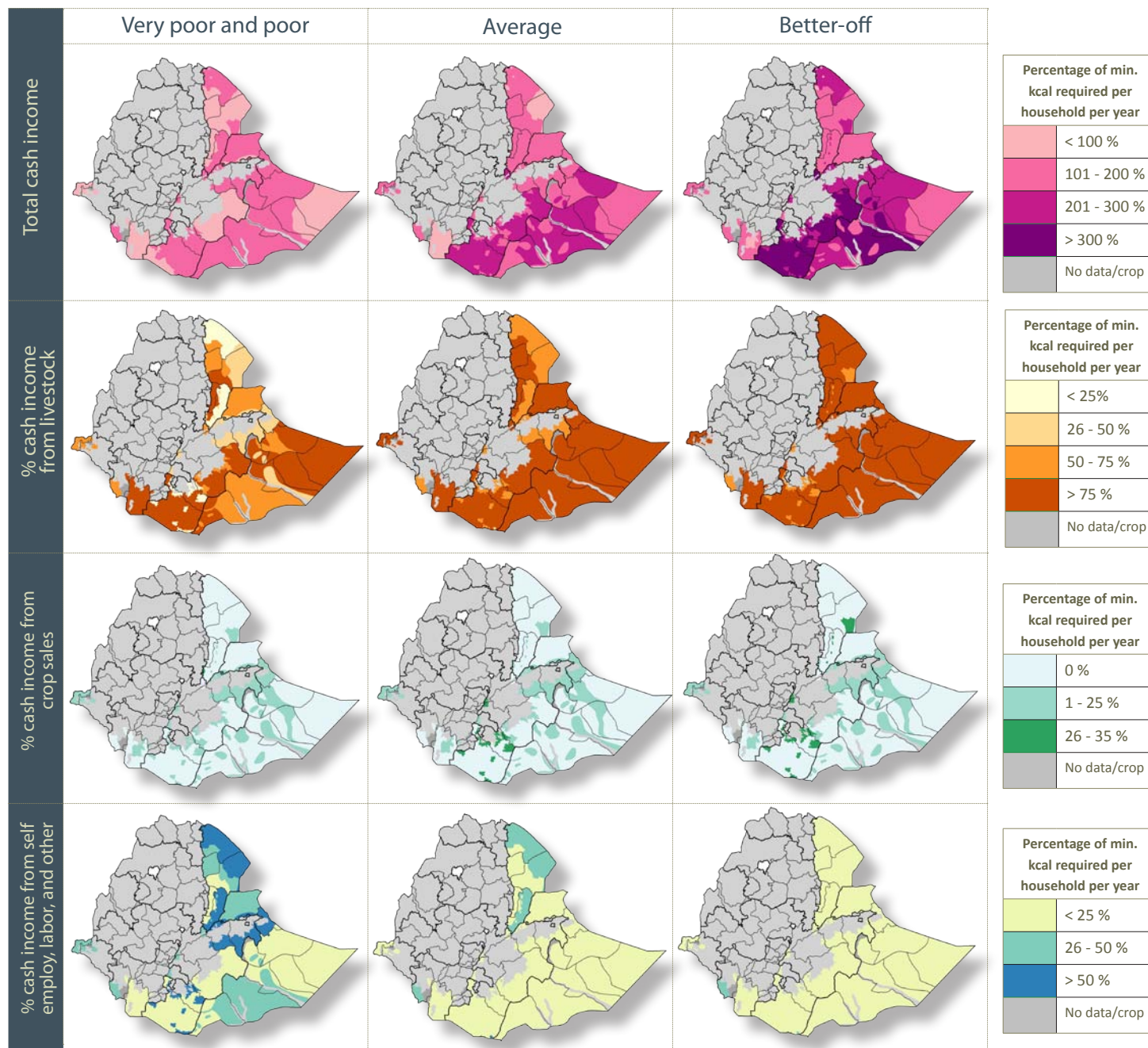
Camels are the common factor in most of Afar, alongside shoats or cattle. Again, the exception is in the agropastoral localities where cattle predominate: it seems that cattle are maximized where conditions allow. In the west and south-west of the country there are no camels, and the agropastoralists herd mainly cattle, although in the Omo area of the far south of SNNPR better-off households in particular invest in very large numbers of goats.

Are all herders the same?

There are differences in diet and income

Although most pastoralists depend heavily on purchased grain, they want to consume as much milk and meat as they can. In the top set of maps, generally only the better-off stock-owners manage to approach this ideal with more than 50% of calories coming from milk and meat. Nevertheless, for the *overall* pastoral population in the reference years, milk and milk-products gave on average nearly 40% of food calories. In agropastoral areas even the better-off consume on average less than 50% of calories from milk and meat, which is consistent with their economic balance between livestock and crops. The maps on the bottom row suggest that where we see lesser market dependence, extreme distance from main grain markets must play a role, e.g. far western Somali. Neighboring pastoralists in far-southern Oromia and south-western Somali show respectively lesser and greater consumption of milk and meat. There may be some influence of cattle vs camel pastoralism, but the Somali are also more isolated from main trade roads to the highlands.





These maps show cash income in terms of what proportion of household food requirement it could buy.

From the top set of maps we can see that better-off households benefit from cross-border trade (south Oromia, south Somali) and from answering neighboring highland market demand for meat (in east/south-east Oromia, and in Afar where incomes are nevertheless comparatively low generally). In the second row we see that overall livestock cash can cover most food requirements, which is important, because most herders have far less milk than would be needed.

The third row shows us that few agropastoralists get much from selling as opposed to consuming their crops. And in the fourth row we see that - in addition to livestock sales - cash income for poorer people comes from salt industry employment in northern Afar, from working on neighboring Awash irrigation schemes in southern Afar, from firewood sales and casual labor in neighboring Harerge highlands in eastern Oromia, and in south Somali from collecting and selling bush products.

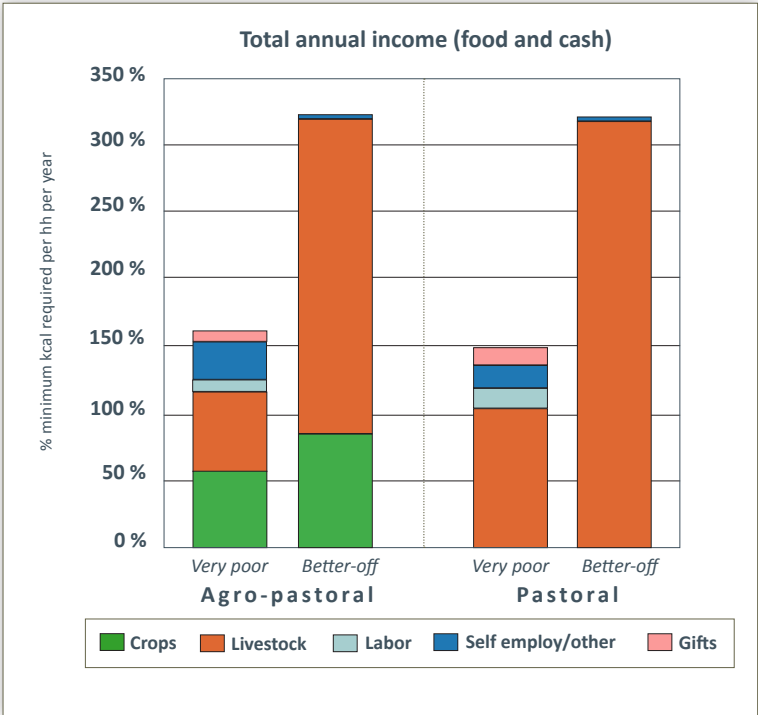
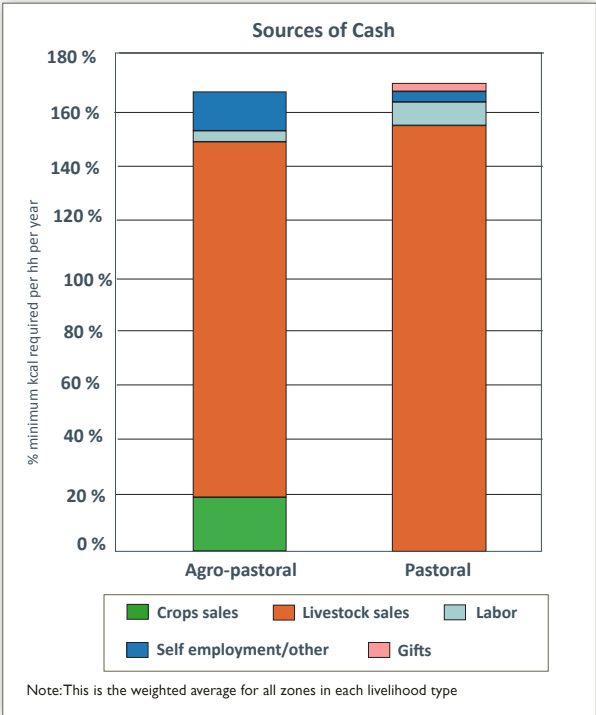
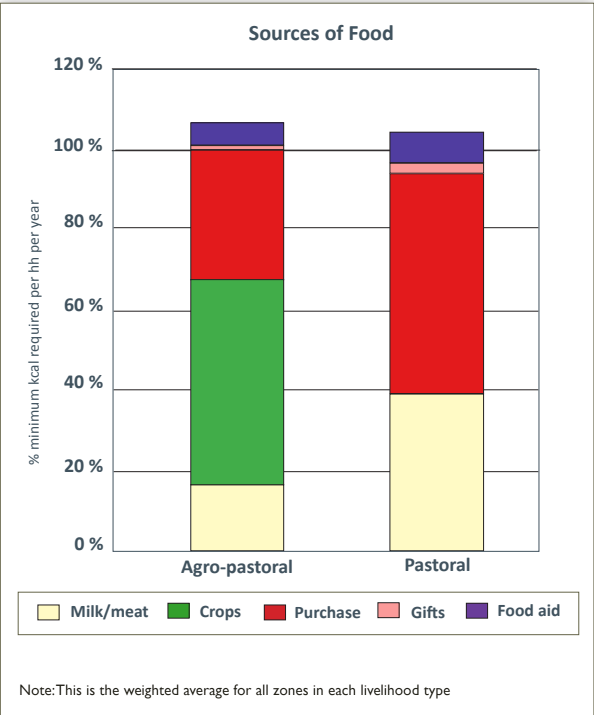
How dependent on the market are pastoralists vs agropastoralists?

The differences is in food rather than cash

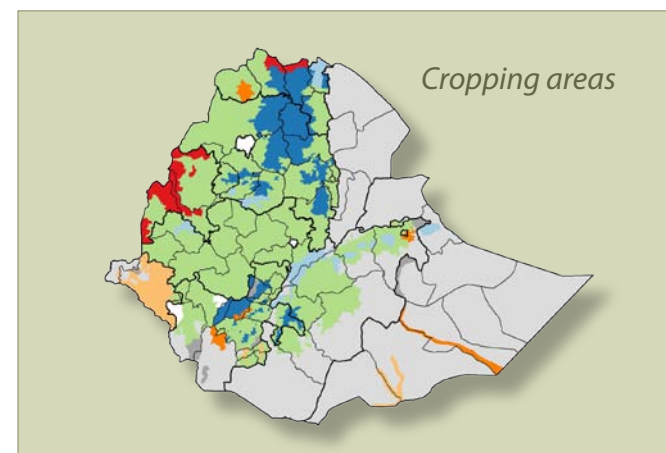
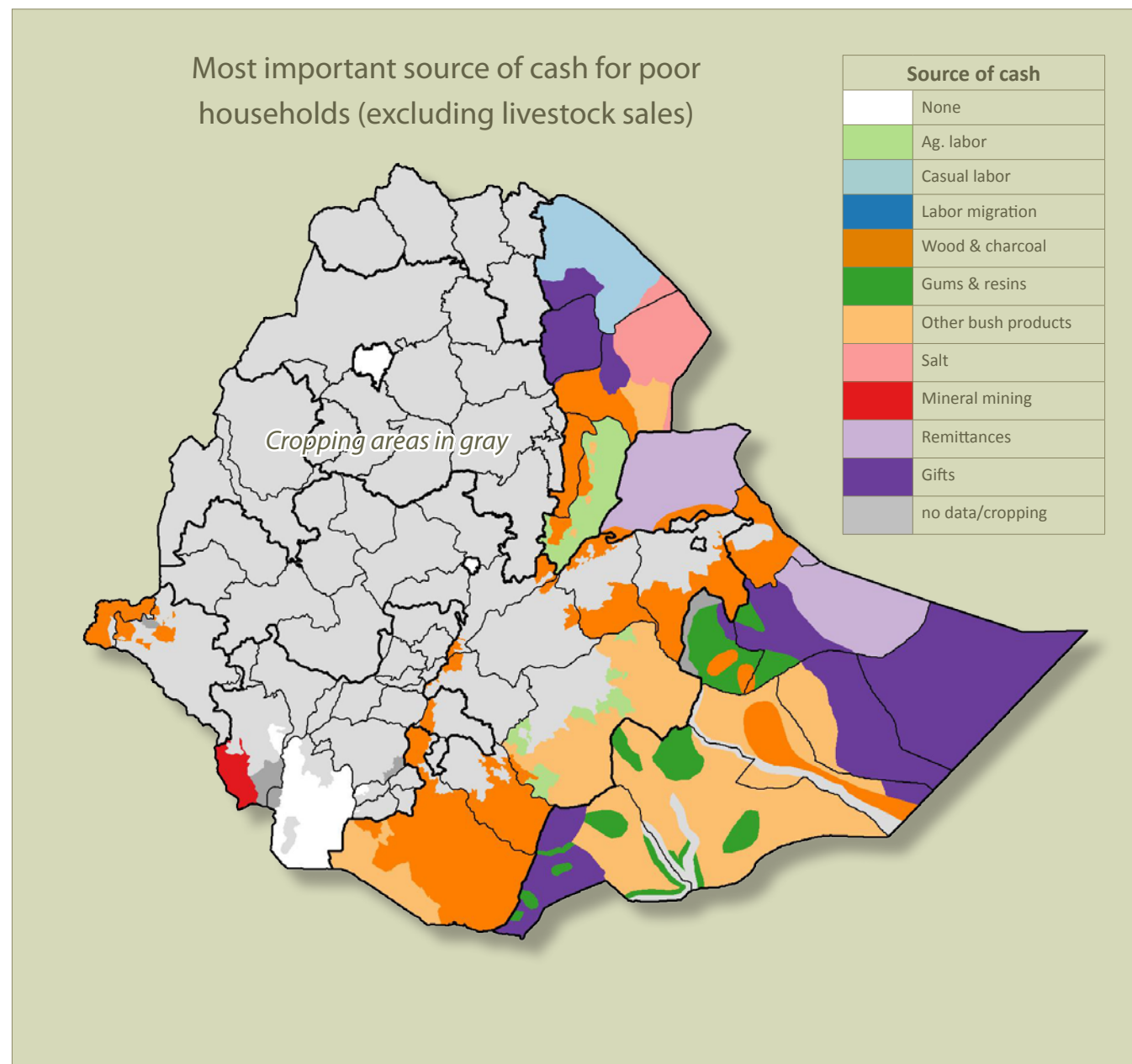
The left-hand set of graphs show that agropastoralists get nearly half of their food requirement from their own fields, but also drink much more milk than croppers up the hill. Pastoralists, in turn, drink more than twice as much milk as agropastoralists but must buy the bulk of their food, in the form of cereals, from the market. Also, pastoralists have been more dependent on food aid to reach their minimum food requirement. The middle graphs

show that differences in cash earnings are minimal: both groups depend to an overwhelming extent on selling livestock and their products, while in terms of other income, agropastoralists get more from 'self-employment', which largely means selling firewood: they have a better-wooded environment and are generally far nearer to highland markets than pastoralists. Poor pastoralists depend to a greater - though still modest - extent on paid work for their wealthier neighbors and sometimes the offer of herding or other work is in effect as much a kind of 'solidarity'

as the outright gifting of money by kin. In terms of overall income (right graphs), taking own-produced food together with cash earned, livestock are always most important. Given the risks faced by both groups in these semi-arid environments with frequent rainfall irregularities, it is notable that the poorest agropastoralists have a more diversified and balanced income set than the poorest pastoralists, and thus more options in the face of losses - whether of crops or livestock.

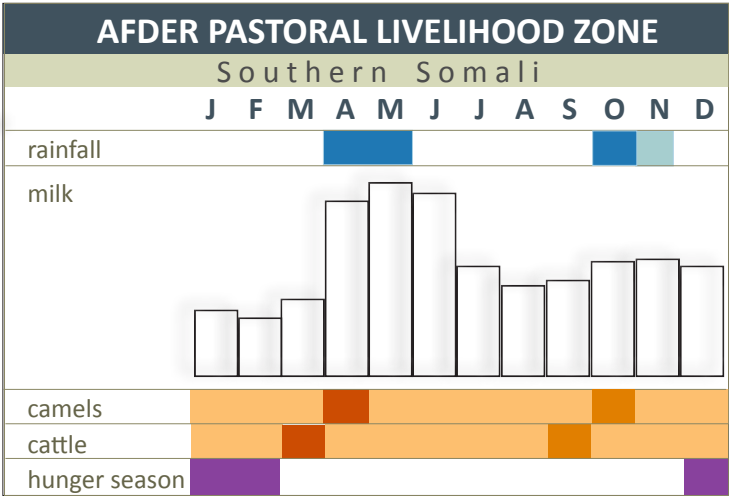
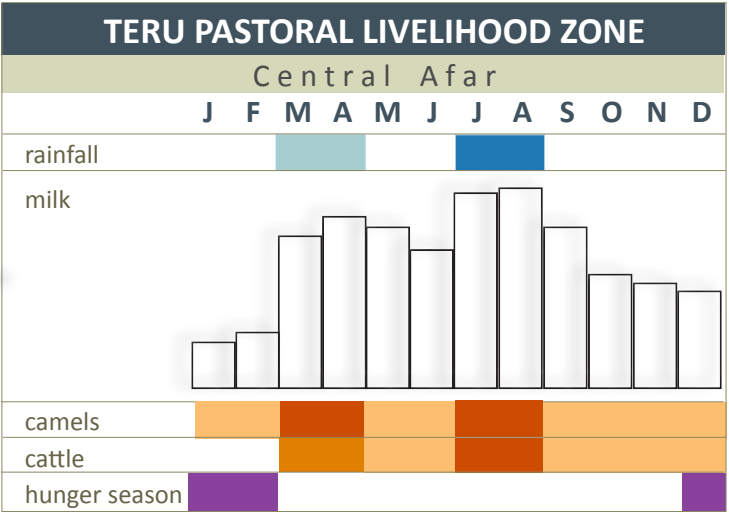
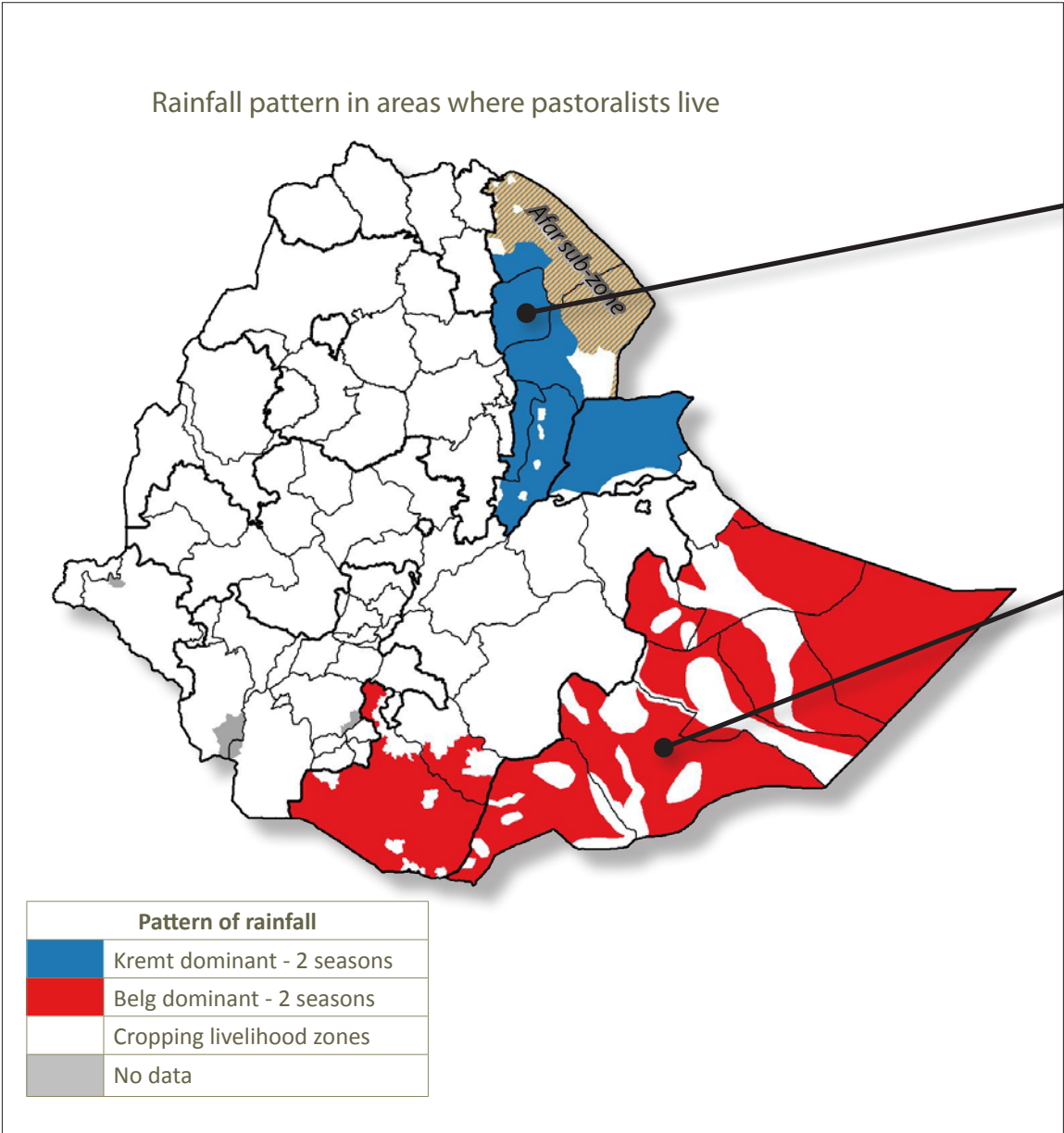


What are the most important cash sources for poor pastoralists?



Livestock are usually the single biggest source of cash for poor pastoral and agropastoral households, if not for the very poorest. It is striking that firewood is the next biggest source, especially in agropastoral (and some pastoral) areas which are relatively near to the highland demand or on major trade routes. This is one (increasingly unsustainable) use of the semi-arid environment; another widespread use is the collection of gums and bush products. Unlike in the cropping areas (see inset map above), agricultural employment is rare (the Afar example regards irrigation schemes) and labor migration doesn't feature. Otherwise there are particular instances: salt industry work in northern Afar, gold panning in far western SNNPR; or without other options, dependence on gifts and remittances – or not even that in far southern SNNPR.

What are the seasonal patterns of production and hunger in pastoralist areas?



LEGEND		
Monthly rainfall		Livestock production
<div></div>	> 25 mm	milk production
<div></div>	> 50 mm	main season for births
		2nd season for births

Pastoralists manage risks season on season and year on year

Pastoralists live under very risky rainfall regimes. In the north-east, south-east and south of the country they have frequently been the recipients of emergency interventions. It has been important to establish the *normal* relationship between rainfall, livestock production and hunger seasons as a context for predicting the effects of rain failures.

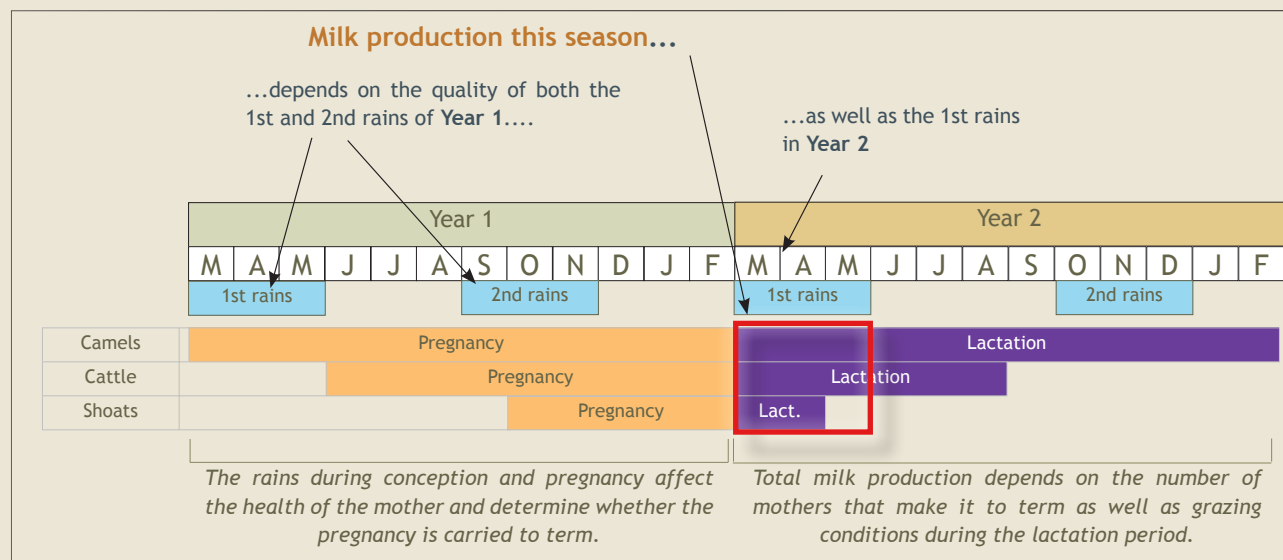
The main hunger season in pastoral areas falls in the months before the *belg* rains. This is linked to patterns of livestock births and milk production and to the physical condition and marketability of livestock. Here we illustrate two livelihood zones, one in each of the two mainly pastoral regions, Somali and Afar. Most pastoral areas in Ethiopia have a bimodal pattern of rainfall, and livestock births occur at two periods of the year, at the beginning of each rainy season. In the south, the largest number of births occur at the beginning of the main *belg* (*gu*) rains of April-May, heralding the period of maximum milk production fuelled by the abundant pasture and ground water. At the same time animal condition peaks, and with it the prices received on the market for livestock; and so the livestock-grain terms of trade tend to be favorable to the herders.

The main hunger season for people is experienced from

December to February/March, as the main dry season progresses following the shorter *deyr* rains around October and milk production dwindles. In the north the *belg* rains from March-April are lighter than the *kremt* rains which peak in July-August. The dry period between the rains is shorter than in the south, and there is a concentration of births in the *belg*,

with the advantage of favorable grazing conditions normally up to or beyond September. But then the main dry season is very long, so that the hunger period deepens up to March, and livestock and herders are especially vulnerable to any lateness or inadequacy of the *belg* rains.

*Milk production - which is critical for both consumption and cash income - is complicated to monitor because output depends not just on rainfall quality (and hence grazing) in the **current** season, but on rainfall in **previous** ones as well. This is because grazing affects livestock conditions, which determine whether the mother will carry her pregnancy to term: in a drought, animals are less likely to conceive in the first place; and with poor grazing conditions, aborted pregnancies are common. With lower rates of birth, the number of milking animals is reduced. So even if the current season's grazing conditions are good, previous poor seasons can reduce this season's milk production.*



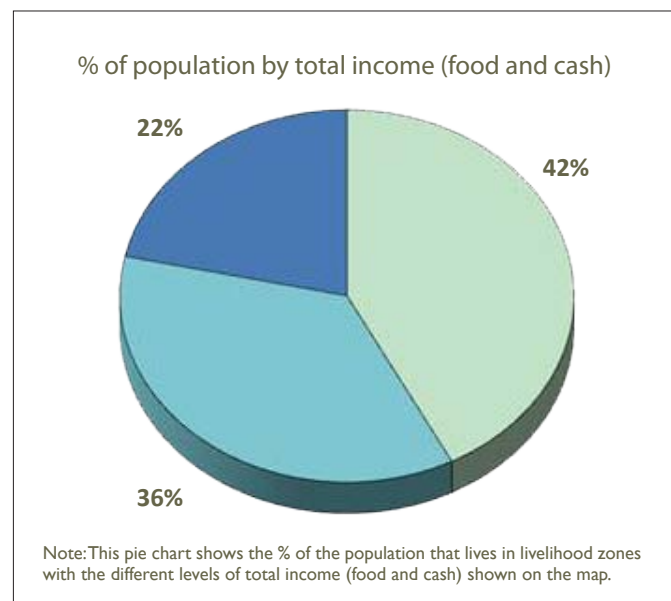


Differences in Wealth

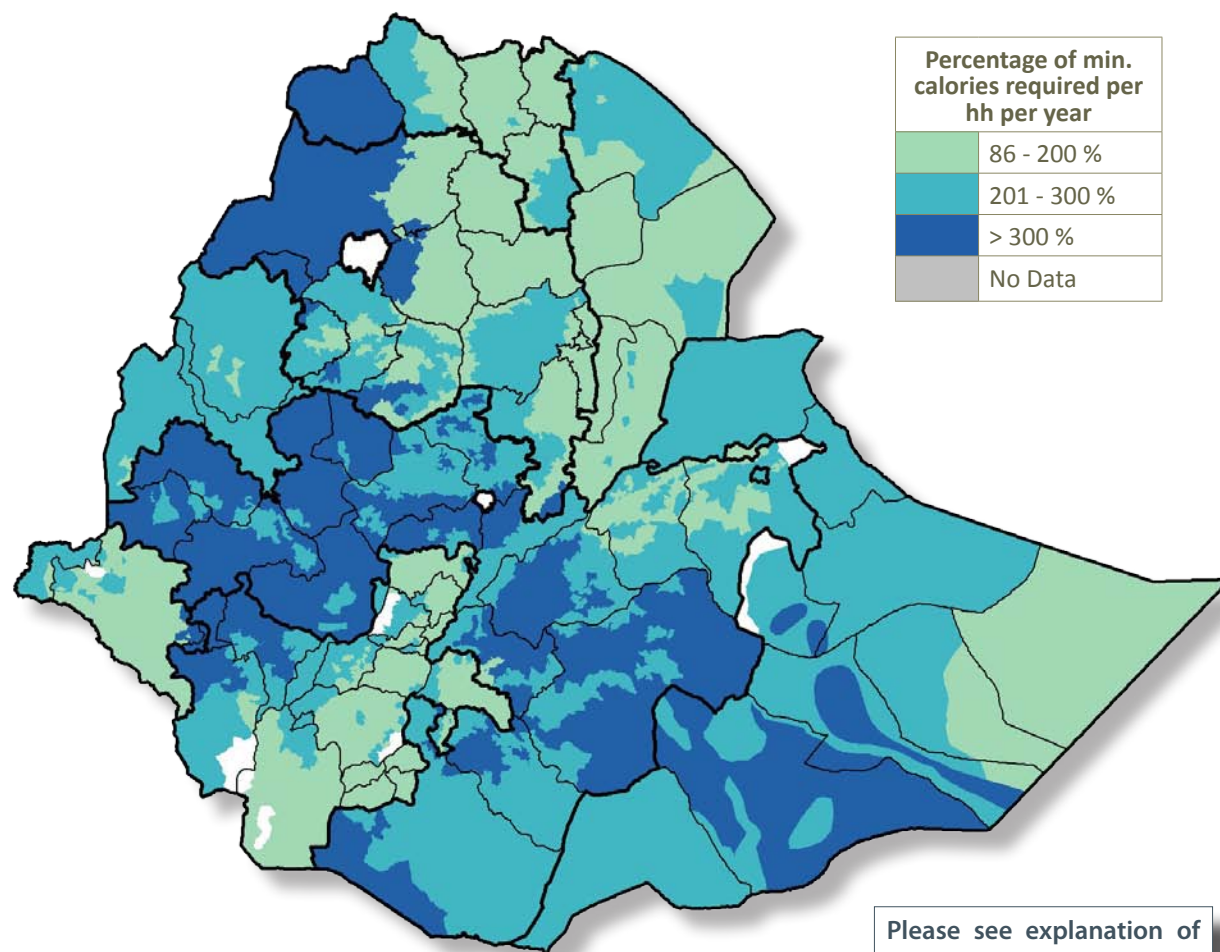
At the core of the livelihoods information on which this Atlas is based is the question of differences of wealth amongst the households that make up the livelihood zones. Even without this distinction we are able to show important wealth differences between areas based on the overall types and levels of production and market activity. But with it, we are able to enrich greatly our view of how local economies 'work': who holds what assets, who gets how much from their field and herds, who sells what, who employs whom. In the following pages we see that between the three grand livelihood divisions - cropping, pastoral, agropastoral - there is a similar pattern to the proportion of households in the different wealth groups, suggesting strong common factors revolving around the ownership of productive assets and capacities to use them. Beyond that, however, there are major differences both between and within areas. And we note that while food or cash assistance from the Productive Safety Net Programme regularly supports the poorest in some areas, it never approaches to being the largest item in livelihoods: people everywhere live overwhelmingly by their own efforts.

Which areas of the country are the wealthiest & poorest?

For the cropping areas, small average landholdings make for relative poverty, as in Gambella Region, especially if combined with low fertility and/or restricted rainfall as in much of northern Amhara and Tigray, and even where there is high cash-crop production, as in densely-populated coffee or *chat* producing areas of SNNPR and some chat localities in eastern Oromia. Amongst the sparsely-populated pastoral areas, the quality/availability of pasture and water makes the difference, although special local resources or proximity to main trade routes may increase wealth.



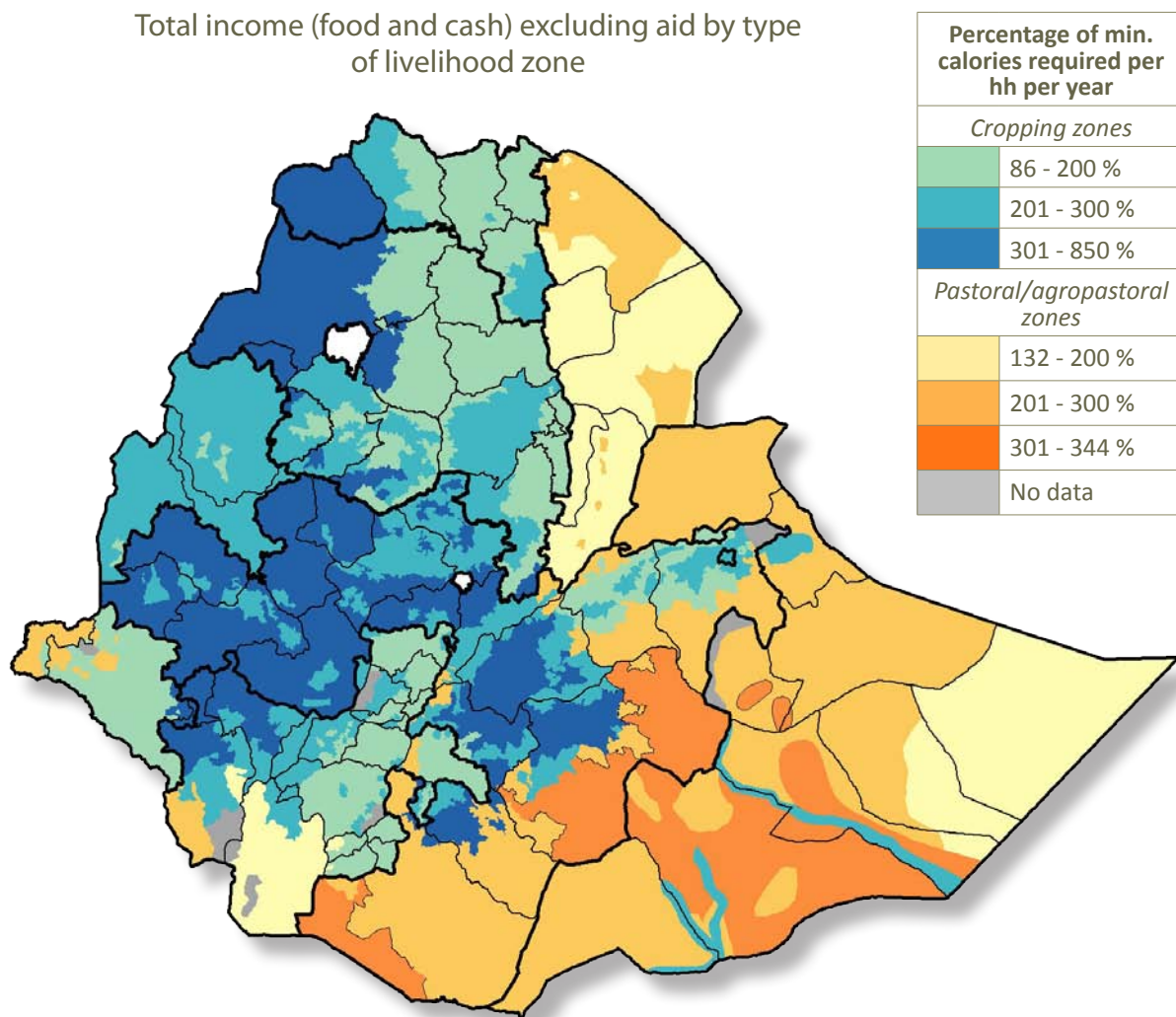
Total income (food and cash) excluding aid



Note: Weighted average

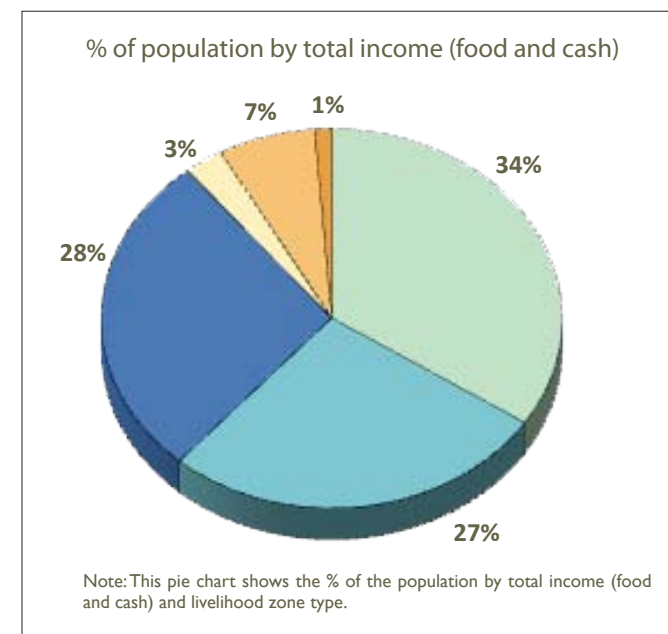
Please see explanation of 'total income' in *Glossary*.

Total income (food and cash) excluding aid by type of livelihood zone



Note: Weighted average

Pastoralists and agropastoralists live in harsh physical conditions with risky climatic regimes, yet they do not dominate the low-income areas of the map. This indicates above all the high value of livestock; but fewer agropastoralists than pastoralists are in the poorest band, suggesting that their mix of cereals harvesting and herds and their relative proximity to main markets have advantages. However, for both populations rain failures make poorer people frequently dependent on assistance. The same is true for croppers in the north-east highlands, where rainfall irregularities compound soil problems. This contrasts sharply with the generally favorable climatic and environmental conditions and greater incomes in the west and parts of the south of the country.



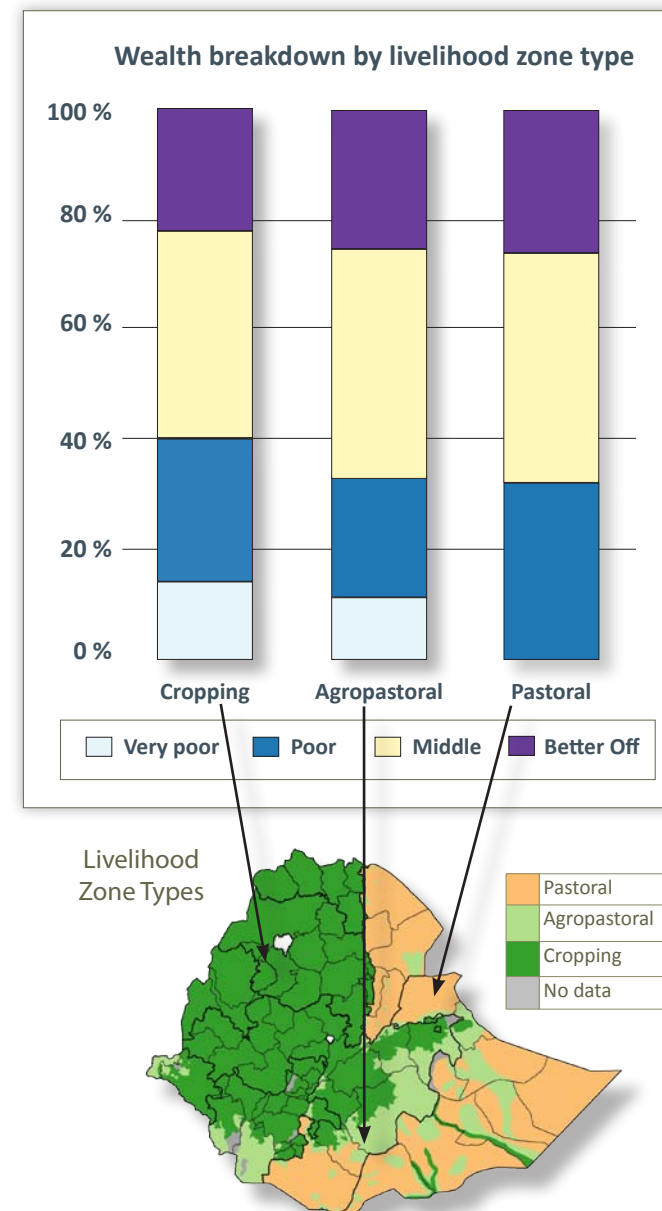
What variations in wealth do we see between different livelihood modes?

Looking first at the three modes of livelihood

If we view the graph as a three-way wealth division, setting aside for the moment the distinction of the very poor, then what is perhaps most striking is the lack of difference between the columns. Give or take a few percentage points, the proportions of different levels of wealth are very similar between the types of livelihood. Yet to the left and right, settled croppers and nomadic or transhumant herders operate extremely different economies, and in the center, agropastoralism is not some sort of mathematical half-way house but rather has a logic of its own as an economic operation. The implication is that there are strong common factors guiding wealth and poverty.

What the three modes of economy have in common is firstly that they are based on primary production, whether of crops or livestock, so that possession of productive assets is the key: cultivated land, grazing land, or the livestock themselves where there is extensive communal or rangeland grazing. Secondly, all three types of livelihood are highly involved in cash transactions, selling crops or livestock or labor in order to buy food and other necessities. We may conclude that at some general level these factors end up distributing wealth in similar proportions. And there is no particular reason to suspect

that the *very poor* group amongst pastoralists would be much greater than in the other livelihood types. *Very poor* households tend to live essentially by working for others and additionally selling firewood or other collected items. There is a limit to which employment can be offered within any of these kinds of communities, but especially amongst pastoralists who do not have the heavy labor of cultivation.



The graphs show proportions of absolute population, not households, falling within each wealth category for each type of livelihood zone. The fieldwork for the pastoralists generally split the households into three categories, with the very poor subsumed under "poor".

What makes cropping areas wealthier or poorer?

The recipe for highest wealth amongst cropping areas is: large land holdings and land area cultivated per person; dependable rainfall; good available grazing; good market access; and good opportunities for poorer people to be employed as labor on cash-crop or surplus food crop production, while still producing the greater part of their own staple food. This combination makes the sesame cash-crop area of Tigray the wealthiest livelihood zone in the country in terms of total food and cash income. In much of western Oromia too, wealth is relatively high as coffee, a good mix of food crops, and valuable cattle all make the best of a fertile and humid environment.

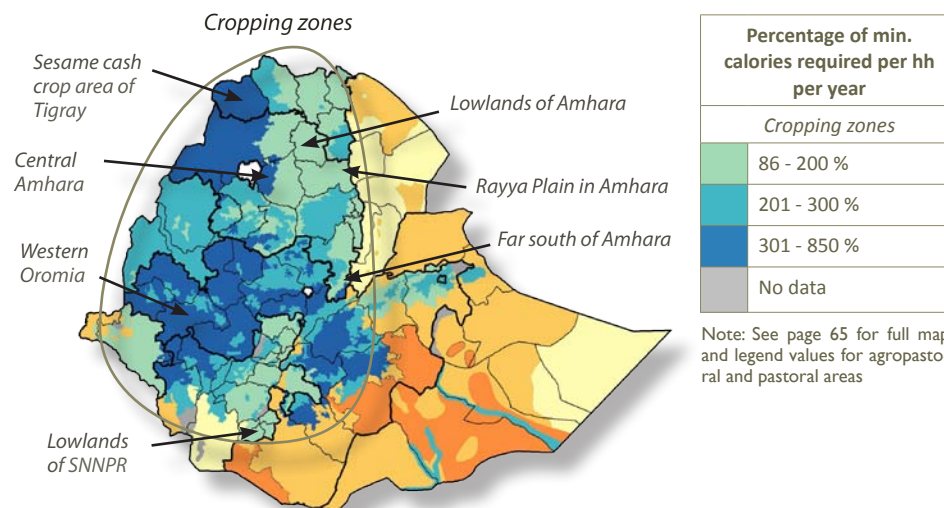
In other localities the absence of one element may be compensated for by the others. Around Lake Tana in central Amhara, for instance, landholdings are limited, but good rainfall, high fertility and the sales value of the abundant mix of crops (including some paddy rice) and livestock and butter make this one of the country's wealthiest areas. Particular niche areas also have advantages, for instance the most southerly agricultural area of Oromia where coffee and enset together with maize make a powerful combination, as do peppers and maize/enset, and chat/spices and cereals, elsewhere in Oromia and western SNNPR. Then there is the large zone of

commercially-oriented wheat, barley and oilseeds production in the Arsi-Bale Mountains of south-east Oromia. Again, the market demand of Addis Ababa is felt in a radius of several hundred kilometers and inevitably most affects wealth levels in its immediately neighboring areas, especially to the south and west, where production conditions are good and *teff* is produced in quantity. By contrast, most of the areas with lower total income levels, especially those in the lowlands of SNNPR and Amhara, are characterized by particularly poor market access, on which most of the *very poor* and *poor* households are nevertheless heavily dependent to buy food.

In general in the cropping areas, wealth and relative self-sufficiency in food go together – as do poverty and food insecurity. But these tendencies are not absolute. There are areas which are relatively food self-sufficient but also relatively poor, for instance in the far south of Amhara (Minjar middle-highland) where land holdings are too small to allow a substantial surplus for the

market, although *teff* sales bring in the greater part of such cash as households earn. Further north in Amhara on the Rayya Plain bordering Afar and south Tigray, there is another anomaly. On the one hand, there are normally substantial sales of *teff*, and good staple sorghum production, and high livestock earnings; on the other hand, there are numbers of poorer people on the Productive Safety Net register. The reasons are food insecurity due to periodic severe rain failure, and also the increasing settlement of former migrant workers on very small land holdings or none at all.

Total income (food and cash) excluding aid by type of livelihood zone



What variations in wealth do we see within different areas of the country?

WCT = West Central Teff, Tigray Region.

Relatively fertile, with dry (low) middle-highland crops - sorghum, teff, finger millet, maize, pulses - and with cattle and goats and sheep, all depending on a single and relatively short meher rainy season. More productive and food secure than the Tigray livelihood zones further east, but land holdings are very small.

SME = South Wollo Meher, Amhara Region.

A zone of hills and mountains on the Blue Nile watershed, with highland and wet (high) middle-highland crops depending only on the meher rains: mainly teff, wheat and pulses (including the valuable lentils which are mostly marketed). Substantial stands of eucalyptus bring profits from poles sold to the regional urban construction industry. The main livestock are cattle and sheep. Moderate size of landholdings and quite fertile, but the area is chronically food insecure due to frequent rainfall irregularities.

WMR = Wolayita Maize and Rootcrop, SNNPR.

Dry (low) middle-highland and upper lowland ecology between the Rift Valley and the upper watershed of the Omo river. Maize, sweet potatoes, teff and field beans are the main annual crops; enset is a substantial food perennial; small amount of coffee. Very high population density, very small landholdings. Food insecurity made acute when there are late or reduced belg (early) rains. Very modest livestock numbers overall, but some milking cows and oxen for fattening are stall fed.

TER = Teru Pastoral, Afar Region.

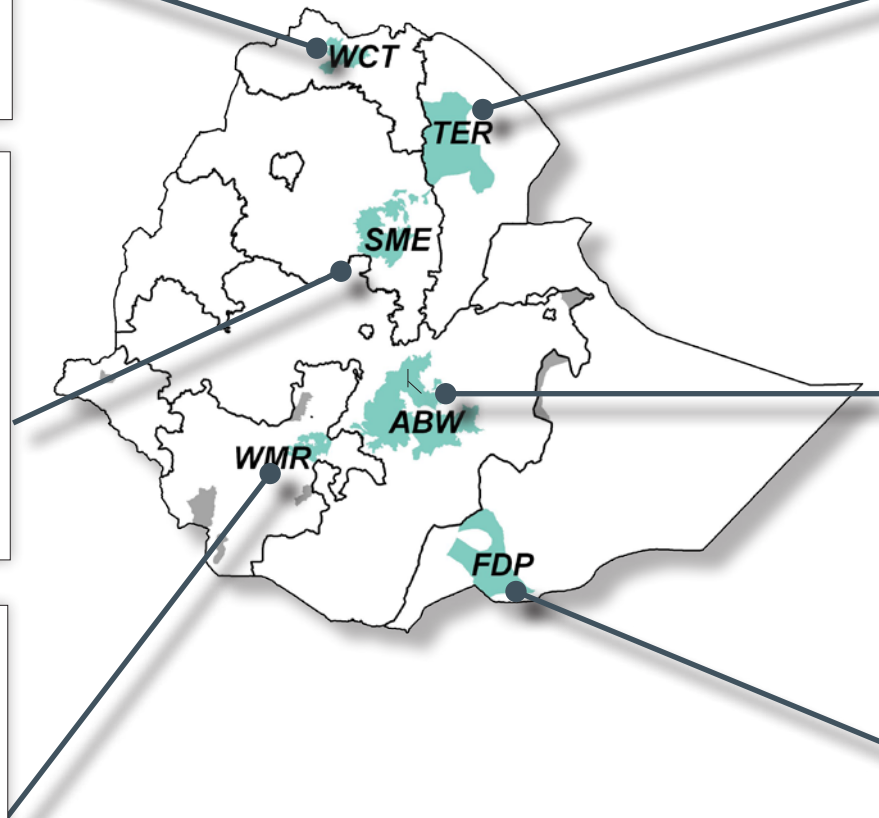
A zone of pastoralists with an accent on camels but also substantial cattle herds, and more goats than sheep. Physically isolated from neighboring Amhara and Tigray by a high escarpment, but critically dependent on their markets for grain (and therefore also on the success of their harvests) and for selling livestock, and even for grazing areas to migrate to in frequent years of poor rains.

ABW = Arsi-Bale Wheat and Barley, Oromia Region.

Mainly wet (high) middle-highlands but also highland mountain areas including national park territory. A substantial surplus of wheat and barley, some of it contracted to the country's modern brewing industry. One of the very few areas of Ethiopia with significant tractor use. Maize, pulses and oilseeds also grown. Moderate numbers of cattle and sheep.

FDP = Filtu-Dolow Pastoral, Somali Region.

Camels outnumber cattle, and there are substantial flocks of goats and sheep. The better-off possess four times more camels and cattle than poor, and three times more smallstock. Collected bush products bring small amounts of cash seasonally, but otherwise the only resource is livestock. Cross-border trade from Dolow market increases the selling prices of animals.



The study of livelihoods allows geographical comparisons of, amongst other things, differences and similarities between wealth groups. We have chosen as examples six livelihood zones from the north to the south of the country. On page 68 we give snapshot zone descriptions. On pages 70 and 71 we show the patterns of the two pillars of livelihood: how people get their food, and how they obtain cash. The text below, which continues onto page 72, provides an explanation of the graphs found on pages 70 and 71.

The agricultural areas

The first message on sources of food (see graphs on page 70) is that the *poor* groups of households, let alone the *very poor*, do not approach self-sufficiency in **own crops**, and this is true even in the surplus production area ABW. Amongst all of Ethiopia's livelihood zones, it is rare to find *poor* households typically approaching self sufficiency: these are mainly to be found in western Oromia and neighboring western SNNPR. On the other hand it is often the case that the *middle* as well as the *better-off* groups approach or exceed self-sufficiency even in zones which are in overall food deficit¹. Even in productive areas the poorer

¹ It should be noted that even where wealthier households can well cover their requirements from their own crops, they very often choose to sell a part of these and buy preferred types that they do not cultivate, or not sufficiently, e.g. teff and pulses. Therefore households showing, say, 90% of self-sufficiency would likely be capable of 100%+ self-sufficiency if they so chose.

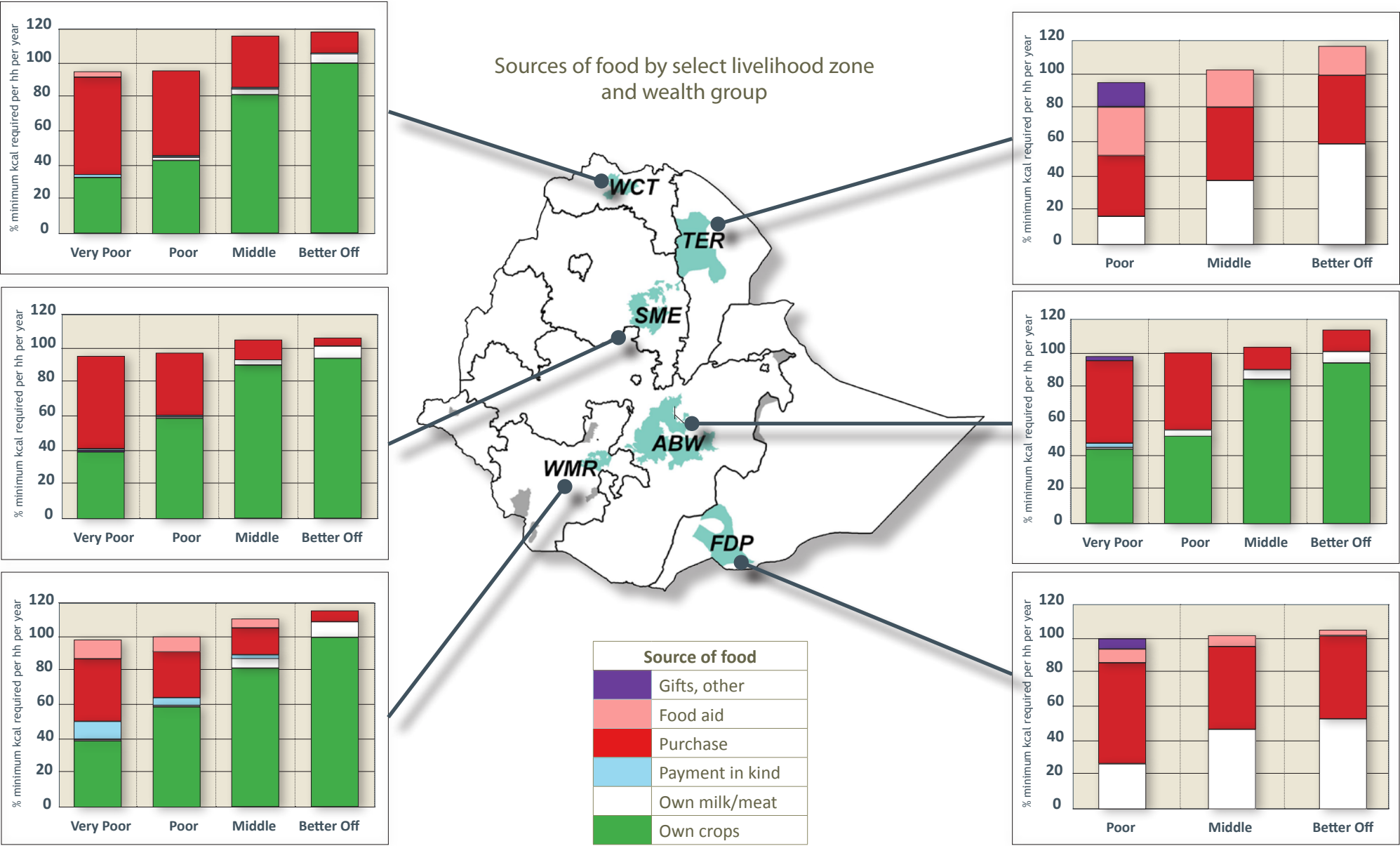
households do not have enough land to satisfy their needs, and a lack of oxen often pushes them to loan a part of their land to the wealthier or to engage in share-cropping arrangements. In less productive areas it is, if anything, even more common for the poorer to loan land to the wealthier in this way, since the latter are especially eager to extend their cultivation. As a sign of differences in dietary quality, only the wealthier half of households get to consume their **own milk and meat** in any significant quantity, since they are the owners of the majority of livestock in any area. As regards **food aid**, in the examples shown here it is WMR in SNNPR which stand out. But there are many zones, especially across the more rain-failure prone north and east of the cropping area of the country, where food aid has formed a regular part of the household food budget, or cash aid as in SME and WCT shown here.

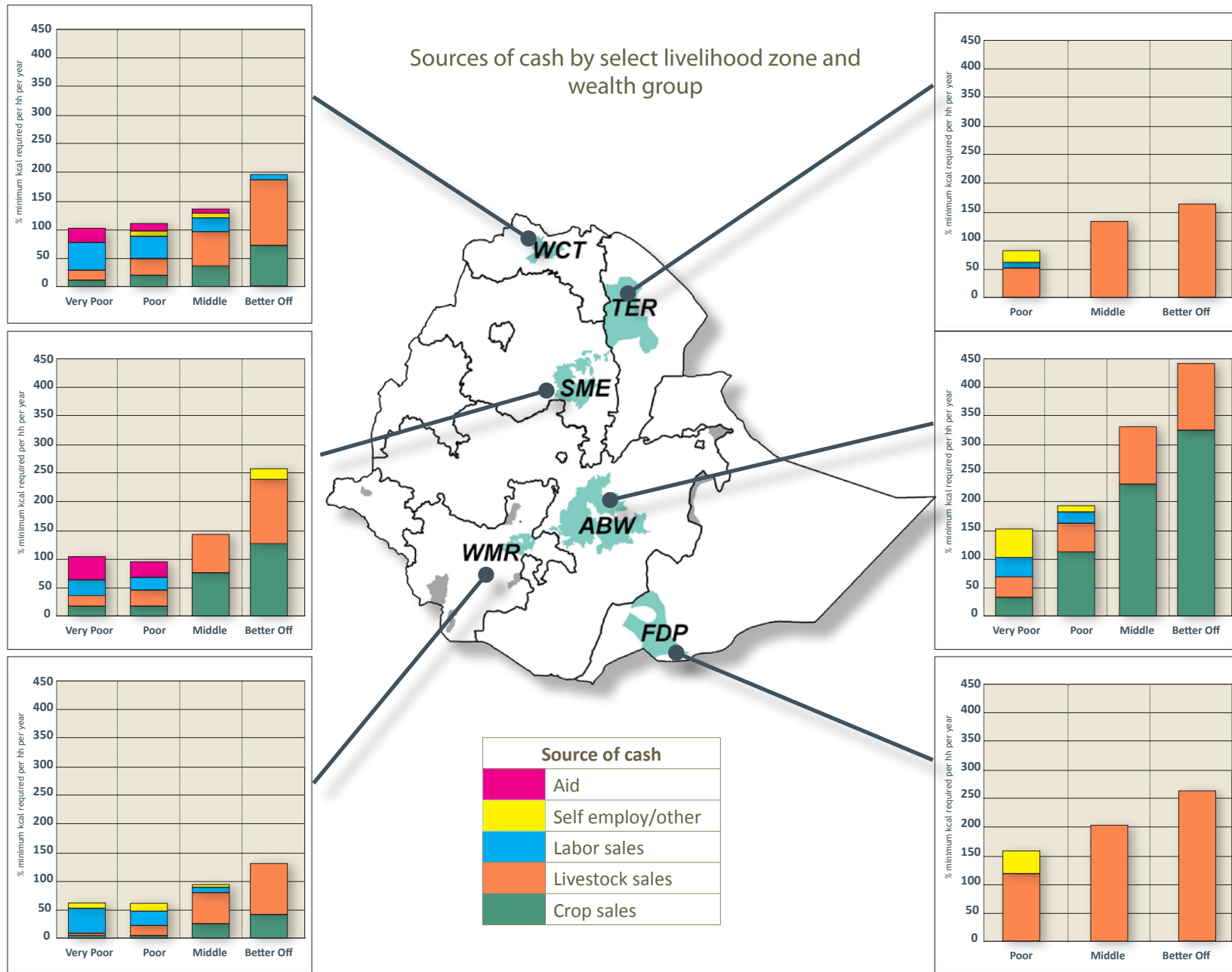
The sources of cash (see graphs on page 71) reveal considerable differences. ABW shows the highest capacity across the wealth groups to depend upon **crop sales**, with some livestock. Only the *very poor* depend more on **labor sales** and still more on '**self employment**', here meaning men selling firewood and women selling traditional beer. By contrast, across the wealth groups in WCT the relatively few livestock surprisingly bring in

more cash than do crop sales. This is as much a testament to the limited crop production as it is to the high prices received for butter and livestock in the major towns the trade reaches. But the 'labor' element reflects that everyone - even the *better-off* - engage to some extent in seasonal work migration of household members to the sesame fields of western Tigray. In SME the cash contributions received by the *very poor* and *poor* from work in the Productive Safety Net Programme exceed their earnings from private casual work; in contrast the *middle* and *better-off* rely very substantially on sales of primary products. Finally WMR shows a different picture still, and another livestock surprise. This is one of the country's most densely populated areas, and little cash comes from crop sales, while the *very poor* are overwhelmingly dependent on working for others. But despite communal grazing being in extremely short supply, the few livestock account for well over half of the total cash earnings of *better-off* and *middle* households as well as significant income even for *poor* households. Access to the Addis Ababa market means that premium prices are got for any **livestock sales** (including poultry) as well as for butter, and careful stall feeding is worthwhile.

Continued on page 72....

What variations in wealth do we see within different areas of the country?





What variations in wealth do we see within different areas of the country?

...continued from page 69

The pastoral areas

Between the two pastoral areas, regarding sources of food (see graphs on page 70) there is a clear pattern of increased **milk** consumption¹ as wealth rises, as one would expect given that the wealthier pastoralists possess several times more livestock than the poorer. Indeed, some of the milk drunk in poorer households is donated to them by wealthier kin in the encampments. But only the *better-off* tend to live *primarily* on milk, and then only when the rains give satisfactory pastures. Averaged across the wealth groups, the majority of pastoral households in Ethiopia - and beyond amongst Africa's other pastoral populations - get the greater part of their food calories from **purchased** grain, sometimes added to by remarkable amounts of sugar. The higher overall milk consumption in the Somali FDR example than in the Afar TER example reflects the greater livestock holdings in FDR, putting camels, cattle and small stock together. (See page 40.) Levels of milk consumption vary considerably between pastoralist livelihood zones within each region, and may be affected, for instance, by how many

household members move with the main livestock on far grazing migration, and so continue to drink the milk; or whether there are nearby markets for this perishable commodity. In TER the level of **food aid** consumption across the board, and the dependence by the poor on private **gifts**, raises questions about the marginal viability of that pastoral economy as a whole, or at least about the population's extreme vulnerability to shocks, whether in terms of rain failure or hikes in the price of the grain which they buy from the highlands.

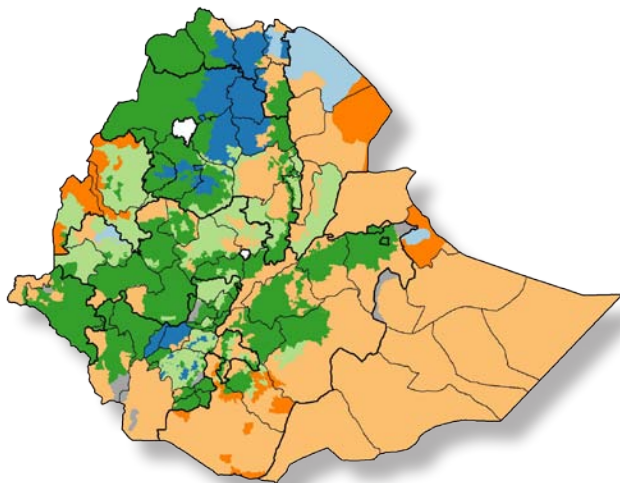
Turning to sources of cash (see graphs on page 71), **livestock sales** are of course the prime element, particularly since in neither area is there a source of paid employment, and pastoralists tend to be very far from rural or urban employment opportunities beyond their zone. In TER they are relatively isolated from markets and sell virtually no milk, while the FDP pastoralists are better served and sell substantial amounts of animal products. In both areas poorer people glean some profit from natural resources (**self employ/other**): in TER they collect gum arabic and mine salt from deposits within the zone or in neighboring areas; in FDP they collect and sell bush products. Overall the levels of cash earnings, seen in terms of the

proportion of annual food requirement they could purchase, are higher in FDP than in TER across the wealth range.

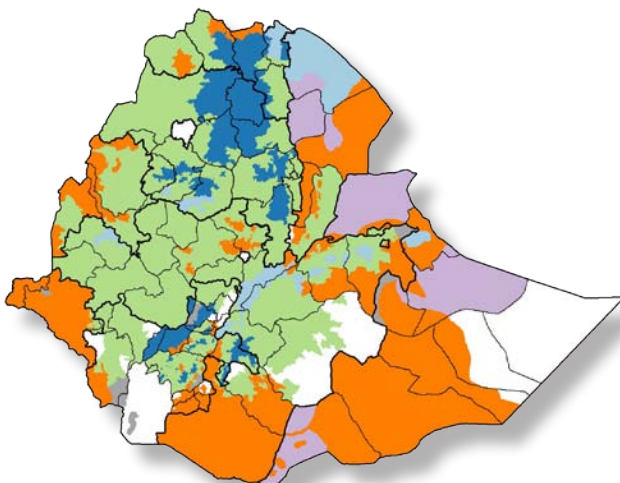
¹ By far the greater part of calories from animal products comes from milk consumption.

Poor Households

Most important source of cash income



Most important source of cash income
(excluding crops & livestock)



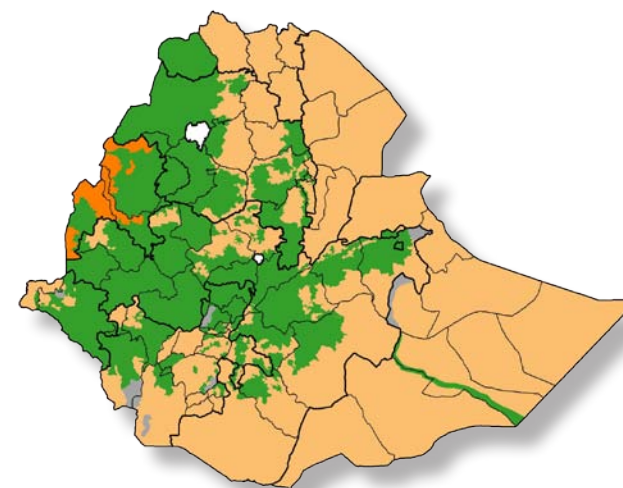
Differences in sources of income

Remarkably, in the north-east highlands, mainly because of unfavorable cultivating conditions, even the wealthier farmers make more from **livestock and butter sales** than from **crops**. Where **migrant labor** is uppermost amongst the poor, in the north and in SNNPR, whether through inferior land resources or dense population, this means the zones simply cannot support all their people. Elsewhere it is local cropping and employment that count. Most wealthy pastoralists do nothing but raise livestock. In western Benishangul gold-mining (under 'self-employment') takes first place for poorer and wealthier alike. Elsewhere **self-employment** usually means sales of collected items, notably firewood.

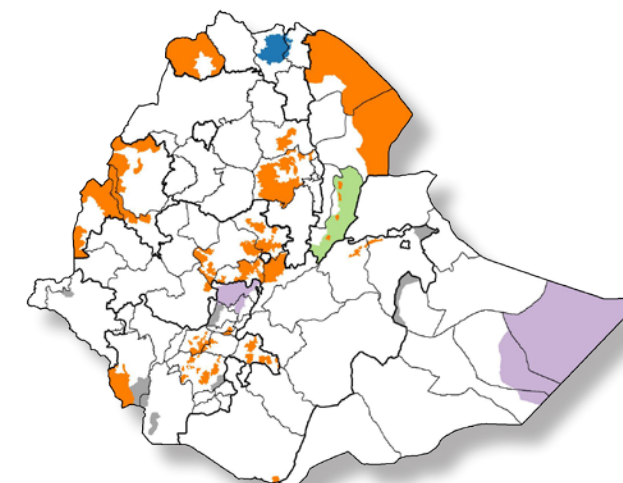
Source of cash	
	None
	Labor (ag.)
	Labor (casual)
	Labor (migration)
	Self empl/petty trade
	Crop sales
	Livestock sales
	Gifts & remittances
	No data

Better-off Households

Most important source of cash income



Most important source of cash income
(excluding crops & livestock)



How skewed is the distribution of wealth in the form of land and livestock?

The combined data from Tigray and Amhara regions

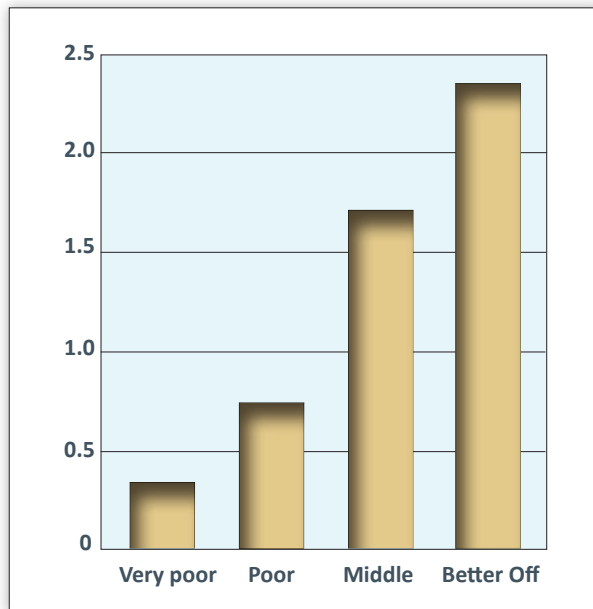
Three things stand out. Firstly, there is the great difference in land and livestock assets between wealth groups despite the fact that this is almost universally a rural *smallholder* economy with strict limits to individual landholdings, given the policies since the 1970s which have aimed at preventing the existence of larger farmers or landlords. Secondly, there is the particular gap between the poorer two groups and the wealthier two

groups: in other words wealth is quite highly concentrated in the *better-off* and *middle* households (which are usually not much greater in size than poorer households). And one aspect of this is the widespread tendency for wealthier households to 'rent' land from poorer neighbors, giving in return a share of the harvest or some other benefit.

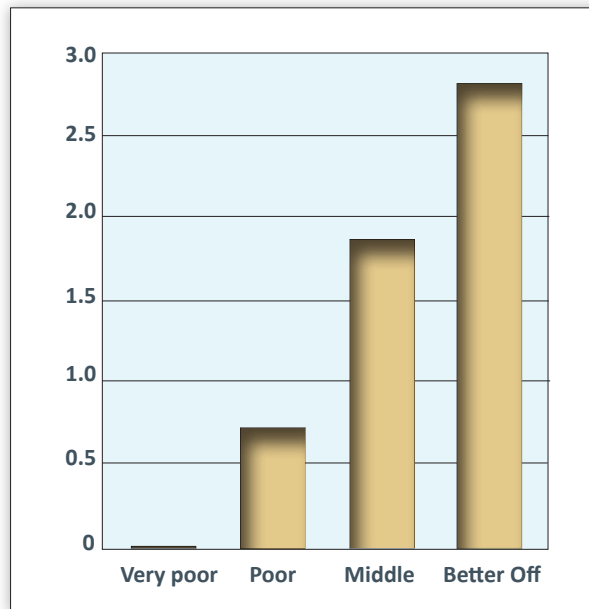
Thirdly, there is actually a substantial gap between the *poor* and the *very poor*, most particularly in livestock ownership.

A minority of the *very poor* are effectively landless, while the majority have especially low land holdings and minimal livestock, and virtually no ownership of that engine of crop production: the team of oxen. Their dependence on working for others, allied to their acute lack of capital assets, often renders them almost a kind of rural proletariat.

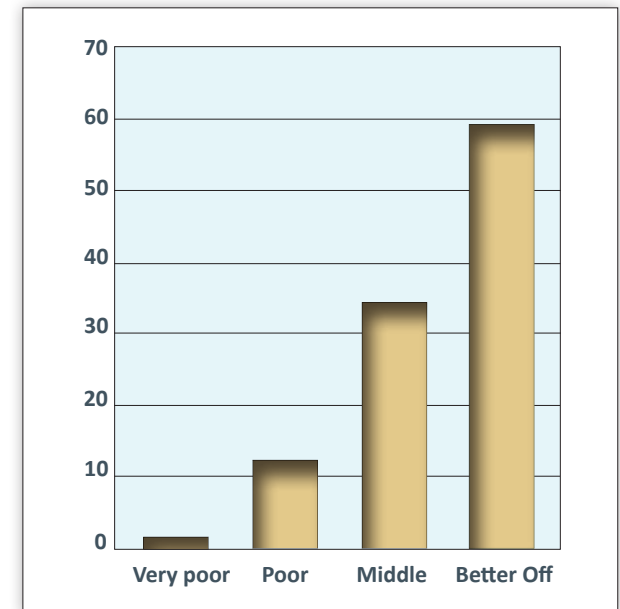
Total area cultivated per household (ha)



Oxen ownership per household



Total livestock per household (shoat equivalents)



Note: Shoat equivalent: 1 camel = 6 shoats; 1 cow/ox = 4 shoats

Is there a relationship between better-off and poor household income?

These graphs make two statements – and invite some explanation. On the left-hand graph, many of the wealthiest farmers are in cash-crop areas, notably coffee and sesame, or in surplus food-crop areas, notably *teff*. The poor have good opportunities for farm employment and/or relatively high labor

rates especially at the crucial harvest times; and they also make some money from their own crops. In herding areas the same logic applies as regards numbers of livestock and the herding employment and holdings of the *poor*. In other words, wealthy areas reward poorer households. But only to a degree. In the

right-hand graph, as the better-off get richer the income gap widens, from roughly 1.5 at the lower end of the scale to 3 at the higher end. This suggests a story of accumulation of assets by wealthier people: draft oxen, use of land, herds.





The Market and Livelihoods

Cash and the market are today important in every corner of the country, from the high mountain areas to the low rangelands to the western forests. It is not just a matter of wealthier producers selling their cereals surplus or cash-crops or livestock. The following pages show that poorer farmers simply could not survive without the market in its most general sense: the exchange of goods and services mediated by cash. For even in the most productive areas, poor farmers almost never manage to produce enough food for their basic requirements: they are not in that sense 'subsistence' farmers. So they have to use the market not only to purchase food but also to sell what they can to get the cash. For the most part it is their labor which they sell, to wealthier neighbors or sometimes in distant cash-crop or irrigated plantation areas. They also collect what nature gives for free: they cut and sell firewood and fodder grasses, and collect other bush or forest products. Pastoralists both rich and poor are the most dependent of all upon the market: few get as much as half of their food requirement from the milk of their herds, and the exchange of livestock for grain is at the center of their livelihoods.

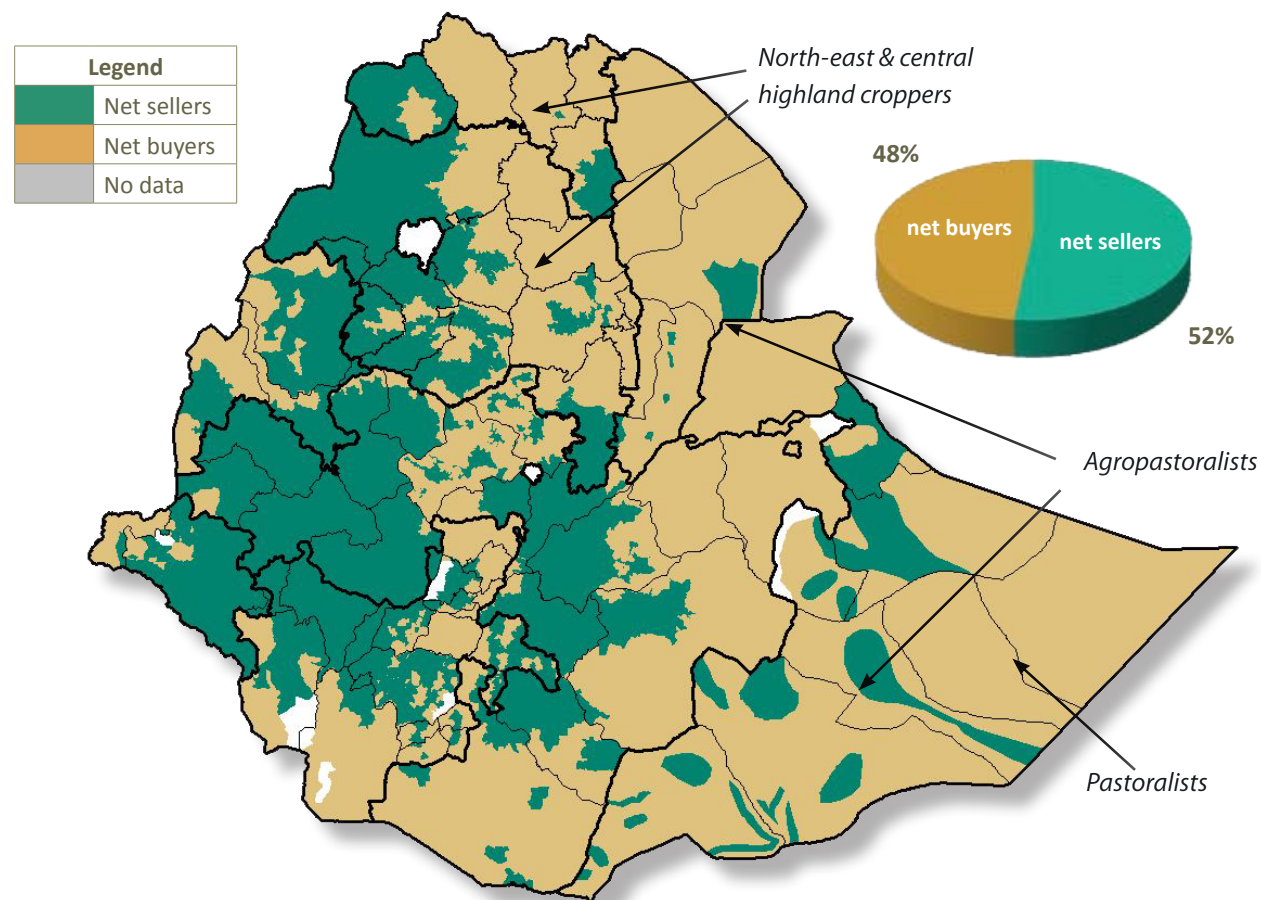
Where are the food surplus and deficit zones?

The first thing to note is that an individual net buyer may well sell crops: even poor people with wholly inadequate harvests must often sell some part immediately to pay pressing debts or for other needs. The data here represent the basic split between *areas* that are net exporters and net importers of food crops. Since the unit of reference is households, it is interesting that it is a slight majority who are net sellers.

This reflects the fact that around the country very nearly all food producers are *smallholders*. Even if some of the wealthier amongst these sell substantial surpluses in relation to household requirement, there are extremely few commercial farmers producing large tonnages of food crops who might tip the balance towards a *minority* of net sellers (as in countries with modern, mechanized agriculture).

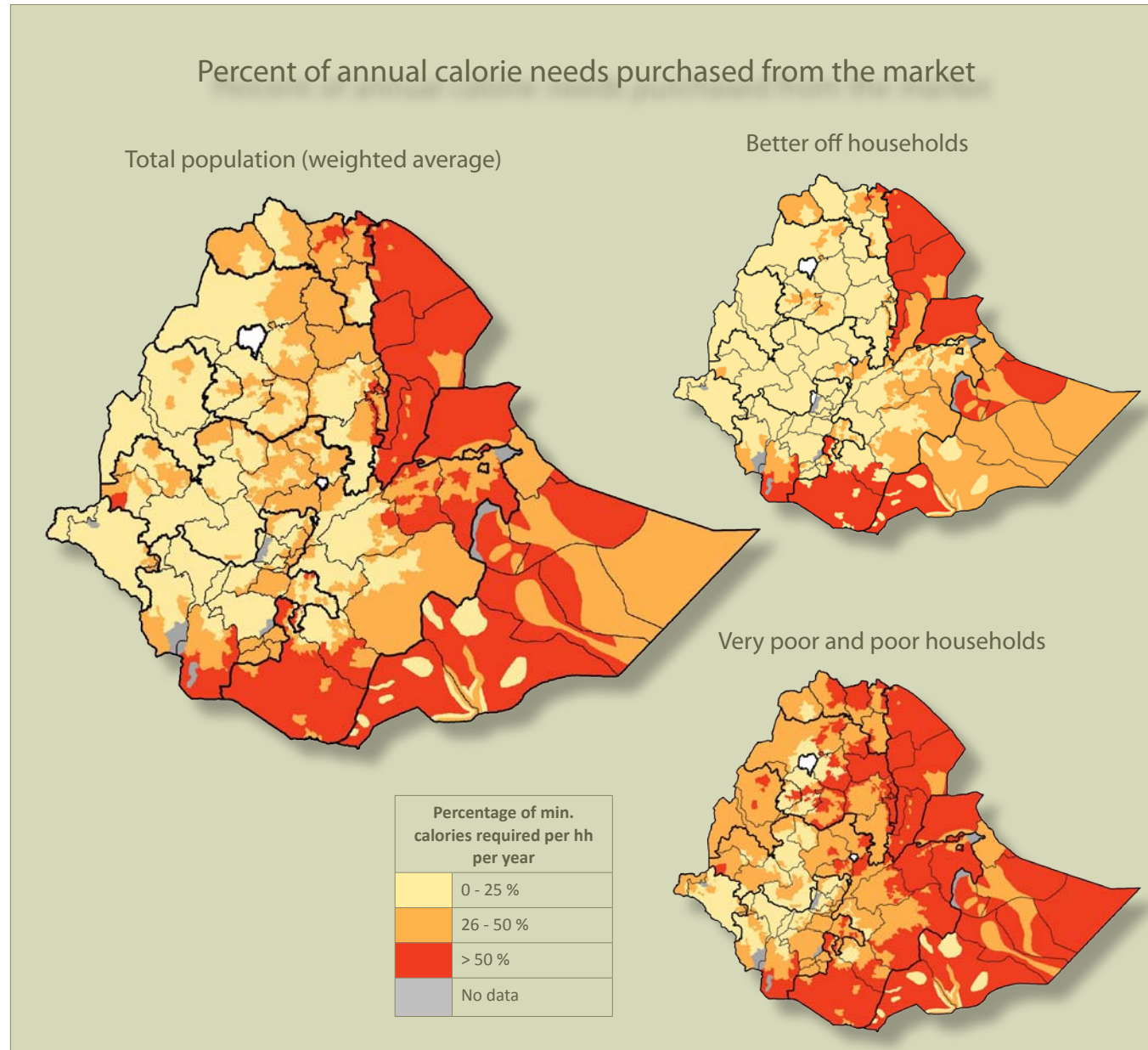
There is a clear picture here of surplus in the western half of the country and in south-central Oromia, and of deficit not simply in the pastoral areas but amongst north-east, east and central highland croppers. For agropastoralists it is only those within the largely pastoral Somali and Afar Regions who are net sellers – and they have ready local or cross-border customers.

Net sellers and net buyers of food crops



Notes: A food crop is defined here as a crop of which at least 50% of total production (kg) is consumed by households in the livelihood zone. Wet and dry maize are calculated as one crop, with kgs green maize consumed included in the total calculations for kgs maize consumed. Purchased food crops include all staples and pulses purchased. Calculations are based on a weighted average for all wealth groups.

How much do different households depend on the market for food?



Across the livelihood zones, the majority of households purchase some part of their staple food. But there are different degrees of market dependence. The highest is where there is no crop production or it is a secondary activity, namely in the pastoral and agropastoral zones. In some cropping areas, especially in the north-east, limited land and rainfall make for particularly insufficient harvests for poorer households.

Elsewhere, in more favorable environments, better-off farmers may devote a good part of their land to cash-crops, but they still try to secure most of their basic food requirements too.

Poorer households only manage to secure most of their basic food requirements from their own land in high food producing areas of the western half of the country.

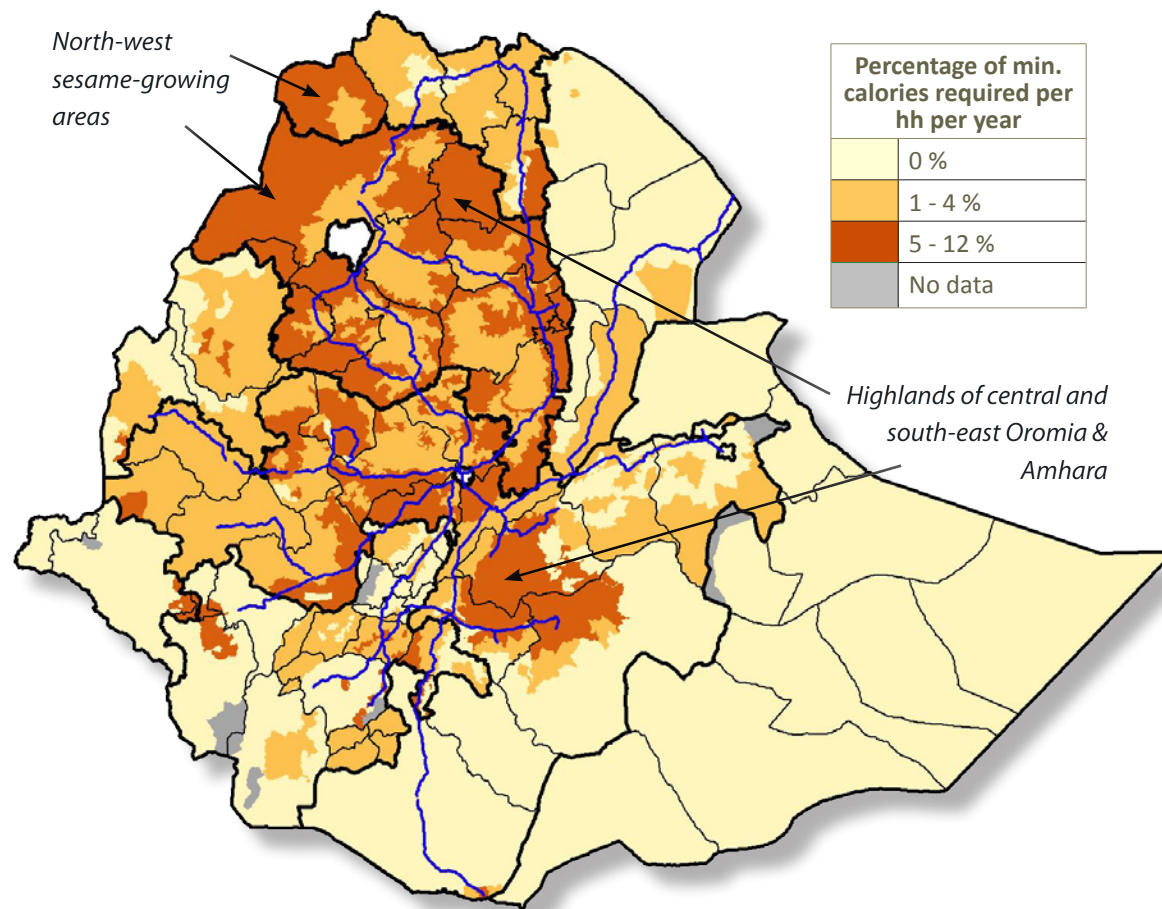
Where are poorer households able to purchase extra protein?

Roads matter

Pulses are the most expensive food crops on the market apart from oil-seeds. But they are not just for wealthier households, although these may eat more of the costliest pulse - lentils. Dishes with field beans, chickpeas or split-peas, often ground to make *shiro*, are the most common accompaniment to the staple *injera* across much of the country. It is this which provides most of the extra protein above that from cereals¹: poorer farmers consume extremely little milk or meat.

The map contains a mixture of two different stories. One is the areas where pulses are grown in volume, notably the highlands of south-east and central Oromia and Amhara, so that local consumption is comparatively high even amongst poorer households. The other story is the areas, notably the far north-west sesame-growing zone, which grow hardly any pulses but which are comparatively wealthy, so that even poorer households can afford to buy more pulses than their fellows elsewhere. And the element which literally links the stories is the road network serving the urban and rural markets (only main highways are shown here).

Percent of annual kilocalories from purchased pulses:
very poor & poor households

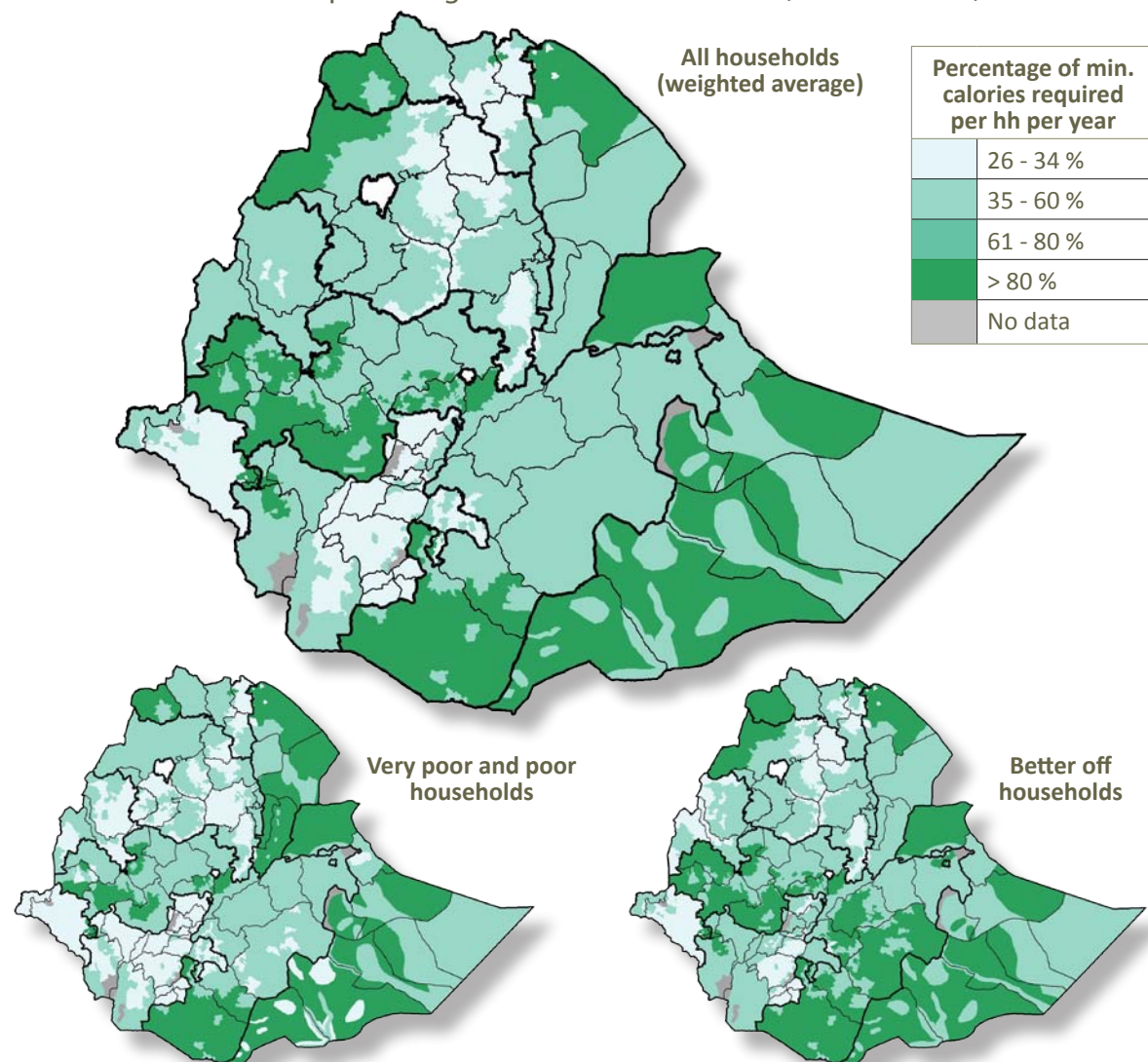


Notes: The blue lines show main roads

¹ cereals flour or meal generally contains around 10% protein per unit weight, pulses around 20-25%

What proportion of household income comes from market-related activities?

Cash income as a percentage of total annual income (food and cash)



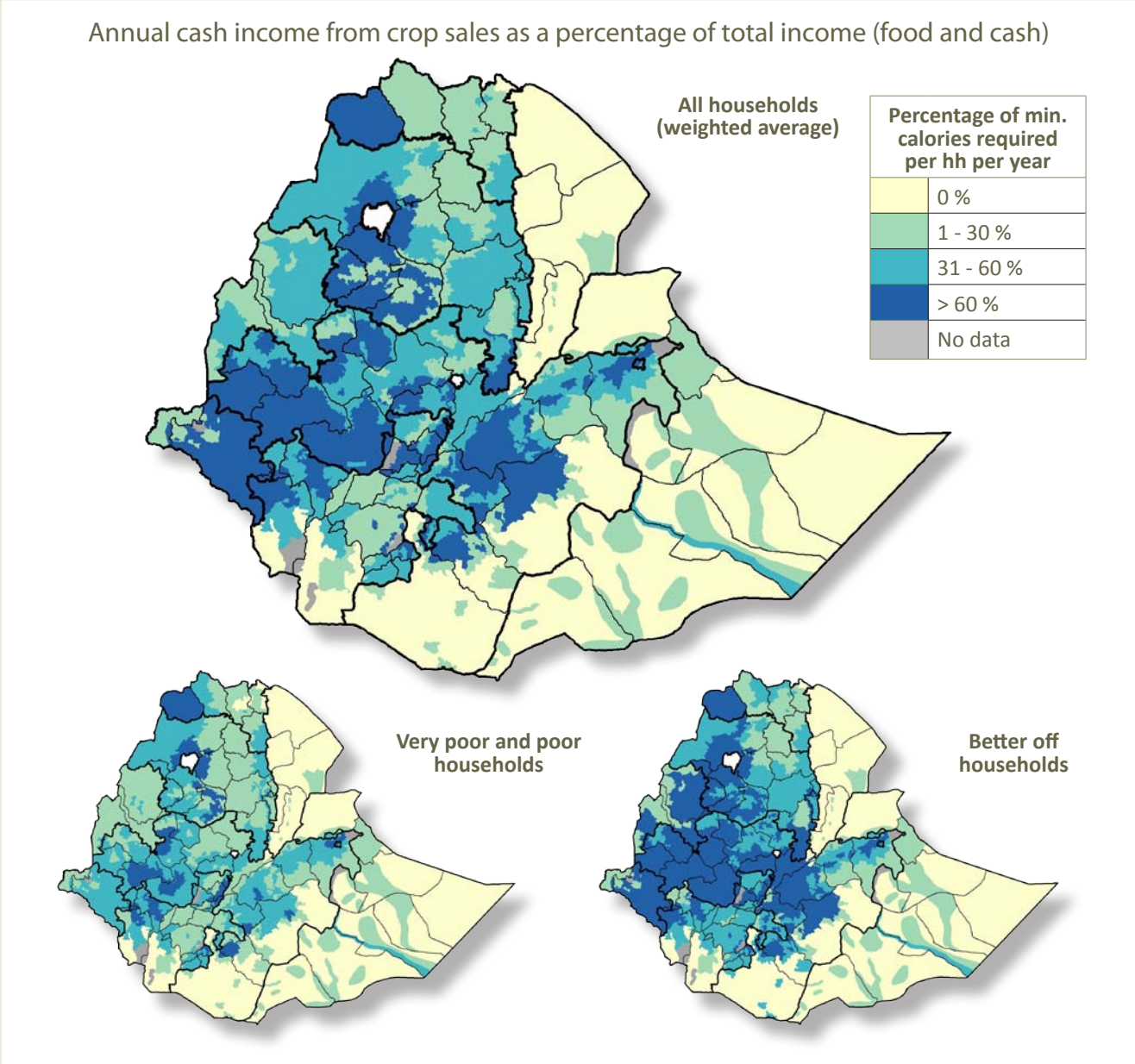
Notes: Total income excluding aid. Total income (food and cash income) is converted into a common unit – kcal – and expressed as a % of minimum kcal requirements.

Cash income

The market-place is the main medium through which crops and livestock and firewood, etc. are exchanged for cash. Pastoralists are the people most dependent on the market, selling livestock and in addition bush products or mined salt to buy most of the food they consume (i.e. cereals). On a whole-region basis, Somali comes highest of all with cash income on average at nearly 80% of total income.

Cash income in agropastoral areas makes up the second highest proportion of total income in the country (70%), and differences between wealthier and poorer turn mainly on the money from livestock sales. Within the overall cropping zone (at 66% cash income in total income) the cash income element is generally lower where food crops are dominant rather than cash crops (e.g. the coffee of western Oromia), and especially where there is little surplus sale, and livestock earnings are small, as in the far south of Amhara and in Gambella. Paid labor income is also important. Otherwise, food aid partly substitutes for cash income in the lowest-scoring, food insecure areas located in the north-eastern highlands in Amhara and central Tigray and in central and north-eastern SNNPR.

What proportion of household income comes from market-related activities?

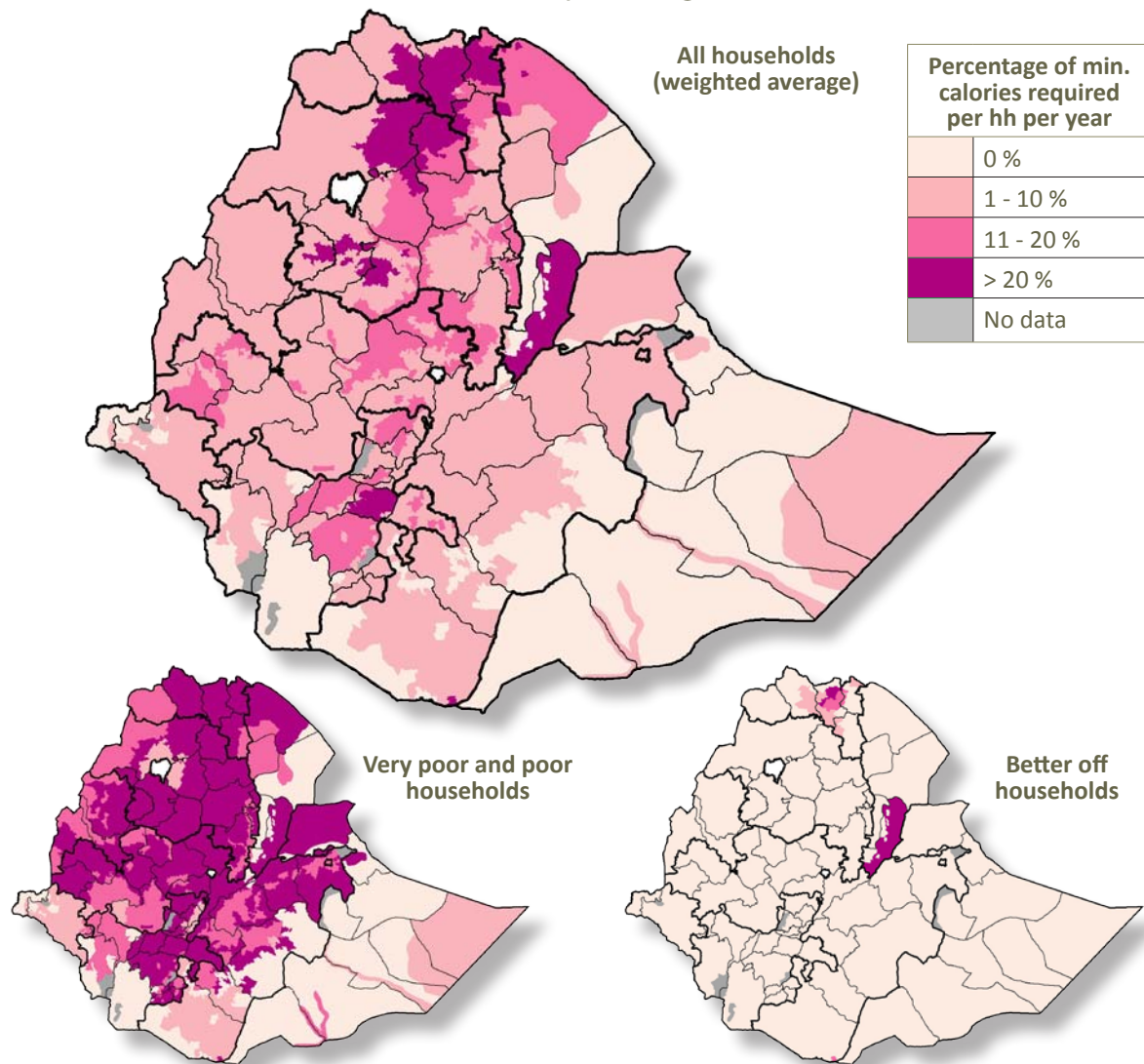


The importance of crop sales

The overwhelming majority of rural Ethiopians are smallholder farmers, and they are mainly highly cash-oriented. Overall, 65% of the population receives the equivalent of at least 65% of its food needs in terms of purchasing power from food-crop and cash-crop sales, indicating a very high level of rural-urban and rural-rural market activity. Areas with low cash income from crops tend also to be those that are normally food-insecure and receive food aid.

Tigray, despite the very wealthy sesame cash-crop area in the far west and *teff* surpluses in the far south, gets on average the equivalent of only some 57% of calorie needs from crop sales – so low is production in *most* of the region. Amhara, Oromia, and SNNPR score markedly higher at 70 – 75%, and in some localities even poorer households get a major part of their cash income from crops. But for each region this masks wide variations: north-east Amhara cereals deficits versus center and west surpluses; in Oromia, major areas of coffee, *chat*, and surplus *teff* and wheat versus other much poorer cropping and agropastoral areas; and in densely-populated SNNPR, coffee and *chat* but very few localities with high crop incomes averaged across all households.

Annual cash income from labor sales as a percentage of total income (food and cash)



Notes: Total income excluding aid. Total income (food and cash income) is converted into a common unit – kcals – and expressed as a % of minimum kcal requirements. Labor includes both migratory and local labor.

Labor sales

Today the cropping economy could not work without the selling and hiring of labor. This is a major message coming from the livelihoods studies. It is true even though very few farmers cultivate as much as five or six hectares. Wealthier farmers would survive, but they would be poorer, with considerably reduced productivity. Every stage of their farming tends to include some hired labor – perhaps least for plowing, more for weeding and most for harvesting, when timeliness is critical.

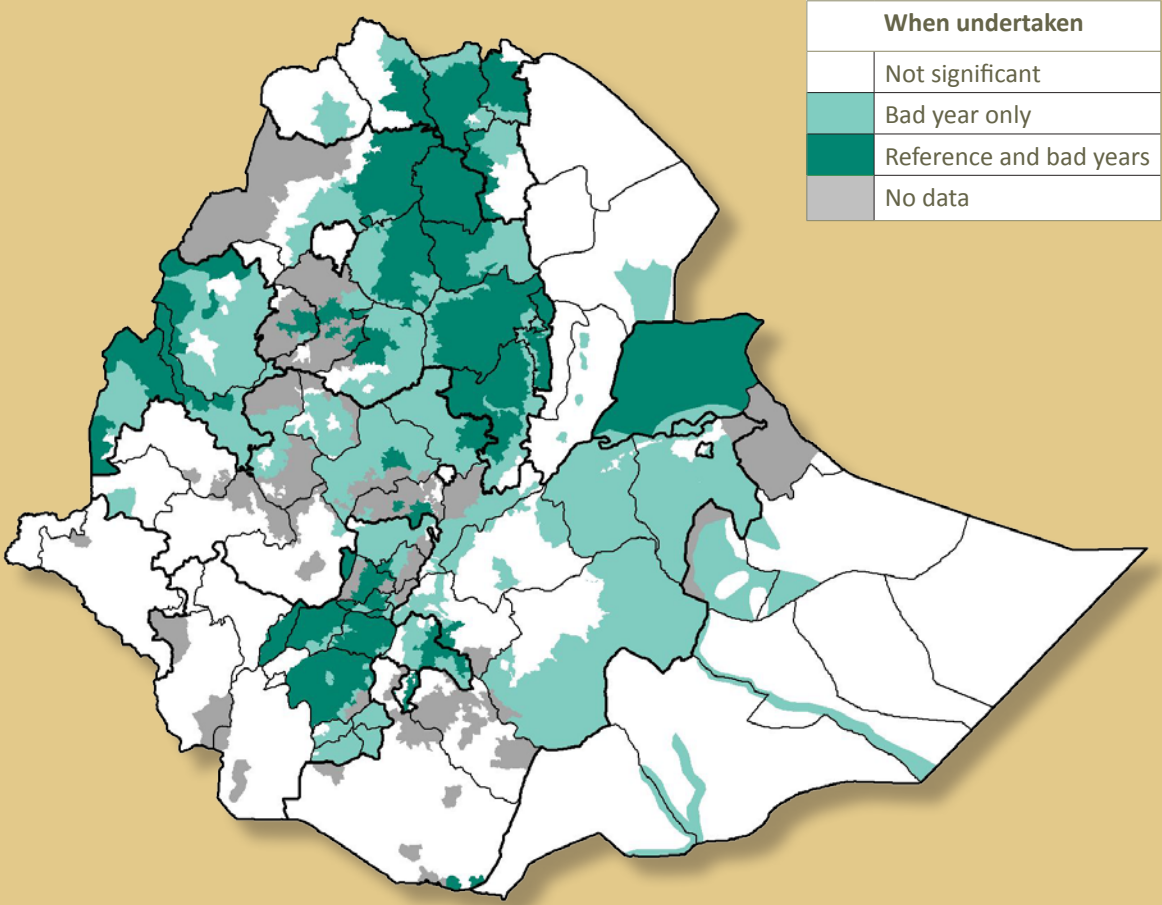
On the other hand, most of the poorer half of the population would not be there: given the land and livestock and other assets they hold, they simply could not make ends meet without employment earnings. This is true whether they are in cereal surplus or deficit areas, or in cash crop areas. One has to go to forest areas of the far west of SNNPR to find two or three livelihood zones where food crops and livestock, and honey or coffee sales suffice for the poor without any significant employment income; in a further handful of far western livelihood zones in Oromia, Gambella and Benishangul it is only the very poor for whom employment is critical.

Special focus on labor and livelihoods

Which households undertake labor migration?

No one lightly undertakes travel away to find laboring work for weeks or months: extra physical hardships are involved, and social costs at home. There are also the risks of capital outlay for transport and of taking able hands off work on the household's own land. Thus there are wide areas of the country where the migration option is only taken up by poorer people in bad years. Arguable exceptions are Benishangul localities conveniently near the north-west commercial sesame zone, and far north Somali pastoralists with intimate connections with Djibouti. Otherwise pastoralists are hardly involved, but in east/south-east Oromia agropastoralists in trouble commonly go up the hill to work in neighboring cropping areas. Generally, where the option is taken every year (dark green) this signals chronic local resource pressures and food insecurity. Magnet host areas are the north-west sesame zone for Tigray and northern and central Amhara; Rift Valley irrigated plantations for southern Amhara and SNNPR; and the western Oromia coffee harvests for workers from far across the regional boundaries. Addis Ababa and major regional towns also offer employment to many thousands in the agricultural off-seasons.

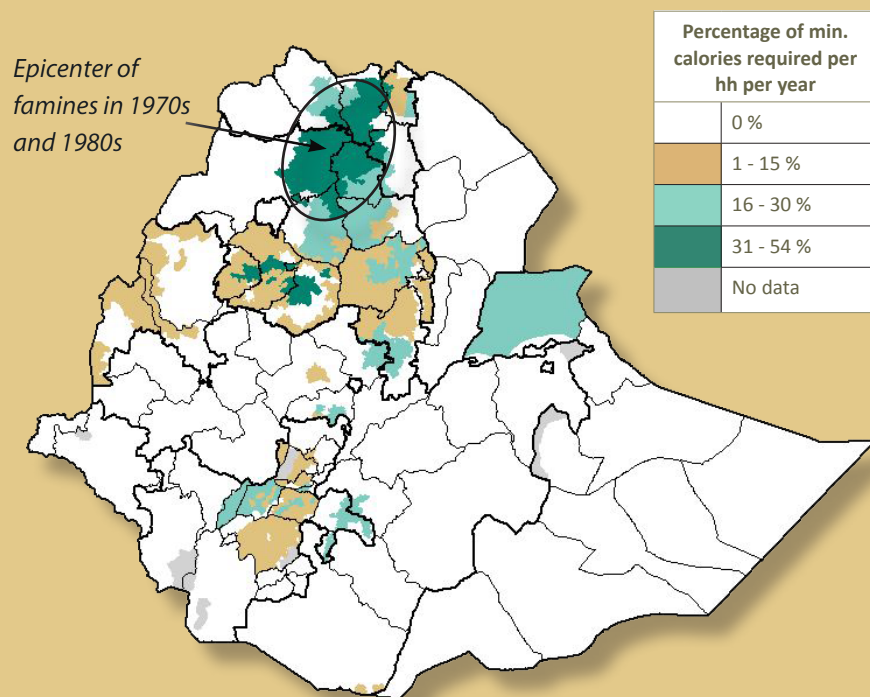
Poor household labor migration



Two areas stand out where poorer households have a particularly high dependence on labor migration. The biggest and most northerly area, joining Amhara and Tigray, essentially comprises lowlands and nearby middle-highlands in the watershed of the Tekeze River. These are mainly rugged terrains with poor soil resources and a recent history of rainfall irregularities stretching back to the catastrophic droughts of the early 1970s and mid 1980s whose 'epicenter' was here. They are therefore amongst the country's poorest and most food insecure areas. But drought is not a necessary condition of such poverty. The second,

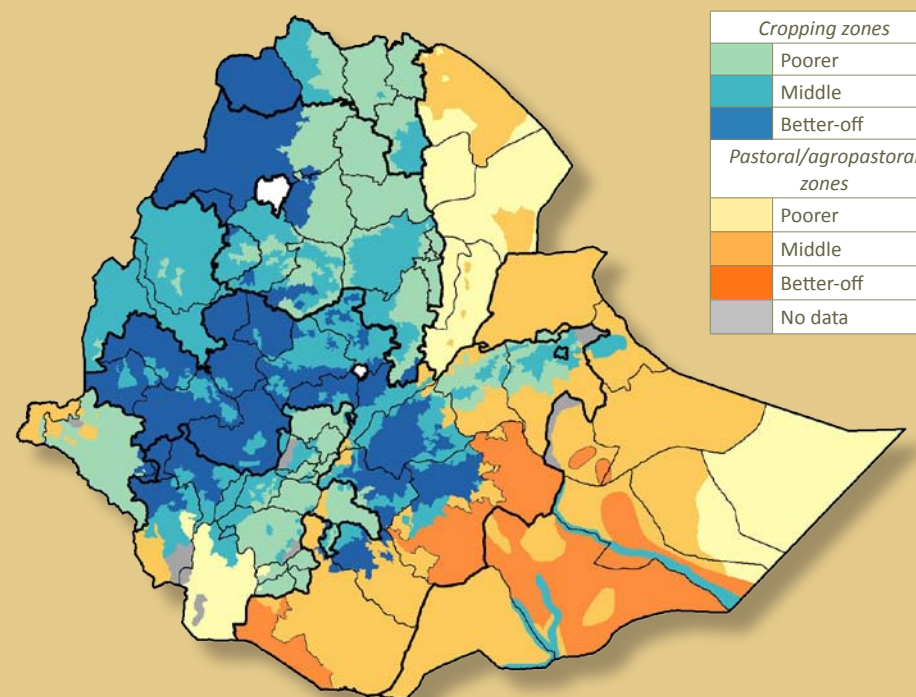
smaller area, is the central mountain area of Amhara where sometimes excessive rainfall has helped accelerate the extreme erosion and degradation triggered by cultivation of slopes and cutting of natural vegetation. Here, very exceptionally, nearly all plowing is done with horse-power because oxen cannot be maintained. But elsewhere, as can be seen comparing the second map, not all migration is from the poorest areas. Resources and profits are sometimes concentrated amongst the wealthier to the extent that the poorest minority must seek employment outside their zone.

Cash income from migratory labor: very poor and poor households



Notes: This map shows the number of days labor required to purchase one quintal of the main staple locally

Relative wealth of livelihood zones by type



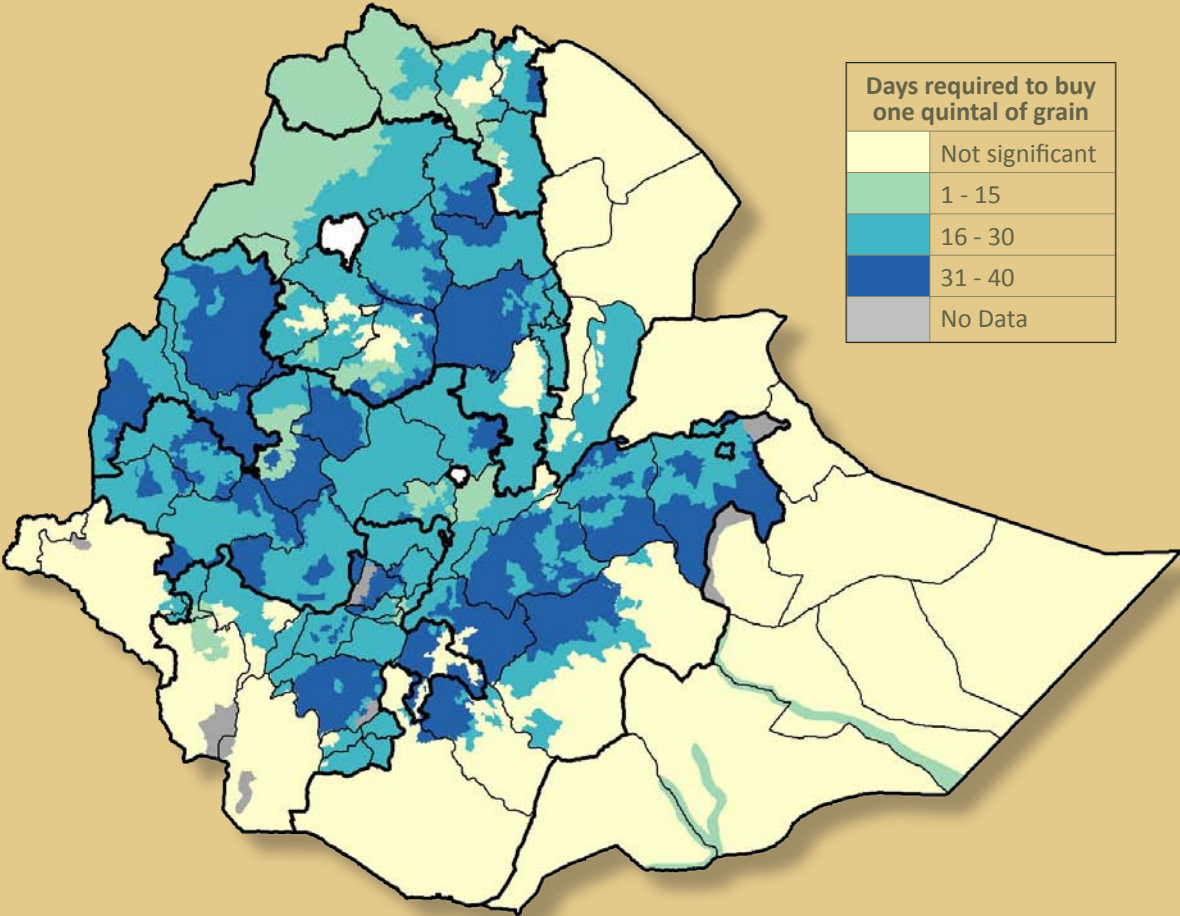
Notes: 'Wealth' here is measured by 'total income'. The same map is shown on page 65, in the Differences in Wealth section.

Special focus on labor and livelihoods

Where can you get the most for a day's labor?

To offer some perspective, one quintal (100kg) of grain represents the calorie requirements of a household of 5 people for about 40 days if we assume that 15% of their diet is other food. Therefore, we see here a good number of areas where people work for a daily wage that will just feed their family for a day. But in the majority of areas the wage is worth more than that, sometimes considerably more. What makes the difference? The major area of valuable wages is in Tigray, where the biggest influence is the western sesame cash-crop area, which also produces a surplus of sorghum. Producers need considerable labor; local laborers are too few; the sesame crop is extremely profitable; sorghum is relatively cheap; and tens of thousands of migrant workers need to earn enough in weeks to feed their families for months. Elsewhere, local workers may be many, the crop less valuable or labor-intensive, grain expensive far from surplus markets. And so wages are as low as they can be: the price of a day's food. The biggest area on the map is between these extremes.

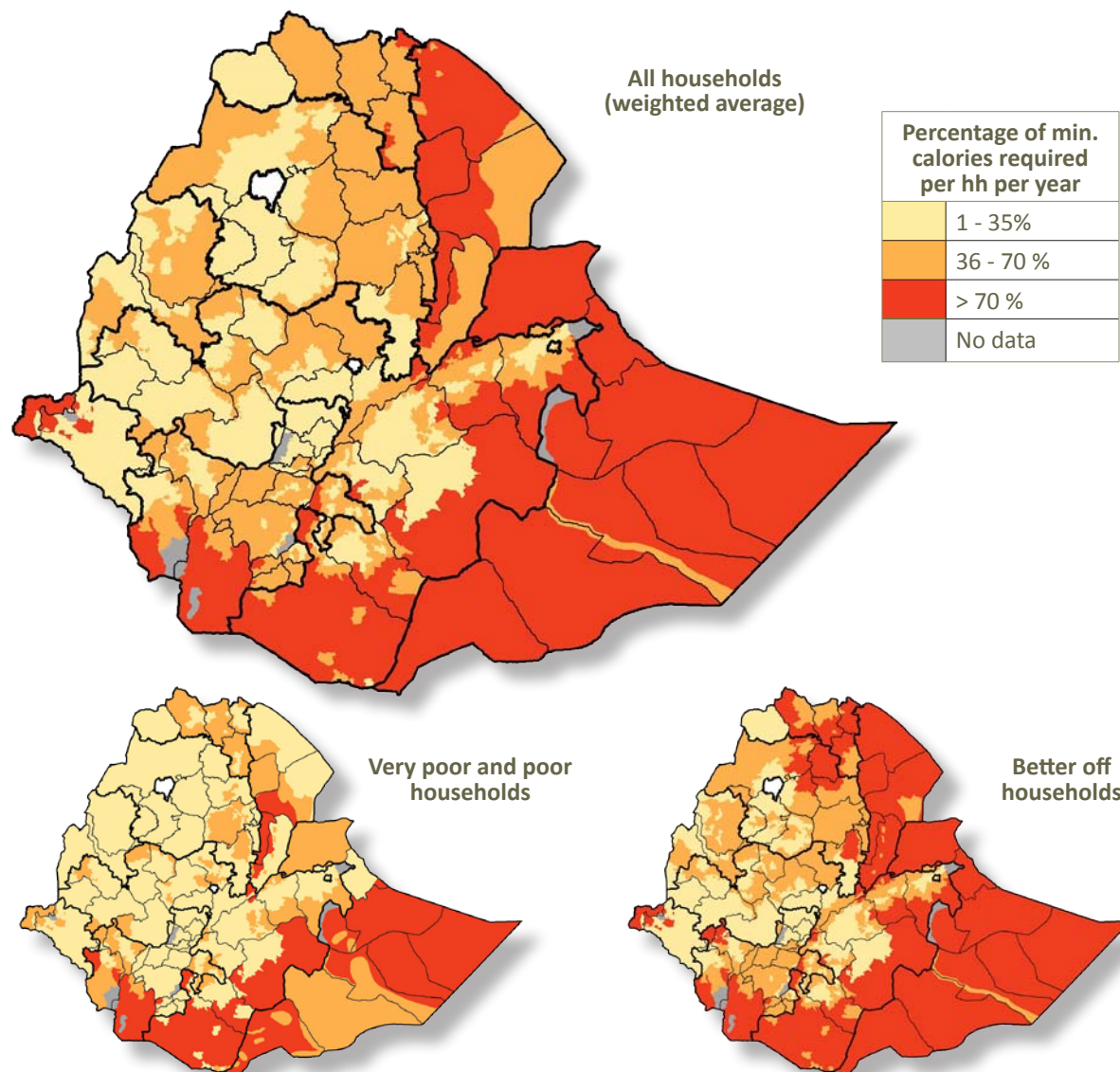
Terms of trade for labor



Notes: This map shows the number of days labor required to purchase one quintal of the main staple locally

What proportion of household income comes from market-related activities?

Annual cash income from livestock sales as a percentage of total income (food and cash)



The importance of livestock sales

Pastoralists naturally score highest: in Oromia their cash income from livestock is in fact the equivalent of roughly 250% of calorie requirement on average, followed by Somali (180%) and Afar (100%). Agropastoralists naturally score next highly.

But perhaps the real story here is the widespread cropping areas where livestock (including poultry) and butter sales bring in upwards of one-third of total income – sometimes much more. This does not mean these are all the wealthier areas: in Amhara the far north-west is wealthy in both crops and cattle, but much of the east is in food deficit. In Tigray, with its generally poor crop performance, the *better-off* commonly obtain more than half of their cash from livestock, sometimes more than 70%. In most of that region even the *poor* get over one-third of their total annual income from livestock. This begins to approach agropastoralism. It is also remarkable to see that much of the most crowded part of SNNPR owes more than one-third of total income to livestock and butter sales. The great geographical span of cropping Oromia contains every gradation; but cattle, especially in lower-lying ecologies, are a particularly important resource in both the wealthy west and the generally poorer east.

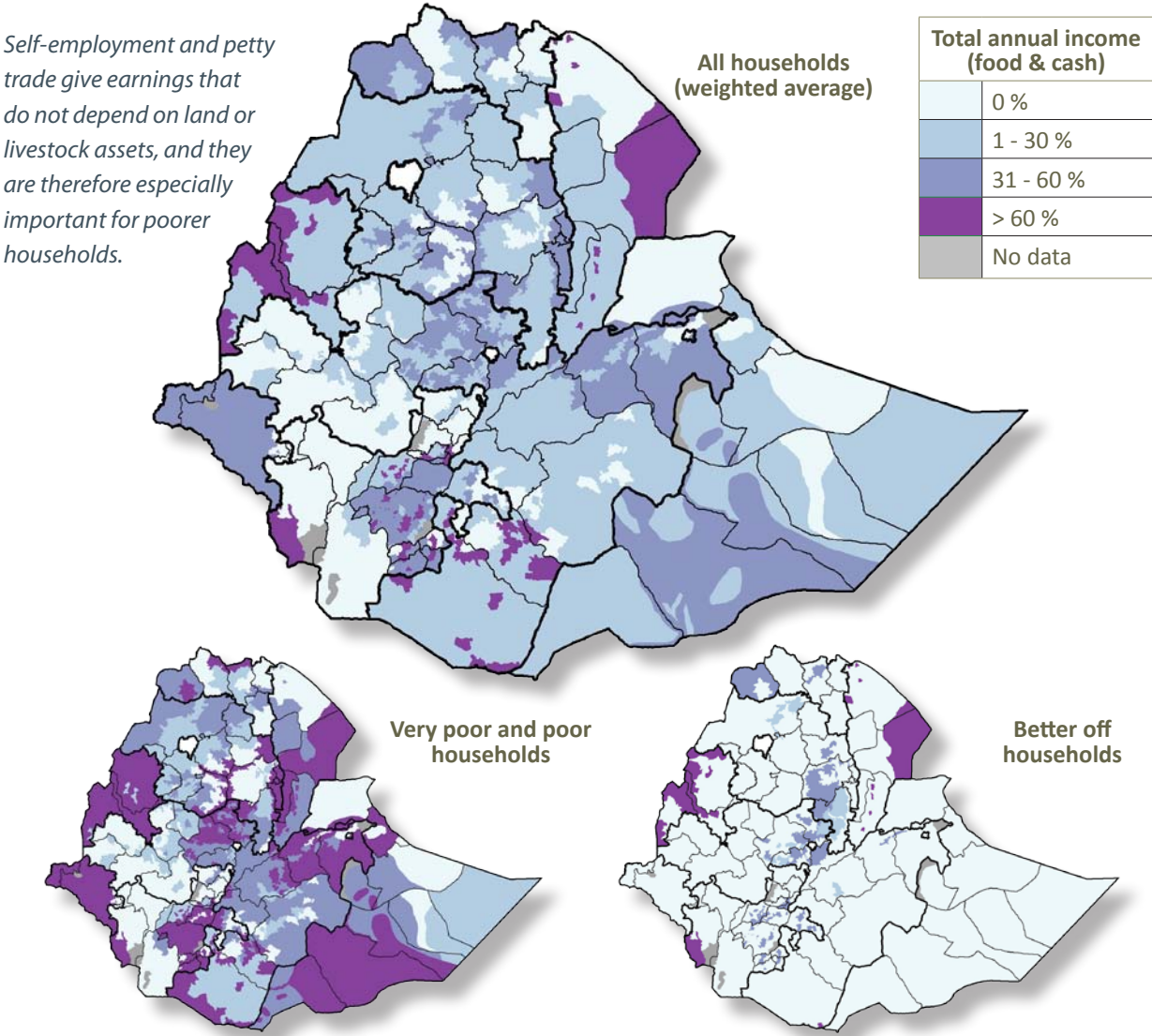
What proportion of household income comes from market-related activities?

The importance of petty trade and self employment

‘Self-employment’ includes the sale of any natural resources, and sometimes basketry. Petty trade means the retailing of small amounts of commodities or low-value goods, for often tiny profits. Firewood¹ is the most significant source of self-employment income especially in lowland areas where that resource is exploited to sell uphill. Collected grasses for fodder sales are also important, notably around Addis Ababa where some city-dwellers keep a milking cow in the yard, but also in rural areas. In Benishangul and Gambella the sale of wild foods and fish is common. Elsewhere, in the more denuded highlands cow-dung is often collected and sold in dried cakes for fuel. But petty trade is more significant here, and it is also especially important in crowded parts of SNNPR where night markets are common and women are the main retailers. In far western Tigray wealthy farmers have small retail shops or businesses. In western Benishangul and far west SNNPR informal gold mining is uppermost. In the pastoral areas self-employment generally means collecting and selling gums, resins and other bush-products.

¹ See *Environmental Products & Livelihoods* section.

Annual cash income from petty trade & self employment as a percentage of total income (food and cash)





Environmental Products and Livelihoods

In previous sections, under the category of 'self-employment' we have touched on items offered 'free' by nature if people are willing to expend the effort of collecting and selling them. It is poorer people with limited assets of their own who tend to exploit these resources. Here we look again at the most important item for people's incomes - firewood - and at two much smaller items - cactus pear and gums/resins. We include here also eucalyptus trees: these are planted on smallholdings and so are not strictly 'free', although mainly labor-free except when poles are stripped and carried on foot to the roadside for motor transport.

What role do environmental products play?

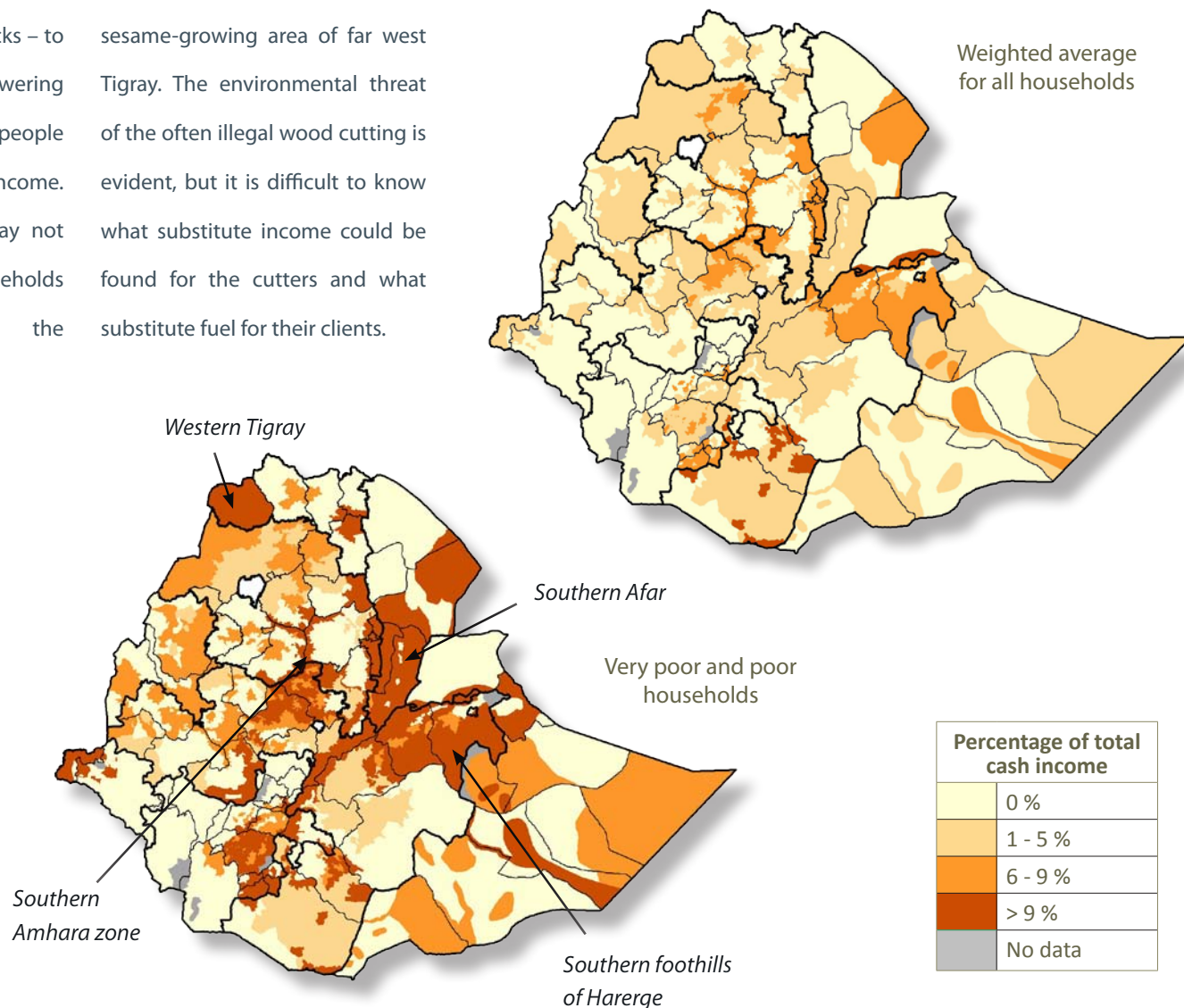
Firewood and charcoal

Firewood as a natural resource is mainly found in rangelands and in lowland areas where cultivation has not taken up so much of the land as in the historically settled higher altitudes. Lowland trees and shrubs tend to consist of slow-growing hardwoods that burn longer than eucalyptus and can be converted into charcoal. Thus there is an important market in rural highlands for these fuels, in addition to the great demand of the towns; and there is some cross-border trade to Djibouti and into Somalia. Both wood and charcoal are mainly traded beside motor roads and bought by private truck and car drivers as well as specialized traders. Proximity to a main highway is a great advantage for rural sellers, but both men and

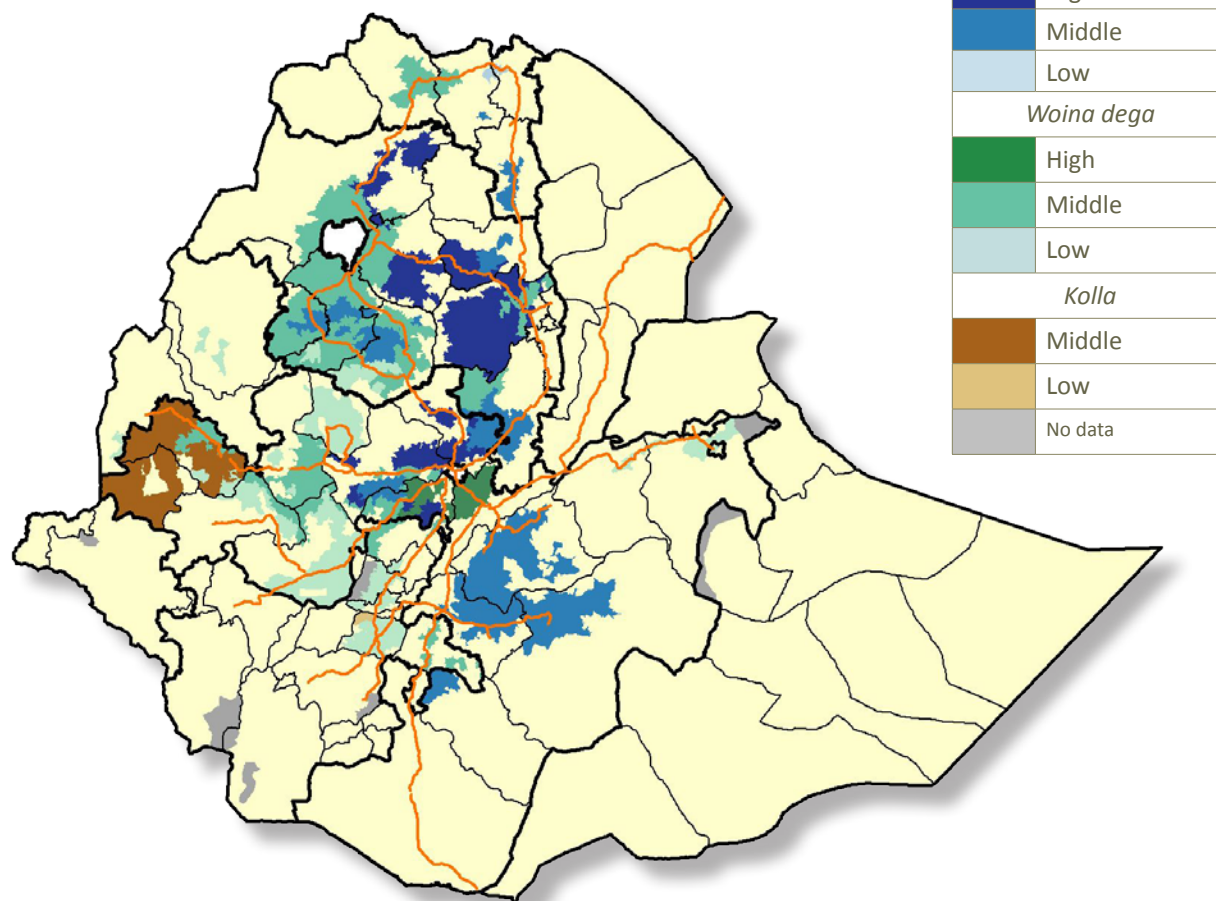
women may also walk many hours with a donkey load – or even a load on top of their heads or backs – to weekly market sites. Answering this demand gives poorer people an important slice of their income. Ten percent of income may not seem great, but for households operating little above the threshold of survival, it is literally vital. In fact, it is sometimes a larger percentage of income: 15% for *poor* households in south Afar; 22% for *poor* households in the extensive agropastoral zone on the southern foothills of Harerge, east Oromia; 25% of *very poor* income in the zone of south Amhara which runs along the Blue Nile gorge

and its Beshilo tributary, and 18% even in the relatively very wealthy sesame-growing area of far west Tigray. The environmental threat of the often illegal wood cutting is evident, but it is difficult to know what substitute income could be found for the cutters and what substitute fuel for their clients.

Cash income from firewood and charcoal sales as a % of total cash income



Cash income from tree sales by altitude zone



Note: Need to define high, middle, low

Tree sales

This refers to the eucalyptus plantations of smallholders, sometimes in community-managed plots. Introduced in the late 1800s, the fast-growing eucalyptus species can succeed almost wherever ground-water is sufficient. But they thrive particularly in highland and upper middle-highland areas, where they have now almost completely substituted for the disappearing indigenous juniper and other tree-types. In western Oromia conditions are favorable even in lowlands. From the mid-1990s the value of timber has multiplied due to the demand of the growing urban construction industry. The biggest trade for smallholders is in poles from trees of some 2-3 years growth used for scaffolding, where hundreds may be used for a single multi-story structure. Wealthier smallholders with the land for larger plantations may grow thousands of trees. Proximity to a motor road is a great advantage, and it is not surprising that the map shows a marked road bias in the main selling areas. The Addis Ababa demand has been so high that it accounts for a good part of the trade as far as central Amhara and south-east Oromia. Bigger trees give timber used for rural house/hut construction. Nothing of the cut tree is wasted: twigs and branches are used as fuel under the cooking-pot, and the dried leaves provide an even flame under the clay plate (*mitad*) for baking *injera*.

What role do environmental products play?

Cactus, gums and resins

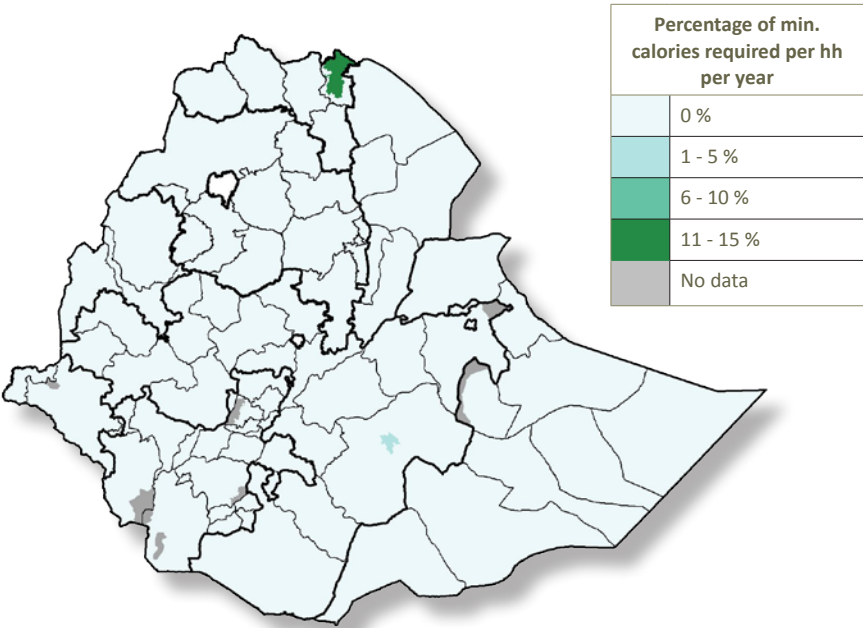
Introduced to the country in the mid-19th century, cactus pear (*Opuntia ficus indica*) both wild and planted is today particularly present in the far north. It is well adapted to dry environments, invading rocky hillsides and often used to mark field boundaries. The plant provides not only fruit for human consumption but pulp for animal feed. In the very rugged Irob Mountains and the neighboring plateau in north-east Tigray it

is eaten in sufficient quantities to provide a substantial addition to people's food intake, and a little is traded to markets in urban centers.

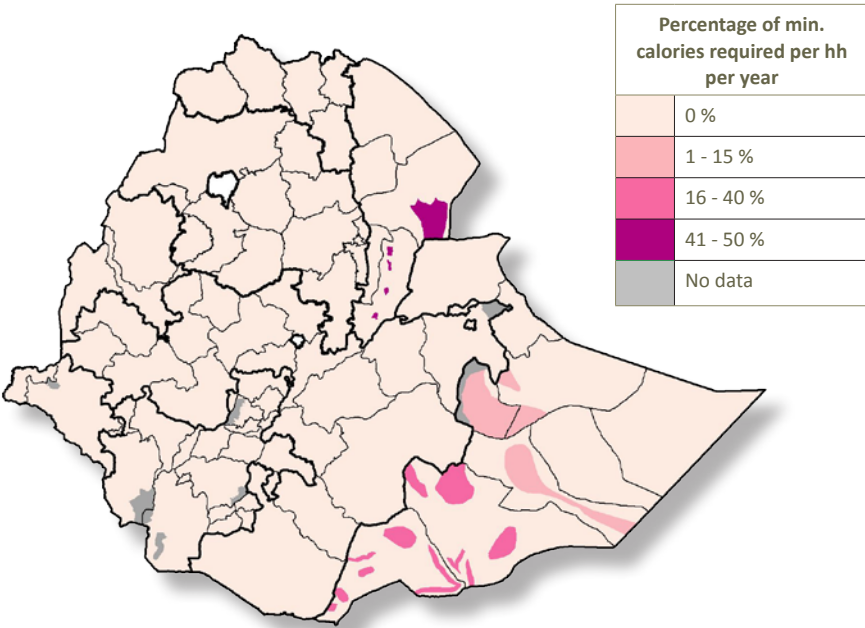
It is in the eastern rangelands, in Afar and Somali, that the sale of gums and resins typically provides a significant income for poorer households, sometimes alongside other collected bush

products. Gum arabic and other resins are very widely present in Ethiopia's lowlands, including cropping areas in the north-west - Tigray, Amhara, Benishangul. But here they are collected and sold only by a minority of people. The local market is especially for incense resins. Frankincense is a particularly valuable but rare and localized item notably in Tigray and Somali. Gum arabic is the most exported item.

Total income (food and cash) from cactus for very poor and poor households



Total income (food and cash) from gums and resins for very poor and poor households





Diet

Although the databases that this Atlas draws on do not purposely track what people eat, there is still a great deal of dietary detail in them. The following spread shares this information, providing an overview of how much different components of people's food basket contribute to the whole. The main conclusion is that diets of rural households in Ethiopia are generally quite limited, consisting mainly of cereals, with localized reliance on a variety of protein sources (mainly pulses, meat and milk), root crops, and oil seeds.

How much do different foods contribute to the annual diet?

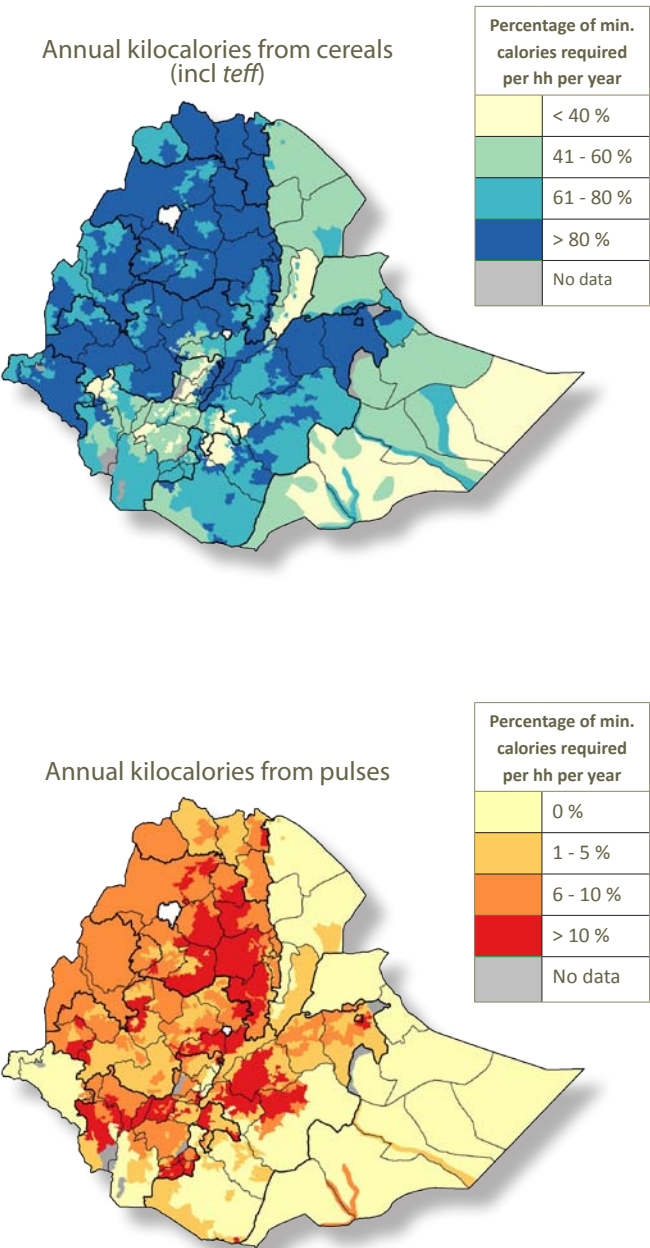
Rural diets are mainly limited in variety. The great majority of rural Ethiopians depend on home-grown or purchased **cereals** for some 80% of their calories. The main exceptions are in pastoral areas and where **milk**, and **sugar** (especially in Somali Region) contribute significantly. **Enset** and **root crops** are important in SNNPR and parts of Oromia. Vegetables are found everywhere in cultivated areas, but consumption is generally infrequent except for the traditional onions, garlic, fresh green chilis and kale (*gommen*) or in the south some larger-leaf varieties. **Pulses** are by far the most habitual addition to cereals in the diet and the biggest non-cereal source of dietary protein. Pulses are produced in quantity and much marketed in the eastern half of Amhara, while elsewhere, especially in the Arsi-Bale Highlands of south-east Oromia, most of the pulses grown are consumed by the households. However, the rural demand for pulses comes from nearly every corner of the non-pastoral parts of the country, including lowlands where they are hardly grown at all.

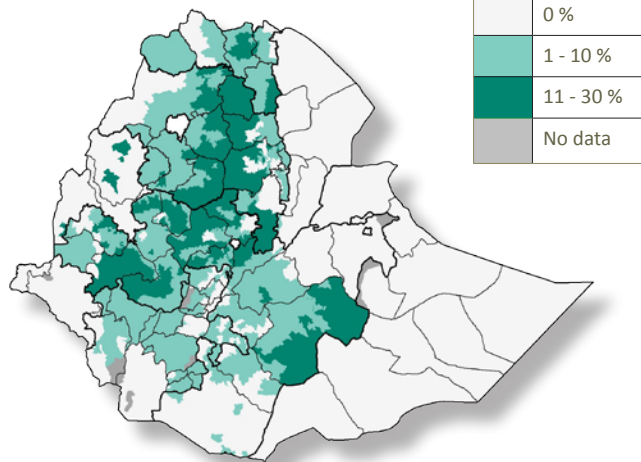
Teff is the preferred cereal in much of the country, and is naturally most consumed by rural populations where it is most produced, namely in middle-highland areas. But it is in fact virtually never the main staple across a population, because it is the most expensive cereal: most producers sell *teff* especially

for the urban market to buy cheaper cereals in greater volume in return. Only wealthier people tend to sell other crops and buy *teff* to consume.

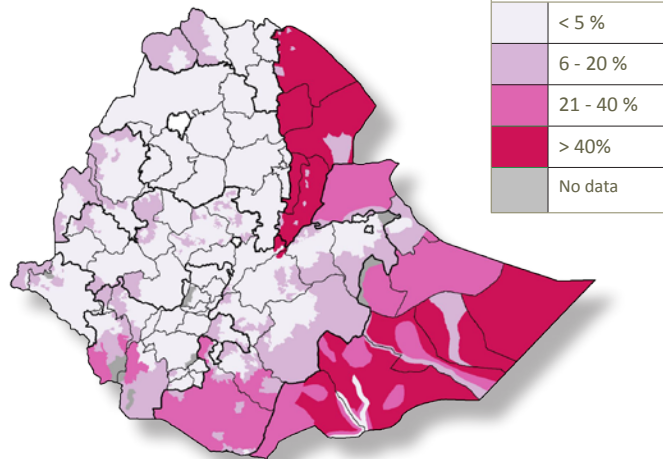
Enset is a relatively localized staple in SNNPR and in Oromia, but it is a secondary food – home-grown or purchased - in a far wider area of SNNPR. Thus enset is eaten by many millions of people, but is the main staple of relatively few. **'Root crops'** in SNNPR and in eastern Oromia are mainly sweet potatoes; in Benishangul and Gambella they are usually collected wild tubers and bulbs. In SNNPR sweet potatoes are a crucial buffer while people wait for the maize to mature. Processed vegetable oil is a luxury in rural Ethiopia, and crushed **oilseeds** are only modestly consumed because they are rarely produced in great quantity and they tend to be marketed to profit from their high prices. Exceptions are in the sesame area of western Tigray and in the Arsi-Bale Highlands where *nug* (niger seed), flax and rapeseed are produced on some scale.

Substantial **milk and butter** consumption amongst populations is confined to pastoral and agropastoral zones; but in some cropping areas with much cattle, in the west and north-west, there is relatively high milk consumption too, although far from the levels amongst herding communities.

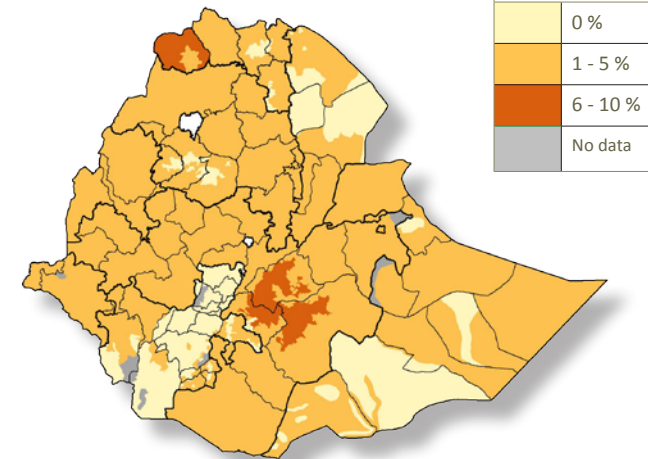


Annual kilocalories from *teff*

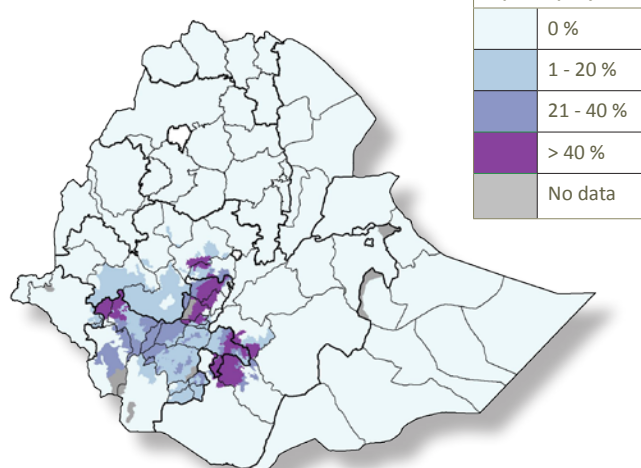
Annual kilocalories from milk/butter



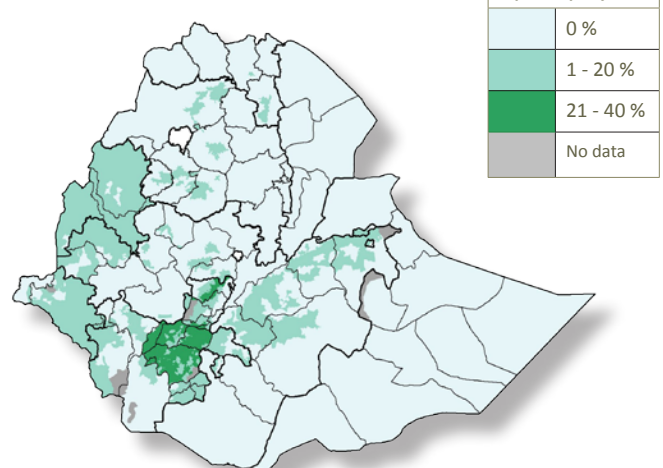
Annual kilocalories from oil/oilseeds



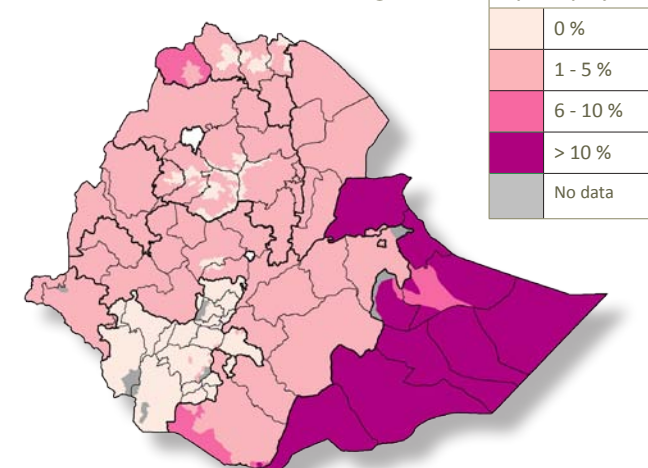
Annual kilocalories from enset



Annual kilocalories from roots



Annual kilocalories from sugar





The Cost of Maintaining Livelihoods

In the previous sections we have looked at what people produce, how much of their food comes from the market, and how they earn the cash to pay for this and other necessities. Here we complete the general picture by looking directly at what people spend their money on. Wealthier people have some margin of choice about the balance of expenditure between items of food to improve their diet, purchase of other household items and a few modest luxuries, investment in improving their crop or livestock production, and expenditure on education, ceremonies and charity. For poorer people, however, 'balancing expenditure' means as often as not hard choices between one thing and another. Yet even the *very poor* cannot live by bread alone, and it is remarkable to see the proportion of their expenditure that must go on other quite basic things – including, for instance, kerosene for a single lamp in the hut in the evenings. This tends to leave little or no room for investment in fertilizers or livestock, so that the cycle of poverty continues.

What is the cost of living in rural Ethiopia?

The surprising cost of household items

People use cash for a number of purposes, but poorer people rarely have the margin to spend on anything beyond the bare necessities of life and livelihood. Looking at the legend, top left on the facing page, the most obvious necessity is to buy **staple food** to make up whatever the harvest does not cover. To go with this there is the purchase of **non-staple food**: first and foremost pulses, the essential accompaniment to the staple amongst most farmers. Other items that we might consider essential additions are in fact the subject of careful purchasing decisions by most households. For instance, oil and vegetables: purchased vegetable oil, as opposed to crushed oilseeds, is generally used only very occasionally by poorer households, and even onions, usually produced with small-scale irrigation, are expensive enough to be used sparingly. Milk and meat are luxuries for poorer households and they may only consume them when offered by wealthier neighbors or kin, especially on religious feast days. And insofar as they produce butter, they are far more likely to sell it than consume it.

Still on food, **household items** include condiments such as salt and spices, especially chilli pepper which is an important source of vitamin A. Other items are coffee, tea and sugar, and

in Christian areas also hops (*gesho*) for traditional beer. These are the most basic items of rural hospitality, and a household which cannot offer such to the occasional guest is in the depths of poverty. Further everyday items are milling fees, kerosene to light simple wick-lamps for two or three hours of the evening, matches, soap for bathing and for clothes. Clothes or the cotton throws/blankets (*gabi*) may not be renewed by poor people as much as once a year. But even without these, the everyday items - while incremental on a daily basis - mount up to a major proportion of expenditure on an annual basis, especially for poorer households.

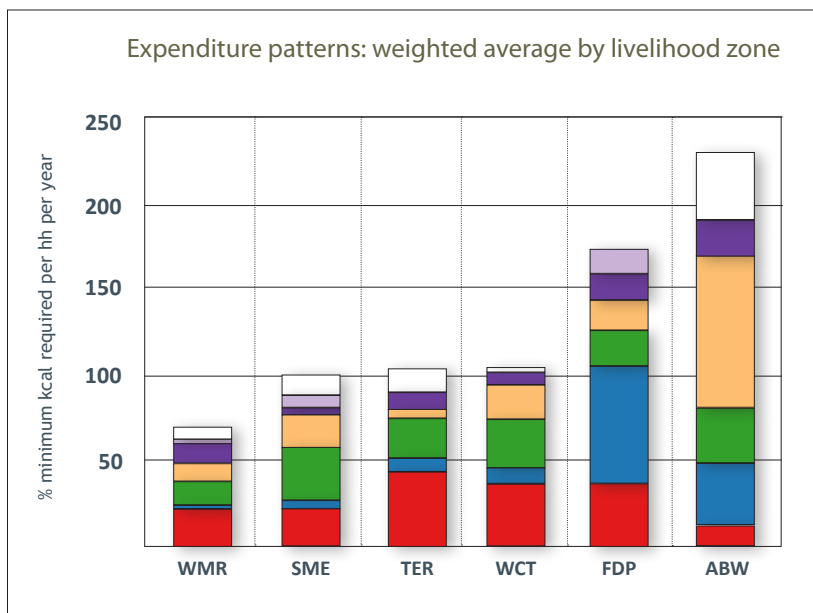
Beyond the household necessities, there is investment in production - **inputs**. The big item tends to be chemical fertilizer, but there is also protection of crops (insecticides etc.) or livestock (veterinary drugs, vaccinations etc., and there are sometimes payments for watering); also the replacement of tools or plow-parts. Wealthier farmers may occasionally purchase livestock to regenerate the herd or to replace an ox. This heading also covers the hiring of labor. This is all expenditure on the *annual* cycle of production. But expenditure on education is investment in the *future*. The field information tells us that it is taken very seriously

by just about every household with children, even these days amongst nomadic pastoralists. **Social services** covers both education costs and spending on medical treatment. By far the greater part of **tax & gifts** is gifts to poorer kin or neighbors. It has to be said that it is sometimes difficult to draw the line in field information between gifts and social obligations which come under **other**: funding or contributing to celebrations and ceremonies such as baptisms and weddings; payments into group savings or funeral clubs (*equb*, *iddir*); also the annual *zakat* contribution amongst Muslims; and finally contingencies such as bus transport.

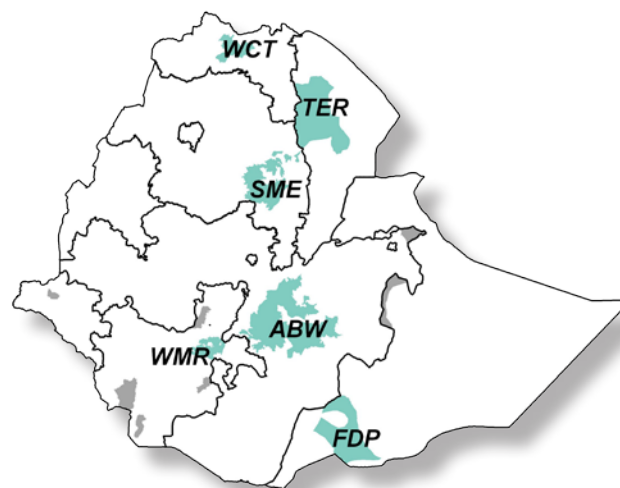
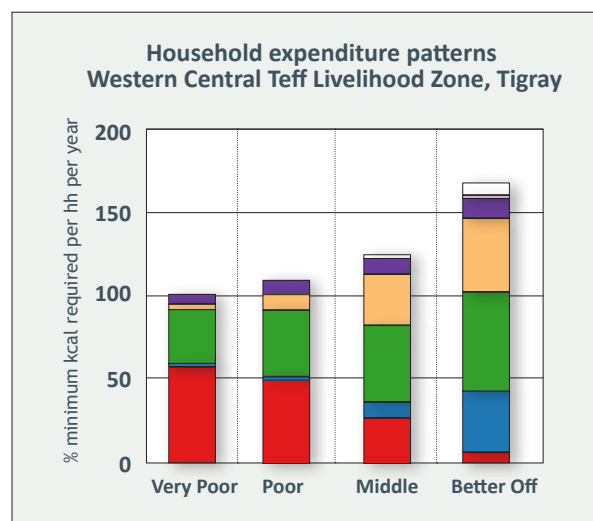
These are the basic categories of expenditure in rural households. In the graphs we look again at the six livelihood zones exemplified in the previous section. The set of graphs on the top shows expenditure by livelihood zone (on average). The graphs on the bottom left show expenditure by wealth group in one of these zones (*Western Central Teff Livelihood Zone*). These graphs are described further in the accompanying text on page 103.

Every day household items cost only small amounts on a daily basis, but they mount up to a major part of expenditure on an annual basis

Expenditure category	
	Other
	Tax & gifts
	Social services
	Inputs
	Household items
	Non-staple food
	Staple food



The example of the *West Central Teff Livelihood Zone* of Tigray (bottom left) shows that the poorer you are, the more your expenditure is limited to just feeding the family. And the more you need to spend on staples, the less you can spend on non-staple foods, which are important for the quality of the diet. Poorer people eat less, and less healthily. Yet even the very poor, although hardly able to meet their basic food requirements, still sacrifice some 3% of their impossibly tight budget for education. For the wealthier, input expenditure is far greater than for the poorer: wealth begets wealth.



In the top graph, inputs expenditure is particularly marked in ABW, where cereals surpluses are the basis of the greater wealth of the area. In the other zones food aid reduces the volume of food purchase – in TER (Afar) it amounts to 22% of food (calories) for the whole population; elsewhere 6-13%.

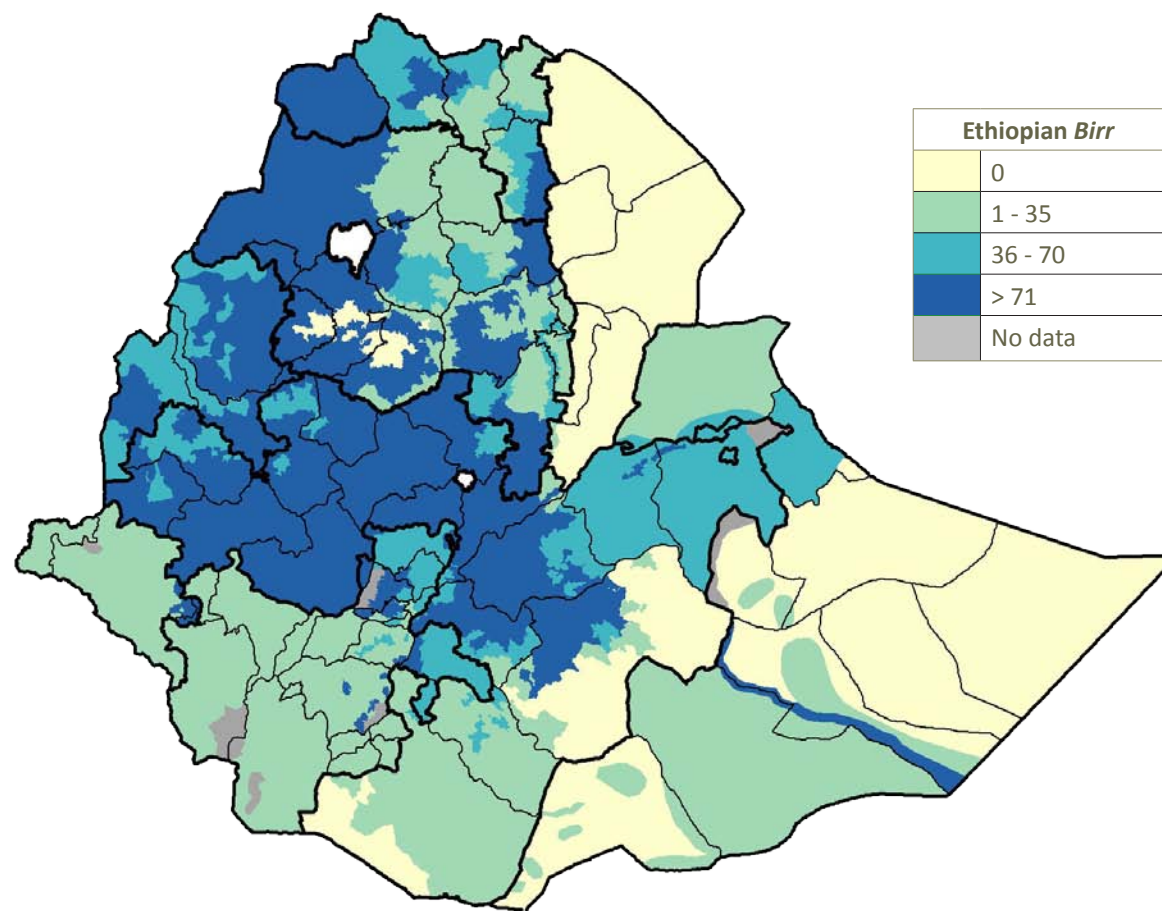
What do people spend on production?

Crop production

Overall, the clear pattern is for the biggest expenditure on inputs to be in the most productive areas. These include areas of surplus cereals (often with pulses or oilseeds) in Amhara, Tigray, Benishangul and parts of east, central and west Oromia, as well as the irrigated strip of Somali Region along the Wabi Shebelle River. Secondly, there are the areas with substantial cash-crops, especially the coffee of western Oromia and the sesame (with sorghum) zone of far north-west Amahara/west Tigray.

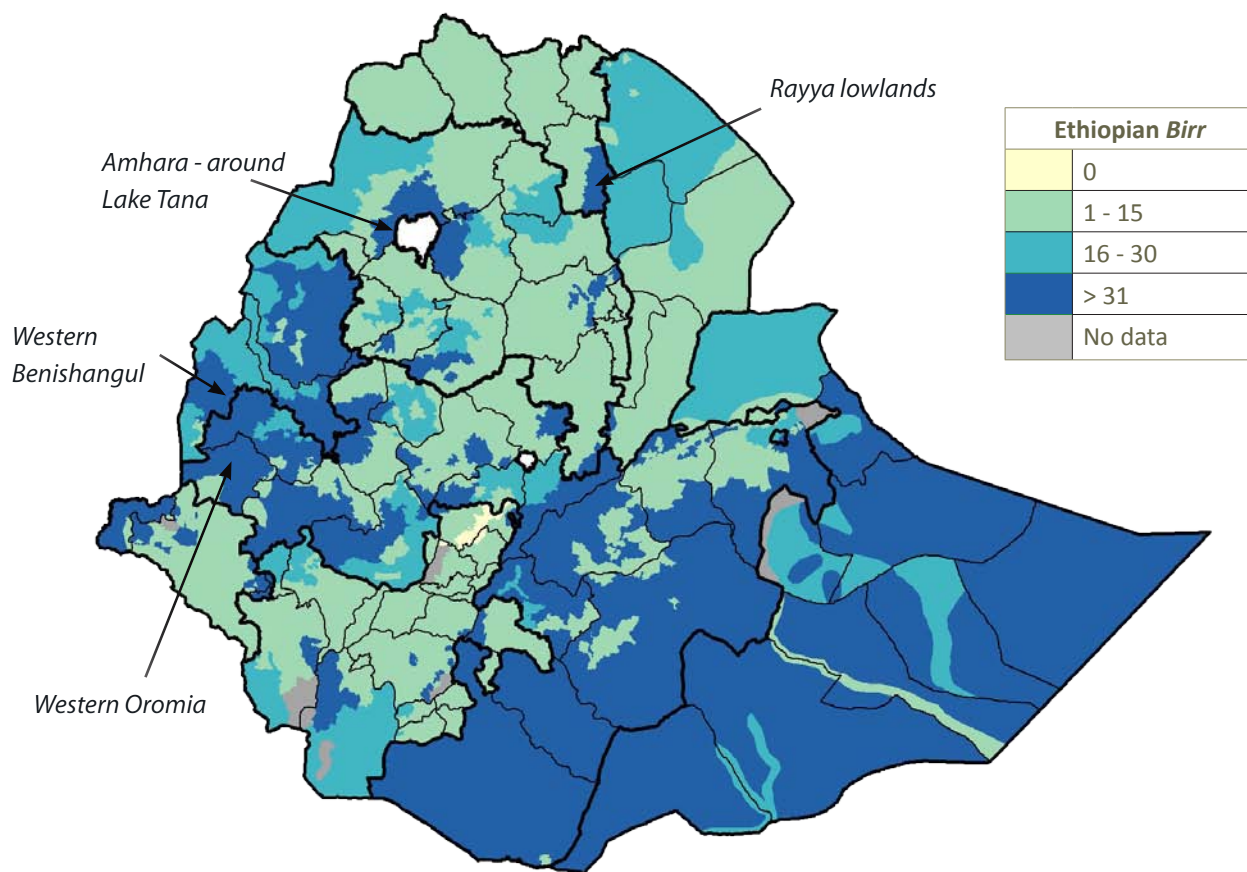
Not all of these areas are amongst the wealthiest. In southern Amhara, for instance, quite modest producers invest in inputs at least for *teff*, because of the prices influenced by Addis Ababa. And not all cash-crop areas are high spenders: only middling investment is seen for the famous Sidama-Gedeo coffee area of far-east SNNPR, and the *chat*-growing areas of north SNNPR and Harerge in east Oromia. Among the areas with lesser expenditure on inputs are the low-production ones of Tigray and north-east and south-central Amhara, as well as most agropastoral areas – while those of Afar spend nothing at all. The map is influenced by the expenditure of the wealthier households; however, those in low potential areas do not seem to feel that inputs will make much difference.

Annual per capita expenditure on crop inputs



Note: The map shows the result for the population overall (a weighted average). ETB expenditure is adjusted for inflation against a 2005-06 non-food inflation index based on CSA data.

Annual per capita expenditure on livestock inputs



Note: The map shows the result for the population overall (a weighted average). ETB expenditure is adjusted for inflation against a 2005-06 non-food inflation index based on CSA data.

Livestock production

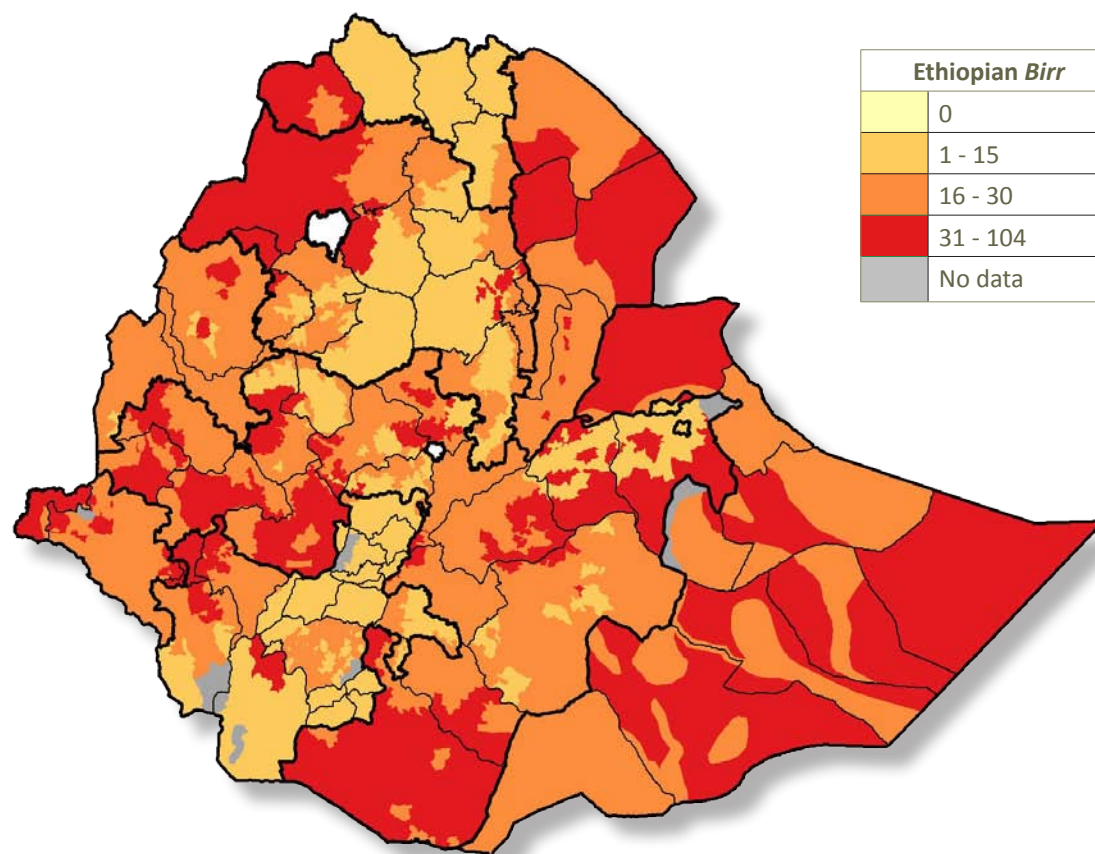
As one would expect, pastoral and agropastoral livelihood zones stand out (although Afar again proves the exception). But a number of cropping zones also show high expenditure on livestock inputs: in the Rayya lowlands of south-east Tigray, around Lake Tana in Amhara, in west Benishangul, in coffee and chat-growing areas of western Oromia, and in the cereal highlands of center-east Oromia, for instance. What these areas tend to have in common is relatively high incomes overall, so that the money is there to invest in the protection of livestock for greater profits, which come from butter/milk sales as well as sales of live animals. In several of these areas there is also a strong tendency for poorer households to gain as much as 20% of their income from livestock. It is not clear why the wealthy and cattle-rich sesame area of far north-west Amhara shouldn't also show high average expenditure, except that here the *very poor* group has unusually minimal livestock and livestock earnings. Referring back to page 43, it is interesting that the relatively poor cropping areas in Tigray, Amhara and SNNPR, where livestock earnings are more important than crop earnings, are amongst those that spend least on livestock inputs. It seems people here have little money to spend on anything.

What do people spend on 'social services'?

The cost of a future

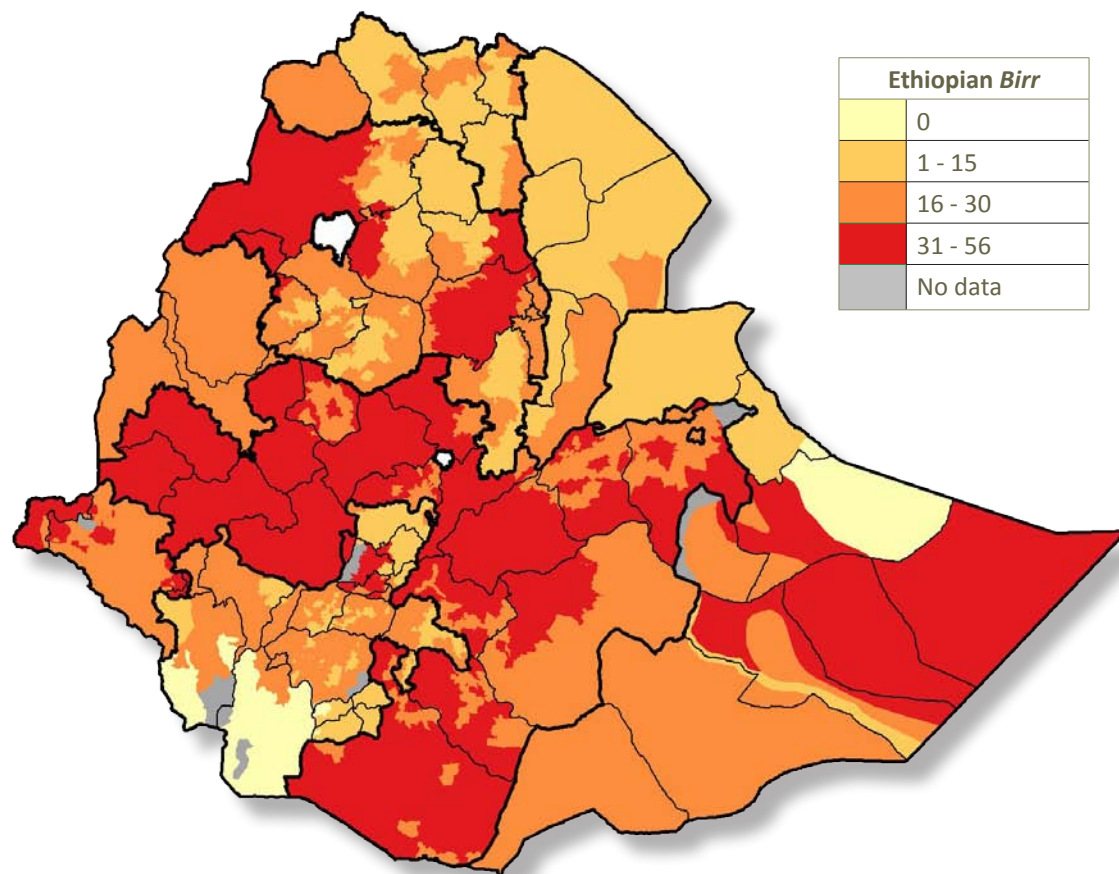
The livelihoods data is rich in subject matter and detailed as to the central operations of household economy. But no survey can fully cover every aspect of life, and some that are only peripheral here invite much more specific study in their own right. Amongst the most important are payment for education and health. On **education**, we can say that there seem to be two general, although not universal, patterns here. One is not surprising: less is spent on education in the poorest areas, e.g., much of Tigray and Afar, north-west and parts of central and south Amhara, Harerge in east Oromia, parts of SNNPR. By the same token the general pattern in the cropping areas is of most expenditure in the wealthier areas. But secondly, the higher expenditure in more remote, pastoral and agropastoral parts of Somali Region and south Oromia suggests that people are paying the cost of distance to schools. Sometimes there is no nearby school, and parents must pay for children to live away from home, whether as boarders or with kin in centers. This must especially be true of the children of pastoralists. But even in ordinary cropping areas this cost is felt at secondary level, and poorer households very often cannot afford more than primary education.

Annual per capita expenditure on education



Note: The map shows the result for the population overall (a weighted average).

Annual per capita expenditure on health



Note: The map shows the result for the population overall (a weighted average).

The cost of health

On **health** there also seem to be two patterns.

In the cropping areas, more starkly than for education, there is a general division between the poorest areas and the others. There is no evidence that treatment is cheaper in these areas: poorer people simply spend less, and must sometimes make very hard choices about whether to invest in treatment, often waiting until the patient's condition demands action – and then expenditure is sometimes too late for a cure.

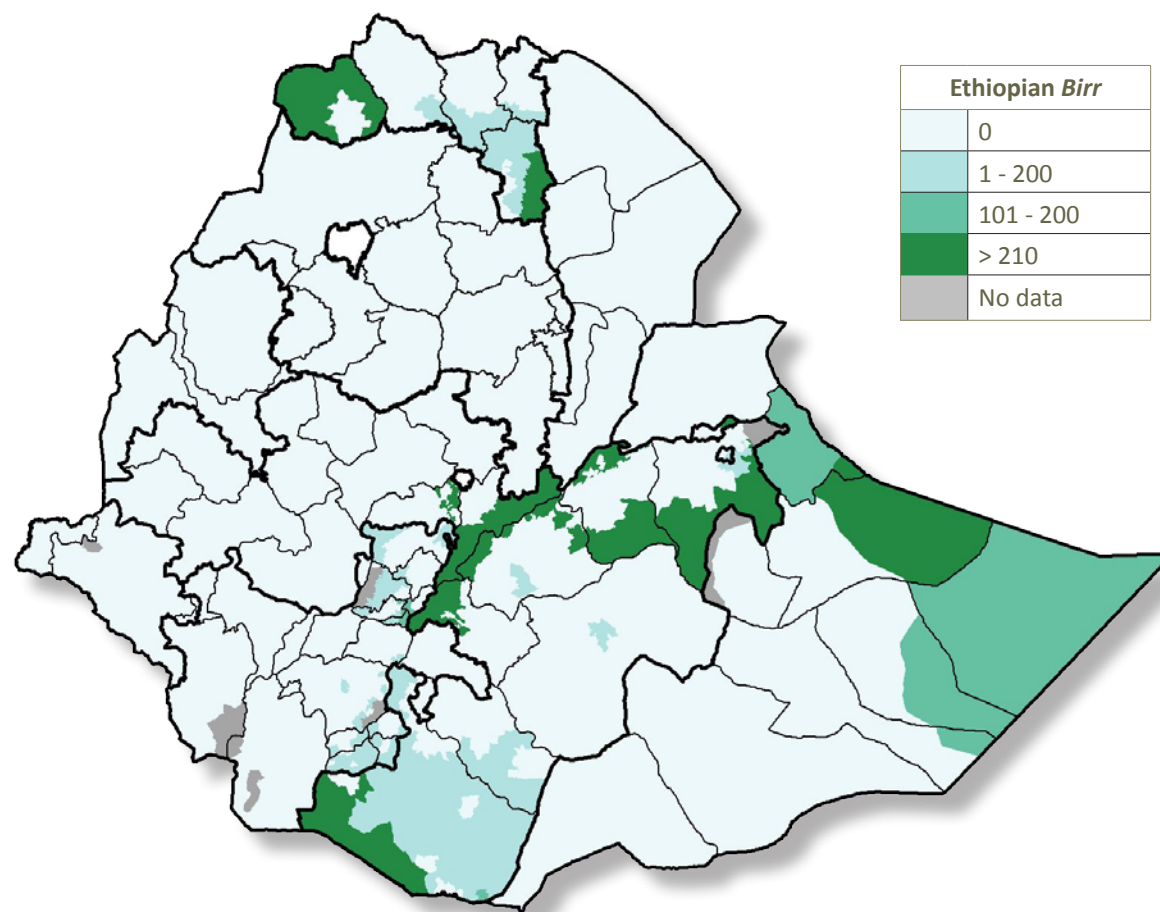
But the pastoral and agropastoral areas clearly pay the price of remoteness: when illness is serious, the journey to treatment facilities must be made; and prices for locally marketed medicines, as for other items, may be relatively high.

Where do people pay for water?

It is important to say that the water expenditure information shown here is *indicative* only, because much of the livelihoods fieldwork was done in the earliest years of the government's new rural water improvement plan launched in 2005. Since then, expenditure on rural water supply, particularly for human consumption, has been on the rise, with an increased focus on cost recovery, i.e. payment for safe water. Nevertheless, some points may be made from the map.

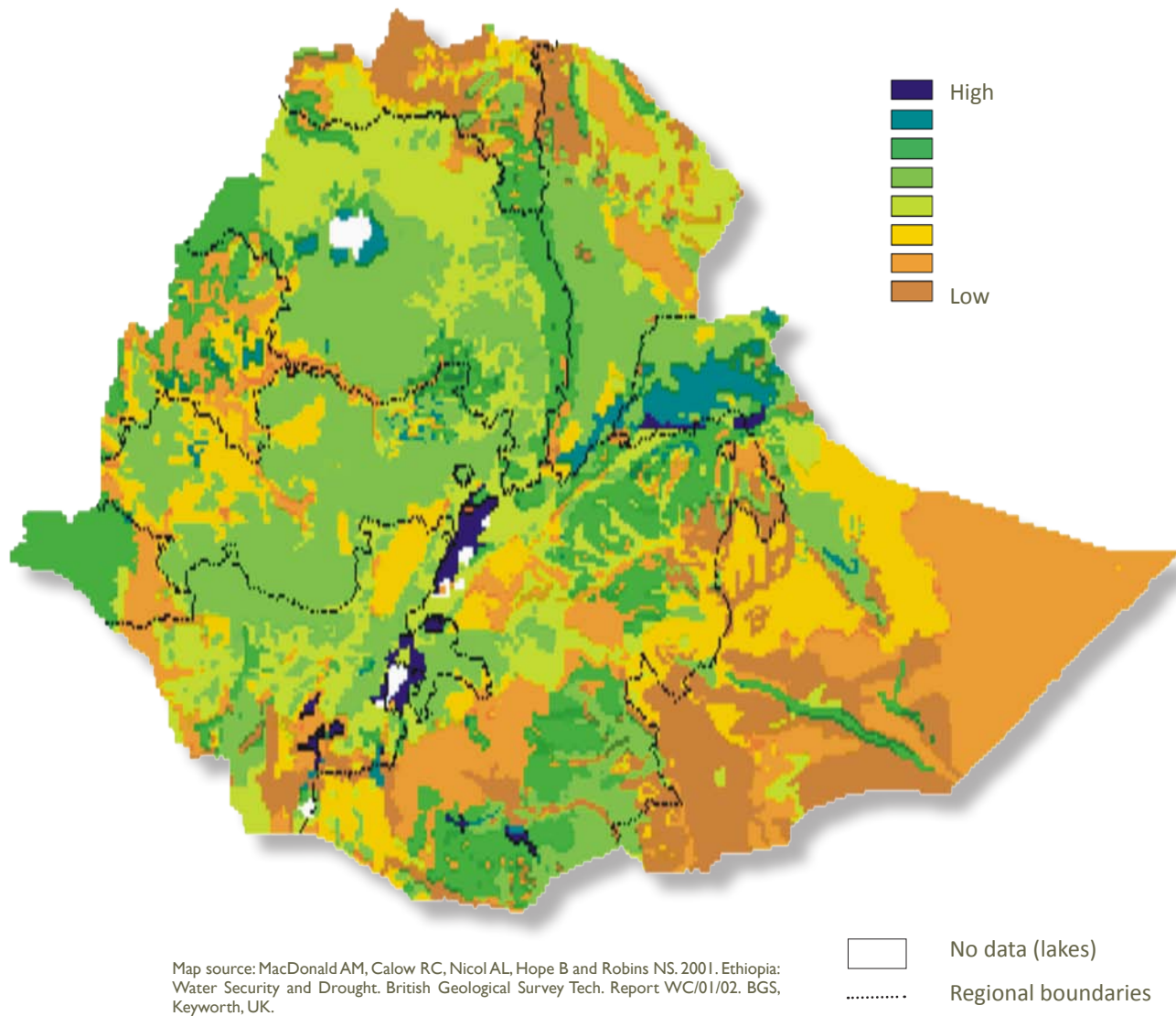
The highest expenditure tends to be related to water from mechanized boreholes. In pastoral and agropastoral areas the main expenditure is for livestock watering, and therefore by wealthier stock-owners. Depending on the performance of traditional deep wells, such as the *ellas* of south Oromia, average annual household payments for borehole water vary from ETB 40 to over ETB 1000. In the east of Somali Region the main payment is to private owners of ground-water collection tanks (*birkads*). Regarding more modest costs of human consumption in the cropping highlands, poorer people still often avoid payment for safe water if there is the free alternative of an unprotected spring or well or stream. Payment for private irrigation remains highly localized in Ethiopia.

Annual per capita expenditure on water



Note: The map shows the result for the population overall (a weighted average).

Ground water availability during drought



Securing adequate water is essential for human survival; it also underpins the ability of households to earn cash income through water-dependent production activities such as livestock keeping and small-scale irrigation. Households must balance the daily trade-offs associated with gaining access to water - allocating time, labor, and money that could otherwise be spent obtaining alternative income, or caring for children, or attending school, or purchasing other essential goods.

As shown on the map to the left, from the British Geological Survey, water scarcity is especially prominent across Somali Region, where there are low rainfall levels and few significant aquifers (rocks that store and transport water beneath the ground). Livestock exert significant stress on the water base in this predominately lowland region. Groundwater availability is also a concern in Tigray, northern Afar and Benishangul, where unreliable rainfall is made worse by poor aquifers in many locations. In the central areas of the country - in Amhara and much of Oromia regions - rainfall is mostly reliable and aquifers exist, so that groundwater is most likely to be available even during drought periods. Water insecurity here is more likely to be a function of high demand and poor access rather than absolute scarcity of water, even in years of low rainfall.



Hazards, Coping Strategies and Livelihoods

The livelihoods fieldwork on which this atlas is based aims primarily to represent a reference year that is more or less 'normal' in terms of levels of local economy and food security. This is the baseline against which the effects of the shocks of bad years are measured. Nevertheless, during the fieldwork some information was gathered on perceived main hazards and on reported main mechanisms to cope with their effects. The maps which follow summarize this information; and although it is not enumerated like the basic household economy data and is less complete in coverage, it is of interest as a complement to the baseline picture. On the other hand, the early warning system for which the livelihoods data was primarily developed regularly monitors and analyzes local production and market trends, as well as the hazards - or indeed the favorable conditions - which affect them.

Which hazards affect people most?

Drought predominates but crop and livestock diseases cause consistent losses

The first, composite map shows the single most important perceived short-term hazard faced by rural people from year to year - but not necessarily every year. This can be shown geographically; what cannot be added conveniently is the second and third most important hazards stated. But it is a lucky farmer who has only one hazard to report. Therefore the subsequent maps take the categories of hazard separately, and here a hazard is shown if it was amongst the three most important reported in the individual livelihood zones that in combination make up each map.

This map complements pages 33 and 34 showing perceived constraints to crop production, with rainfall now featuring strongly as an unavoidable hazard. The lack of, or erratic, rainfall is by far the most widespread hazard reported, since in rural Ethiopia primary production of crops and livestock is the basis of livelihoods, and rainfall is the most fundamental determinant of what can be produced. Here two elements are in play: the perennial fact of relatively low rainfall by comparison with other places, and the threat of frequent and/or severe failures within that regime. It is clear that the pastoral rangelands are almost universally places of anxiety about rainfall (the anomaly

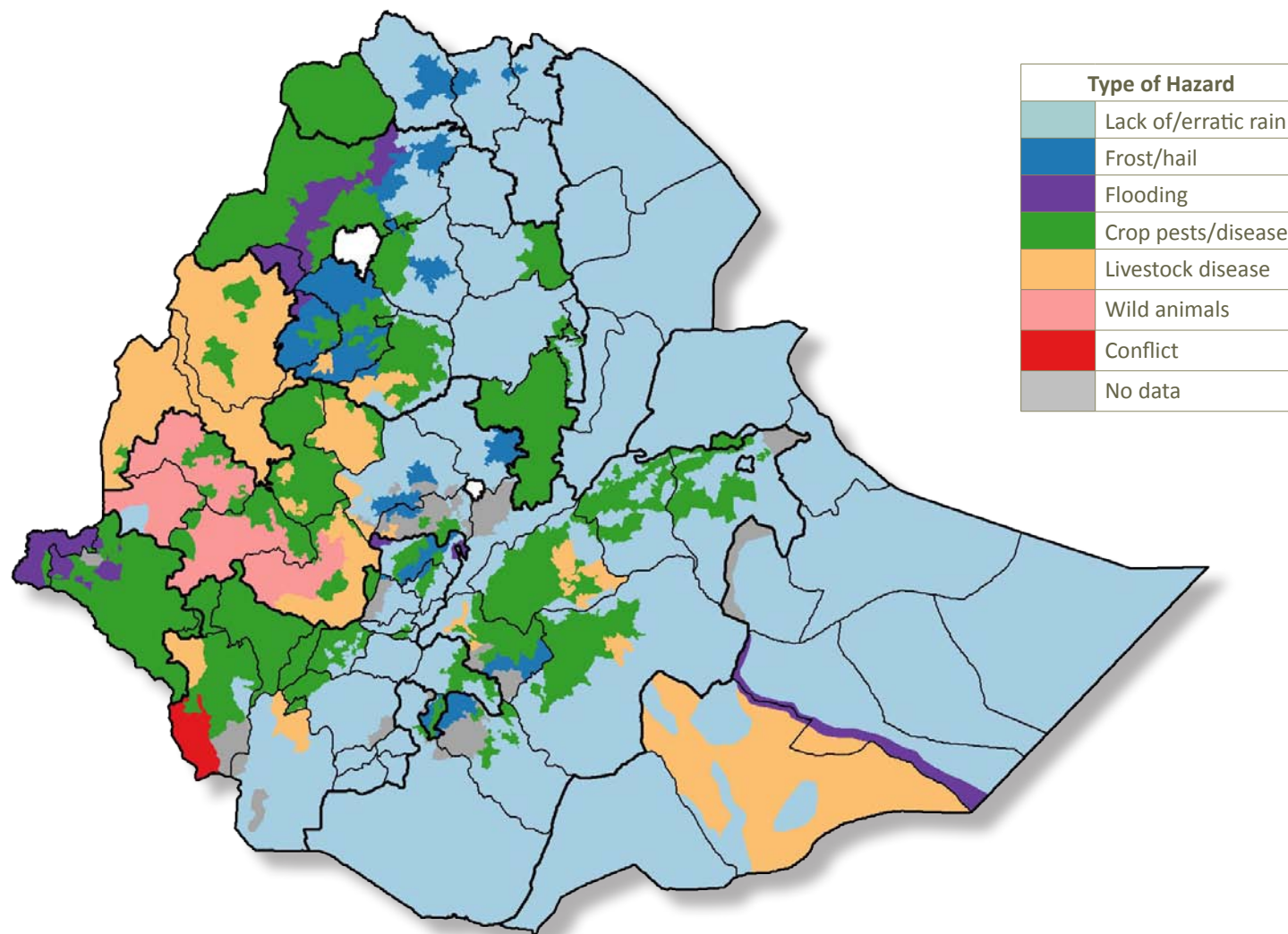
in the south of Somali Region may be influenced by recent disease events). Pastoralism is designed to live with very low annual precipitation, but at this level disturbances can have big effects, especially the late arrival of pasture-reviving rains after long, hot dry seasons. It is a serious matter for croppers to have a diminished harvest, but when the rain comes back next season a new harvest is prepared - even after catastrophic drought. However, when pastoralists lose much livestock it takes several years to regenerate the herds, especially cattle. The agropastoral areas join this east and south lowland anxiety about rainfall, but not in far less failure-prone Gambella in the west.

The east-west divide is also quite clear on a grand scale in the cropping zone, with rainfall generally higher and markedly more reliable in the west than in the east in comparable altitude bands. There are one or two exceptions that prove the rule. Thus in Tigray, the **West Central Teff Livelihood Zone** which shows white in the rainfall map is an upper middle-highland area where the most feared rainfall irregularities are in fact excessive showers which waterlog fields (the other main anxiety is about the local plague of the *striga* weed). The Arsi-Bale Highlands

of south-east Oromia evidently catch rainfall which frequently misses the surrounding lowlands. But on the whole, the east of the cropping zone has been the scene of frequent rainfall irregularities, as well as of the severe agricultural droughts which have captured international attention.

Damaging frost is mainly a problem of highlands, notably in the north, but it is hail that farmers fear more widely, particularly in the immediate pre-harvest period when it hits the standing grain. Hail damage can be extreme on the delicate *teff*, because this very fine-sized grain is largely lost if falls to the ground. *Teff* farmers pay high labor rates to get in the harvest as soon as it is ready. Very localized flooding of fields under hillsides by rainfall run-off is a frequent problem, but in the foothills of the high mountain areas of north-west Amhara it is a particularly widespread hazard. In western Gambella the Baro and Gillo rivers allow 'flood-retreat' cultivation, but in some years the flood is of the damaging sort. The same is the case for irrigated crops on the banks of the Wabi Shebelle River in Somali, and to a lesser extent for irrigated plantations on the Awash River in the Rift Valley. (Continued on page 114...)

The most important hazard (as perceived by rural households)



Which hazards affect people most?

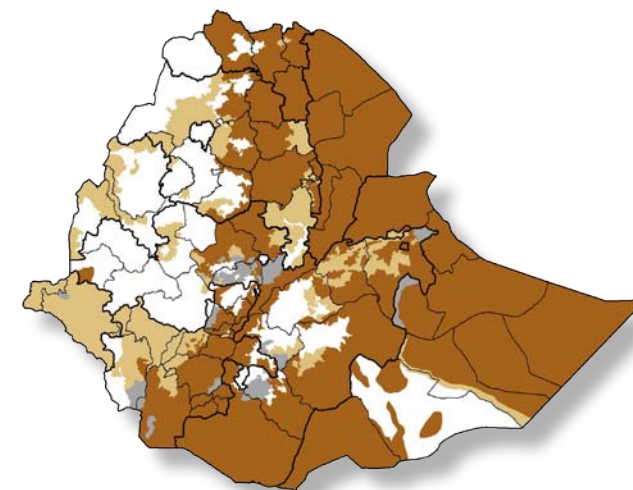
(...continued from page 112)

Crop pest is a problem everywhere in agricultural Ethiopia, annually reducing the national food harvest by hundreds of thousands of tons.

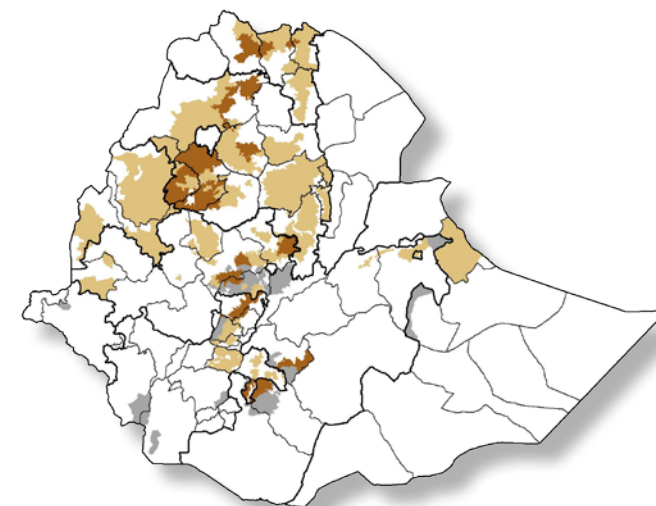
In areas where there is an accent on crop sales - e.g. in the sesame zones of the far north-west, and around Lake Tana in Amhara, and in the *teff*-lands of east and south Amhara and the wheat lands of the Arsi-Bale Highlands of south-east Oromia, - farmers especially fear the very heavy losses to harvests that happen periodically. In the higher elevations, aphids, bollworm, rust and smut fungus are among the diseases that affect wheat, barley and *teff*; in the south, outbreaks of coffee wilt and blight on enset are concerns. Most of the pests are those found in many other African countries and beyond, such as stalk/stem-borers on sorghum and maize; or the rarer plagues of army-worm which hit small-grain crops and grasses; and termites in lowlands; and sweet potato butterfly in SNNPR. But Ethiopia has one or two special pests too, amongst which are the Wollo bush cricket (*Decticoides brevipennis*), spreading in the north and damaging a variety of grains, pulses and oilseeds.

Livestock are found in every part of the country and so, therefore, are livestock diseases. Like crop pests these present a great challenge to the government services, from Newcastle disease in poultry to pox in camels. Many common cattle and smallstock diseases are present – blackleg, anthrax, *pasteurellosis* – and *trypanosomiasis* has been an increasing problem to cattle in the west of the country, sometimes affecting cultivation through losses of oxen. It has to be admitted that there is no ready explanation for the particular fears of the ‘primary importance’ areas on the map, although the accident of recent disease events can influence local priorities. As regards wild animal damage, throughout agricultural Ethiopia standing crops are threatened at least by birds, and amongst the weapons deployed are children with slings sitting on platforms. Near the edges of highland escarpments, gelada baboons pose another threat to crops, and in lower-lying areas other baboons. But in western Oromia, especially in more forested lowlands, there is a particularly great problem of a combination of animals including not only monkeys and baboons but warthogs and bush pigs. Finally, inter-clan or inter-ethnic conflict, sometimes cross-border, remains a problem amongst herding communities, although mainly at a low level.

Lack of/erratic rain



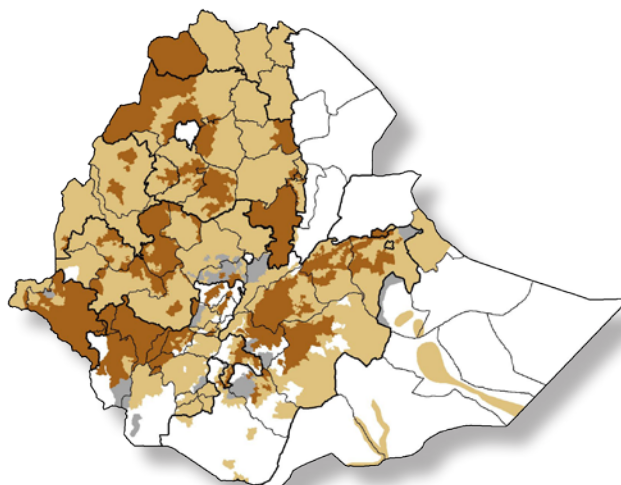
Frost/hail



Flooding



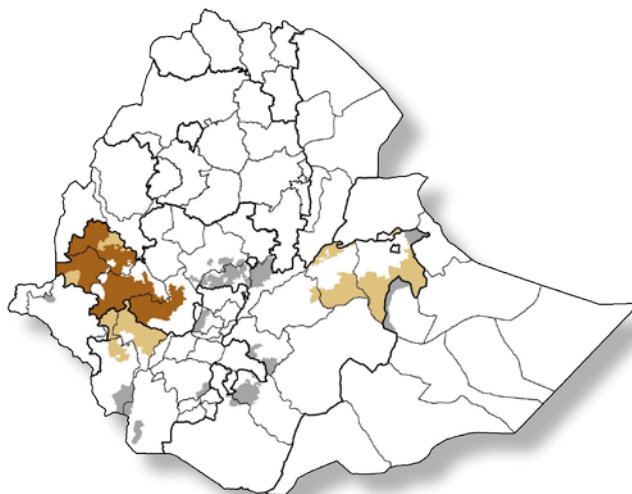
Crop pests/disease



Livestock disease



Wild animals



Conflict



Legend

	Not important
	Primary importance
	Secondary importance
	No data

What do people turn to in bad years?

The first maps on page 117 show the single most frequently cited coping mechanisms for poor and better-off households, and the subsequent maps show individual coping mechanisms for poor households where they were one of the three most cited in each livelihood zone. In any community at any time, some people are suffering individual misfortune. Where people cannot help themselves – for instance by selling a goat to pay for emergency medical treatment, or finding employment to cover some other urgent cost – the problems are mostly taken care of within the community through kinship or group solidarity: people will be supported with food, a kinsman will donate cash, a brother will plow the field of a deserted wife, a household will take in an orphan. But this social ‘insurance’ cannot cope with misfortune that hits the whole community. If crops or pastures fail, a farmer cannot give his neighbor a bag of grain, and a herder will have no cash to spare as livestock prices go down on a glutted market. In bad years for everybody, everybody must look to their own solution. Households will often try two or three solutions. For instance, as people in Afar run out of the gifts which they seem to expect, they will try to get more paid work in the salt industry in the north, or look more intensely for wild foods in the south or will try to sell more firewood up in highland markets. The repertoire of coping is limited essentially

to attempting to increase collecting and/or earning activities that are normally available. Aside from eventual official relief, no new avenue of coping is evident. In catastrophic situations whole households may finally be forced to move away from the village to camp at roadsides or in towns and beg for help. That is not coping, of course: it is the final breakdown.

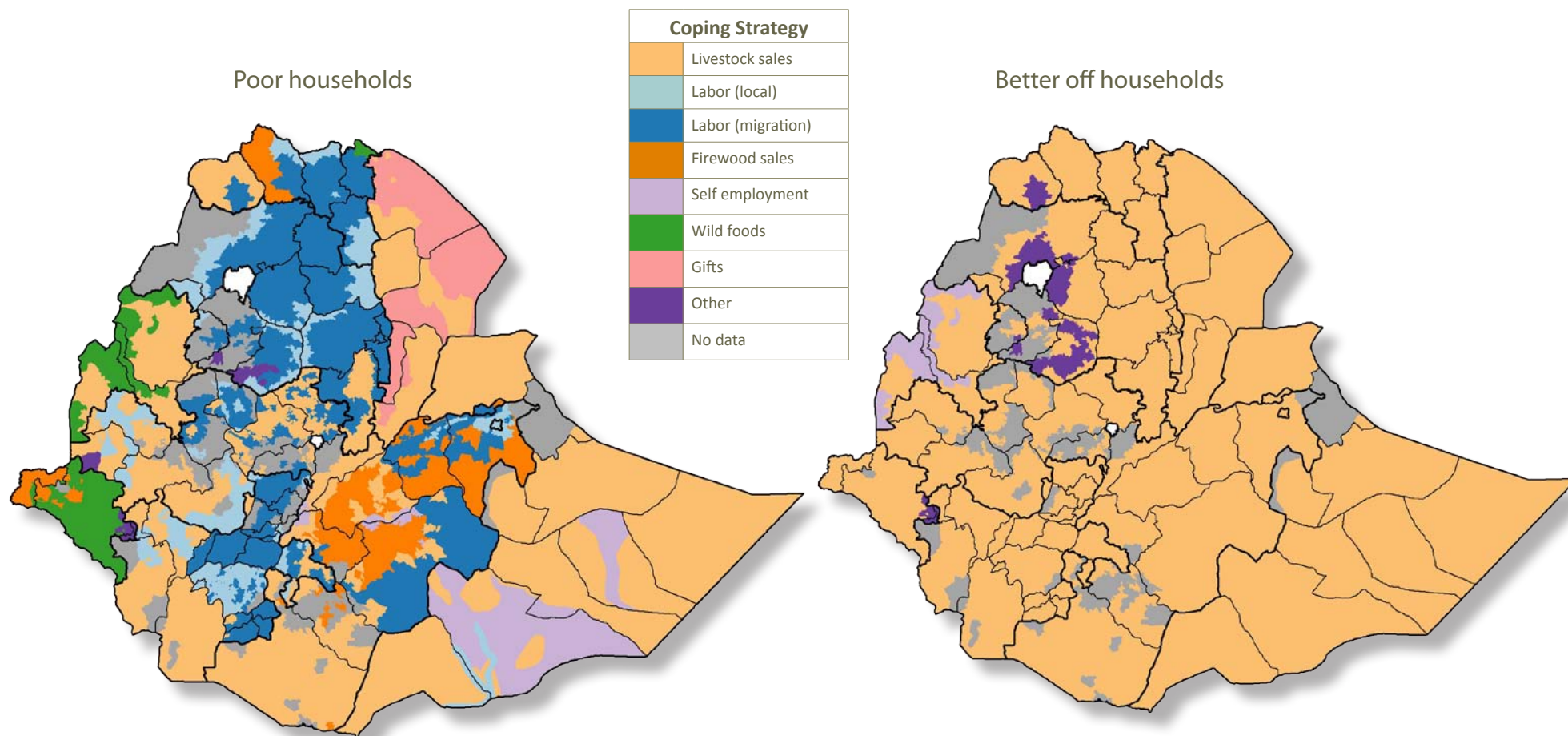
The following text refers to pages 118 & 119

The most widespread individual ‘insurance’ lies in **selling extra livestock**; apart from pastoral areas, it is the first recourse of even *poor* households in livestock-rich areas of the west (first map). But elsewhere it is really only feasible for wealthier people (second map). In highland Amhara people commonly refer to sheep and goats as ‘our money’ (*genzebachin*). But for poorer people with only a handful of goats this is not a big savings account; they very soon run out of animals to sell – and the sale of the last productive female will be ‘negative coping’, i.e. a blow to reviving their post-crisis livelihood. This is particularly the case in the relatively poor north-east highlands, while in the large agropastoral area of Harerge in eastern Oromia it appears that even the couple of cattle that poorer people own are too soon devalued in a bad year by their condition and the market

glut to be of much help to their finances. It is interesting that amongst household assets it is only livestock that are sold in an ‘ordinary’ bad year: the sale of farming equipment or jewellery or even house timbers is reported only for famine years.

Increasing **local agricultural labor employment** is shown as of primary importance only in a few, mainly lowland and somewhat remote localities. One exception is the Rayya plain which joins southern Tigray and north-east Amhara, and which is a major employer of labor on the *teff* fields, including much migrant labor. In a bad year local workers have first chance at getting such employment as is available and so do not need to migrate. If the data were available this would undoubtedly also be the case on the other side of Amhara in the sesame cash-crop area of the north-west - but rainfall is anyway much more reliable here. The increased search for work away from home - **migrant labor** - is a crucial coping mechanism for large areas of the country, as it is in normal times, a topic dealt with in detail in the *Markets & Livelihoods* section. Of course there is a limit to the capacity of host areas to offer employment at the best of times; but the important thing is that the host area should not be having a bad year at the same time as the area

The most important coping strategy in a bad year (as perceived by rural households)



What do people turn to in bad years?

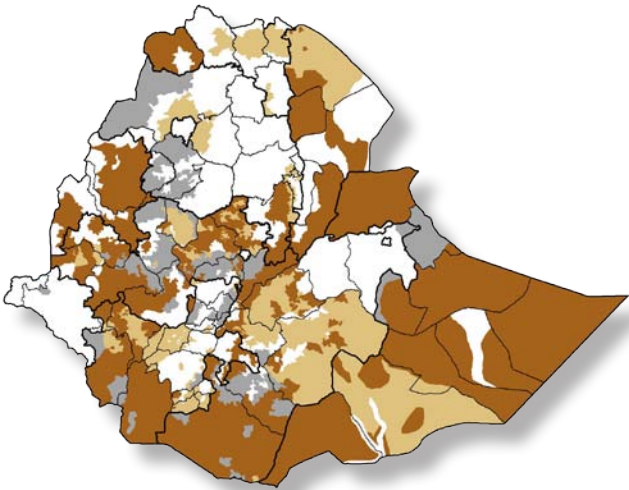
that the extra migrants come from, otherwise they will find little work and suffer hunger. This event is more likely in eastern than in western host areas. The catastrophic eastern drought of 1973 was the first time ever for many men from north-west Amhara and adjacent parts of Tigray to venture far away from home to try to find work. Those who went west to Gojjam and Gonder often found employment, or at least some local, charitable food support. Those who went south-east to Wollo *teff* areas or the Afar plantations generally found no work and ended up in famine camps in south Wollo, while the women and children ended up in the northern camps nearer home.

Extra firewood sales and **‘self-employment’** (here separated) are both most prominent in lowland areas, and follow the pattern of normal years: foothill areas adjacent to the denuded highlands have an advantage in selling firewood, while in more remote rangeland areas it is gums and resins and bush products which count. Similarly, it is especially in Gambella and Benishangul that **wild foods** are collected, and sometimes sold, every year; the search for this resource increases in bad years when cultivated food is scarce. On the other hand it is interesting to note that **enset**, in the areas where it is most grown, is only considered a secondary extra resource in bad years, although

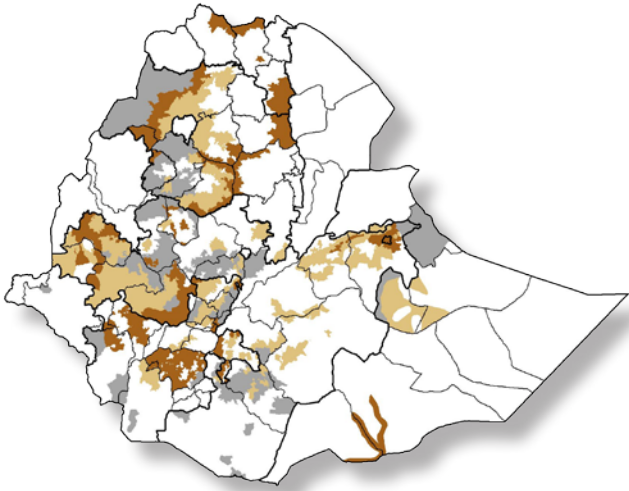
it is reputed to be a drought resistant food ‘store’ in times of hunger. This topic would require further inquiry, but the first indications are that poor people can no longer wait for enset to mature for six or more years, and so they generally only have young plants which yield limited food.

Legend	
	Not important
	Primary importance
	Secondary importance
	No data

Livestock sales

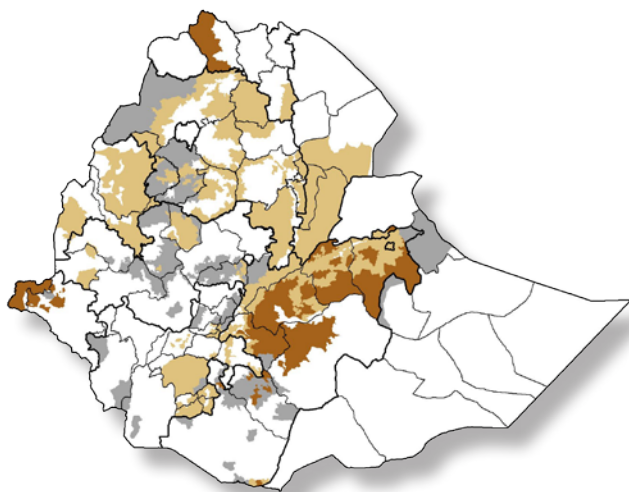


Local labor

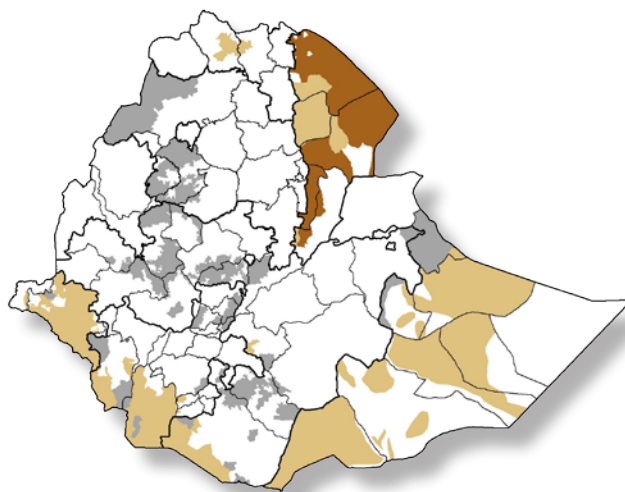


The importance of individual coping strategies for poor households

Firewood sales



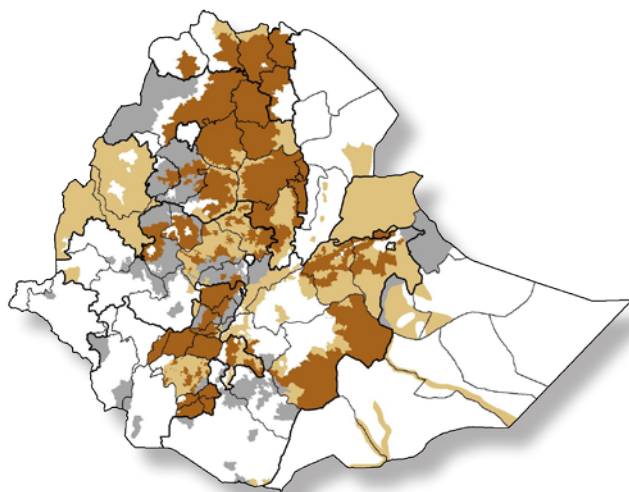
Gifts



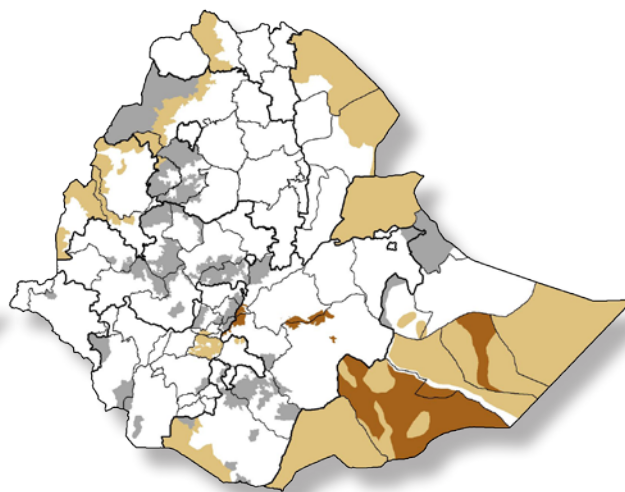
Enset consumption



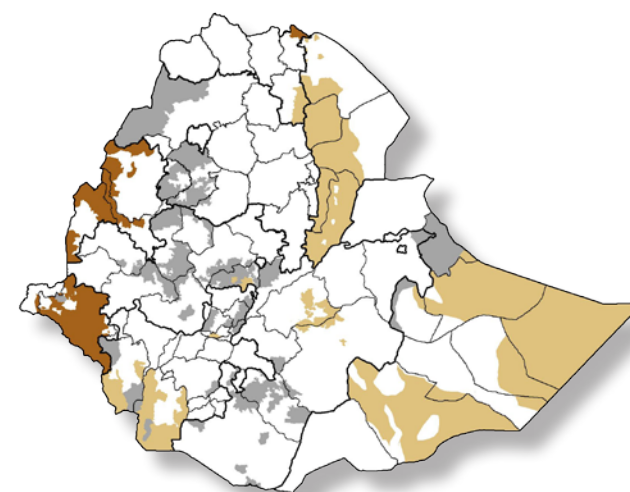
Labor migration



Self employment



Wild foods



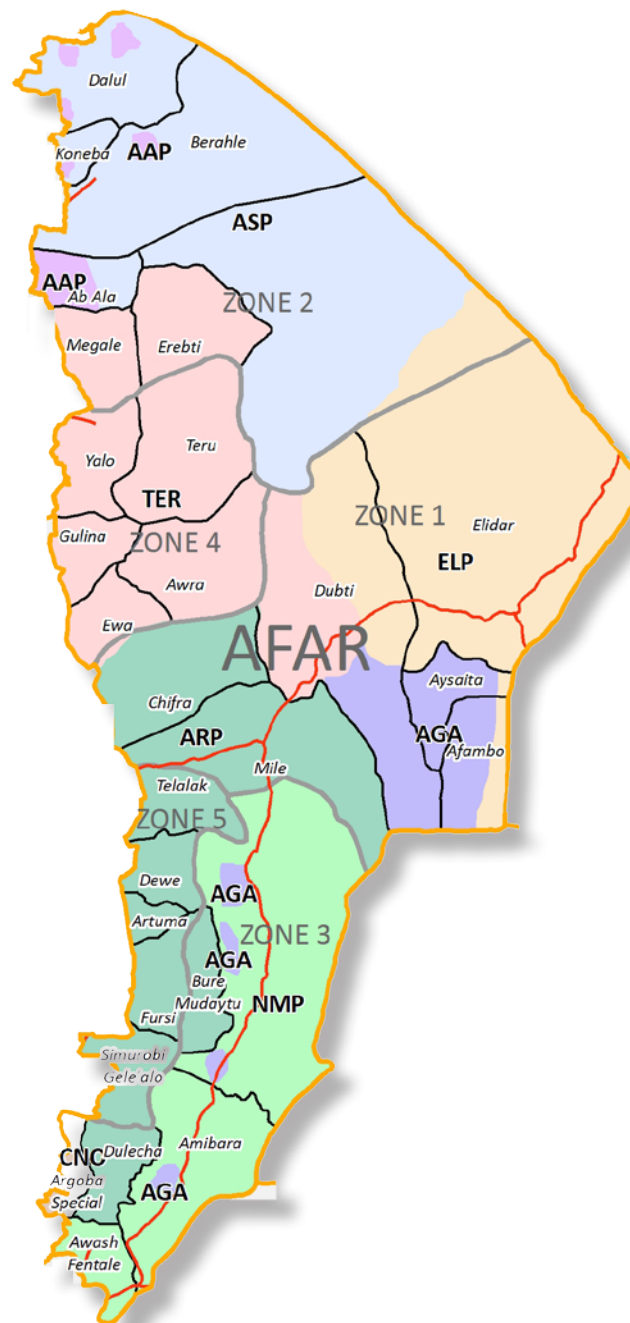
The background of the top right section of the page features a photograph of a rural village. It shows several traditional dwellings with conical thatched roofs, likely made of straw or dried grass, situated in a grassy field. In the background, there are more huts and a line of trees under a slightly overcast sky. The image is partially obscured by a dark blue overlay on the left and a dark olive green overlay on the right.

Annex 1: The Livelihood Zones

Livelihood zones are areas within which households share - on average - the same options for obtaining access to food and cash income, and share access to the same markets. In Ethiopia, these delineations were determined through a standard process of zoning, which included regional workshops, reference to existing maps, and targeted field work. Annex 1 contains a full list of livelihood zones by region; these can be used as a reference for the maps throughout this atlas.

AFAR REGION

Code	Livelihood Zone Name
AAP	Asale Agropastoral
AGA	Awsa-Gewane Agropastoral
ARP	Aramiss-Adaar Pastoral
ASP	Asale Pastoral
CNO	Chenno Agropastoral
ELP	Eli Daar Pastoral
NMP	Namalefan & Baadu Pastoral
TER	Teru Pastoral



AMHARA REGION



Code	Livelihood Zone Name
ABB	Abay Beshilo River Basin
ATW	Abay Tekeze Watershed
CBP	Central Highland Barley & Potato
CHV	Cheffa Valley
GHL	Guna Highland
MLS	Merhabete Lowland Sorghum and <i>Teff</i>
MTL	Minjar <i>Teff</i> and livestock
MTS	Minjar <i>Teff</i> and Sorghum
NHB	North Wollo Highland <i>Belg</i>
NMC	North East Woyna Dega Mixed Cereal
NSS	North Shewa Highland Sheep and Barley
NSW	North Shewa Highland Wheat and <i>Teff</i> Productive
NWB	N Highland Wheat, Barley & Sheep
NWC	NorthWest Cash Crop
NWE	North Wollo East Plain
NWS	NorthWest Sorghum Belt
SME	South Wollo <i>Meher</i>
SWB	South Wollo <i>Belg</i>
SWM	South West Maize, Finger Millet and <i>Teff</i> Productive
SWS	South Wollo & Oromia Eastern Lowland Sorghum & Cattle
SWT	South East Woyna Dega <i>Teff</i>
SWW	South West Woyna Dega Wheat
TSG	Tekeze Lowland Sorghum and Goats
TZA	Tana Zuria
WMB	South Wollo <i>Meher</i> and <i>Belg</i>

OROMIA REGION (WESTERN)

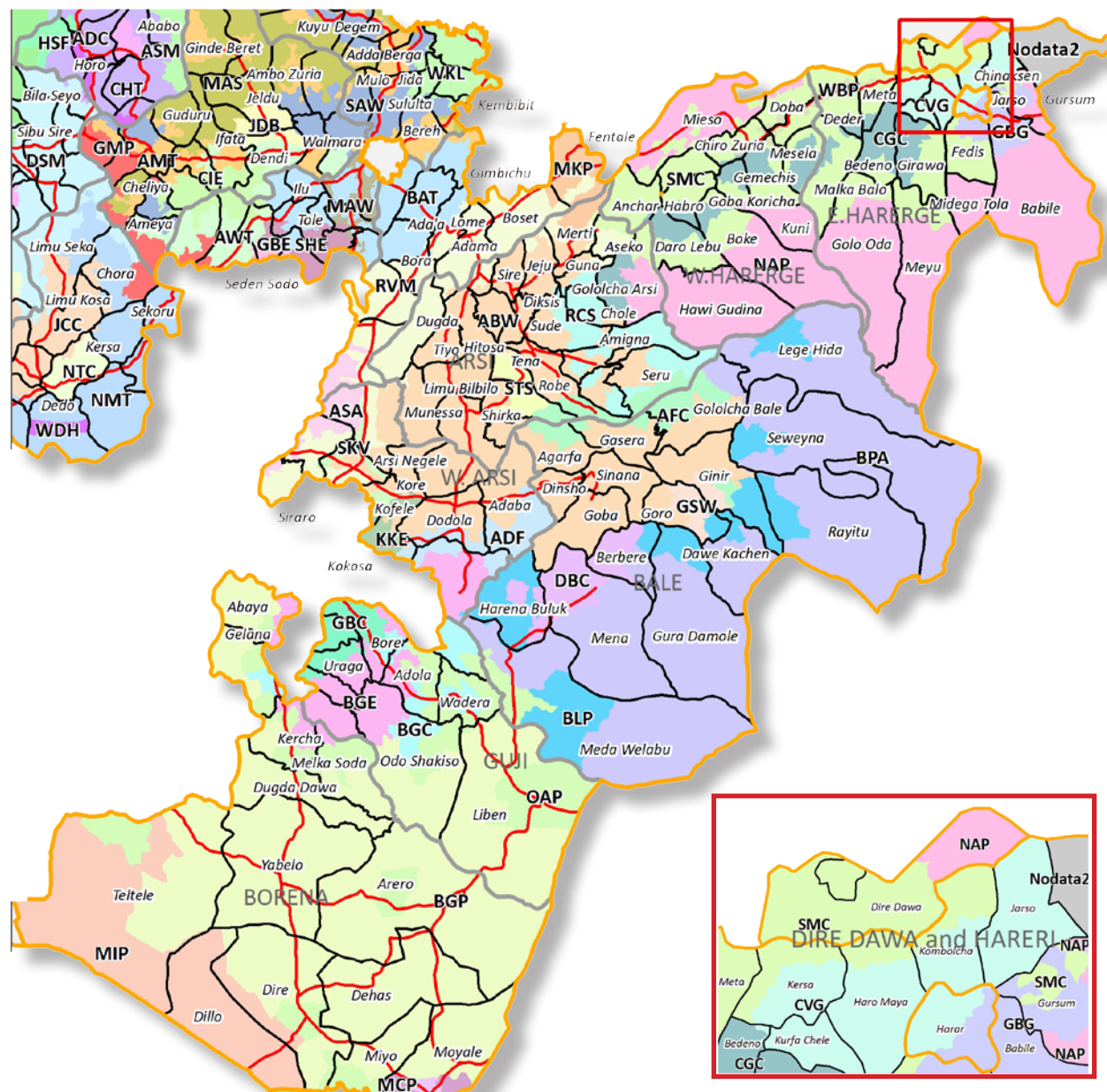


Code	Livelihood Zone Name
ACH	Anfilo Coffee Monoculture & Honey
ADC	Abe Dongoro-Diga-Sasiga Coffee & Sorghum
AMT	Ambo Selale Ginderberet <i>Teff</i> & Wheat
ASM	Abay Gorge Sesame, Maize & Honey
AWT	Ameya-Wolisso-Ambo <i>Teff</i> & Cattle
BAT	Becho-Adea <i>Teff</i> & Chickpea
CHT	Central Horo <i>Teff</i> , Nug & Cattle
CIE	Chebo-Inchini Enset, Barley & Cattle
DLS	Dale-Lalo Sorghum & Maize
DSM	Didessa-Gibe-Wama Valley Sorghum, Maize & Oilcrops
ETC	Ebantu-Limu <i>Teff</i> & Cattle
GAM	Guduru-Amuru Maize, <i>Teff</i> & Cattle
GBE	Gerbo Enset & <i>Chat</i>
GHT	Gera-Setema-Sale Forest <i>Teff</i> , Honey & Cattle
GMP	Gibe Maize & Peppers
HSF	Anger Maize, Sorghum & Finger Millet
IMP	Illu-Wellega-Birbir Maize, Peppers & Sesame
JCC	Jimma-Illubabur Coffee, Cereals & <i>Chat</i>
JDB	Jaldu-Dendi-Ifata Barley & Potato
JTM	Jimma-Yama Logi <i>Teff</i> & Maize
MAS	Muger-Abay-Jema Sorghum & <i>Teff</i> Belt
MAW	Melka Awash-Ochocha Mid-Highland Wheat & <i>Teff</i>
MMC	Mendi-Dabisu Maize, Sesame & Cattle
NMT	Nadda-Gilgel Gibe Maize, <i>Teff</i> and Sorghum
NTC	Nole-Meko-Diga <i>Teff</i> & Cattle
NTF	Nejo-Dilla <i>Teff</i> , Finger Millet & Nug



Code	Livelihood Zone Name
QBC	Keto-Begi Cereals & Cattle
SAW	Selale-Ambo Highland Barley, Wheat and Horsebean Belt
SHE	Soddo Highland Wheat, Barley & Enset
WDH	Wellega-Dedo Highland Wheat & Barley
WKL	Wuchale-Abichu-Kembebit Livestock, 'Wild Oats' & Barley/Wheat
WMS	Wellega Coffee, Maize & Sorghum

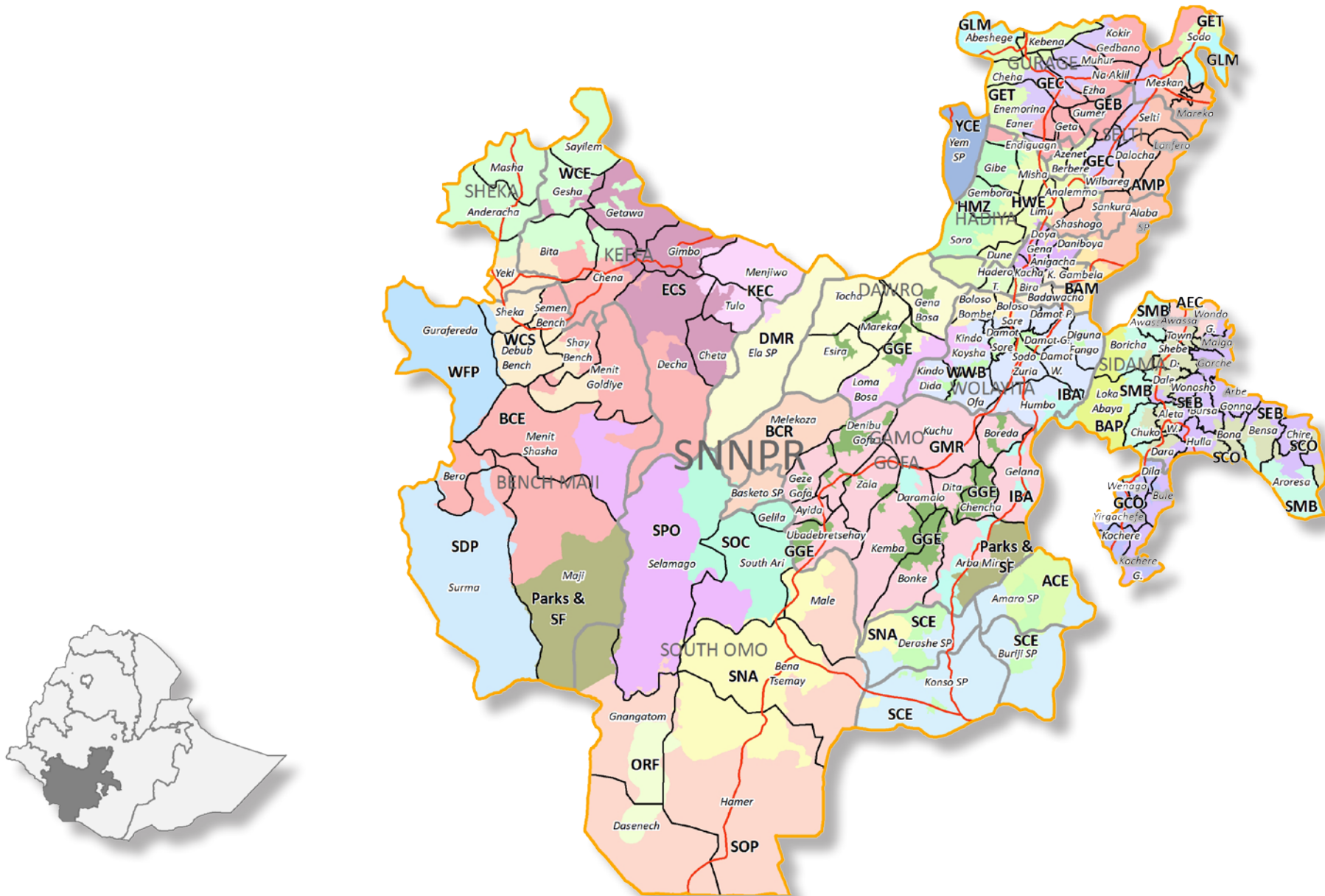
OROMIA REGION (EASTERN)



Code	Livelihood Zone Name
ABW	Arsi Bale Wheat, Barley & Potato
ADF	Adaba Dodola Community Forest
AFC	Agarfa, Gasera, Ginir & Gololcha Fruit, Coffee & Chat
ASA	Abijata Shala Jido Agro-Pastoral
BGC	Borena-Guji Maize, Wheat & Livestock
BGE	Borena-Guji Coffee & Enset
BGP	Borena-Guji Cattle Pastoralist
BLP	Bale Agro-Pastoral
BPA	Bale Pastoralist
CGC	Chercher & Gololcha Chole Coffee, Maize & Chat
CVG	Chat & Vegetables
DBC	Dallo, Barbare & Arana-Buluk Coffee
GBC	Guji-Borena Enset, Barley & Cattle
GBG	Gursum-Babile Groundnuts & Sorghum
GSW	Goro-Ginir Spice & Wheat
KKE	Kofele Kokosa Enset & Cattle Belt
MCB	Moyale Agro-Pastoral, Labour & Cross-Border Trade
MCP	Moyale Cattle, Shoats & Camel Pastoralist
MIP	Market-Isolated Cattle & Shoa Pastoralist
MKP	Kereyu Pastoral
NAP	North-East Agro-Pastoral
OAP	Southern Agro-Pastoral
RCS	Robe Chole Sude & Seru Teff Maize Haricot Bean Belt
RVM	Rift Valley Maize & Horse Bean
SKV	Siraro Kofele Potato & Vegetables
SMC	Sorghum, Maize & Chat
STS	Shirka Ticho Spice & Teff
WBP	Wheat, Barley & Potato

SOUTHERN NATIONS, NATIONALITIES & PEOPLES REGION (SNNPR)

Annex 1: The Livelihood Zones



Code	Livelihood Zone Name
ACE	Amaro Coffee and Enset
AEC	Awassa Chat and Enset
AMP	Alaba-Mareko Lowland Pepper
BAM	Badewacho-Alaba Maize
BAP	Bilate Basin Agro-Pastoral
BCE	Bench-Keffa Cereal and Enset
BCR	Basketo-Melo Coffee and Root Crop
DMR	Dawro-Konta Maize and Root Crop
ECS	Western Coffee and Spices - Eastern Sub-zone
GCO	Gedeo Coffee
GEB	Gurage-Siltie Highland Enset and Barley
GEC	Gurage-Siltie Midland Enset and <i>Chat</i>
GET	Gurage-Siltie Enset and <i>Teff</i>
GGE	Gamo Gofa Enset and Barley
GLM	Gurage Lowland Maize and <i>Teff</i>
GMR	Gamo Gofa Maize and Root Crop
HGZ	Hadero Ginger
HMZ	Hadiya Maize
HWE	Hadiya-Kembata Cereal and Enset - Hadiya Sub-zone
IBA	Chamo-Abaya Irrigated Banana
KBC	Kedida-Badewacho Coffee
KCE	Hadiya-Kembata Cereal and Enset - Kembata Sub-zone
KEC	Kaffa Cereal and Enset
LCE	Southern Special Woredas Lowland Cereal
ORF	Omo River Flood Recession
OVM	Omo Valley Maize and Sorghum
SCE	Southern Cereal, Enset and Root Crop

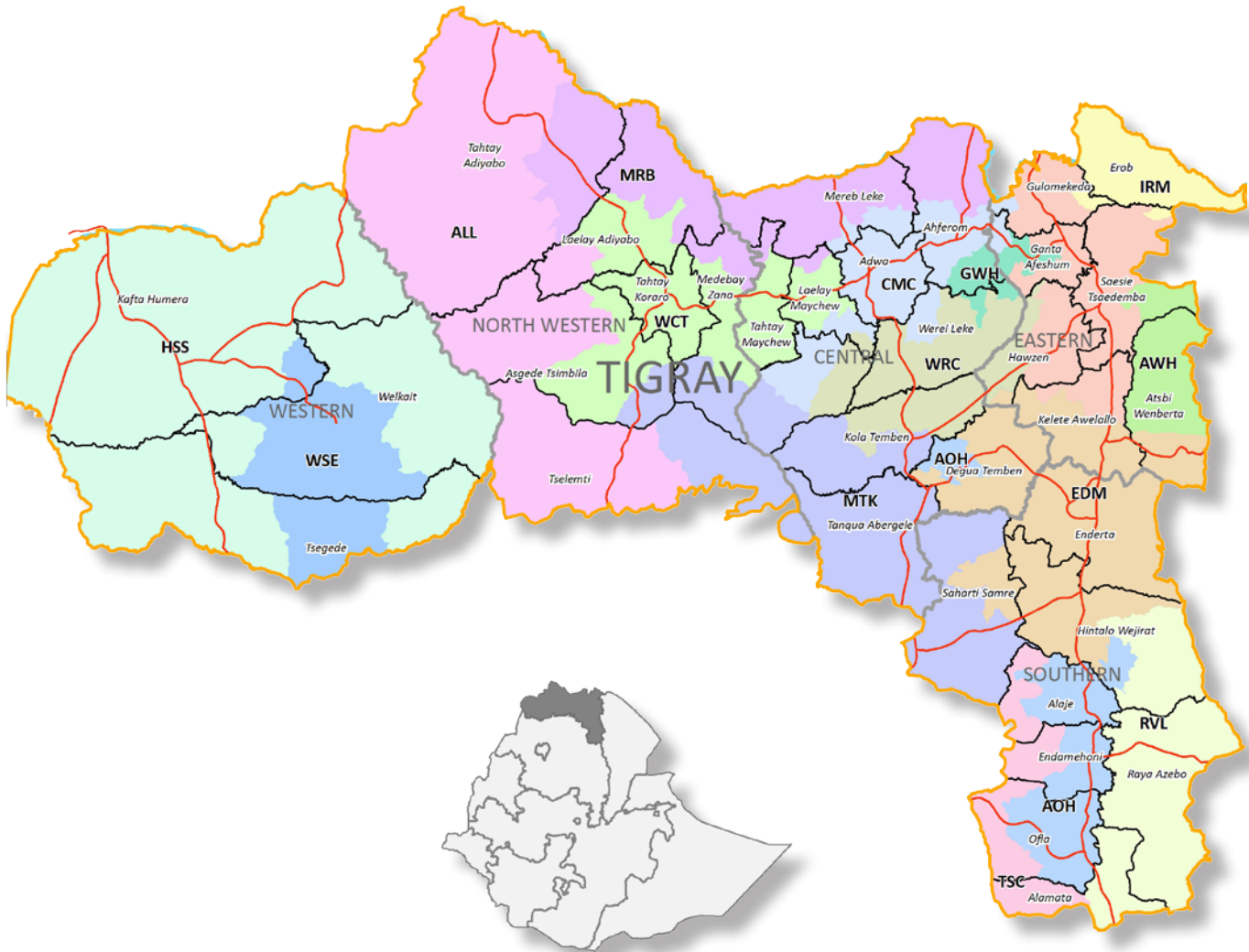
Code	Livelihood Zone Name
SCO	Sidama Coffee
SDP	Surma Agro-Pastoral
SEB	Sidama-Gedeo Highland Enset and Barley
SMB	Sidama Maize Belt
SNA	Southern Agro-Pastoral
SOC	South Omo Crop
SCP	Salamago Pastoral
SPO	Sheka Cereal and Enset
WCE	Sheka Cereal and Enset
WCG	Wolayita Ginger and Coffee
WCS	Western Coffee and Spices - Western sub-zone
WFP	Western Forest Products
WMR	Wolayita Maize and Root Crop
WWB	Wolayita Barley and Wheat
YCE	Yem Cereal and Enset

BENISHANGUL GUMUZ & GAMBELLA REGIONS

Code	Livelihood Zone Name
BENISHANGUL	
BCK	Central Kolla Sorghum, Maize & Millet
BCT	Midland Teff & Coffee
BDK	Western Dry Kolla Sorghum, Maize & Mining
BMH	Meketel Highland Cereal & Pulses
GAMBELLA	
GAG	Gambella Agropastoral
GHC	Gambella Coffee, Honey & Cereal
GMA	Gambella Mixed Agriculture



TIGRAY REGION



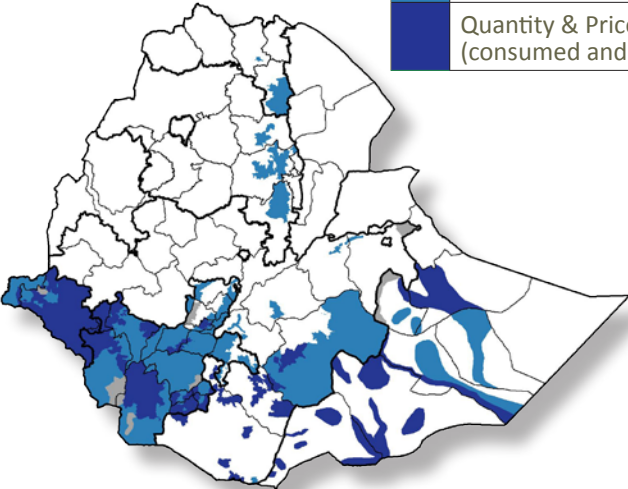
Code	Livelihood Zone Name
ALL	Adiyabo Lowland
AOH	Alaje Ofia Highland
AWH	Atsbi Womberta Highland
CMC	Central Mixed Crop
EDM	Enderta Dry Midland
EPL	Eastern Plateau
GWH	Gesho and Wheat Highland
HSS	Humera Sesame and Sorghum
IRM	Irob Mountains
MRB	Mereb Basin
MTK	Middle Tekeze
RVL	Raya Valley
TSC	Tsirare Catchment
WCT	West Central Teff
WRC	Werie Catchment
WSE	Western Cereal and Sesame

Annex 2: Monitoring Livelihoods

Seasonal assessments in Ethiopia occur twice a year, to monitor production in the meher and in the belg seasons. The following maps show where different components of the livelihood are significant enough to warrant their inclusion in a seasonal assessment. These are, in essence, 'key parameter' maps, providing a geographic reference for where a particular food or cash income source contributes at least 5% of households' minimum annual requirements.



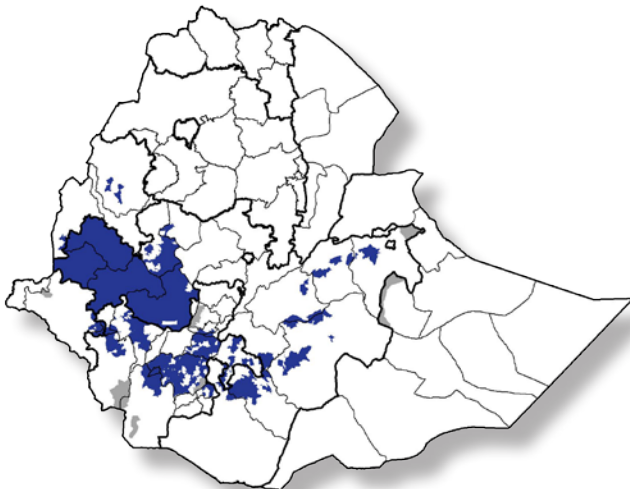
Belg cereals



Belg oilseeds



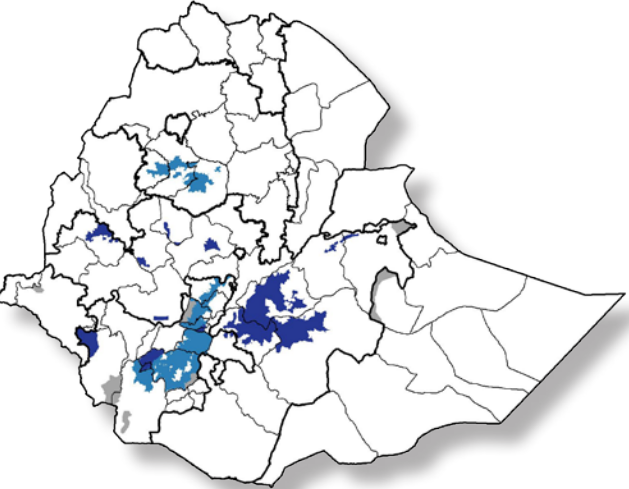
Coffee



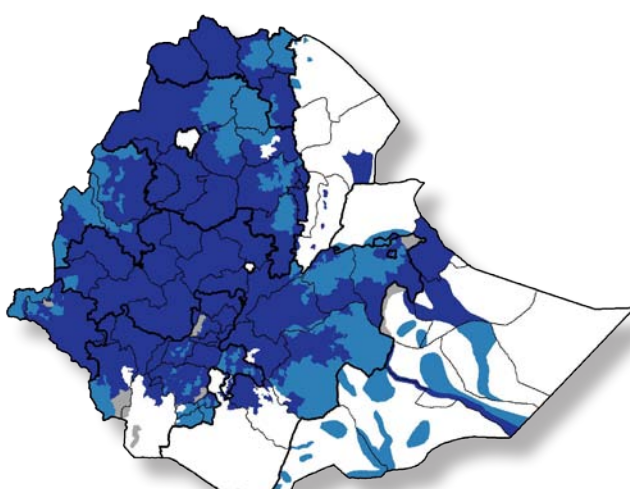
Belg pulses



Belg root crops

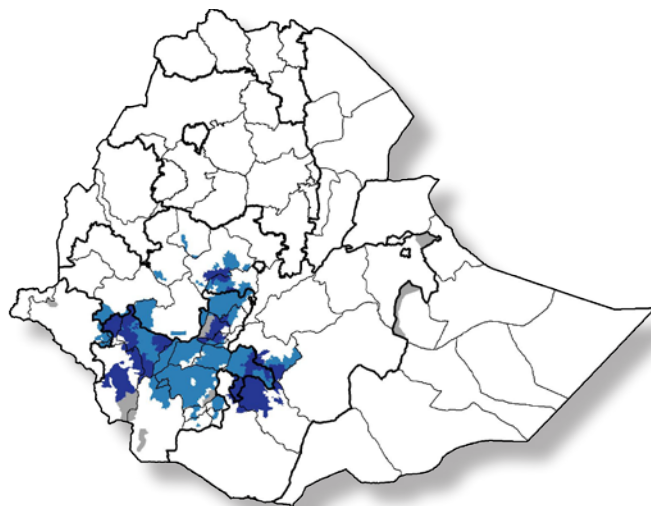


Meher cereals

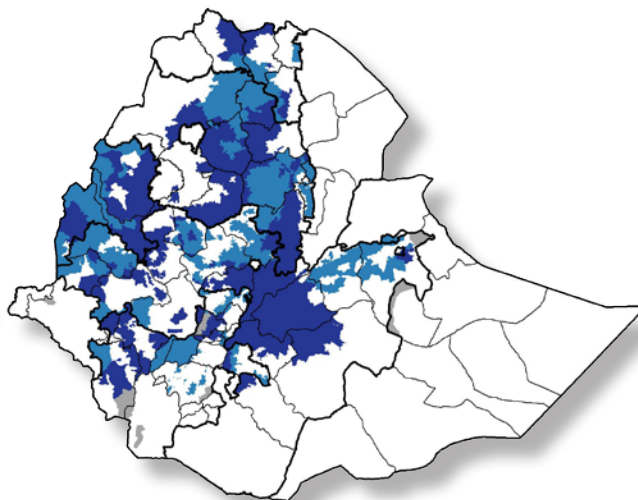


What to monitor	
	Not a key parameter
	Quantity (only consumed)
	Quantity & Price (consumed and sold)

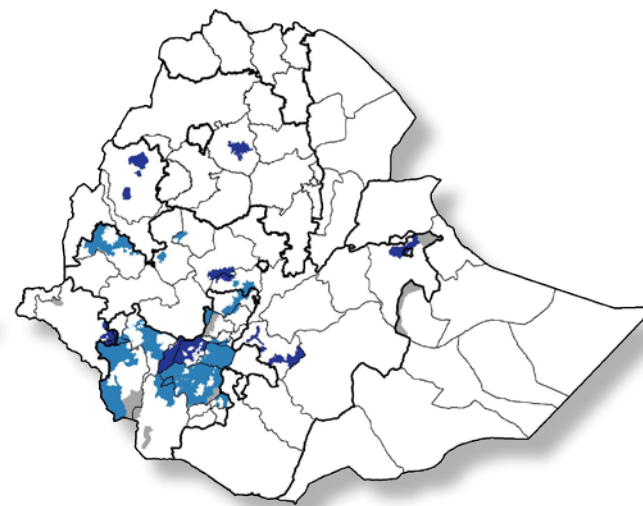
Enset



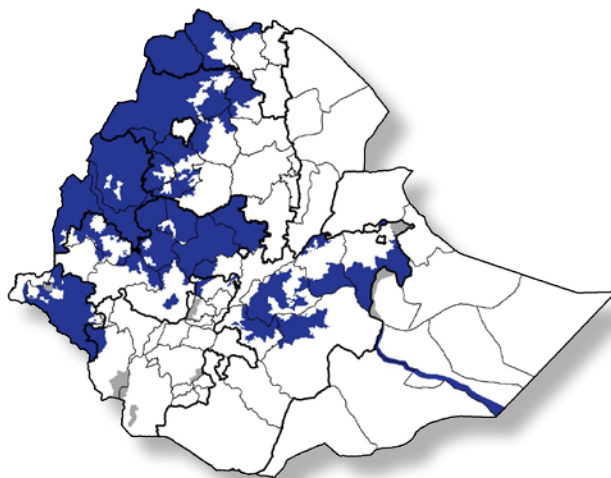
Meher pulses



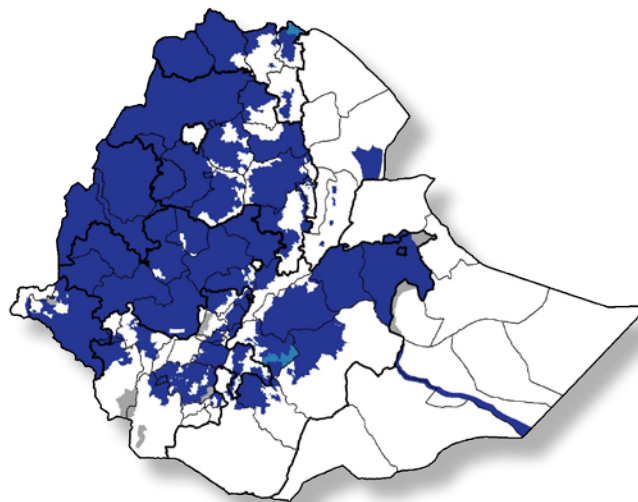
Meher root crops



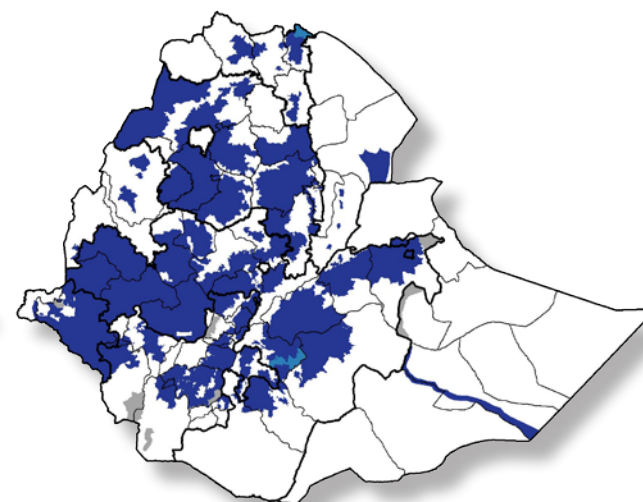
Meher oilseeds



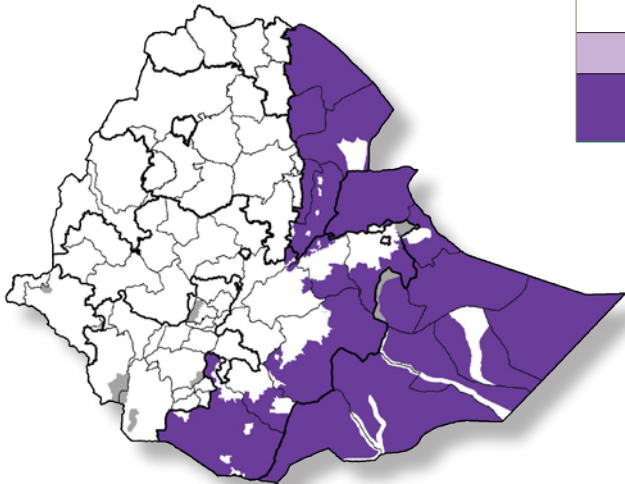
Traditional cash crops (all)



Traditional cash crops (excluding oilseeds)

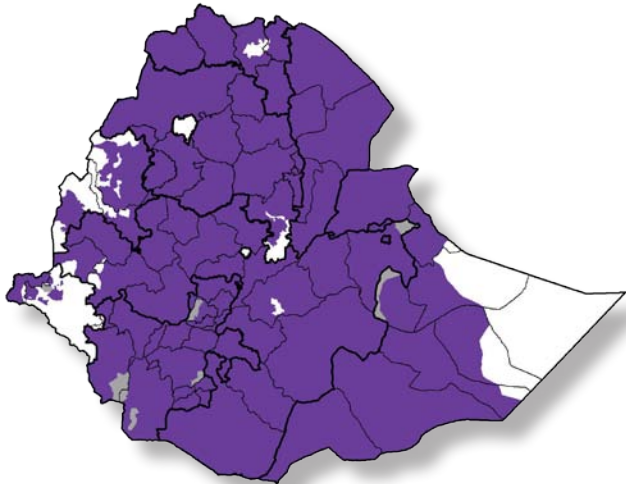


Camel sales

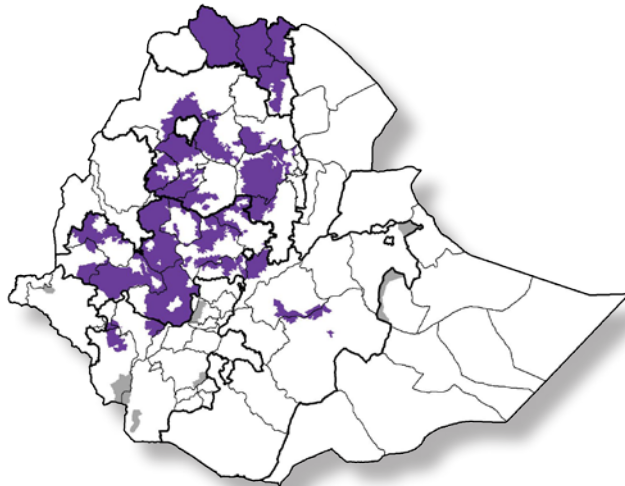


What to monitor	
	Not a key parameter
	Quantity (only consumed)
	Quantity/holdings & Price (mostly sold)

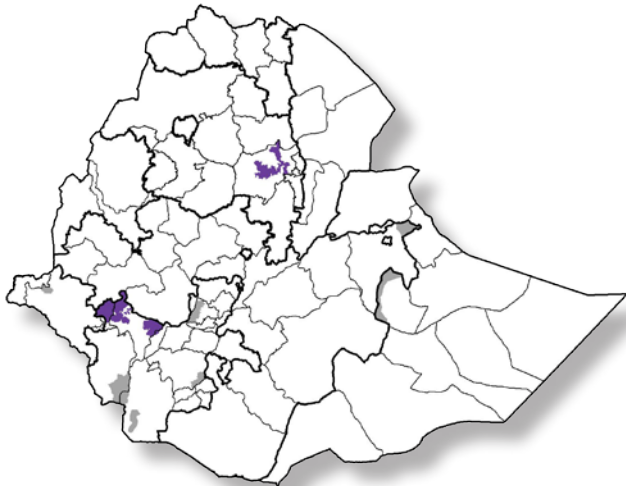
Cattle sales



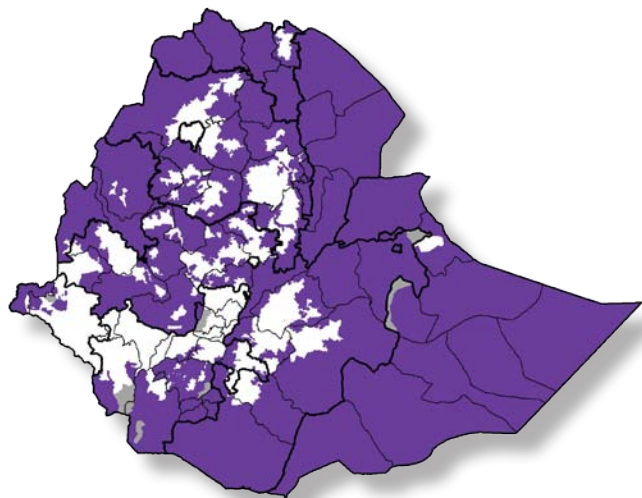
Chicken and egg sales



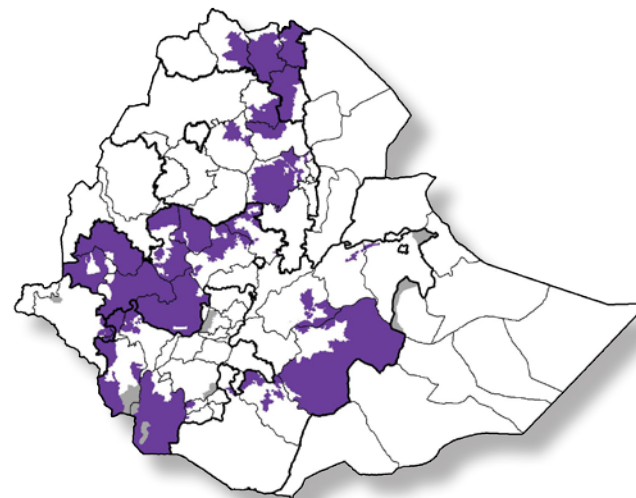
Equine sales



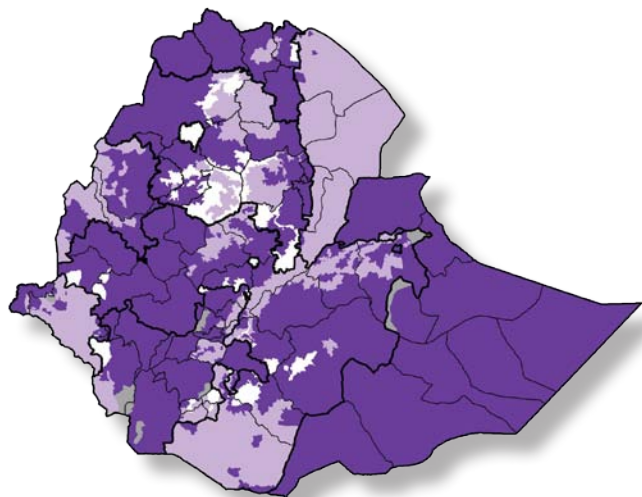
Goat sales



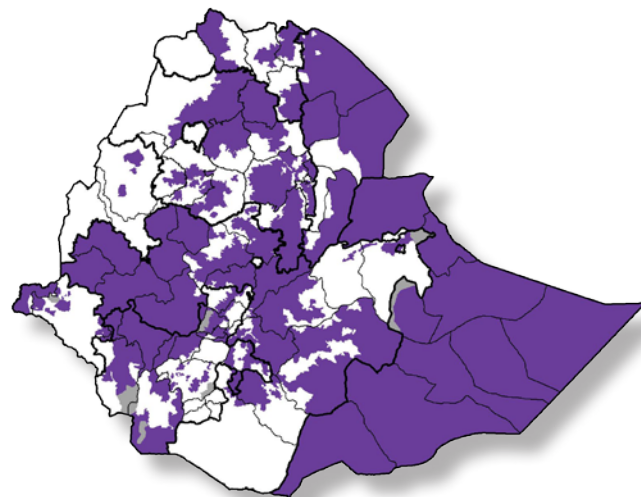
Honey sales



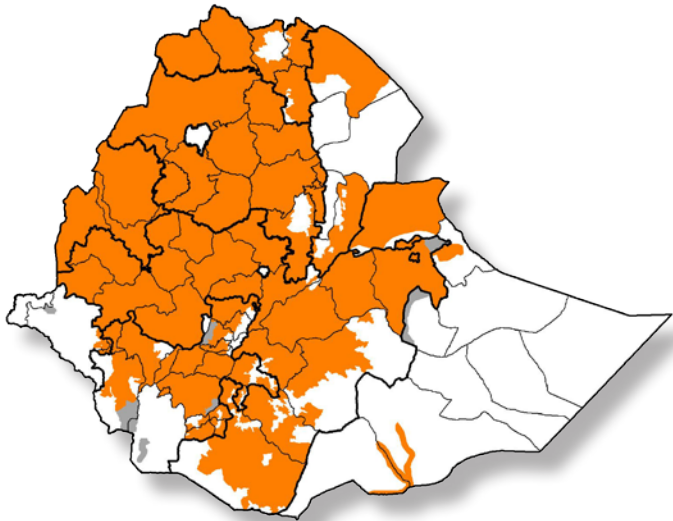
Milk & butter



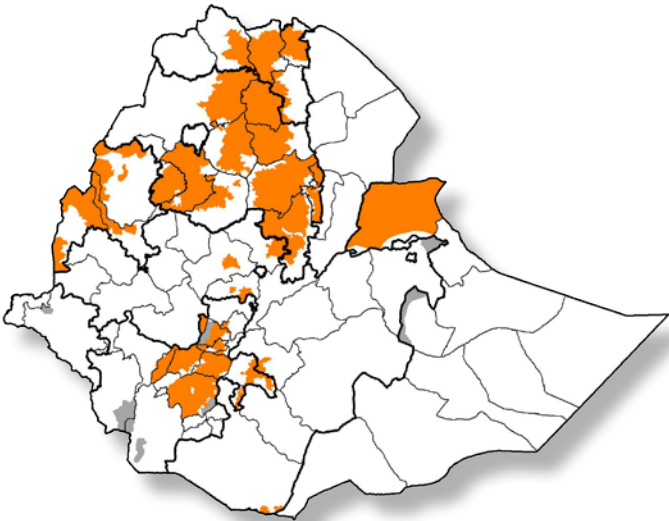
Sheep sales



Local labor



Migrant labor



Remittances



A joint Government of Ethiopia
and USAID Ethiopia Document

Contact information

Tel: +251-115-54-64-32/33/34

E-mail: marua@dppc.gov.et

