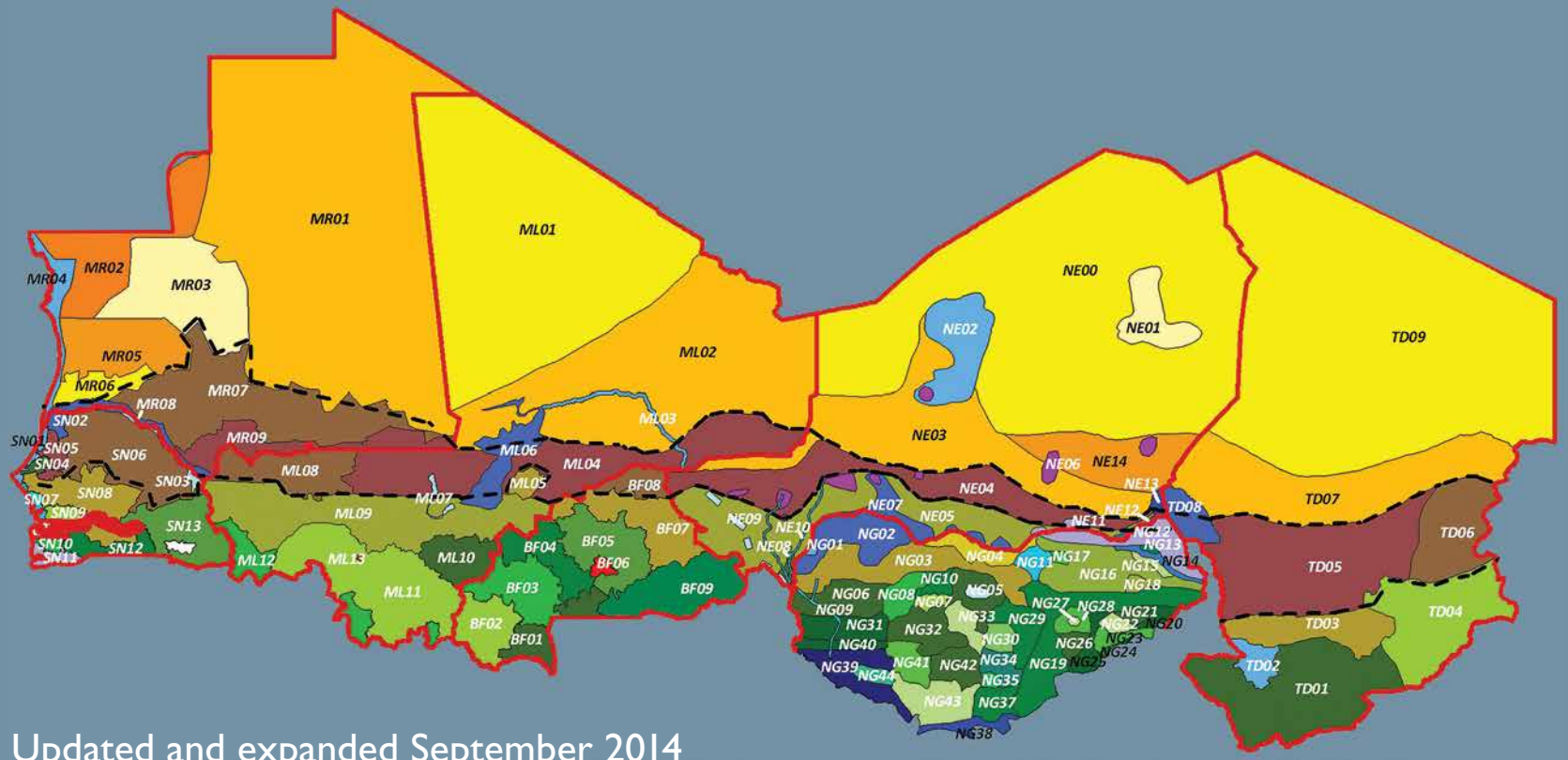
AN ATLAS OF HOUSEHOLD ECONOMY ANALYSIS INFORMATION ACROSS THE SAHEL



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FEG
THE FOOD ECONOMY GROUP

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PHOTO: JONATHAN HYAMS/SAVE THE CHILDREN

A couple plant seeds in preparation for the unpredictable rainy season, Maradi, Niger

1 INTRODUCTION

1.1 HEA AND THE ATLAS

Household Economy Analysis (HEA) is a methodology for assessing livelihoods and food security. It provides a quantitative database and analysis centred on three integrated elements: first, where households normally obtain their food from, and in what proportions, to satisfy their energy requirements (measured in food calories) – whether from their harvests, or from the market, or as gifts or collected wild foods, etc. Second, how do they obtain the cash to pay for purchased food and other essentials for life and livelihood? Third, what do they spend their money on, and in what proportions? Information on these questions and associated subjects is gathered in relation to wealth groups within the population: in rural studies, the split is usually into four groups: 'Very Poor' households, 'Poor' households, 'Middle' households and 'Better-Off' households (see Appendix 2 for the proportions of the population in each wealth group).

This document is a revision of the 2013 *Pilot Atlas* and takes into account revisions made to the maps in view of new HEA baseline studies in additional livelihood zones after that first atlas was published. In this, as in the original exercise, we have looked for geographical patterns in HEA information across the Sahel on a number of key subjects. Our aim was to see if a visual appreciation of the data adds to our understanding of what it can tell us. Three maps are presented on each theme. First, we present the average values across the four wealth groups, weighted according to the proportion of households or population in each wealth group. Then, to examine the contrast between wealth groups, the values for the Very Poor and for the Better Off are presented in separate maps.

Due to the substantial increase in HEA studies in the Sahel between 2013 and 2014, we have been able to use 68 rural baseline studies across the region as against 50 in the *Pilot Atlas* (see Appendix 1).

This represents a considerable geographical area, and although it is not complete or continuous it does allow some intuitive filling-in of gaps to suggest more extensive patterns. A few aspects of the patterns seem counter-intuitive: our approach is to suggest an explanation if one appears justified, but not to push this too far. Some things we cannot explain.

Given the coverage, a full HEA atlas is not yet possible. However, there is substantial coverage of five countries – Burkina Faso (full coverage), Mauritania, Mali, Niger and Chad (which saw the greatest addition of new studies in 2103–14). In each country we show nearly every kind of livelihood – from those based on irrigated cash crops to pastoral nomadism. However, in Senegal none of the west of the country is represented (except for Casamance in the south), and in northern Nigeria the coverage is still very modest.

The atlas is composed of maps on topics leading from food consumption through cash income to expenditure. In addition, at the end, a particular perspective is offered on food and cash crop yields, and information is presented on production hazards for crop cultivation and livestock-raising, and on people's coping strategies in a bad year.

1.2 MAIN MESSAGES FROM THE MAPS

The contents list shows that most of the map themes are associated in one way or another with cash earnings or expenditure. This is because today the livelihoods of rural populations of the Sahel are highly monetised, from the ordinary cereals farmer to the most remote nomadic pastoralist. In a former era, it would have been the wealthier farmer who was most concerned with the world of money, but now we cannot understand the situation of poorer people without looking hard at their cash budgets. Today they are unable to produce sufficient crops or raise enough livestock to satisfy their food and other requirements, whether through direct consumption or sale. Therefore, apart from some gathering of 'free' wild foods, poorer farmers must seek income away from their farms, obtained in the form of cash except where wages are paid directly in food. Similarly, poorer herders survive mainly by working for wages for kinsmen and clansmen who own the greater part of local herds and flocks. Today, therefore, among farmers and herders there is a paradox: the poorer you are, the more you depend on money. This is an overarching theme of this atlas.

The maps are offered in their own right as a form of evidence that, it is hoped, will provide new perspectives on livelihood economies and food security in the regions. Readers will no doubt draw from this evidence what particularly interests them for policy or other purposes. Without wishing to supersede that, we have considered the maps on the five most important themes and offer some brief, main messages that we feel emerge from the evidence.

MARKET DEPENDENCE FOR FOOD VERSUS SELF-SUFFICIENCY (MAPS 5–7)

One of the striking messages to come out of HEA studies across the Sahel (and also across north-east and southern Africa) is the high degree of staple food purchasing among ordinary farmers both in normal production years and in bad years. As a very general rule, something of the order of half of households usually obtain around half of their food calories from the market. At the root of this is the limited land and family labour available to poorer households; and at the root of their food security is access to cash as much as their own harvests. *Therefore, for development policy there needs to be a judicious balance between investment in increasing food production (which may somewhat favour the wealthier, who have more land) and investment in increasing off-farm cash-earning opportunities.*

CASH INCOME FROM CROPS (MAPS 8–12)

It is very rare to find any farmer, poor or wealthy, who does not grow family food on at least part of their land. Having said that, the production of cash crops as opposed to food crops by poorer people does not in itself make them more food insecure. Their first concern is how they will keep eating during the year, and they must make their own opportunity cost judgements about relative investments of effort and of such money as they have in food crops and in cash crops. But since they are heavily dependent on the market for food, whatever threatens their cash earnings threatens their food security. *Therefore, a dip in commodity prices, and/or a failure by an official buying agency to honour pre-agreed prices for a product, should immediately prompt concern about food security. It is not just food harvest failures that bring hunger.*

LIVESTOCK OWNERSHIP AND INCOME (MAPS 13–17)

The value of livestock in the region has long been enhanced by market demand from the southern and coastal areas of West Africa, a demand greatly increased in recent decades by burgeoning city populations and their appetite for meat. There are many ordinary farming areas where, for the Better-Off and Middle households, livestock sales provide one-quarter to one-half of their total annual earnings, mostly rivalling or exceeding income from crop sales. And it is this minority who own the vast majority of livestock in the villages: quite commonly, 100% of the cattle and more than 70% of the sheep and goats – even in pastoralist communities. But for poorer people too, who usually own not more than a handful of sheep and goats and a few hens, this possession is precious: it is the sale of one or two animals, even of eggs, that helps to pay for that last bag of grain before the harvest, or for other pressing household needs. By the same token, the loss of a single goat is a big economic blow to a

poor family. *Therefore, government and agency investment in this crucial sector, from the provision of permanent veterinary services and water sources to subsidised fodder during pasture failure, should be regarded as a priority rather than just as a baby brother to agricultural investment.*

CASH INCOME FROM LABOUR AND 'SELF-EMPLOYMENT' (MAPS 18–25)

The great majority of poorer farmers and herders earn the greater part of their cash income by working for others, notably field labour and house construction, as well as for employers found during seasonal work migration. Without this they could not survive. If we add 'self-employment', meaning collecting and selling firewood or other wild products, brick-making, selling crafts such as mats, or simply fetching and carrying in markets, and if we also add petty trade, then this income far outstrips any that poor farmers earn from selling their own crops and livestock. For these poorer households, improvements to their own farm output may be one important development goal, but with the small plots of land at their disposal, and without access to irrigation, their own production can never substitute for these off-farm earnings. The employment is informal and arranged between individuals, and it would be a great challenge to officially increase and fix daily payment rates. *But for other activities at least, there is scope for adding value through skills training (eg, carpentry) and equipment provision: just the shared possession of a cart, even if the horse or ox has to be hired, can significantly boost income from self-employment.*

EXPENDITURE ON FOOD (MAPS 26–28)

For pastoral households everywhere, even the wealthiest, the position of milk and meat in their sources of calories is far outweighed by that of purchased grain. For the poorer farming and agropastoral households also we have seen the importance of purchased food for their survival. But staple grain is not the only purchased food. For a minimally balanced and palatable diet, vegetables, oil, dried fish, sugar, etc are very important – but also expensive. The cost of those items might limit the purchase of staples above the bare minimum to keep a family going, let alone for affording a properly balanced diet (as 'cost of diet' studies in some of the same zones have repeatedly shown). This is, then, not starvation in normal years, but it is hunger – the hunger of sheer poverty. And yet here is a surprising fact: expenditure on staple foods even by the Very Poor is rarely above 50% of total household expenditure, more often around 30%, and apart from communities in pastoral and some northern agropastoral areas, if we add the non-staple foods, expenditure on all food is rarely above 60% of total expenditure. But this is not a testament to a high standard of living: on the contrary, it means that non-food expenditure essential to keep up lives and livelihoods – eg, basic condiments, torch batteries, a few simple clothes, minimal school materials, seeds for the new season – weigh heavily upon household capacity to spend on food. *We do not attempt here to draw one conclusion about policy; rather we suggest that this evidence throws a particular light on how livelihoods operate, and on the constraints imposed by household budgets so marginal that there is simply no room for manoeuvre. Only the combined effect of livelihoods protection and sustained wealth generation can lift such constraints.*

1.3 MAPPING THE LIVELIHOOD ZONES

The template upon which the various HEA-surveyed zones are shown in this atlas is the combination of national livelihood zone maps constructed by FEWS NET[1] with local partners. The primary aim of this remarkable effort was to develop national maps offering FEWS NET and others a division of each country based on the ecological and economic factors that shape local livelihoods, rather than simply making analyses on the basis of the administrative map (although administrative divisions are always shown superimposed upon the livelihood zones map). The national livelihood zones maps were mainly developed between 2003 and 2005, although the map of northern Nigeria was done in 2007 and the Senegal map was finalised in 2010. Revisions were made for four countries in 2010–11 – Burkina Faso, Mali, Niger and Chad – and for Mauritania in 2014. The maps were accompanied either by brief descriptions of each zone or by longer profiles.[2] FEWS NET's requirement was to identify zones using a broad brush rather than a fine pencil, in order to have a reasonably practical number for monitoring purposes rather than a plethora

[1] The Famine Early Warning Systems Network commissioned since 1985 by USAID.

of localised zones. As a result, there are some rather wide zones in most of the countries; but for Nigeria this principle was taken to an extreme in 2014 when the country was re-zoned, but with only 13 livelihood zones for the whole country (the same number as for Niger) rather than the 44 zones originally identified for northern Nigeria only. For our particular purpose, it is more appropriate to keep to this original zoning.

In each country, the zoning was taken as a separate exercise in its own right, and there was no formal attempt to match cross-border zones if a neighbouring country had already been mapped. However, it is clear that certain types of livelihood zone are repeated across much of the Sahel, forming rough bands: sahelian/sudano-sahelian rainfed agriculture, sahelian agropastoral economy, and transhumant or nomadic herding up to the desert edges. The underlying ecology, and the paramount influence of rainfall on shaping it, are shown in Map 1.

MAP 1: CLIMATE ZONES

LEGEND

Isohyet (mm/year)

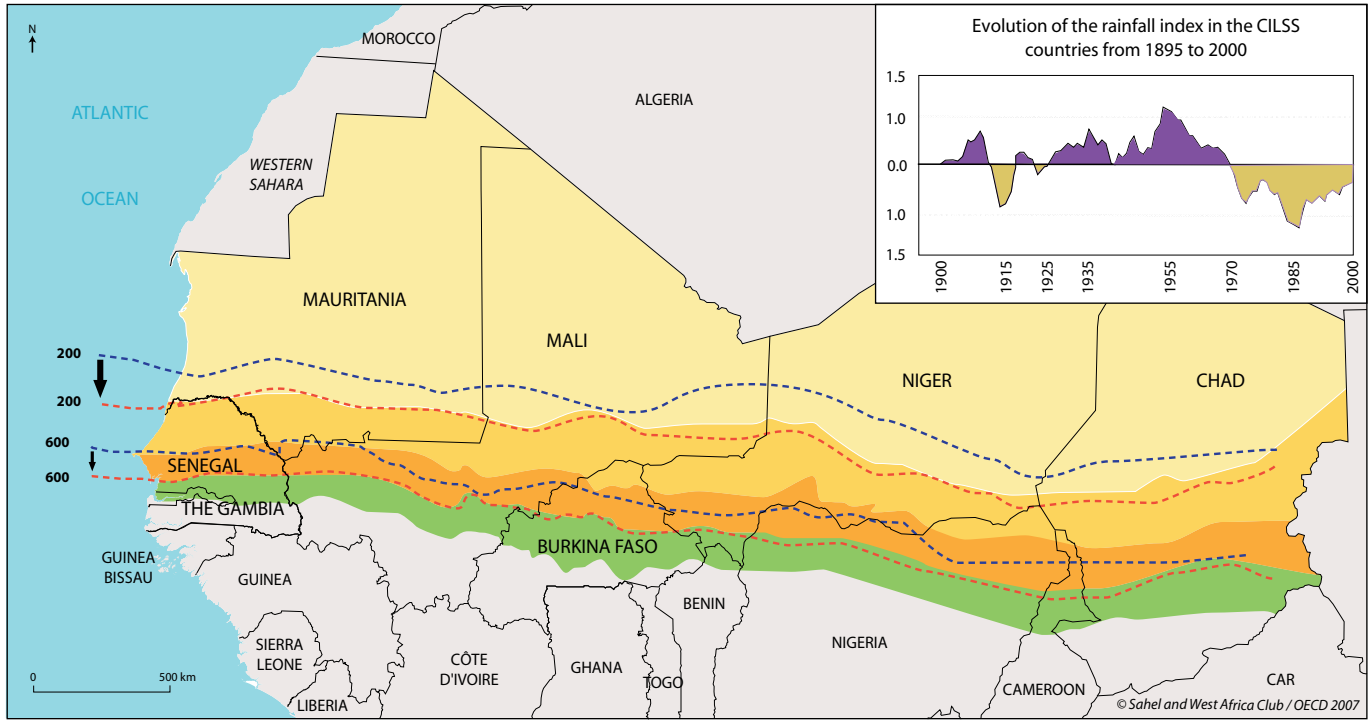
200 **Average isohyet 1940–1967**

200 **Average isohyet 1968–2000**

Current climate zones

- **Saharan**
- **Sahelian**
- **Sahelo-sudanian**
- **Sudano-sahelian**

Border



Source: *Vulnerability in the Sahelian Zone*. Philipp Heinrigs and Christophe Perret (SWAC/OECD) Regional Atlas on West Africa, Chapter 15. OECD

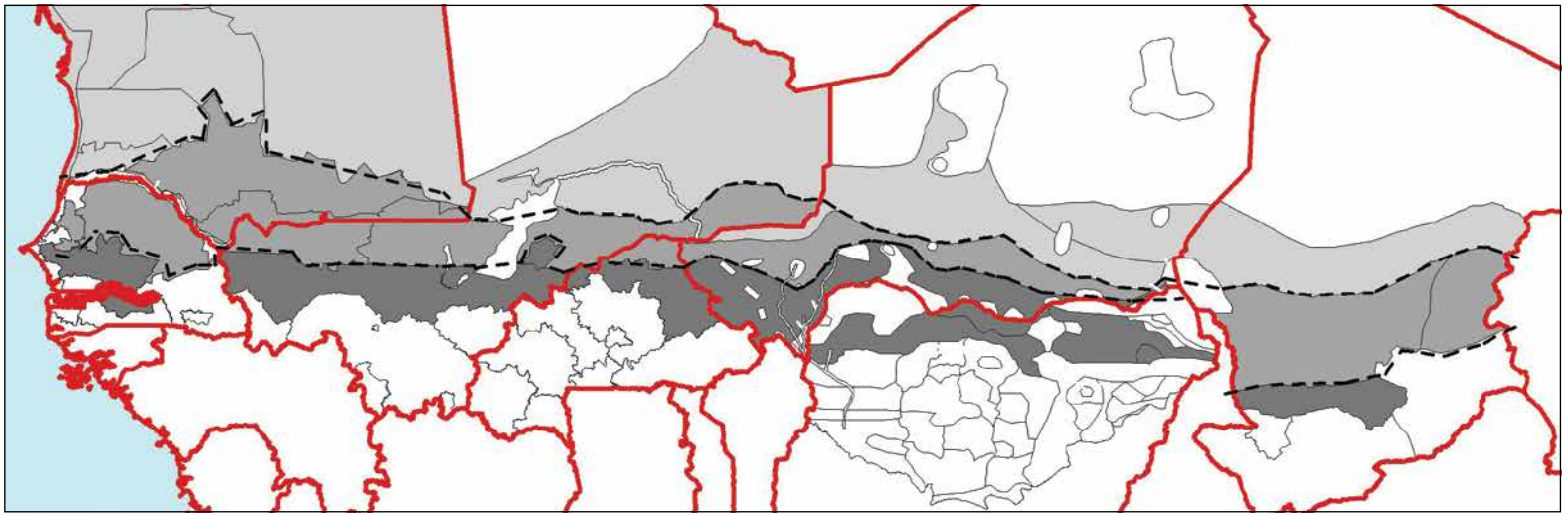
[2] The descriptions were put together largely from livelihood zone description forms filled in during the mapping workshops, usually followed up with brief verification visits to the regions. The profiles were informed by rapid fieldwork based on interviews with local government officers together with community interviews in a single village, or at best two. The HEA framework was applied (wealth groups and their characteristics, sources of food, sources of cash, expenditure) but using proportionality or ranking of variables rather than their quantified values (ie, weights, volumes, calorie content or value in cash). These gave a valuable, first snapshot of rural livelihoods and their hazards, but without the quantified depth of a full HEA study. In this atlas, only full HEA data are used.

In the grey-scale illustration in Map 2, livelihood zones with the three basic modes of production are combined into three bands. The darkest grey represents the typical rainfed agriculture of smallholders in the Sahel. The middle grey represents the drier, agropastoral areas where livestock raising assumes a greater and sometimes dominant position in the local economy, although crop cultivation is still important. The light grey shading represents the arid, pastoral areas where livelihoods are firmly based on cattle and/or camels and sheep and goats: here crop cultivation either is not possible or is a localised, minor activity. Livelihood zones that do not fit into these bands are outlined without shading: these are areas with substantial irrigated production, or towards the south they are areas beyond the sahelian ecologies proper, with greater rainfall and with natural vegetation and crop production to match.

MAP 2: LIVELIHOOD BANDS BY BASIC MODE OF PRODUCTION

LEGEND

- **Pastoral**
- **Agropastoral**
- **Rainfed agriculture (sahelian)**
- **Boundaries between the three general zones**



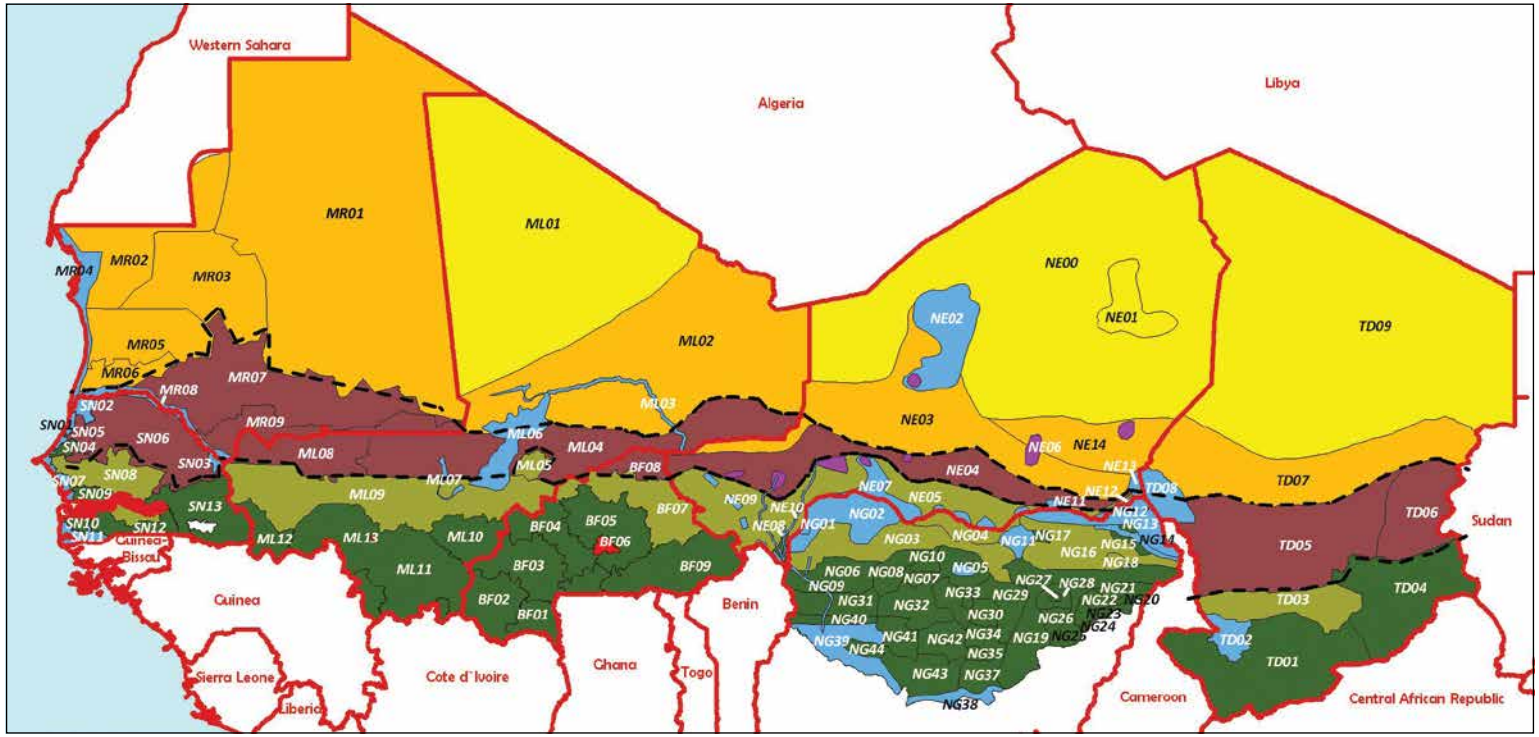
Map 3 is more detailed, showing not only the three bands from Map 2 in olive, brown and dark yellow, but also the more humid 'other agriculture' areas to the south in dark green, the irrigated areas in blue, and the desert in yellow where human beings are only to be found moving in trans-Saharan camel-caravans, or in the case of NE01 in Niger, in very small settlements around a handful of oases where date-palms, natron salt and a few goats and sheep provide the basis of a living.

Also in Niger, the 'outmigration' areas in mauve indicate populations who, whether farmers, agropastoralists or pastoralists, depend to an extraordinary degree on household members going on seasonal work migration, often across national boundaries. The map indicates the outlines of the livelihood zones, but these are more clearly shown in the next section.

MAP 3: WESTERN AFRICA LIVELIHOOD ZONES (GENERAL)

LEGEND

- **Desert**
- **Pastoral**
- **Agropastoral**
- **Rainfed agriculture (sahelian)**
- **Other agriculture**
- **Irrigated/Riverine/Coastal/Lake**
- **Out-migration – Niger**
- **Urban/Peri-Urban**



Maps 2 and 3 show some discontinuities in the bands, which may result from:

- Empirical reality: eg, in the far north-west of Nigeria, in Sokoto State, there is a large zone (NG02) dominated by the irrigation complex from the Rima river and this interrupts the rainfed agriculture band between Niger and Nigeria. Similarly in the far north-east of Nigeria, irrigation from rivers and dams interrupts the rainfed agriculture band, and irrigation stretches to the Komadougou river area on the Niger side and further north to the shores of Lake Chad. And in central Mali the extensive, irrigated Niger Delta zone (ML06) interrupts the agropastoral band.
- Empirical disagreement between the mappers of neighbouring countries: eg, the intrusive dark yellow strip resulting from a mismatch of the pastoral and agropastoral boundary between far-western Niger and far-eastern Mali.
- Disagreement about factors to take into account: eg, the glaring discontinuity of the pastoral zone between eastern Mali and western Niger. It is our understanding that the issue at stake here is the geographical extent of useful seasonal rains for pasture. On the Mali side, it was established that in more years than not, showers fall very far north, giving enough pasture and groundwater in various parts of the overall shaded area to allow grazing and watering for a short period – and so the boundary of the pastoral zone includes this area. If the same phenomenon was empirically appreciated on the Niger side, it was not taken into consideration in setting the boundary of the pastoral area in Niger.
- An even more striking discontinuity exists between the desert of north Mali (ML01) and the Nomadic Pastoral Zone MR01 of north-east Mauritania. We know that on the Mauritanian side there is very extensive nomadism, with herding groups reputedly executing an annual 2,000km round-trip within the zone and, depending on where the rain falls in a given season, even going north into Western Sahara. But it appears that there is no such nomadism in the Malian desert. The truth is probably that on one side or the other of the national livelihoods maps, the mappers have 'filled out' the zone to the frontier: perhaps, for instance, the uninhabited desert in reality stretches some way into Mauritania rather than stopping politely at the Mali frontier.
- More generally, the boundary line between zones on the maps is a necessary fiction: in reality, unless there is a specific marking element, usually associated with groundwater or an elevated area, one zone fades into another across an irregular interim territory tens of kilometres wide: rainfed agriculture fades into agropastoralism where rainfall is more erratic for agriculture and livestock are more important; and agropastoralism fades into pastoralism across the limit of possible millet production, which may change locally from year to year according to the rains and the propensity of settled villagers to venture a crop or of transhumant herders to engage in opportunistic cultivation.
- Disagreement about the definition of the bands: a significant issue here is whether the band dominated by transhumant and nomadic herders should include areas where there is normally some cultivation by herders. In Mali and Niger, the pastoral zone does not include cultivation; in Chad it does for TD07 ('Transhumance') in the FEWS NET national map, and arguably this parallels a large zone at the other end of the Sahel: the 'sylvo-pastoral' zone in Senegal (SN06), dominated by transhumant cattle pastoralism but also regularly producing crops. FEWS NET appears to take this as an agropastoral zone, but in Chad it might well have been called 'Transhumant'.
- Similarly, it is not always easy to identify the southern limits of the sahelian rainfed agriculture band. One might, for instance, easily include the Burkina Faso zones BF04 and BF05 (West Cereals, and Central Plateau Cereals and Market Gardening), but our assessment is that they have more of the economic characteristics associated with the sudano-sahelian ecological band shown in the isohyets map (Map 1) above.

It is not our remit in this atlas to resolve such issues in any formal way, and they do not materially affect the analysis we undertake. It may be hoped that FEWS NET and partners, who include those who have carried out HEA studies, will revise the Sahel Regional Livelihood Zones map (which would then provide a better template for a future, complete atlas). Most of the issues seem not difficult to resolve.

1.4 COVERAGE AND GEOGRAPHICAL REPRESENTATIVENESS OF THE HEA STUDIES

Map 4 shows all the areas that have been subject to an HEA baseline study. But each country makes decisions about the representativeness of a given study *vis-à-vis* the whole livelihood zone within which it is located. The map therefore may be deceptive: in Niger, for example, there has been a restrained attitude about the representativeness of several studies where these are within the very wide, agro-ecological belt livelihood zones, so that two or more studies within the same zone (pastoral, agropastoral or rainfed agriculture) do not result in yellow shading that covers the whole zone, whereas in Mauritania a single study (AIP) in the south of the pastoral nomads zone is taken to represent the whole zone, hence the great expanse of yellow shading on the map.

MAP 4: HEA BASELINE COVERAGE OF THE SAHEL AS AT MAY 2013

LEGEND

Livelihood Zones (and parts of LZs) with full baseline

Grey-shading indicates livelihood zones that are part of the following general sahelian zones:

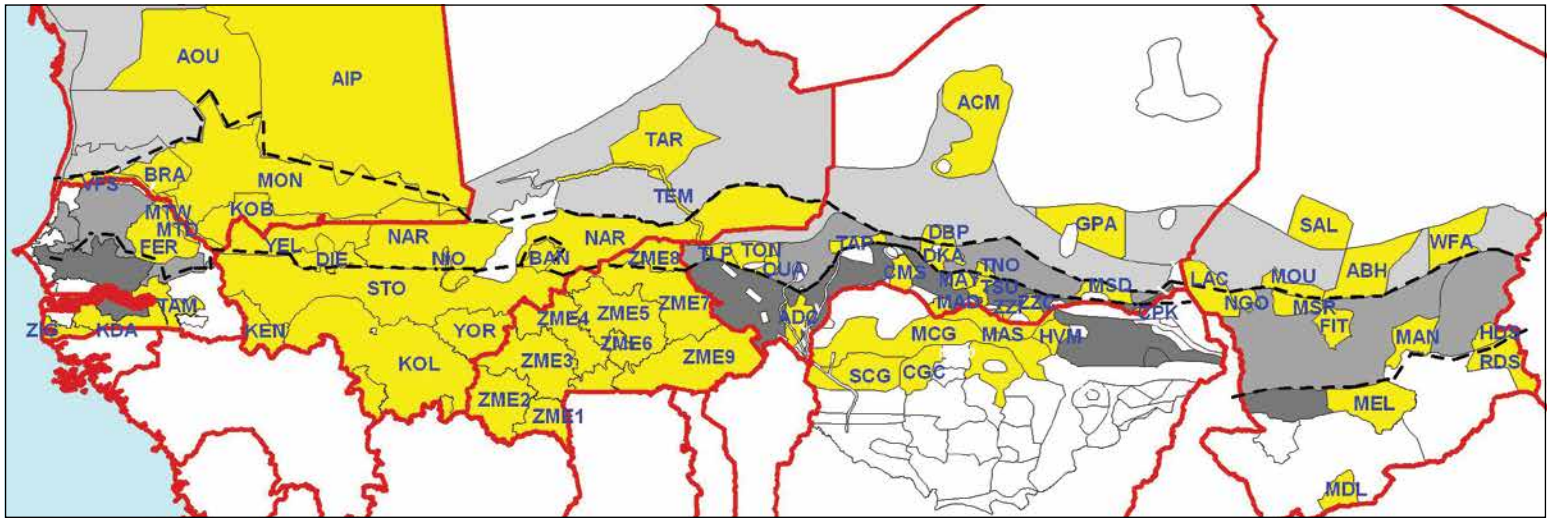
Pastoral

Agropastoral

Rainfed agriculture (sahelian)

--- Dotted lines indicate boundaries between these three general zones.

Note: The labels are the codes used for each HEA baseline data storage spreadsheet. In the text we identify baseline zones by these labels and only non-HEA zones by the FEWS NET national zoning codes.



There are historical reasons for this situation. When the first HEA studies in the Sahel region were undertaken in 2007/08 in central Niger, in Tessaoua district and Dakoro district in Maradi Region, the targets were the project areas of the concerned non-governmental organisations (Save the Children, Oxfam and Action Contre la Faim). It could not have been known then that within six or seven years there would be 18 studies in Niger and 68 in the Sahel overall. In 2007 Save the Children was aware of the national livelihoods map, and identified the localities of the surveys as being within the overall Rainfed Agriculture, Agropastoral and Pastoral livelihood zones, but there was no formal intention of representing these on a national scale. Subsequently, starting with Save the Children surveys in Mauritania, there was more of an intention to represent whole livelihood zones – riverine, rainfed agriculture, agropastoral, pastoral and even peri-urban.

Most recently, there has been growing interest in HEA contributing regularly to seasonal assessments of national early warning systems, developing scenarios ('Outcome Analysis') resting on the HEA baseline information. In Burkina Faso, HEA baseline studies were completed in association with the government's early warning system with this in mind; at the time of writing, Burkina Faso is the only Sahel country to have full coverage, albeit with a single baseline study per zone. In Niger there have been major efforts to fill gaps, and the number of new baseline studies still required to achieve representative coverage is not great. Elsewhere, the picture is more patchy, and the pastoral band is poorly represented everywhere. In at least one instance in Chad no attention was paid to the national zoning, and instead a local agro-ecological zoning of a single district (Kimiti in Ouaddai Region) was made or taken from the local agricultural service, and two HEA studies were undertaken within them ('agricultural' and 'agropastoral'). It is now perhaps time for this issue of representativeness to be resolved within and between countries. However, for the present we have had no option but to accept the status of each study in this respect.

Over the years since 2007 there has been an understandable bias towards studying locations with a history of particularly high malnutrition and/or locations with a particular history of food insecurity. On the other hand, a number of zones have also been studied in the southern, more food-secure parts of countries and/or areas with substantial irrigation. The current coverage therefore offers, as we have said, information from just about all the main types of livelihoods identified by national livelihood zones maps, while there remain gaps in respect especially of small zones with special features, such as the cassava zone in western Senegal (SN04) or the irrigated rice zone in south-west Chad (TD02). Nigeria is the exception in that the six zones so far studied tend to echo the cereals and pulses economies of the Sahel but not the many different ecologies – and therefore livelihood zones – as one goes further south in northern Nigeria to the maize and cassava and sweet potato areas, among others.

There is a visual problem that the reader needs be aware of: the size of a zone on the map should not automatically suggest greater or lesser importance, not least in terms of population. This may seem obvious in principle but, for instance, the large patch of coverage of the MR01 pastoral zone in Mauritania is very imposing, but represents a total population less than the population of the very small Senegal River Valley zone (MR08). In Mali, three small or very narrow patches actually represent whole livelihood zones: Irrigated Rice – Office du Niger (NIO), the Dogon Plateau (Bandiagara – BAN) and Riverine Rice and Transhumant Herding (TEM). In population terms, the majority of rural Sahelians live in the rainfed agriculture band as outlined, and the great majority in the combined rainfed agriculture and agropastoral bands.

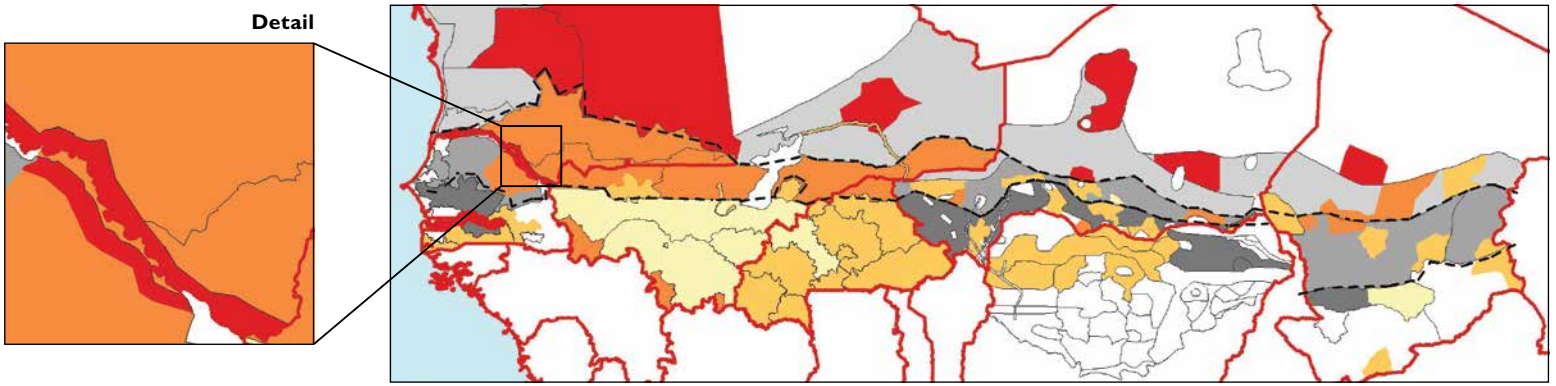
2 THEMATIC MAPS WITH COMMENTARY

Two main questions are prompted by each thematic map-page presented in this atlas. The first is what general pattern we see, and what we may conclude from it. Here the Average map (across all four wealth groups) might be the first point of reference. The second question is what difference we see, and where, between poorer and wealthier households, here represented by the two extremes: Very Poor and Better Off. In practice, we find that it is comparison of these two wealth group maps that gives the greatest overall guidance and that to a large extent explains the Average map.

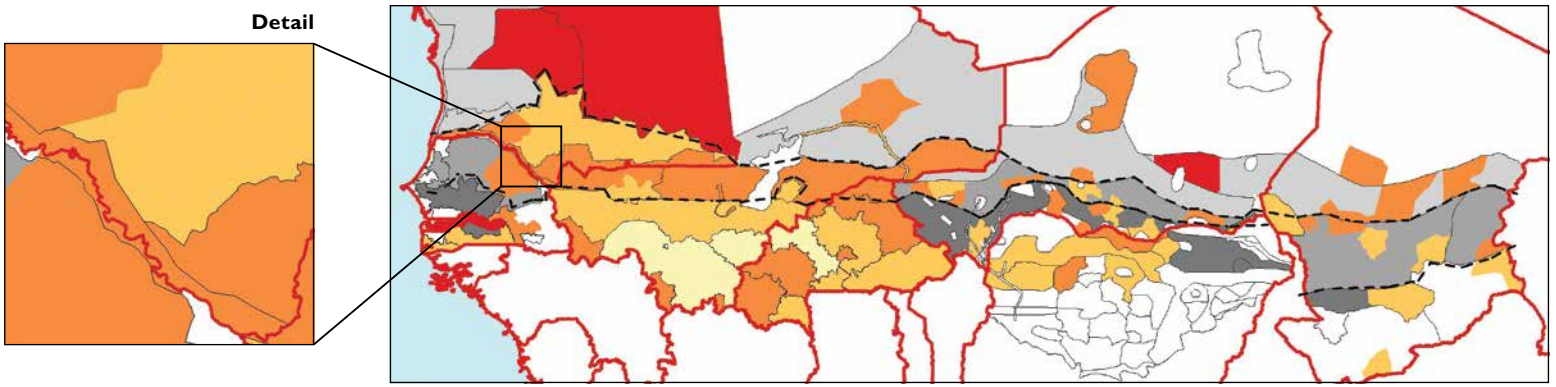
MAP 5: MARKET DEPENDENCE FOR FOOD

(%KCALS CONSUMED THAT ARE PURCHASED)

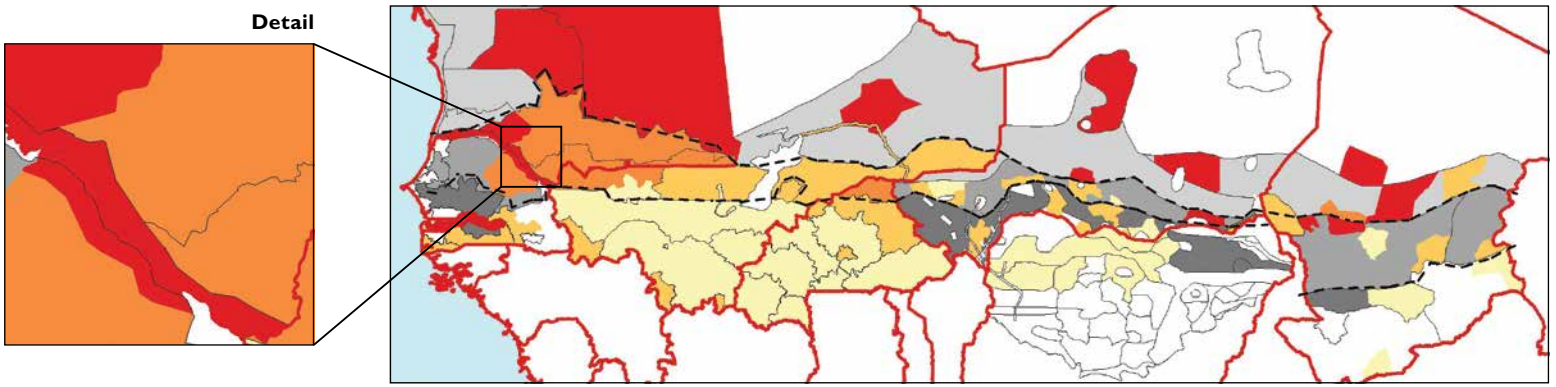
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

% kcals purchased

- **0–25**
- **26–50**
- **51–75**
- **76–100**

MAP 5: MARKET DEPENDENCE FOR FOOD

As stated in Section 1.2, what is most strikingly illustrated here is that HEA studies across the board show that approximately half of ordinary *farming* households obtain about 50% of their food calories through purchase on the market. Market dependence for staple foods, very largely cereals, is almost the obverse of self-sufficiency: almost, but not quite, because poorer households may also obtain some food directly as wage payment for casual labour on farms (see Map 6 and its commentary), and/or as a meal provided on the field during the working day, and/or as a gift, a food loan or food aid.

Pure pastoralists produce no crops and therefore the north of the maps is peppered with the deeper colour. But for the crop-producing rest of the maps, if we are looking for places of greater food self-sufficiency we automatically look to the south where rainfall is higher and average food production per capita is likely to be greater. But in fact only the Better Off map would justify this assumption. As soon as we look at the Average map, we see that only in southern Mali – in the Maize, Cotton and Fruit zone and the Millet, Cotton and Sorghum zone (Kolondièba-KOL, Yorosso-YOR) – and in one contiguous livelihood zone of Burkina Faso – West Cereals (ZME4) – is there the highest level of self-sufficiency. Even in the southernmost of all the Chad zones – MDL, the Southern Staples and Cash-Crop zone – the Average does not meet this level. The message here is important: as far as the spread of HEA studies allows us to surmise, only in a quite limited part of this vast slice of Africa are roughly the poorer half of households able to obtain from their own production more than 75% of the food energy they require.

There are one or two cases that catch the eye in the southernmost latitudes, because here the Very Poor are particularly market-dependent. We refer to two southern zones of Burkina Faso (ZME2 – Southwest Fruits, Cotton and Cereals, and ZME3 West Cotton and Cereals) and, in the south of Zamfara State in northern Nigeria, the NW Cotton, Groundnuts and Mixed Cereals zone (CGC). But it does not mean that these are somehow islands of food insecurity. The clue is in the common element of their titles: cotton. Households give over a good part of their land to this cash crop in the expectation of earning enough money to *more than* cover the purchase of the extra food they would otherwise be able to produce. They are somewhat vulnerable to problems such as the failure of services to supply pesticides or to honour their purchase agreement at the expected price when world prices dip. But as a rule when these problems occur, households are able to use savings, assets or credit, or find enough employment, so that at least they are not threatened by hunger from one year to the next.

This prompts us to make a general distinction between food self-sufficiency and food security. It is not just the case of cash crops versus food crops that is

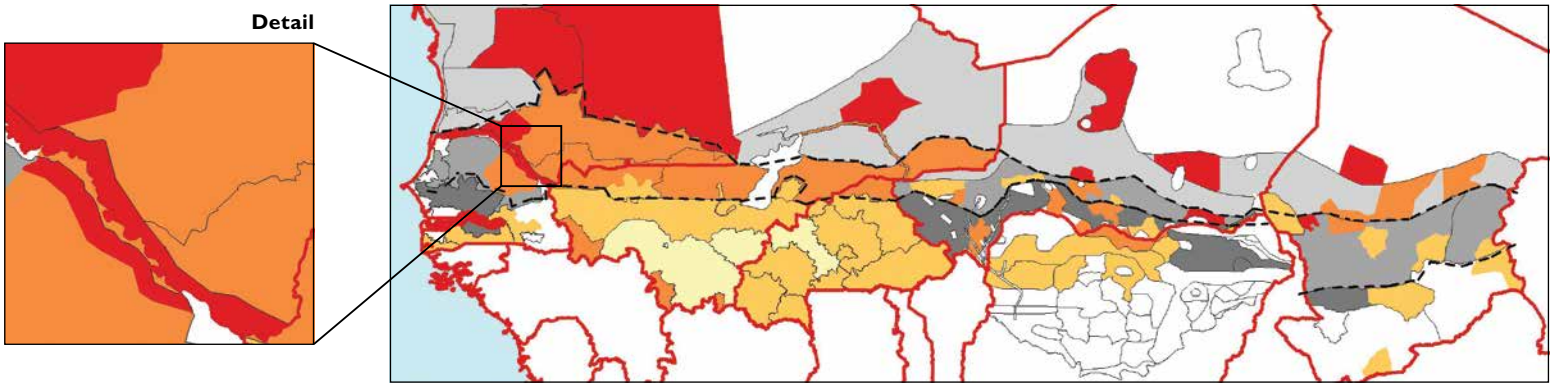
relevant. Poorer people who normally produce very much less of either than can meet their direct consumption and market needs, are not by that token necessarily food insecure. If they can regularly meet their needs through their off-farm income-earning activities, then they may be deemed food secure, however poor they may be. It is when there is an interruption that hits such production as they have, and/or their other income, that people become food insecure. As a rule of thumb, the further one goes north, the more people are threatened with that irregularity – the great enemy being drought.

At the same time, we see in every HEA seasonal calendar, from the north to the south, the 'lean season' (French: *soudure*) before the new harvest, for poorer people at least, when stocks from the last harvest are long gone, money is especially tight and food prices are at their annual peak. This is when the poorer 'pull in their belt', as do pastoralists in the latter part of the dry season when the condition of animals deteriorates as pastures are used up and the heat intensifies; milk production dwindles drastically and herders have to pay extra high prices for grain on northern markets far from the country's cereal basket. This annual 'lean season' is both the symptom and the result of poverty; if it is suggested that it should also be termed food insecurity, so be it.

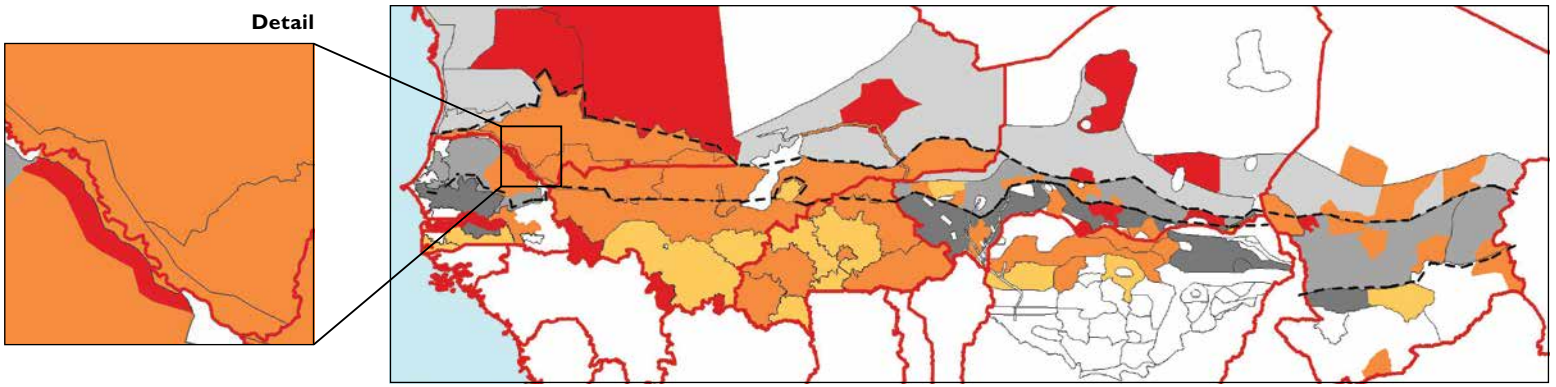
Finally, there are some cases that are counter-intuitive, where the Very Poor depend less on the market than the Better Off. In the Aïr mountains of northern Niger (ACM) food production is very low across the board, as the very limited arable land and the precious irrigation from wells are devoted mainly to cash crops, especially high-quality onions that reach the Niamey market and beyond. The Very Poor, at 74% dependency, just miss being in the uppermost market bracket because they receive *inter alia* 15% of the food they consume as food aid and as direct payment for daily labour in food (payment in-kind). Similarly, in the Senegal River Valley zone in Mauritania (VFS) overall agricultural production is low, but the Very Poor gain a significant proportion of their food through in-kind payments, collected wild foods and gifts. In pastoral Tarkhint in Mali (TAR), the Very Poor receive 20% of the food they consume in payment in-kind (grain bought by their employers), gifts and food aid. In pastoral Salale in Chad (SAL), the case is explicable for the Very Poor because they consume nearly 30% of their calories as milk and meat from their camels and goats. But the Better Off consume 40% in milk and meat, and yet purchase enough grain to bring them far above the 100% calorie minimum requirement mark. Similarly in the Monguel area (MON) of the agropastoral belt in Mauritania, it is not that the Very Poor are somehow more self-sufficient than the Better Off: they are, in fact, exceptionally poor. It is rather that the Better Off apparently consume far above their minimum requirement, and this greatly increases their market purchase. In these cases, one suspects that some part of this apparently high household consumption is in fact unrecorded gifts or payments in-kind to poorer kin; and there is possibly a similar case in this respect in the Senegal River Valley Emigration and Remittance Walo zone in Senegal (MTW).

MAP 6: PURCHASE + IN-KIND PAYMENTS AS A PERCENTAGE OF TOTAL CALORIES CONSUMED

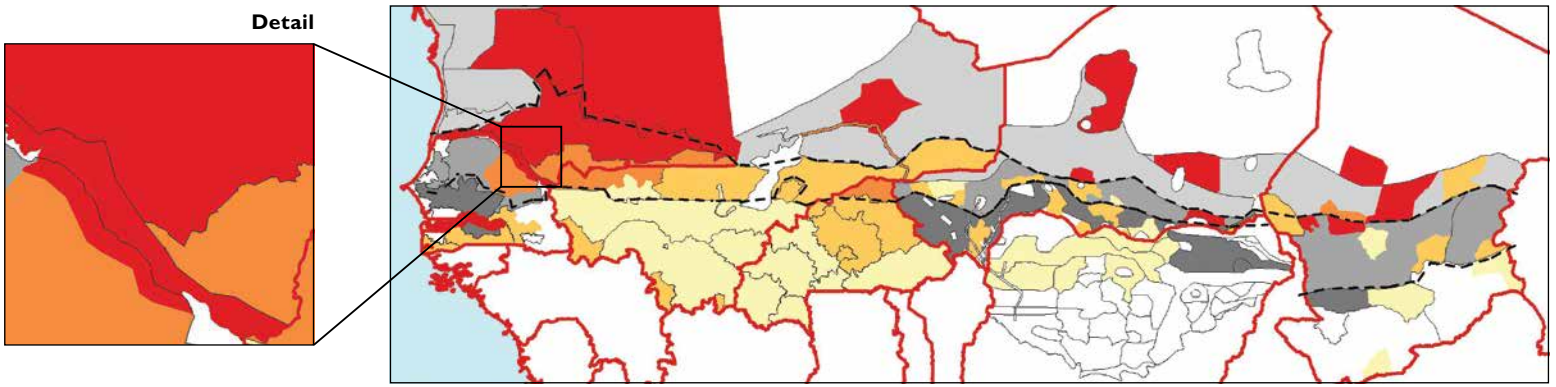
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

% total kcals consumed

- **0–25**
- **26–50**
- **51–75**
- **76–100**

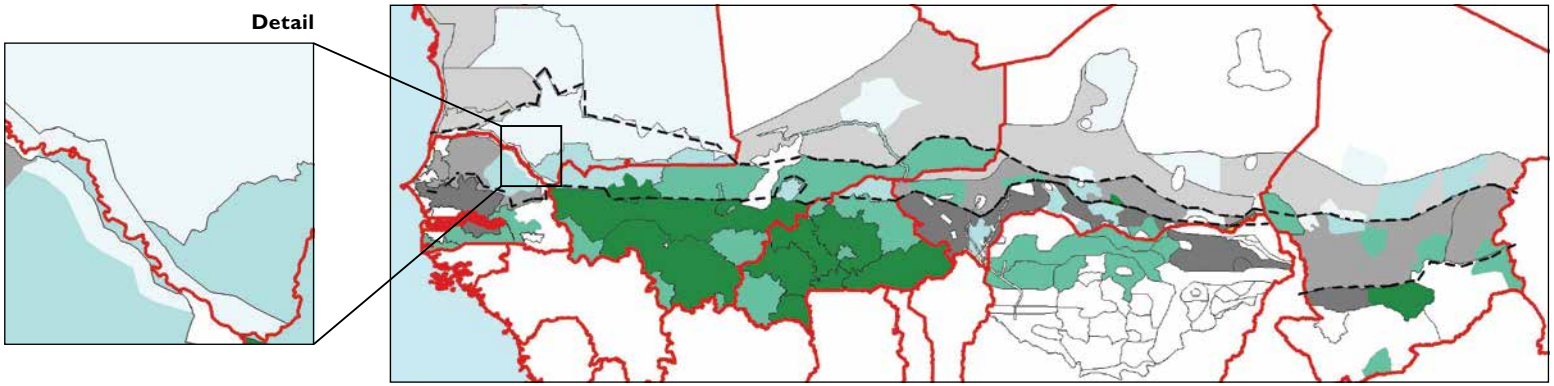
MAP 6: PURCHASE + IN-KIND PAYMENTS AS A PERCENTAGE OF TOTAL CALORIES CONSUMED

Map 6 gives a slightly more complete picture of food obtained as a commercial transaction, in the sense that receiving grain directly as a wage is a substitute for buying it in the market. This essentially relates to poorer households, who provide the workers. The marked difference between Maps 5 and 6 is that for the Very Poor, it is the agropastoral and pastoral zones that tend to show a higher contribution of in-kind food. The explanation we can offer is that in these less densely populated areas there are fewer markets and the distances to travel for food supplies, and the associated cost of transport, are greater here than in the more densely populated agricultural zones. It may therefore be an advantage in terms of potential cost and time for poorer people to receive food directly that they would otherwise have to buy with a cash wage.

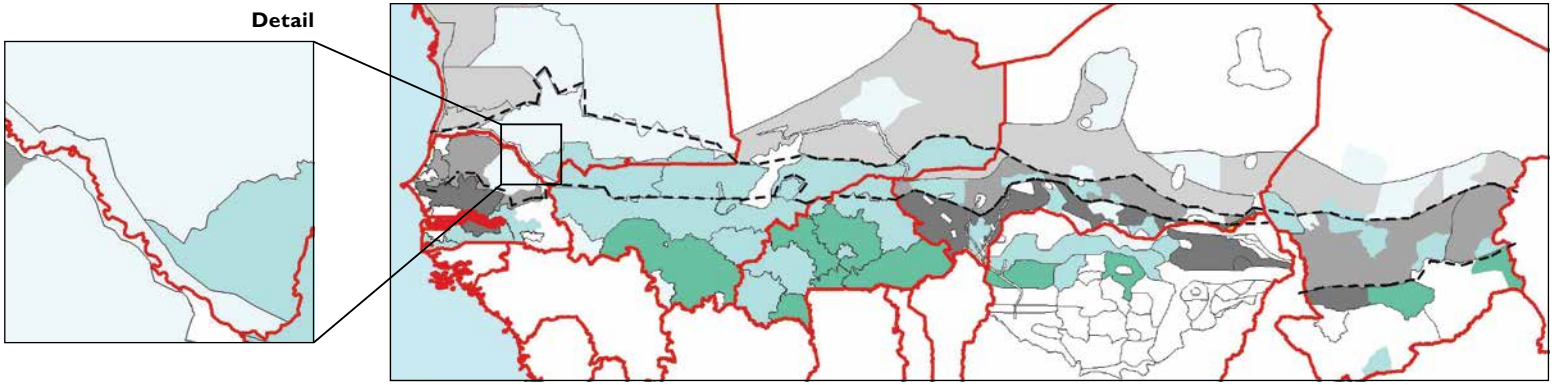
For agricultural employers, there may be an incentive to pay in kind directly from their grain-store rather than giving a cash wage. Pastoral employers must pay in-kind from sacks of grain they have transported from the market, and the wage may reflect this cost, or it may be discounted as goodwill for a contracted herdsman who may well be a close kinsman, but who in any event is entrusted with the care of the employer's most vital assets. But the bulk of wages are paid in cash virtually everywhere, since workers everywhere need cash for more than grain, and cash provides flexibility in the timing of purchases.

MAP 7: CONSUMPTION OF OWN CROPS AS A PERCENTAGE OF CALORIES CONSUMED

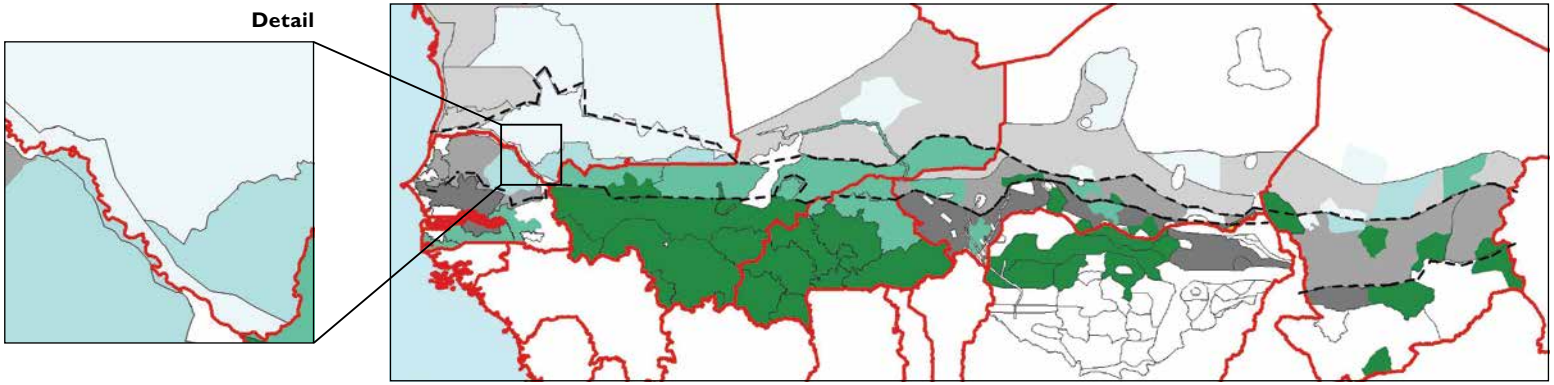
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

% kcals consumed

- **0–25**
- **26–50**
- **51–75**
- **76–100**

MAP 7: CONSUMPTION OF OWN CROPS AS A PERCENTAGE OF CALORIES CONSUMED

As mentioned in relation to Map 5, this is the obverse of market dependence. If we have begun with the latter, it is because that message appears particularly important but is not always fully appreciated by decision-makers and others. But this is in no way to suggest that food production is somehow of lesser importance. It is, on the contrary, the basic premise of agricultural economies in the Sahel, and even in most of the successful, rainfed cash-cropping areas it would be hard to find any farmers who did not put a good half of their land to food crops (that is, where the 'cash crop' is not itself surplus grain). It is because so many households are so far from being able, nevertheless, to feed themselves from their land that the quest in HEA, reflected in this atlas, is to understand how they do manage to get their hands on enough basic food, and how they manage to meet their other life and livelihood needs: in other words, how they make ends meet.

There is a clear confirmation here of greater crop production per capita in the more humid southern areas, which are somewhat beyond the sahelian ecology proper. What is as indicative as the dark green of the Better Off, who typically produce substantial surpluses of grain, is the middle green of the Very Poor. This means that in these areas households obtain more than half of their food energy from their own production – something not seen anywhere in the real sahelian zone. In Kolondieba (KOL) in Mali, for instance, the Very Poor consume 60% of their calories from their own fields. This is far higher than in most other agricultural zones across the Sahel region, but it still means that these households require considerable recourse to the food market to get through the year.

In two countries, Chad and Mali, the higher self-sufficiency of the Better Off stretches quite far north into the agropastoral band. In Chad, these are the HDS, MAN, FIT and LAC zones. It is true that two are lake zones: FIT is around what remains of Lake Fitri where some flood-retreat cultivation of berbere sorghum is still possible, while LAC is at the side of Lake Chad where both flood-retreat and irrigated farming are practised. In Mali, the Yelimane, Diema and Nara zones (YEL, DIE, NAR) are productive enough to show deep green on the Average map – Diema in particular is a very substantial producer of millet. All three are also notable for the high proportion of the income of the wealthier coming from remittances (see Map 22), and this is likely to be reflected in relatively high investment in fertilisers and/or hired labour. More generally in the agropastoral band, the limit to crop production is rainfall, whether in overall volume or irregularity, rather than soil fertility or the people's farming efforts. Perhaps once or twice in a decade there are exceptional rains, and then these areas produce such bumper crops that they dominate the market more than production from the ordinary agricultural zone further south. The problem is that in rather more years in a decade the rains are poor, so that cultivation is more of a gamble for the bigger producers than it is further south (let alone for the poorer farmers) and reliance on livestock earnings becomes paramount.

Looking further at the Average map, two contiguous zones in south-west Burkina Faso stand out as somewhat less self-sufficient (ZME2 Southwest Fruits, Cotton and Cereals and ZME3 West Cotton and Cereals). As noted for Map 5, here it appears that the amount of land households devote to the cotton cash crop diminishes their cereals production. Evidently they expect to make a greater total profit this way than with more food production; that is, the profit on cotton is not swallowed up by the extra food they may need to purchase. In south-east Burkina in ZME9, cotton is again the biggest cash crop, quite closely followed by sesame. Here, however, the Very Poor do not earn much cash from these crops – a subject dealt with in the next section.

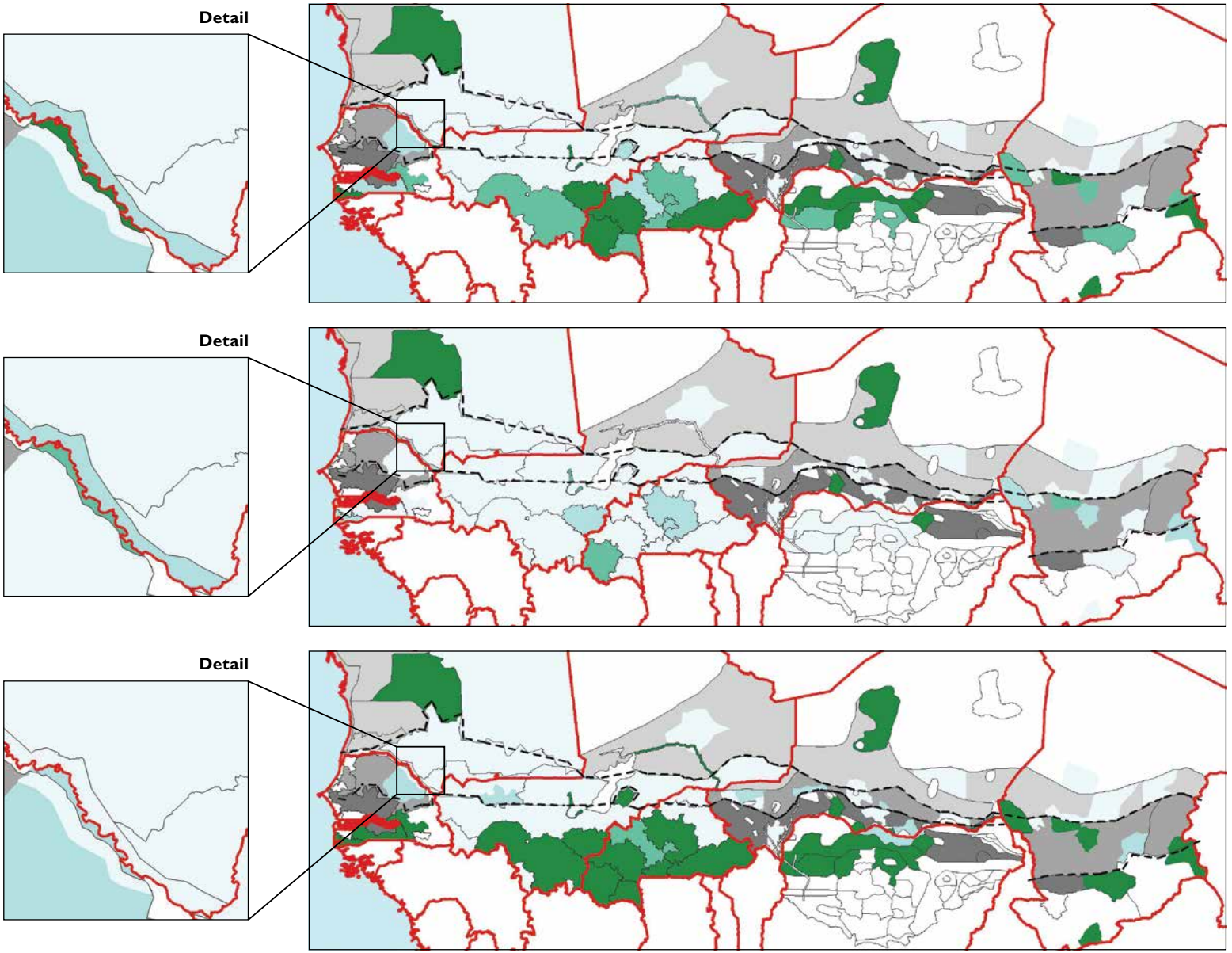
MAP 8: CASH INCOME FROM CROP SALES

(US$ PER PERSON PER YEAR)

AVERAGE HOUSEHOLDS

VERY POOR HOUSEHOLDS

BETTER-OFF HOUSEHOLDS



LEGEND

US$ per person per year

- **0–20**
- **21–40**
- **41–60**
- **>60**

MAP 8: CASH INCOME FROM CROP SALES

Food crops and cash crops are here considered together. One might say they are all cash crops if they are sold, but normally 'cash crops' are thought of as those typically grown mostly or exclusively for sale, such as sugar cane, tobacco, onions in bulk, and sesame. To this should be added market garden produce. For food crops such as cowpeas and groundnuts there is a division: where production is modest, households consume all or most of the crop. But where the crop is produced in quantity, it is usually with the express intention of selling the greater part. Cowpeas, the universal pulse, are usually intercropped with cereals (this is not true of groundnuts) and so a big cowpea crop is associated with a big cereal crop. Big cereal producers sell their surplus. For our general analysis, however, we must define a crop either as a food crop or a cash crop. The definition we have arrived at is that any crop is a cash crop if more than half of production is sold in more than half of all the livelihood zones studied across the region.[3]

It is no surprise that higher cash income from crops is a markedly southern phenomenon. But several zones north of the rainfed agriculture belt also show a high crop income. The one that catches the eye is the Aïr mountain zone (ACM) in northern Niger, and remarkably we see high earnings even for the Very Poor. Here, land holdings are very small, but on the area of land farmers can manage to irrigate from wells, they plant crops during the meagre rains and harvest them in the cold dry season that follows. High-value onions are the big crop, and Better-Off farmers with not much more than 1.5 hectares produce upwards of six tonnes, as well as other vegetables (tomatoes, Irish potatoes) and a few sacks of wheat; they also maintain enough of the perennial moringa trees to give them a tonne of the prized, proteinous leaves. The Very Poor too make most of their living in the same way, although they typically only cultivate one-third of a hectare. There is little offer to them of paid work on others' fields, and little else they can do with much profit except to sell firewood.

Two other northern zones with particularly high crop incomes are in Mali. There is the irrigated rice scheme near Niono on the Niger river (NIO) where again even the Very Poor make significant sales, and the Dogon Plateau–Bandiagara area (BAN). Here, in among the rocky terrain, farmers have managed to create micro-dams that allow irrigation for especially – again – an onion crop, in this case in the form of shallots. But poorer farmers cannot depend so much on this crop and have to seek diverse other earnings: agricultural and construction labour; selling firewood, collected wild foods and handicrafts; and transport in the form of borrowed oxcarts or donkeys. A fourth zone is the riverine area in Matam in north-east Senegal (MTW) where irrigated and flood-retreat crops, notably rice and sweet potatoes, give high returns. Again, in the Transhumant Pastoralism, Oasis and Wadi zone (AOU) in Mauritania, it is the sale of dates, and employment in the care of date-palms, that essentially give people their living.

The picture is less clear in two localised livelihood zones of eastern Chad (MAN and HDS) that show high crop incomes: there seems to be a balance of cereals, oilseeds and garden crops (especially okra that is dried) which works in their favour. However, it is curious that these avowedly 'agropastoral' localities produce sorghum but no millet, which is the typical staple of the northern Sahel. These seem to be actually in the rainfed agriculture belt.

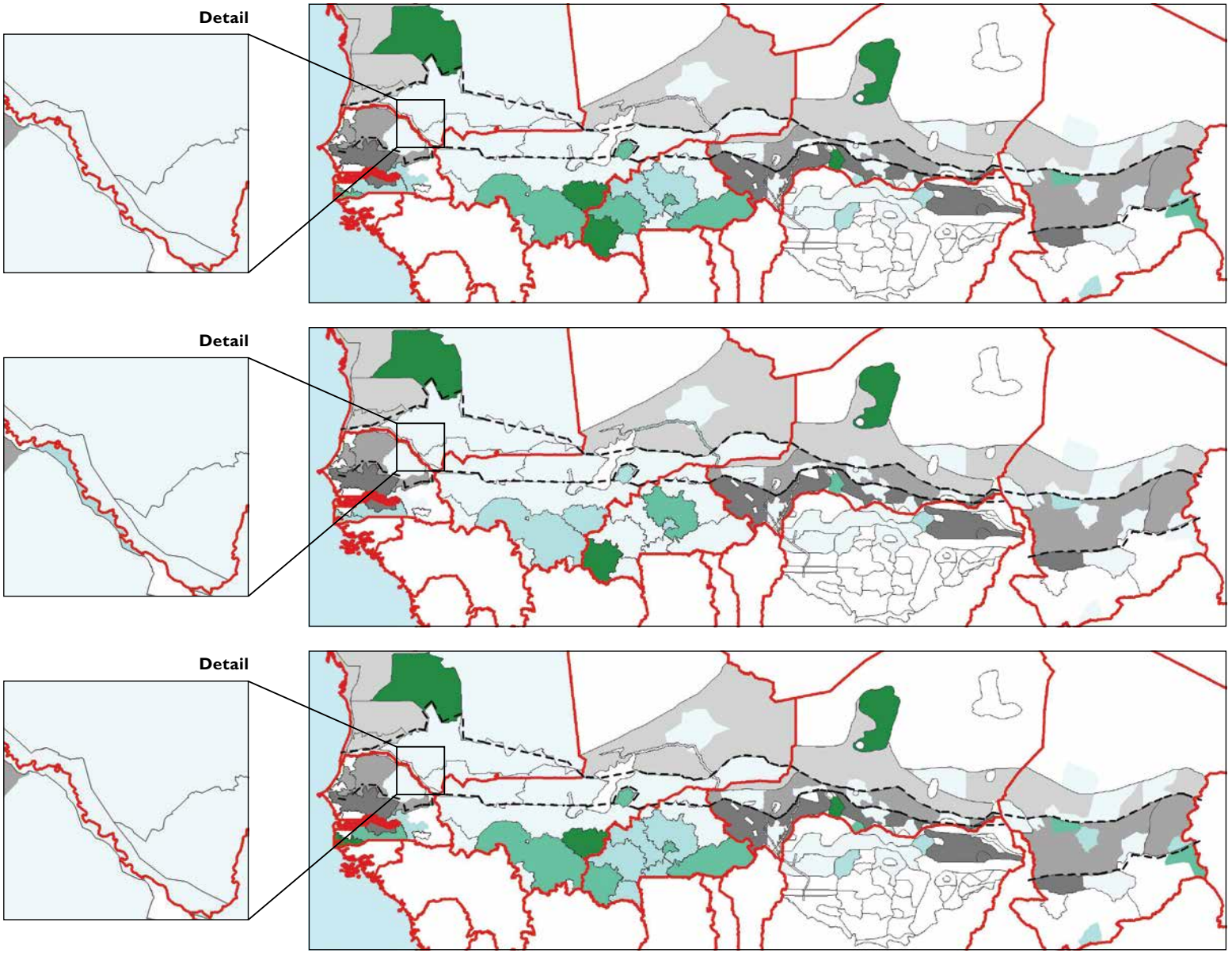
[3] On this basis, the following are the 'food crops': millet (pearl millet – *Pennisetum glaucum*), sorghum (including the type *berberi*), maize, fonio (*Digitaria* – the type of millet with the smallest seed), rice, wheat, cowpeas, vouandzou (*Voandzeia* or *Vigna subterraneana* – bambara nut), and melon seed. The cash crops are: groundnuts, onions and shallots, cotton, sugar cane, tobacco, cassava, sweet potatoes, Irish potatoes, sesame, soya, chilli and sweet peppers, cashews, moringa leaves and seeds, all vegetables or 'market garden crops' including cabbages, tomatoes, okra, aubergines and sorrel, and fruits – eg, mangoes, avocados.

MAP 9: CASH CROP SALES AS A PERCENTAGE OF TOTAL INCOME

AVERAGE HOUSEHOLDS

VERY POOR HOUSEHOLDS

BETTER-OFF HOUSEHOLDS



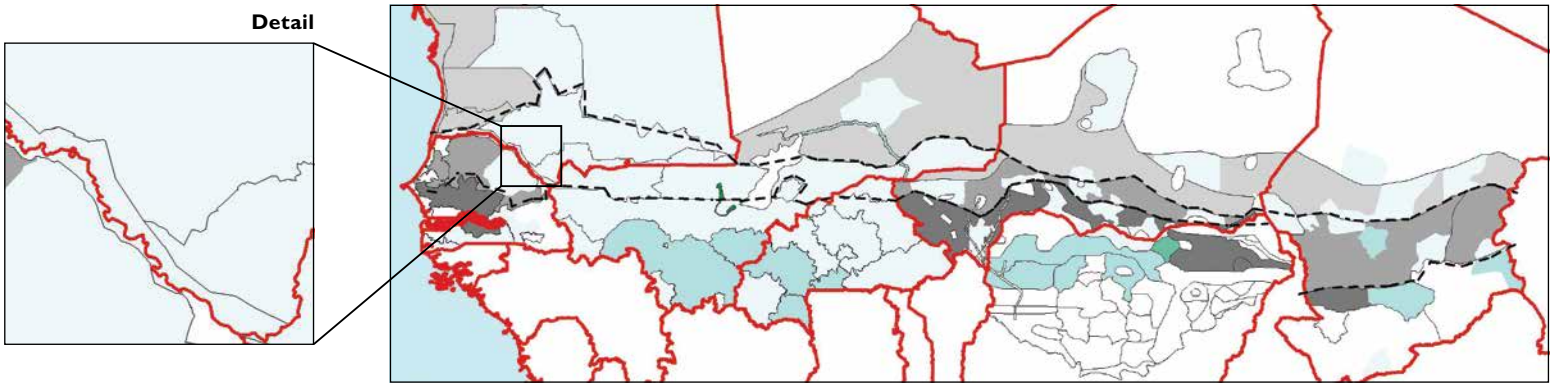
LEGEND

% total cash income

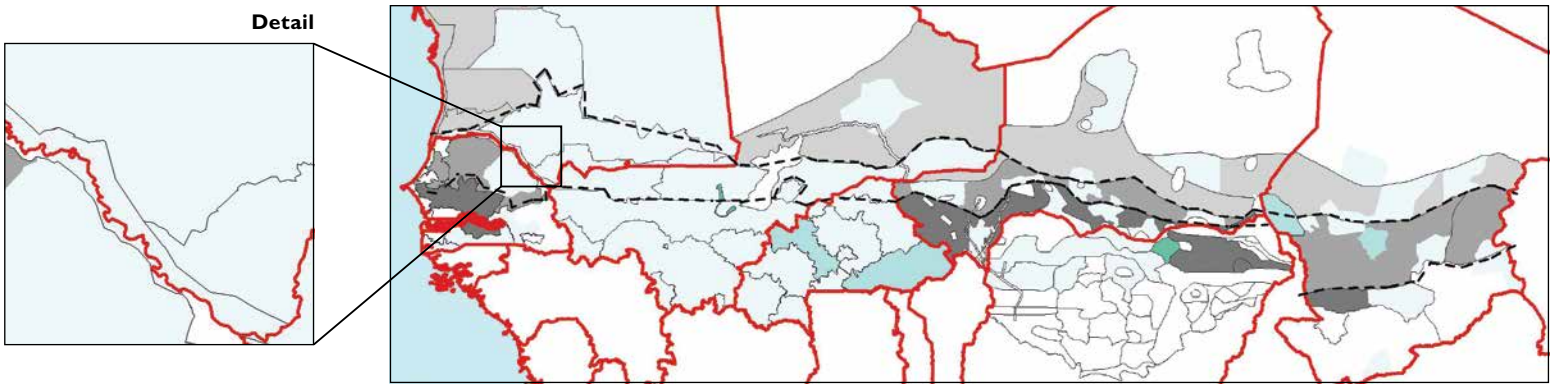
- **0–15**
- **16–30**
- **31–50**
- **>50**

MAP 10: FOOD CROP SALES AS A PERCENTAGE OF TOTAL CASH INCOME

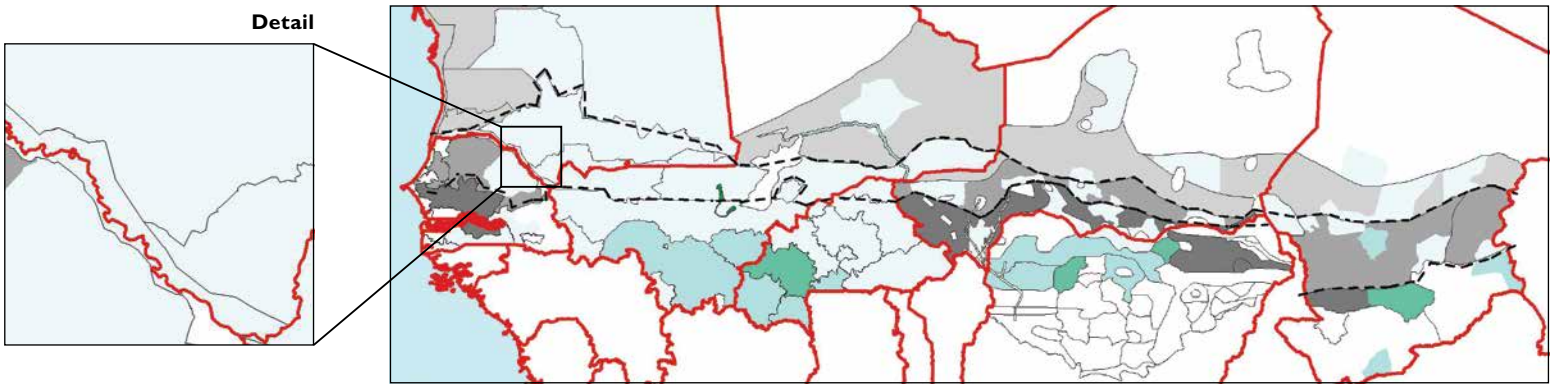
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



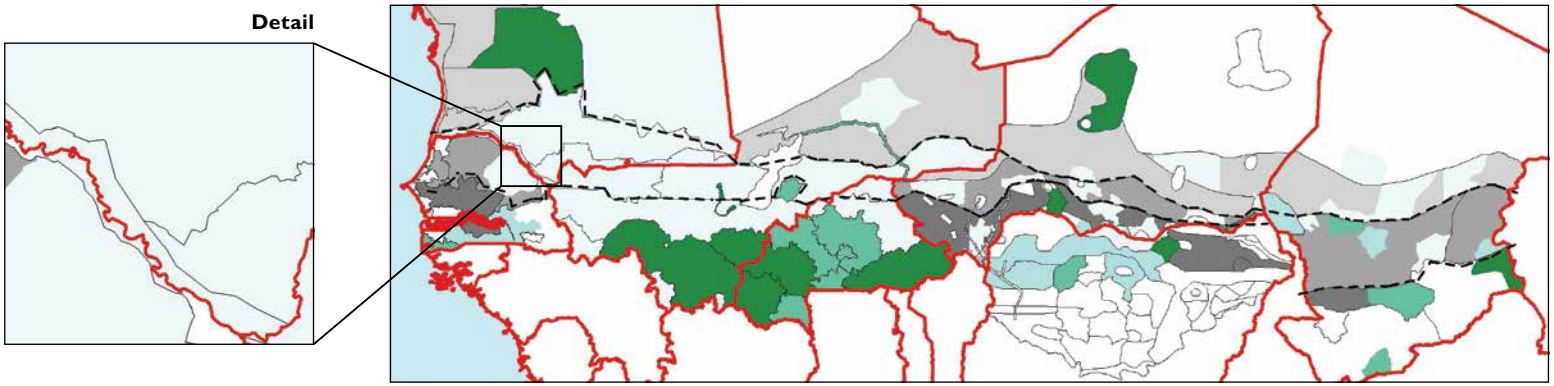
LEGEND

% total cash income

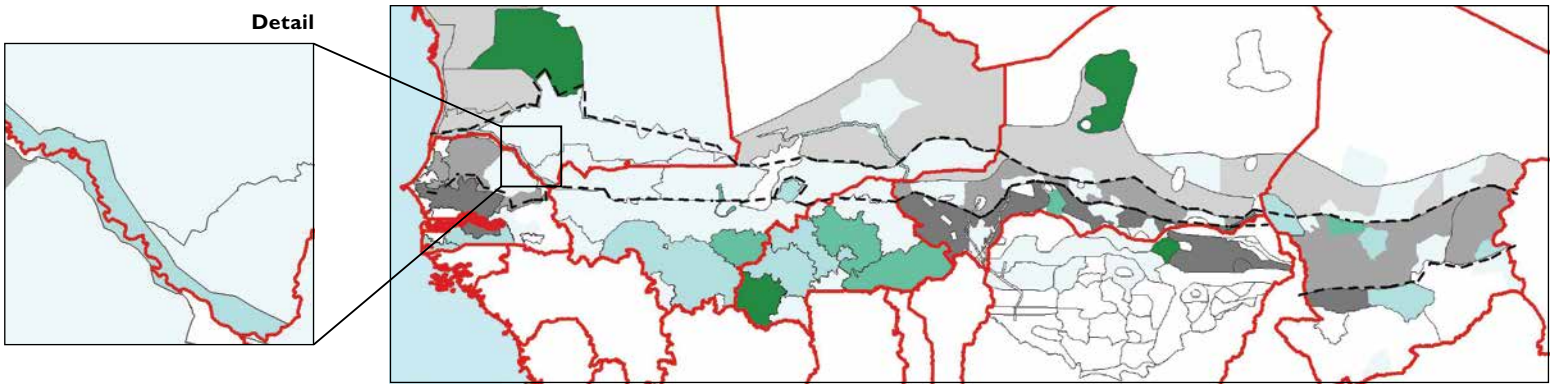
- **0–15**
- **16–30**
- **31–50**
- **>50**

MAP 11: ALL CROP SALES AS A PERCENTAGE OF TOTAL INCOME

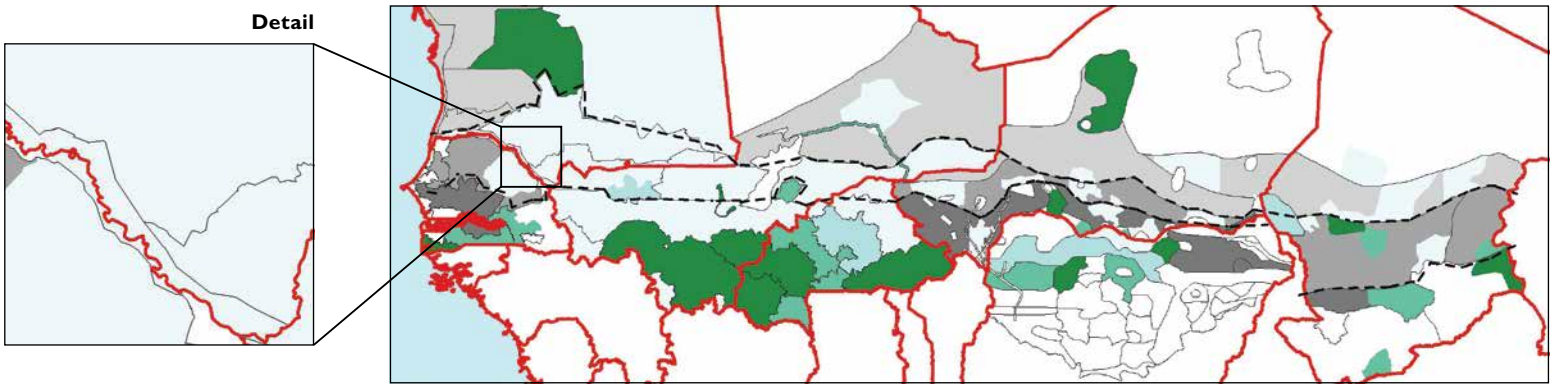
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

% total cash income

- **0–15**
- **16–30**
- **31–50**
- **>50**

MAP 9: CASH CROP SALES AS A PERCENTAGE OF TOTAL INCOME
MAP 10: FOOD CROP SALES AS A PERCENTAGE OF TOTAL CASH INCOME
MAP 11: ALL CROP SALES AS A PERCENTAGE OF TOTAL INCOME

Maps 9, 10 and 11 look at crop earnings in a different and disaggregated way. We see a little more clearly where cash crops have a particular influence and where food crop sales are emphasised.

On the cash crop side, we have dealt with the Niger Aïr mountain zone (ACM) and Mali Bandiagara (BAN) in the previous section. We also see here (Map 9) more clearly other cash-crop zones: in Yorosso (YOR), southern Mali, it is cotton that makes the zone light up on the map, especially for the Better Off. But in fact their sales of cereals, especially sorghum, far outstrip cotton earnings. Nevertheless, for poorer households cotton at least brings cash that can prevent them having to sell their grain at harvest, which is far from a surplus, in order to meet immediate expenses. But in the Burkina Faso zone ZME02 – Southwest Fruits, Cotton and Cereals, we do find one place, apart from the ACM zone in Niger, where even the Very Poor make more money from selling cash crops than from all other sales and activities combined. They sell no grain at all, and cash comes mainly from cotton, although with a good addition from mangoes and cashews.

On the other hand, if in Map 10 we look for those areas where food crop surpluses form the clear basis of cash earnings – at least for the Better Off – we do not find them. This is remarkable for such a wide, mainly agricultural region, insofar as it is represented by the HEA baseline areas. A partial exception is the Hadejia Valley (HVM) in northern Nigeria, where there is the very unusual situation that the Very Poor get as much as 65% of their total annual earnings from crop sales, notably upland rice. (They may also have an advantage in the demand for their employment, since cash crops are typically labour-intensive.) But here, as in the irrigated rice zone NIO in Mali, we might consider rice as a cash-crop, even though we classify it for the general analysis as a food crop for the reasons given under Map 8.

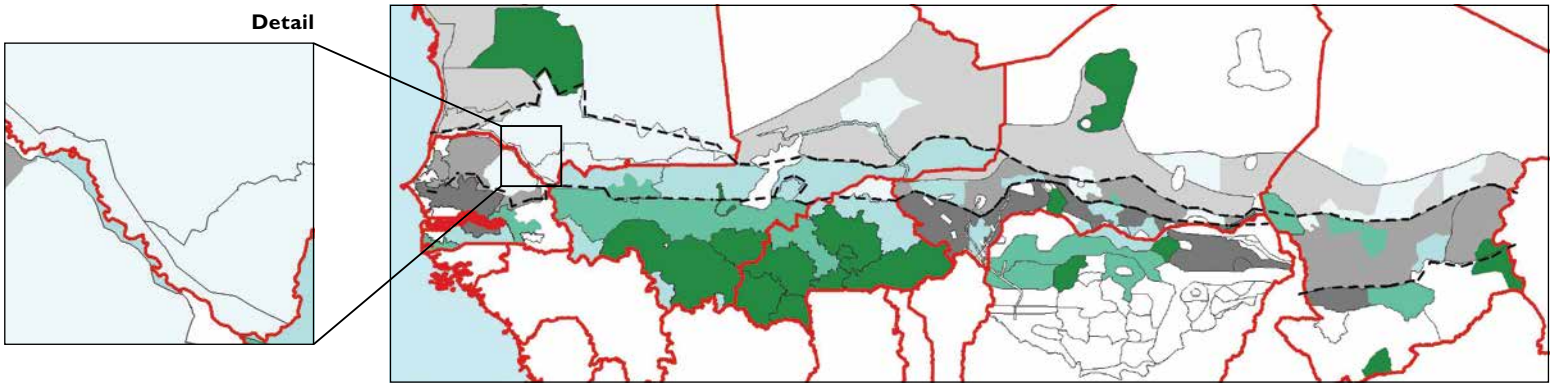
Of course there are zones with relatively high grain production other than rice, notably towards the south, but this does not seem to translate into the highest earnings. It is cash crops that win, even though a good part of each country is a net importer of surplus grain from higher-producing zones. The pattern of high crop earnings in Map 11 is influenced more by cash crops than food crops.

We are not really able to explain this conundrum on the basis of the information available, although three factors may be pointed to: first, that the HEA coverage is somewhat biased towards food insecure areas, so that a full coverage might well redress the balance somewhat in respect of cash from food crops. But second, despite periodic price falls on the international market, notably for cotton, it may be that cash crops are generally a safer bet in respect of producer prices than cereals (except for rice). For if there is generally good rainfall in the Sahel region, there is a danger that local high producers find the market glutted and prices exceptionally low long after the harvest period. This is perhaps less of a market phenomenon today than in former decades, when in southern Mali, for instance, there was a major international programme to support grain prices in years of relatively high production. Third, as will be seen in Map 16, in some areas such as central Niger, livestock earnings rival or exceed crop earnings even where the basic economic activity is rainfed cultivation. This is a testament to the very high value of meat today rather than the low value of grain.

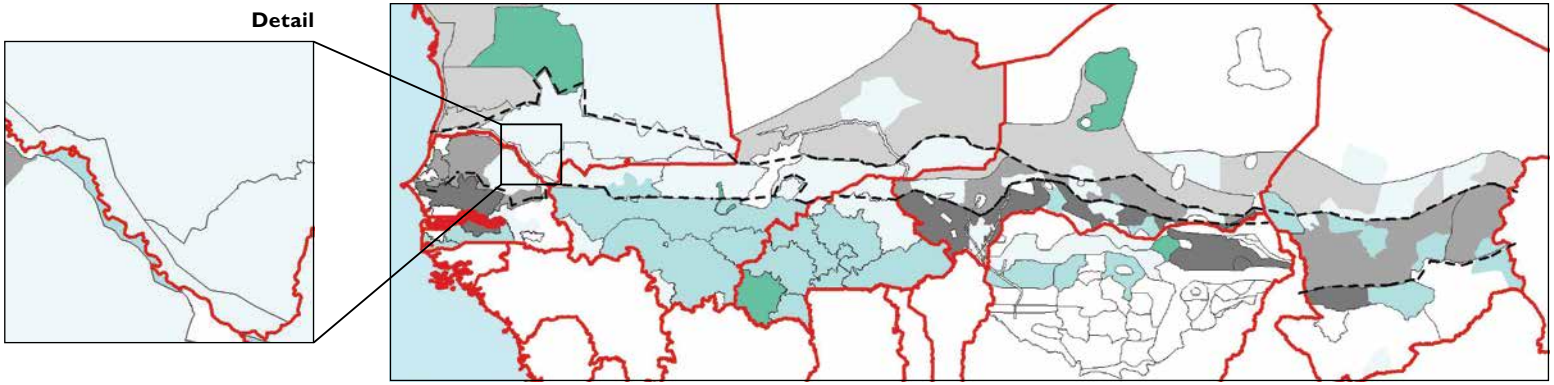
MAP 12: TOTAL INCOME FROM CROPS

(% 2,100 KCALS PER PERSON PER DAY)

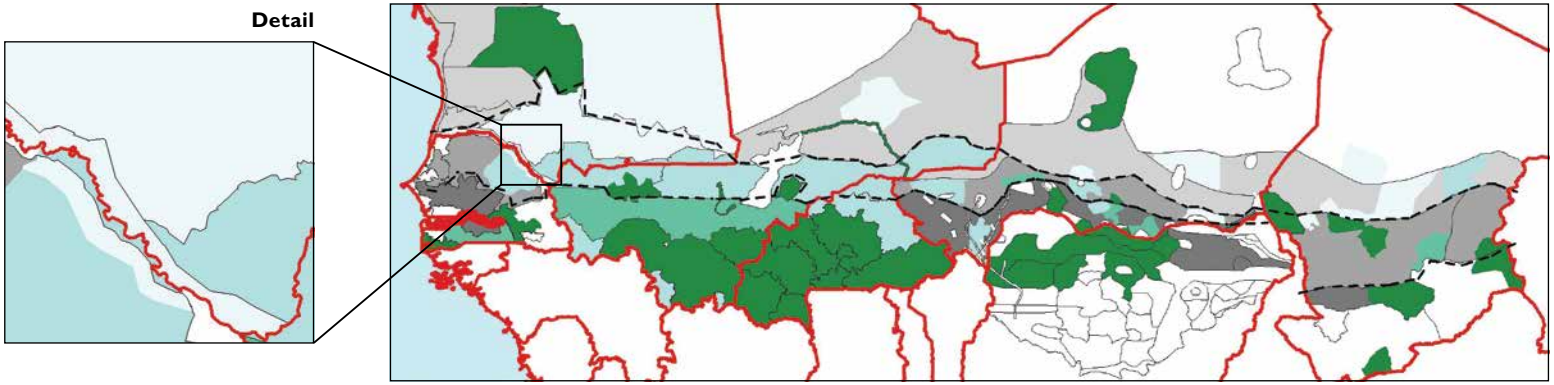
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

% kcals per person per day

- **0–50**
- **51–100**
- **101–150**
- **>150**

MAP 12: TOTAL INCOME FROM CROPS

It will be observed that the measure here is in terms of calories; this calls for an explanation. Households may be considered to have two kinds of 'income': there is the food from their fields that they consume directly – 'food income' – and there is income in cash that they earn from various off-farm sources, as is shown in subsequent maps, but also from the sale of their crops. The question tackled here is: how can we compare the *overall* value to households of their agricultural production? To do this we need a way of combining cash earned from all crop sales, including food crop sales, with direct food income – consumption of own food crops. The method is to convert all to a single unit value of reference, in this case calories. Thus, what is calculated is the actual calories consumed directly from own production, plus the calories that could be purchased if all the cash earnings from crops sold were converted into the commonest staple cereal at local reference prices. Then the total of all these calories is expressed as the percentage satisfaction of the requirement of 2,100 kilocalories per person per day. This gives a way of showing and comparing the overall value obtained from crops produced – ie, the 'total income' from crops.

We take this map on its own terms, and although it essentially confirms the indications from the cash income maps, we can add some further observations. We see strong patterns and few surprises as long as we remember that both food crops and cash crops (and garden crops) are included. Pastoralists who do not cultivate at all have no crop income, of course. Apart from that, as we would expect there is very generally a low total crop income for the Very Poor: in most places almost the definition of their poverty is that they own little land and get relatively little income from it, whether from cereals consumed or sold, or cash crops sold. Nevertheless, such income as they do get from food crops is not exclusively from home consumption. It is common for even Very Poor people, who in a normal season produce not even two months' worth of staples, to sell some of their cereal harvest. The principal reason for this is to repay credit taken in the lean months before harvest – the *soudure* – if, as is all too likely, they have no savings left from the employment or self-employment that are their principal sources of cash. Generally, the credit taken is mainly to buy food (although part may also have been to buy seed for their crops), and to pay for other pressing necessities. But credit must be repaid if the borrower expects to get further credit in the next hard period, and that is sufficient incentive to sell some grain rather than put it in the household store.

There is a definite southern emphasis to the locations of high total food income, underlining the overall better production conditions there, due in good part simply to higher rainfall, or to flood retreat cultivation possibilities, as in eastern Chad. Northern exceptions tend to be where there is irrigation. But cultivation in Diema (DIE) in western Mali is entirely rainfed, and the rainfall is not particularly generous at that latitude; yet the zone produces generous amounts of millet (and is the HEA zone where the Better Off own the most oxen: on average ten head, surely mainly for ploughing).

One or two zones stand out where the income for the Very Poor is in the medium range. The reason is that they are in zones where they can grow their own cash crops, including:

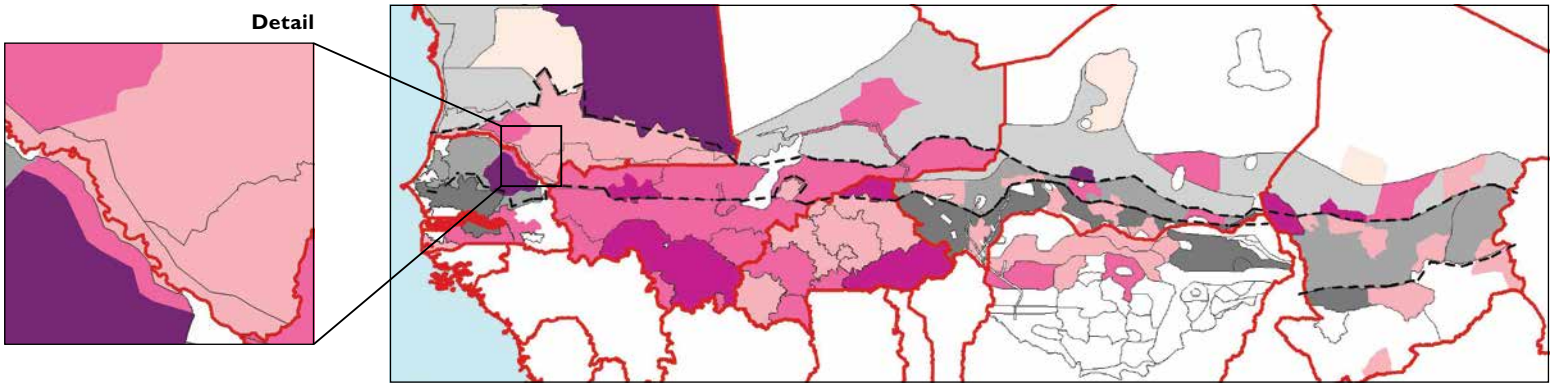
- in Niono (NIO), Mali, irrigated rice, the most valuable of cereals (although for the reason given under Map 8 we classify rice as a food crop)
- in the Aïr mountains (ACM) of northern Niger, the highly prized onions
- in southern Burkina (ZME2), where propitious rains and soil allow for a share in growing a choice of cash crops: cotton, rice, groundnuts, sesame, cowpeas (valuable for sale as well as for home consumption).

There is perhaps less to say about the Better Off, whose production (with Middle households) dominates the Average map. They are the big landholders, they have the means to maximise production using fertiliser and other inputs and hired labour. They are also the people who, by one means or another, have their hands on most of the irrigated or garden land in the relevant zones. In short, they are the people who produce most food surpluses and most cash crops.

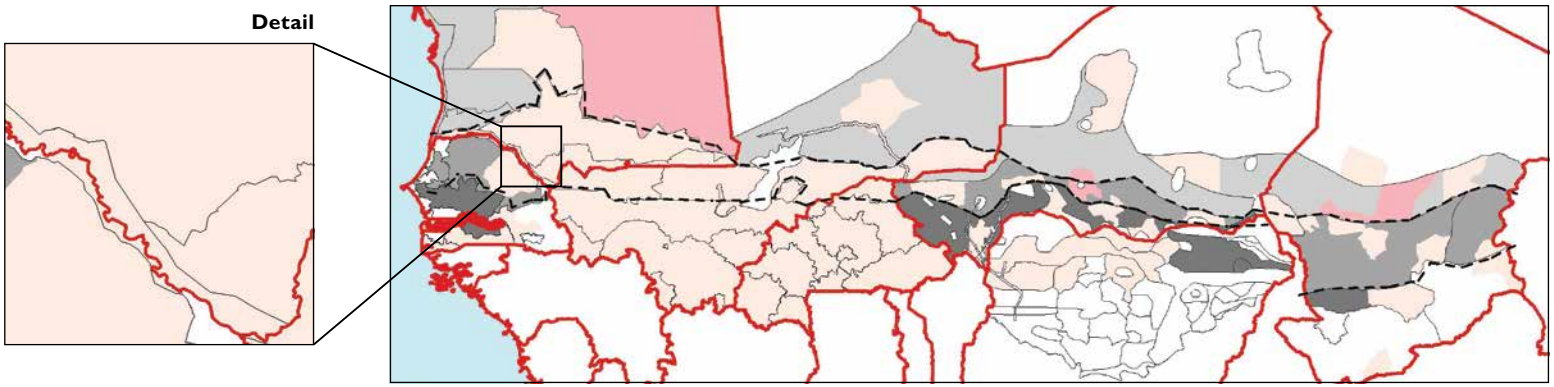
MAP 13: CATTLE OWNERSHIP (INCLUDING OXEN)

(CATTLE AND OXEN OWNED PER HOUSEHOLD)

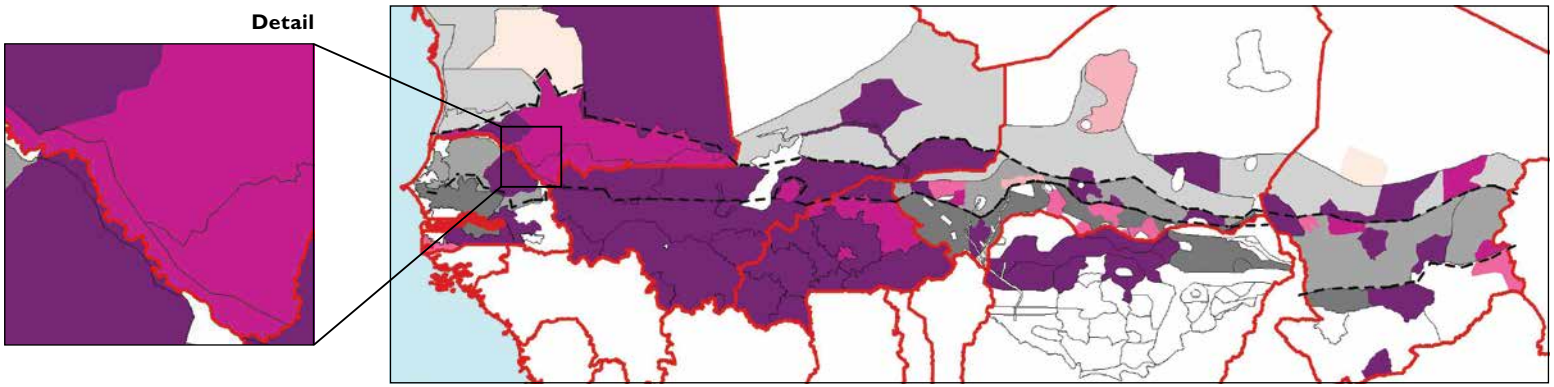
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

Cattle and oxen owned per household

- 0
- 1–5
- 6–10
- 11–15
- >15

MAP 13: CATTLE OWNERSHIP (INCLUDING OXEN)

These maps offer perhaps one surprise, and that is how far north cattle are kept: pastoralists who own cattle as well as camels well outnumber pastoralists who own only camels. Among the transhumant pastoralists of the sylvo-pastoral Ferlo zone of Senegal (FER) the Better Off are by far the biggest cattle owners of all of the Sahel HEA zones, having herds typically of around 125 head, the next biggest owners being the Better Off of the pastoralist zone in Aïoun El Atrouss in Mauritania (AIP), with some 80 head which are, however, joined by 70 camels.

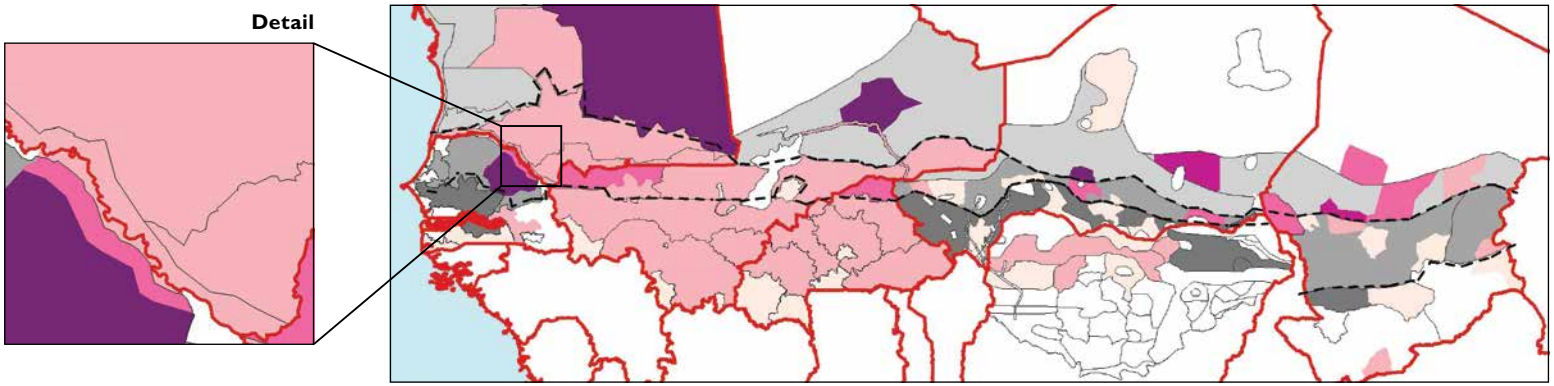
Otherwise two things should draw our attention. One is the fact that the Better Off in the majority of *farming* areas own herds of more than 15 head of cattle: this is substantial wealth, and underlines the importance of livestock in these areas, which is discussed under Map 16 below on livestock sales. Such cattle ownership is sometimes seen by outsiders as being simply a statement of wealth, a symbolic act. But it is more than that. Apart from being a sort of repository of rural savings, capable of yielding interest in the form of births (but also capable of depletion through disease or drought losses), cattle also provide milk, which is a cherished and important element of the diet, and traction power for ploughing and transport. On the transport front, in many places the operation of an oxcart can be a business in itself: wealthier owners often lend carts to poorer men who make money transporting people and goods to market and crops from fields, the profits to be shared with the owner.

Indeed, the second thing to draw our attention is that poorer people hardly have cattle: if a household has a single cow, it is at least not among the Very Poor. There are countless farming villages where 100% of the cattle are owned by the Better-Off and Middle households. Ownership of cattle is far more skewed than ownership of land, but there is a relationship. There are costs to keeping cattle, especially assuring their feeding, and most especially in more densely settled areas where commons grazing is very limited. The more land you cultivate, the more fodder you get in the form of crop residues. But in addition you need to be in a position to buy fodder at critical times, usually grasses collected for sale by poorer people; and in many areas you need to be in a position to contract with a professional herder (very often from a neighbouring Fulani village) to take most of the cattle on grazing migration away from fields under cultivation. There is also the cost of acquiring cattle, and this may help to explain the very low ownership by poorer people. Their usual way of acquiring a cow (or heifer or ox), in the rather rare instances that they do, is to multiply first their flock of small stock, until they can sell enough to buy the cow. However, there are nearly always pressing calls for expenditure, and therefore pressures to sell a goat here, a sheep there, because there are no other savings. That is part of poverty, and it must get in the way of acquiring a cow.

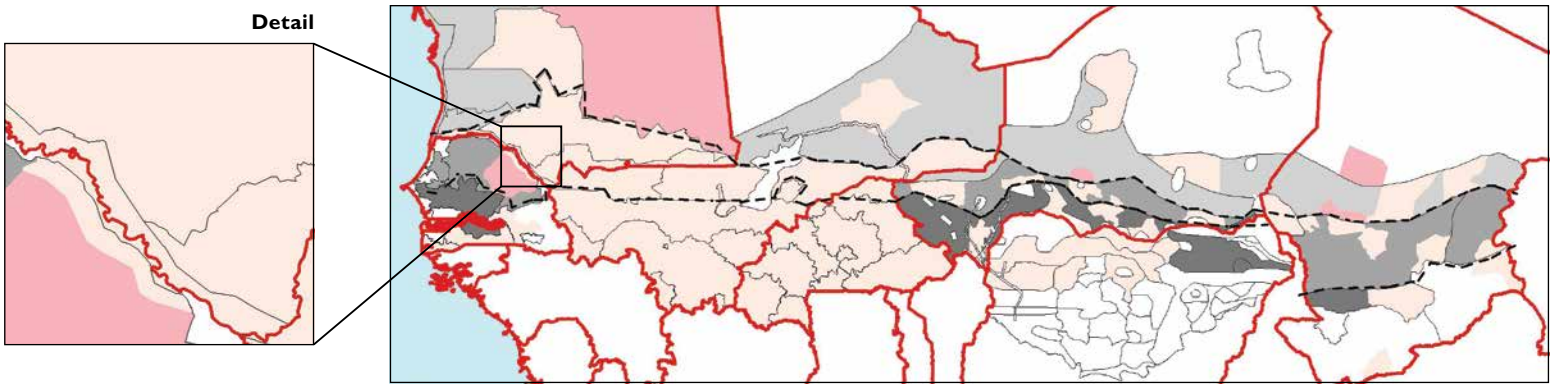
MAP 14: SHEEP AND GOAT OWNERSHIP

(SHEEP AND GOATS OWNED PER HOUSEHOLD)

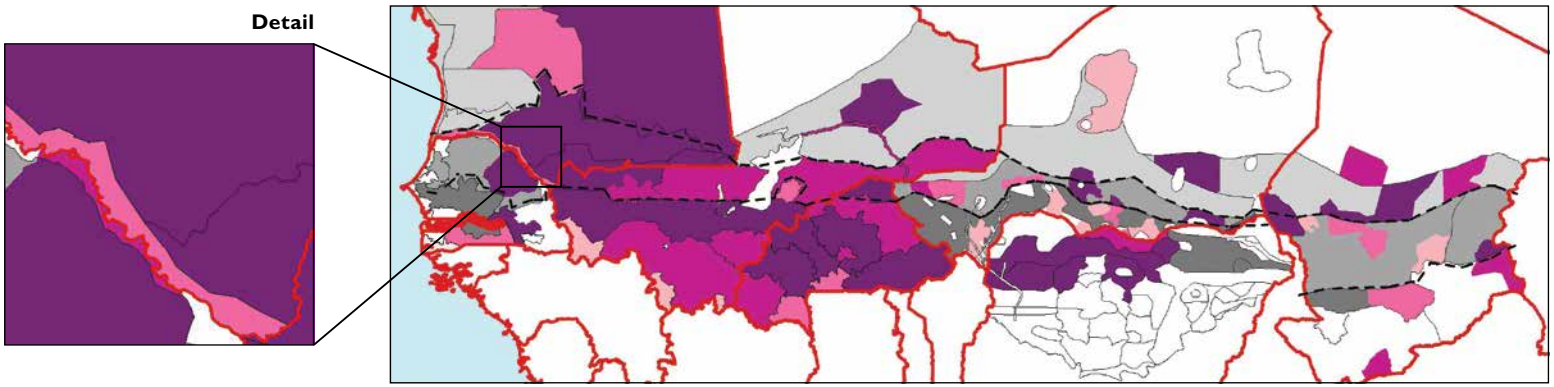
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

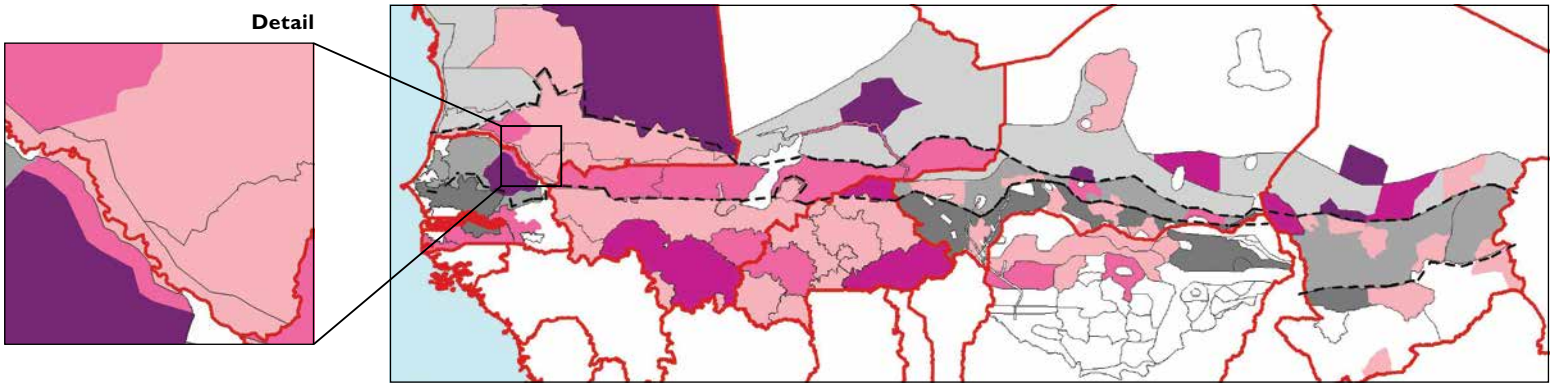
Sheep and goats owned per household

- 0
- 1–5
- 6–10
- 11–15
- >15

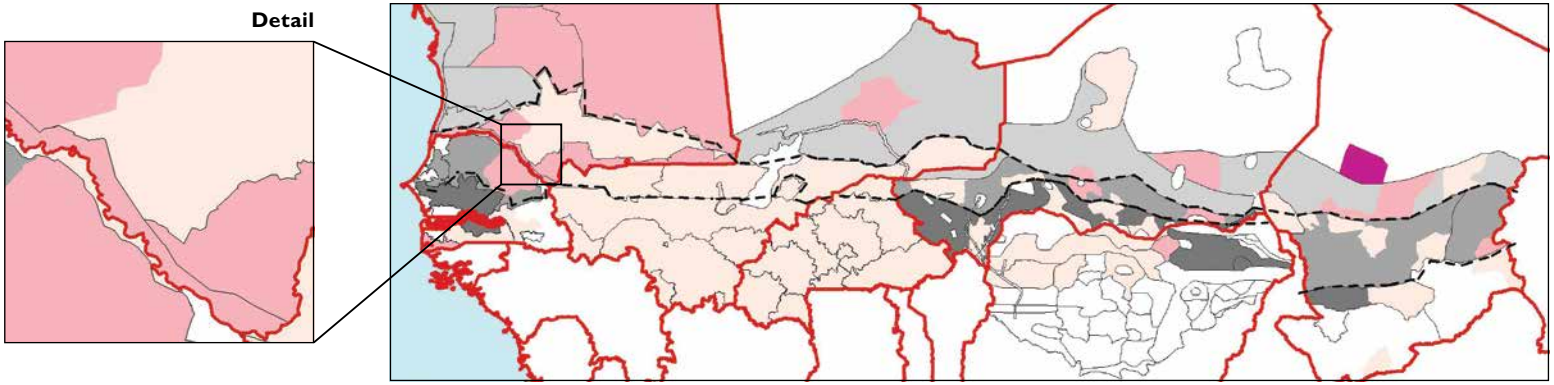
MAP 15: TOTAL LIVESTOCK OWNERSHIP

(TROPICAL LIVESTOCK UNITS OWNED PER HOUSEHOLD)

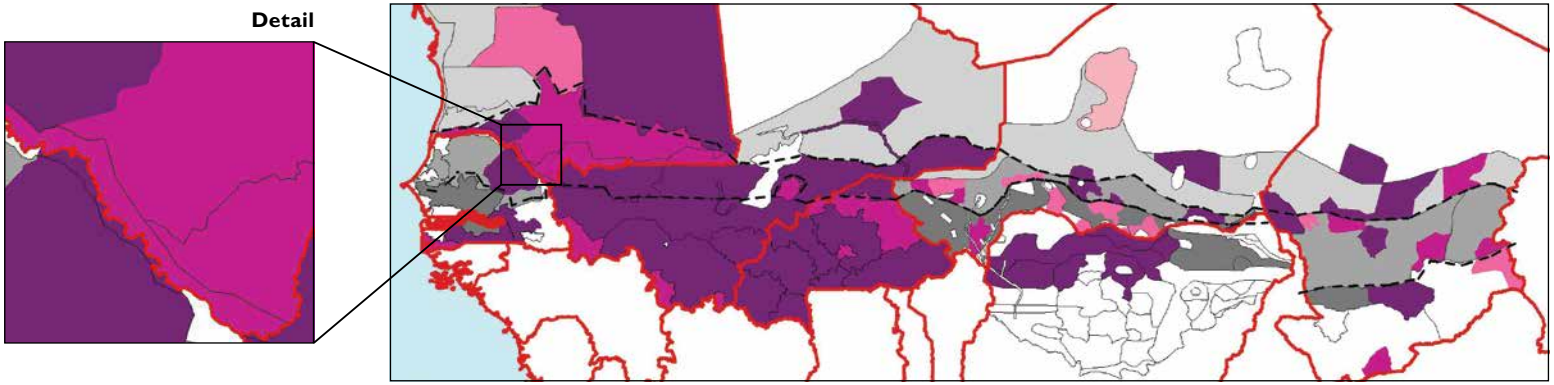
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

Tropical livestock units per household
(1 camel = 0.7 cattle = 0.1 sheep/goats)

- 0
- 1–5
- 6–10
- 11–15
- >15

MAP 14: SHEEP AND GOAT OWNERSHIP
MAP 15: TOTAL LIVESTOCK OWNERSHIP

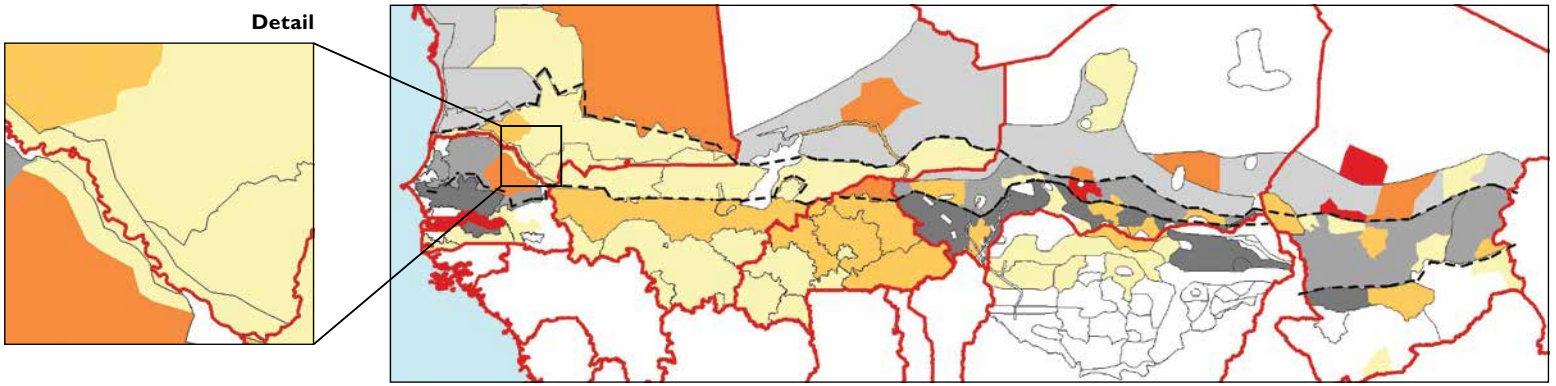
There is singularly little difference between these maps and Map 13 on cattle ownership, except where pastoralists own no or few cattle. The reason is simply that those who own cattle also own most of the sheep and goats, so that, again, ownership is highly skewed towards the Better-Off and Middle households, commonly to the tune of over 70% of the small stock in a village. But it costs far less effort or periodic cash for feed to keep small stock rather than cattle. Why should poorer people so rarely keep more than a handful? We cannot say for certain, but we may suppose the same reason just given under Map 13 in relation to cattle purchase. People attempt to keep a minimum of goats, including especially one or two breeding females, but there are frequent pressures to sell to cover essential expenditure, or more occasionally and happily, to slaughter for a festival.

PHOTO: OSCAR NARANJO/SAVE THE CHILDREN

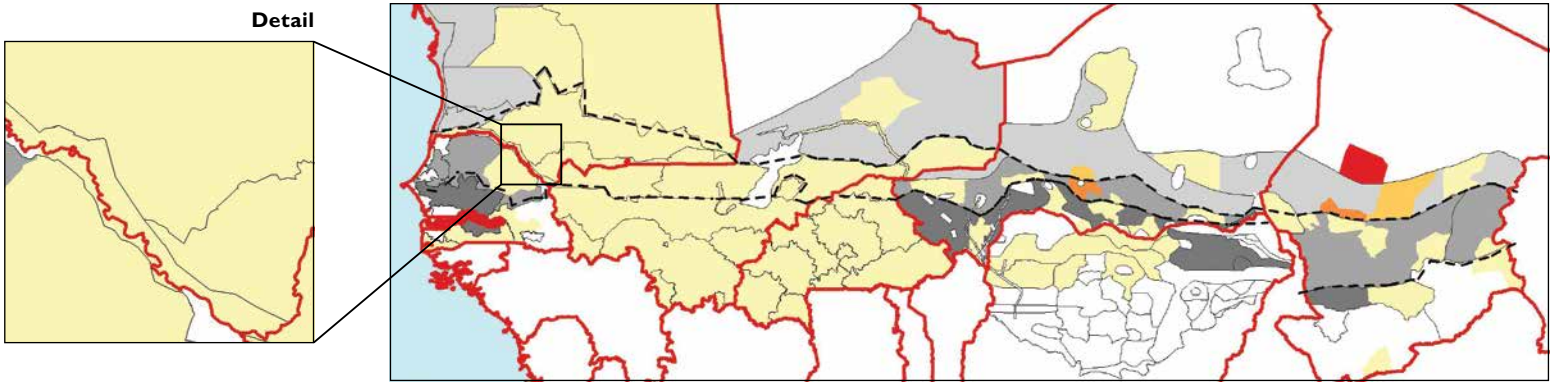
Two brothers lead their family's cattle to grazing before going to school, southern Mauritania

MAP 16: LIVESTOCK SALES AS A PERCENTAGE OF TOTAL CASH INCOME

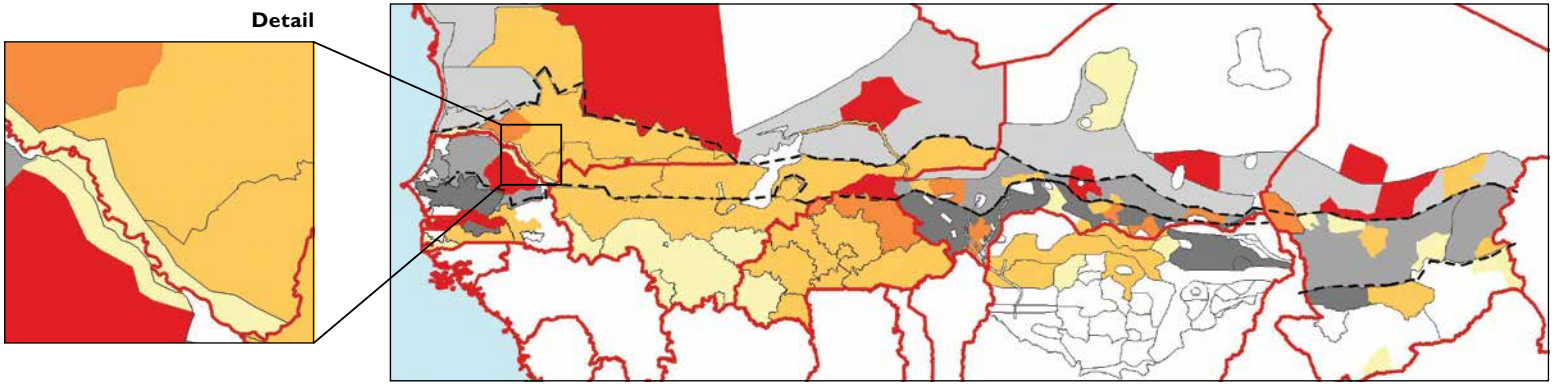
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

% total cash income

- **0–25**
- **26–50**
- **51–75**
- **76–100**

MAP 16: LIVESTOCK SALES AS A PERCENTAGE OF TOTAL CASH INCOME

We would expect pastoralists to stand out here – but not only because all, or almost all, of what they produce is livestock. It is because in modern times most of them receive by far the greater part of their sustenance not from milk and meat but from cereals, for which they must sell livestock. However, if we were to see only the map for the Very Poor, with one exception we would have no special impression of pastoralists. The reason is that poorer pastoralists tend to own remarkably few livestock, very far from enough to afford them a living. They principally work as herdsmen for wealthier pastoralists, for cash wages or payment in grain that their employers have purchased, and both the cash and the grain they receive emanate directly or indirectly from sale of livestock by these employers. The exception that stands out on the map is Salale (SAL) in northern Chad where even the Very Poor own as many as ten camels and some 17 small stock, which together are sufficient not only to afford them very nearly all of their cash income through sales (this is no pastoral salariat) which is in turn sufficient to cover their grain purchases. But their requirement for grain is actually diminished by the fact that they obtain some 30% of the food energy they consume in the form of milk, together with some meat. The Very Poor in pastoral groups elsewhere in the Sahel commonly consume less than 5% of calories in the form of milk and meat.

We would also expect agropastoralists to stand out a bit, and this is the case for the most part. Champions are in Dakoro (DKA) in central Niger and Moundjoura (MOU) in northern Chad, just south of Salale. For them, the *pastoral* in 'agropastoral' is definitely where the money lies. Yet this seems true also of at least one zone in the general rainfed agricultural band, the North and East Livestock and Cereals zone in north-east Burkina Faso ZME7 (indeed, it would not be too difficult to argue that they are, in fact, agropastoralists). On the other hand, the Transhumant Pastoralism, Oasis and Wadi zone (AOU) in Mauritania does not stand out in any of the three maps: the basis of the economy is emphatically the production of dates, not livestock.

But then we see areas of the overall agricultural zone (ie, south of the agropastoral line) in the Average map, and more so in the Better Off map (especially in Burkina Faso), where ordinary farmers obtain one-quarter to one-half of their total annual cash income from livestock. There are two matching reasons for this. One is the high value of livestock on the market, which has for decades been heavily influenced, if not dominated, by the demand for meat from the coastal countries to which livestock – cattle, goats and sheep – are trekked, and these days increasingly trucked, in their hundreds of thousands every year. In addition, in recent years the growth of the urban sector in Sahel countries has increased the local demand for meat. But a less positive reason for the remarkably substantial proportion of livestock earnings in the total income in some areas is that they produce few surplus crops for sale. Many Better-Off farmers, and most Middle wealth farmers, are not substantial herd owners, but the sale of even one or two mature cattle and a few small stock may exceed their earnings from crops and rival their earnings from all other sources put together.

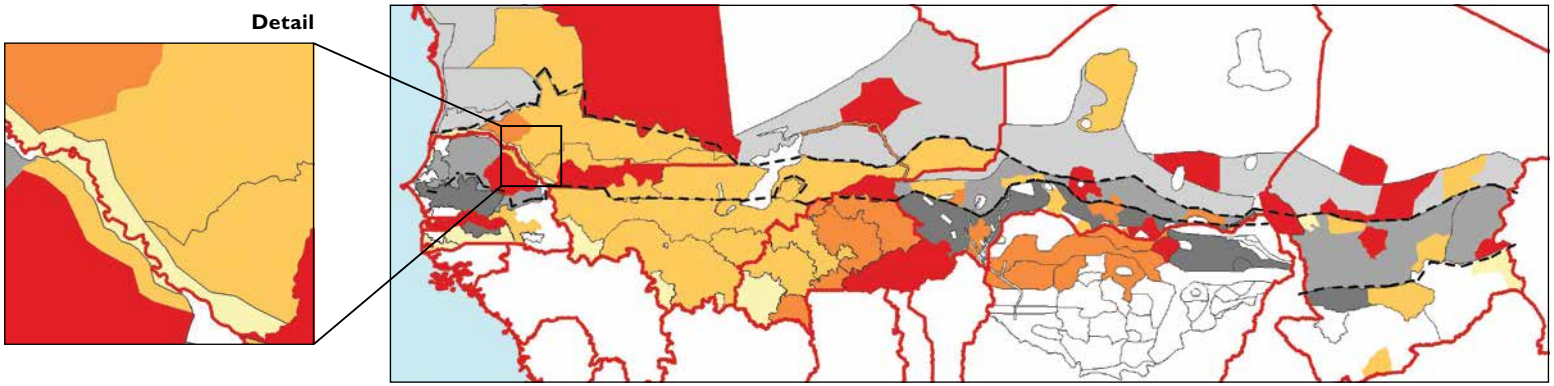
We come back to the map for the Very Poor. Whether pastoralists, agropastoralists or farmers, they do not seem to make much money from livestock. Yet for a poor farmer, the possession of just a handful of goats and sheep, and indeed poultry, is significant. There are plenty of places where their sale of livestock rivals their earnings from crops (even if by far the bulk of their earnings comes from neither of these but rather from paid labour and sales of firewood or mud-bricks, etc) – and this is even more so in agropastoral zones. And in times of adversity, whether through a family misfortune or because of a season of poor crop production, and therefore also of reduced agricultural employment, one important crutch they have to lean on is the sale of a few small stock.

Given the high value of livestock for their owners, whether wealthy or poor, and their importance to national economies, it seems wrong that government and agency investment in the sector – in veterinary provision, watering infrastructure, development of the fodder market, etc – is usually so very much smaller than investment in agriculture.

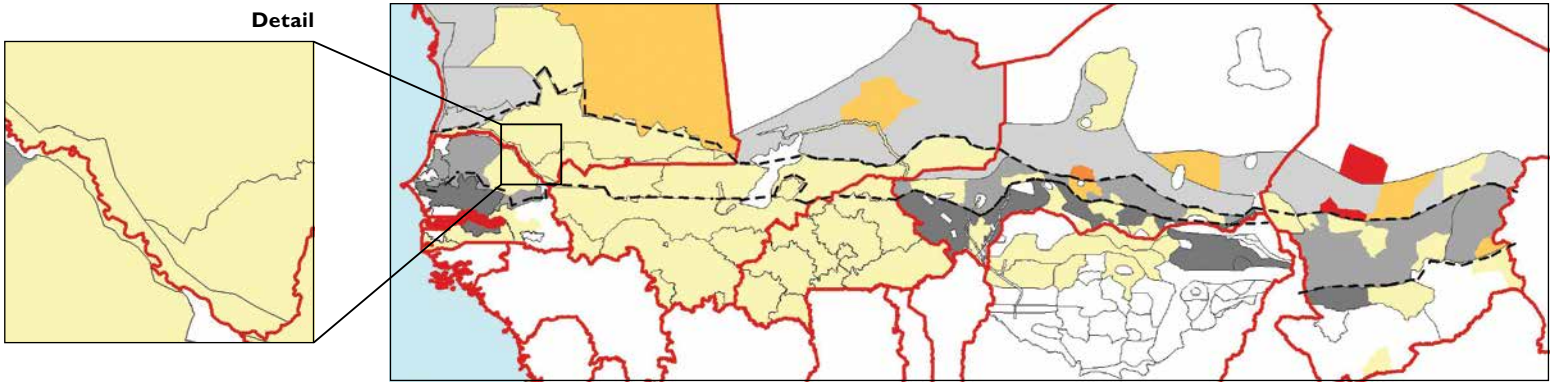
MAP 17: TOTAL INCOME FROM LIVESTOCK (FOOD + CASH)

(% 2,100 KCALS PER PERSON PER DAY)

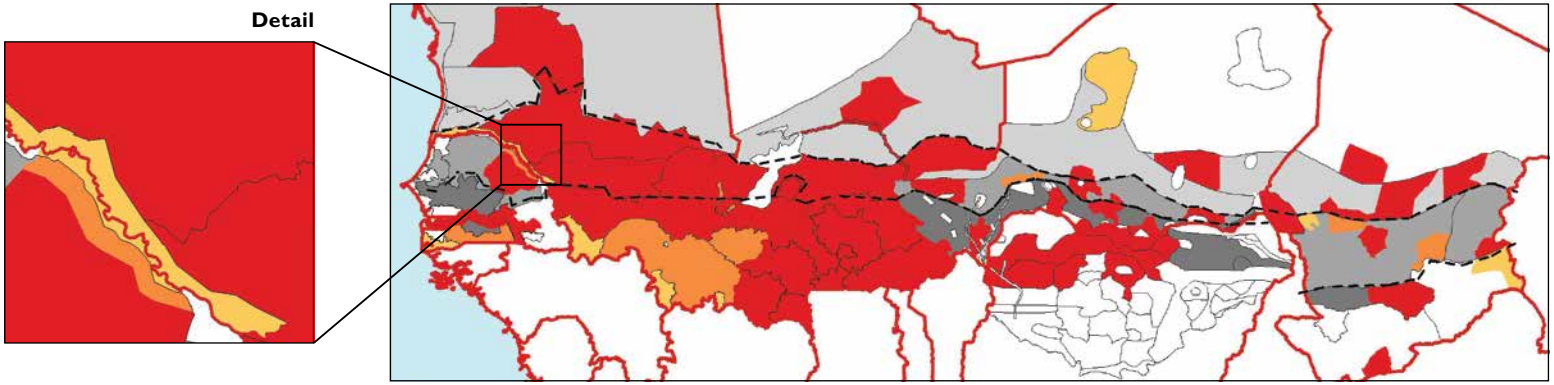
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

% kcals

- **0–25**
- **26–50**
- **51–75**
- **76–100**

MAP 17: TOTAL INCOME FROM LIVESTOCK (FOOD + CASH)

'Food plus cash' essentially means milk plus cash, since slaughtering animals for meat is not taken lightly even by wealthy pastoralists, and meat contributes very little even to *their* calorie intake. For instance, in Tarkhint (TAR) in north-east Mali a Better-Off household of 18 people will typically slaughter no camels and not more than one head of cattle in a year, to be shared with guests for a festival or other big occasion, and otherwise about eight sheep and goats, again mainly for festivals or other occasions.

The poorer households in Tarkhint, as in other pastoral populations, possess no camels or cattle, but around 20 small stock and a couple of donkeys. These are not enough to provide for more than half of their total income, the rest coming mostly from cash from working as herders for wealthier stock-owners. But there are two zones, in northern Chad, where we find a remarkable exception to this rule: the Moundjoura agropastoral zone (MOU), and the Salale pastoral zone (SAL), already highlighted in discussion of the previous map. In Moundjoura even a Very Poor household typically not only cultivates about 1 hectare of land but owns a camel, three cattle, 15 small stock and a couple of donkeys. In terms of wealth, and as we see total income, this puts them far above Very Poor households almost everywhere else – except Salale. Here, as we have seen, a Very Poor household typically possesses around ten camels (Poor households 18 camels), 17 small stock and a donkey. Very exceptionally, in both of these zones, the Very Poor do not need to work for others but make nearly all of their money from selling their own livestock; in addition, in Salale the Very Poor obtain around 30% of their calories from the milk of their own camels, a level of consumption not seen even among the Better Off in most other pastoral zones.

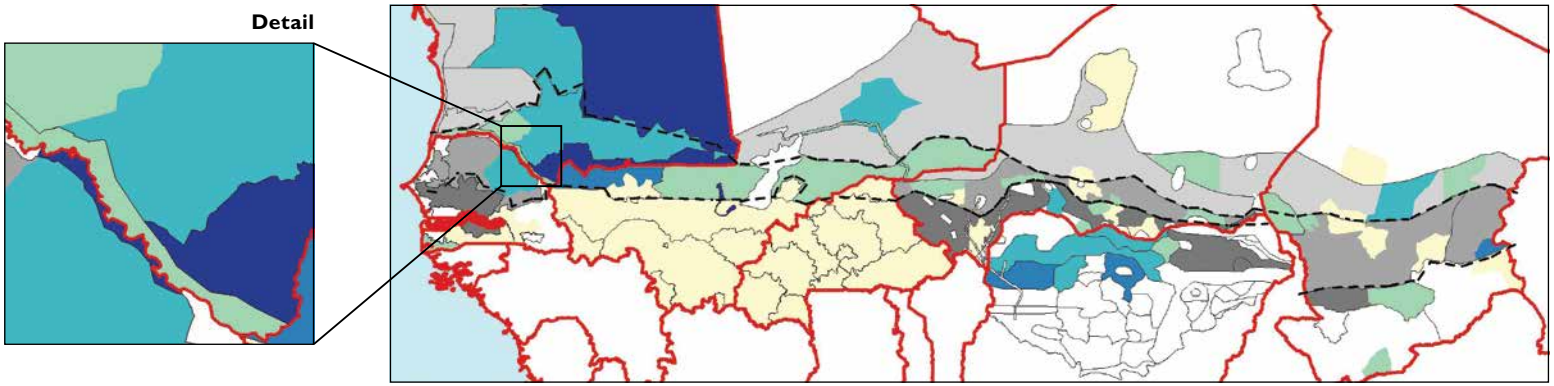
But it seems that these exceptions cannot be models to which other herding communities might aspire. Those have long been confronted with a reducing trend in livestock per capita, because quite apart from episodes of drought the available pastures cannot support increases in livestock numbers to match increases in the human population. As a result, as also touched upon in comments on the previous map, over generations pastoralists have generally lived less and less by milk and more and more by selling livestock and purchasing grain. Their great advantage has been the burgeoning city populations in West Africa, especially in the southern and coastal regions, whose demand for meat has added much value to livestock at source, given also the developments in roads and truck transport.

But setting aside the few pastoral zones that have HEA baselines in the Sahel, the main message of this map lies in the contrast between the almost unvaried expanse of light yellow in the middle map and the expanse of deep red in the Better Off map. We highlighted this in Map 15, namely an acute division between the poorer and wealthier halves of rural populations in terms of livestock ownership. But the significant point is not only that in the huge majority of zones, agropastoral as well as agricultural, the Very Poor (mostly closely shadowed by the Poor) do not own enough livestock to give them more than 25% of their total income (food plus cash). It is that in these same zones livestock give the Better Off more than 75% of their total income, nearly all in cash since milk consumption is generally quite limited, even among the Better Off. This is a remarkable finding that must have implications for policy-makers deciding on the relative investment of funding in agricultural and livestock sectors. Such decisions are complex, but this evidence at least shows that investment in livestock development should not be just a baby brother to investment in agriculture.

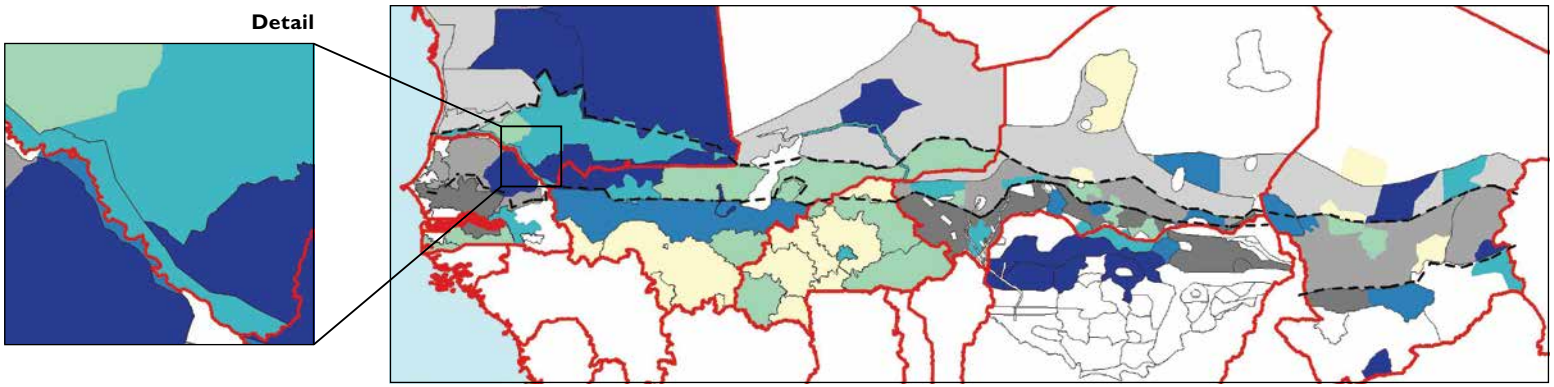
MAP 18: CASH INCOME FROM LOCAL LABOUR

(US$ PER PERSON PER YEAR)

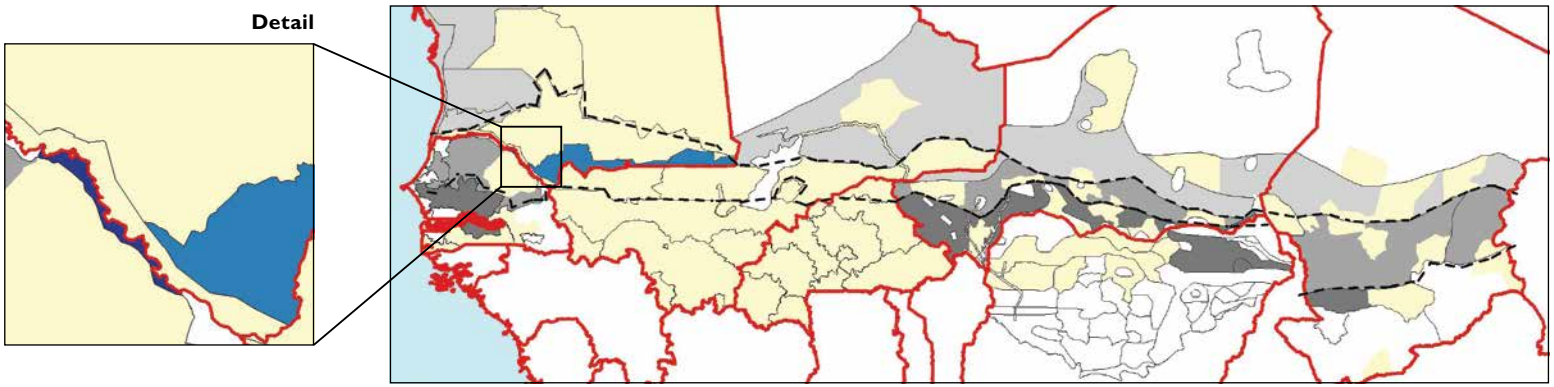
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

US$ per person per year

- 1–10
- 11–20
- 21–30
- 31–40
- >40

MAP 18: CASH INCOME FROM LOCAL LABOUR

'Local labour' mostly means daily paid employment on the smallholdings of wealthier local farmers, or work as a contracted herdsmen in a pastoral group. This type of work is essentially engaged in by members of Very Poor and Poor households, and is generally one of their most important sources of cash. Better-Off fellow-farmers are their main employers, and the lower detailed map attests to the fact that it is rare to see a member of a Better-Off household employed as a daily worker or paid herdsman; it is also at least uncommon for Middle households, who tend to be employers rather than casual workers.

It is interesting that two types of zones are heavily represented in terms of higher labour earnings: pastoral and agropastoral. There is no single explanation for this, but the chief elements are the amount of local employment undertaken by a household and the local wage level. Let us take the variations for the Very Poor in zones in a single country, Mali. In pastoral Tarkhint (TAR) the Very Poor (and Poor) depend very highly on local employment in terms of the proportion of these earnings in their overall income. The reason is that although they are living in pastoralist communities they own remarkably few livestock, as we have noted above, and in these isolated localities they are dependent on wealthier people not only to lend them extra livestock but to employ them, principally as herdsmen. The contracts are generally arranged on a monthly payment basis, and since herders care for the livestock every day, we may calculate that if they are paid on average 11,500 fcfa[4] per month (taking into account extra payment for droving the herd seasonally on far-grazing migration), this works out at 400 fcfa per day. This is usually a year-round, guaranteed job, and also includes some payment in-kind, and so their earnings from local labour are comparatively high. On the other hand, their dependence on the patronage of a single employer makes them extremely vulnerable to rain and pasture failure that may drastically reduce not only their own small flock but also the herd of their employer, who in turn may be constrained to end the contract and get the work done by a family member.

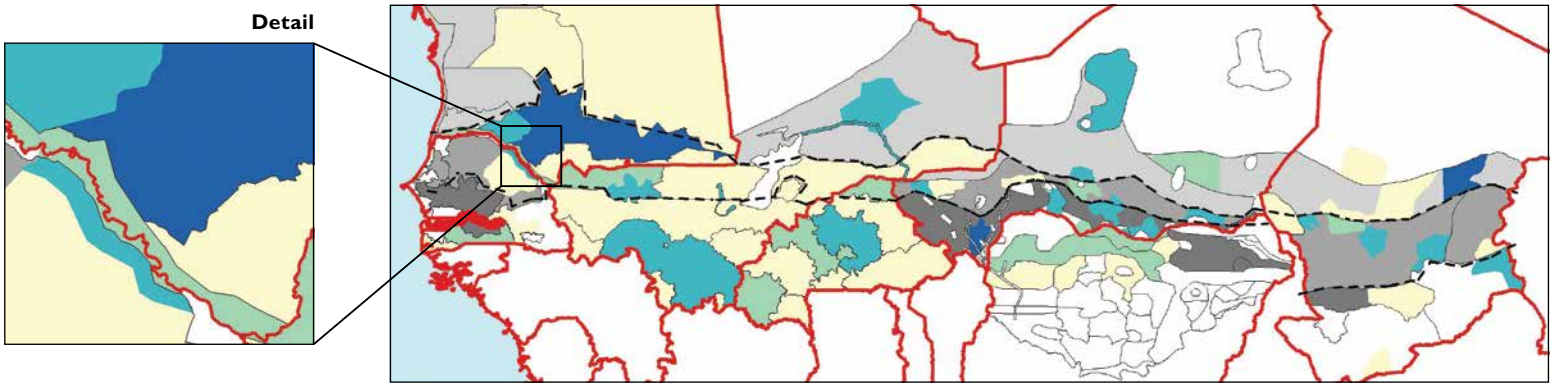
Moving to a contrasting scene, in the irrigated rice zone of Niono (NIO), to all intents and purposes a cash-crop area, the work is seasonal but the wages are far higher than in Tarkhint, reflecting not only the labour-intensive production system, and therefore the high demand for labour, but also the value of the crop. Daily wages are commonly 2,000 fcfa, rising to 4,000 fcfa at the critical harvest time. Local labour earnings are therefore again a large proportion of the income of the Very Poor. Another contrast: in the productive, rainfed cereals and cotton-based Yorosso zone (YOR) in the south, daily wages are comparatively low at 500 fcfa. We might presume that this is at least partly a function of high labour availability in this densely populated area. But in fact seasonal migrant labour from further north may be a factor, because the local Very Poor depend far less on this work, having their own cash crop production, self-employment and sale of collected wild foods, etc. Finally, in the Yelimane sorghum, herding and remittances zone (YEL), we find high daily wages again, around 1,500 fcfa. A strong dependence on remittances (by the wealthier half of the population) tends to drive up the overall cost of living in the area, as seen also further downstream on the Senegal river in Senegal in the Matam Walo zone MTW. People living on remittances, even if these are not very generous amounts, are prone to employ others for all tasks from tilling and herding to domestic work and construction. Whatever the push-pull factors, it seems that high wages are a feature. From all their activities, the Very Poor in Yelimane earn over six times more cash per year than the Very Poor in Yorosso.

[4] US$23 at the exchange rate of 500 fcfa to US$1.

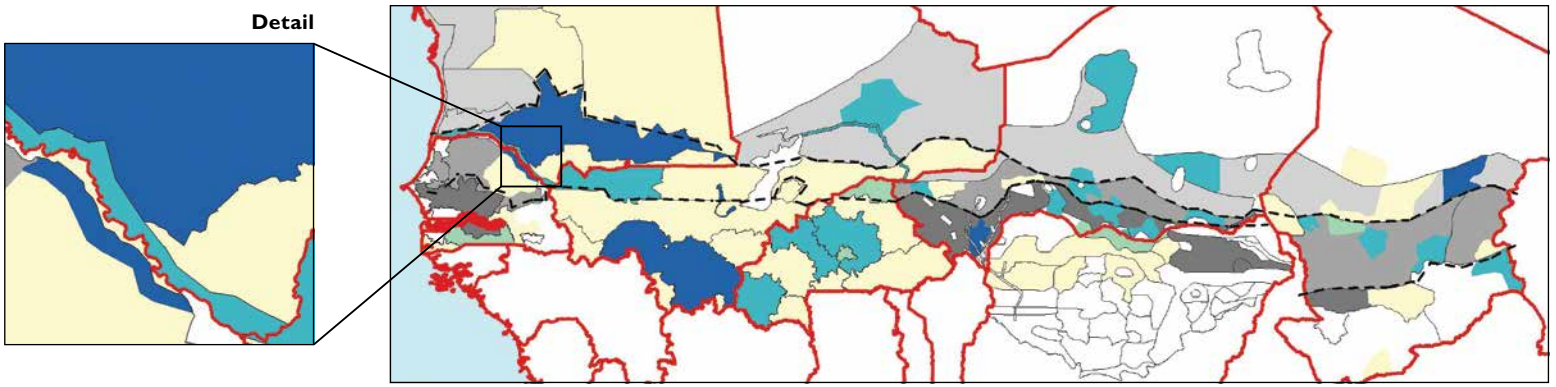
MAP 19: DURATION OF LABOUR MIGRATION

(NUMBER OF MONTHS PER YEAR)

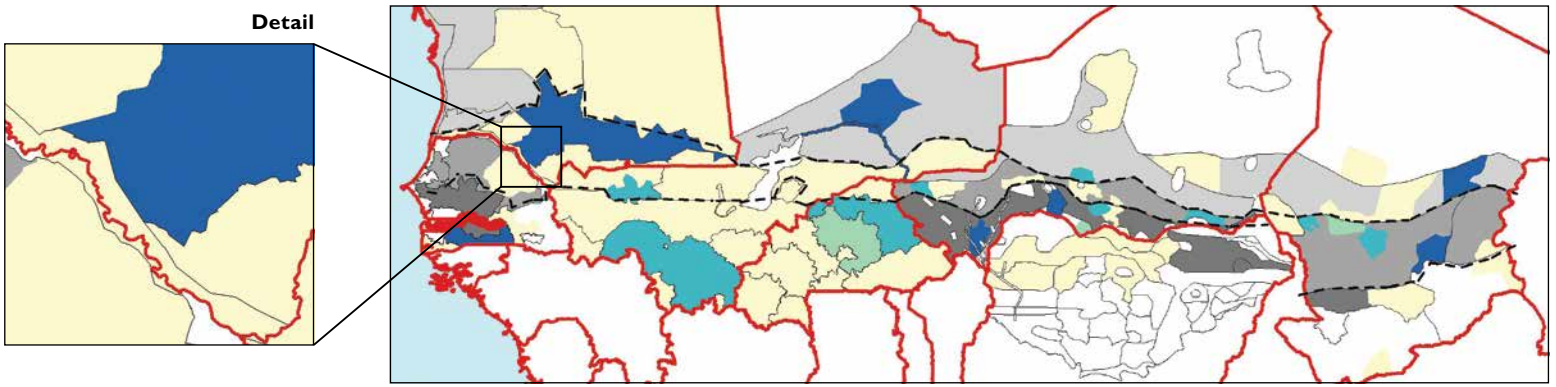
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

Number of months' migrant labour per year

- 0
- 1–2
- 3–4
- 5–6

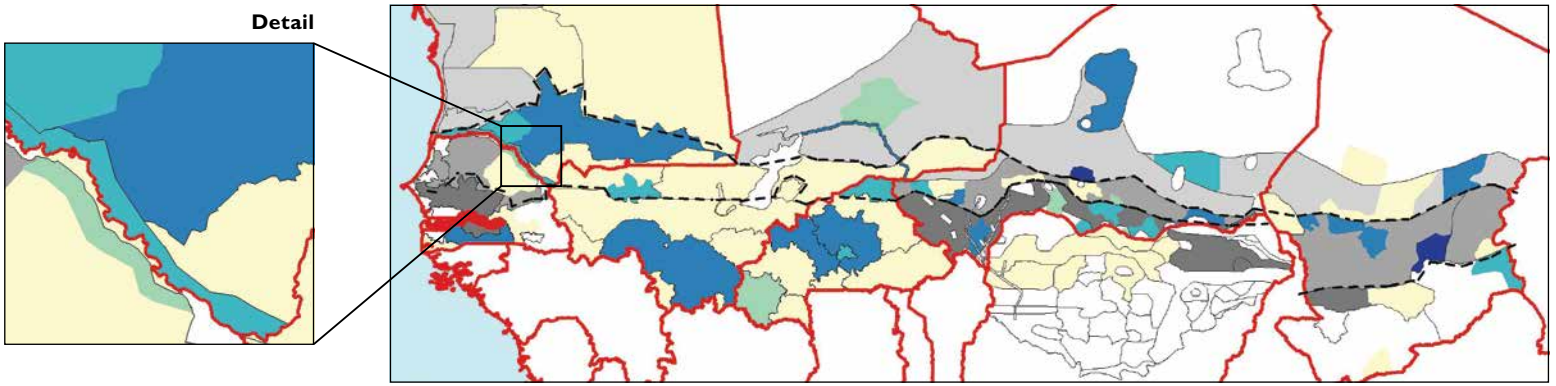
MAP 19: DURATION OF LABOUR MIGRATION

Migrating seasonally for work is a way for people to make use of the wider national or regional economy; those migrating tend to be people from poorer areas, or poorer people with very constrained livelihoods anywhere, or people facing a local production failure. The migration may be for harvest work in a neighbouring zone (especially on cash crops), or casual work in one of the country's bigger cities (eg, market porterage, water carrying, construction work, street hawking). Or it may be for any such activity far inside a neighbouring country, usually to the south, but for northern pastoralists and agropastoralists sometimes north into Algeria and Libya.

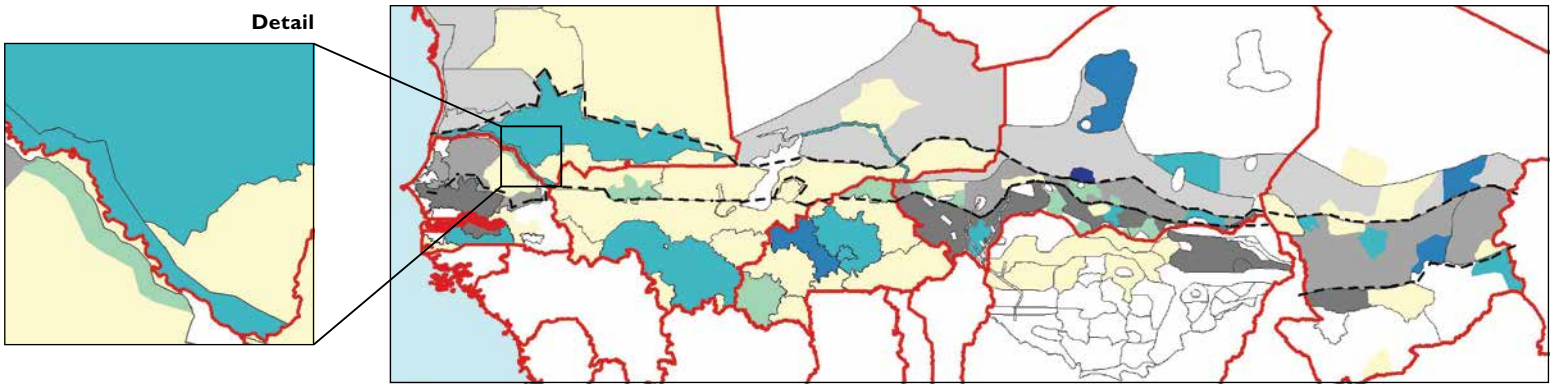
The migration period may last from three weeks to six months. As discussed below in relation to the contribution of work migration to total labour income, we may discern some northern bias in the longer duration of the migration. But this is not a strong pattern, and one cannot easily pinpoint a single main reason for the varying lengths of time. In some cases, it will simply reflect the relative need for maximising earnings; in others, it may reflect the type of work, eg, the difference between casual work and engagement for an agricultural season. But it does not necessarily reflect what may seem the most obvious reason, namely the distance travelled by migrants. This may well be the case for people travelling from the Aïr mountains zone (ACM) in north Niger or from the Tarkhint (TAR) in north-east Mali. But it is not the case, for instance, in the Brakna (BRA) in the agropastoral area of Mauritania that shows up so clearly in all three maps for long duration of work migration. Here, workers typically travel to local urban centres, including on the Senegal river, or to the capital, Nouakchott. The prompt is rather the need for this employment because of the few rural work opportunities within the zone itself.

MAP 20: PERCENTAGE OF TOTAL LABOUR INCOME FROM MIGRANT LABOUR

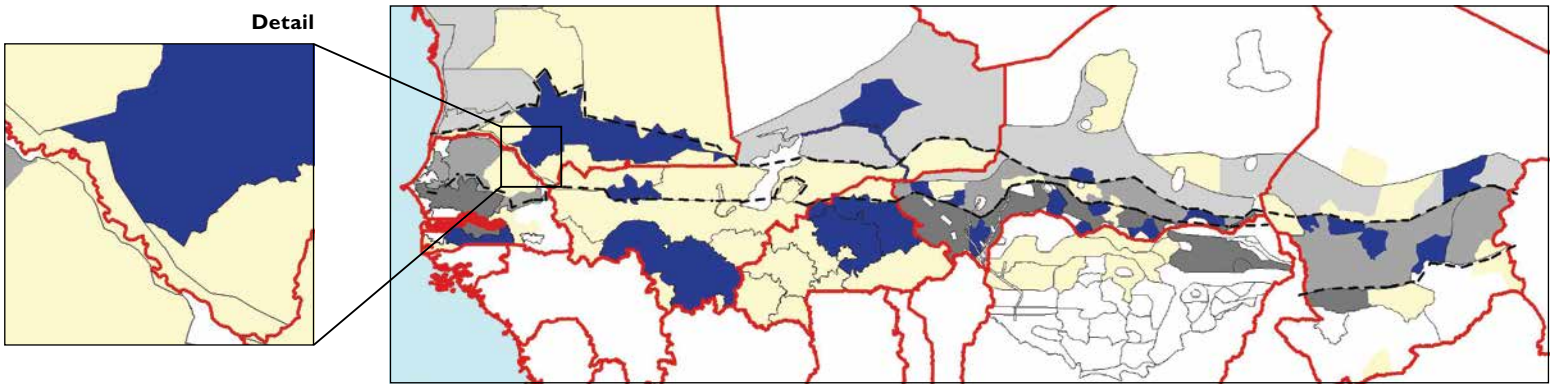
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

Migrant labour as a % of total labour

- 0–20
- 21–40
- 41–60
- 61–80
- >81

MAP 20: PERCENTAGE OF TOTAL LABOUR INCOME FROM MIGRANT LABOUR

It is typically, but not exclusively, younger men who migrate. They may have something of a guarantee of work with an employer whom they visit every year; or it may be much more of a gamble, seeking work in an area where they simply have a contact via a fellow migrant, or no local introduction at all. Again, they may earn enough to send or bring home some cash savings, or one or two sacks of grain from substantially cheaper markets than at home, or they may obtain some second-hand clothes or small electronic items to sell at home at a profit. Or they may earn only enough to pay for their transport (often undertaken with credit) and for their food and lodging on migration. A minority may fail to earn anything at all and return only with debts. Temporary migration of this sort is not without its hardships and risks, both physical (including medical) and social (they may be treated almost like lower-caste members). But for many poorer households migration represents an essential contribution to just making ends meet. It is a sign of the very thin margins on which the poor operate that in the HEA methodology the absence of a single household member even for a few weeks must be carefully accounted as a reduction in the household's annual food requirement.

We have so far talked of poorer migrants. But at first sight the map of the Better Off suggests it is they who have most interest in labour migration. This is deceptive. We have noted that it is very rare for wealthier people to engage in local casual work: therefore, any migrant earnings are automatically a high percentage, mostly 100%, of their total income from paid work. Furthermore, 'paid work/labour' is generally a misnomer for what they do. Typically, young men from these households leave with enough capital for petty trading or other light commercial activities, sometimes with the express intention of buying substantial amounts of clothing or other items to sell at home. One even hears it described in villages as a learning experience or adventure for them, if not a sort of rite of passage.

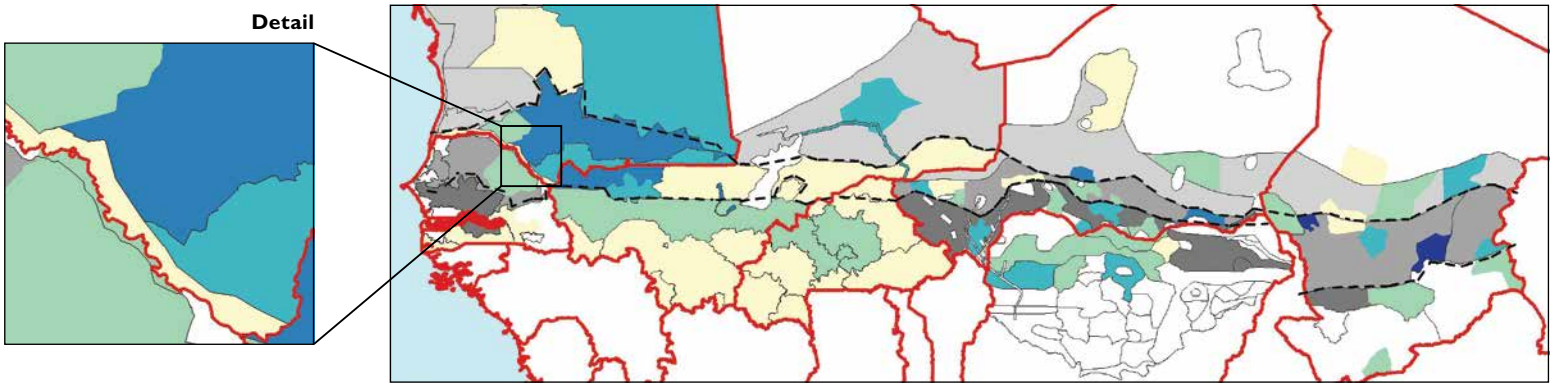
As to the overall patterns on the maps, we see something of a northern emphasis, because more people migrate from areas where there are few local employment opportunities and little scope for profitable, temporary commercial activity. For the implicated zones further south it is tempting to point to the proximity of the Nigerian economy for villagers in southern Niger, or the Ivoirian economy for southern Malians, but this is not a consistent picture. The large area in the centre of Burkina Faso, especially the Central Plateau zone (ZME5), is relatively productive and commercially active, but also particularly densely populated, which may be a clue as to why there is emphasis here on work migration.

Three nearly proximate areas in western Niger (Tahoua – TLP, Tondiwiki – TON, Ouallam – OUA) are known for the villagers' high propensity to migrate for work. Although it is said to be part of their history and culture, it is surely no coincidence that these are areas also known for poor production conditions and food insecurity. And although the map suggests that they earn rather less than migrants elsewhere, to obtain 21–40% of their income from migration is very significant, considering the large number of poorer people involved. In Niger again, there is a remarkable case of women rather than men migrating. This is among the M'Bororo cattle pastoralists of Dakoro (DPB), where the main yearly work migration involves women more than men, usually in groups (including many wives and mothers), who travel west to Dakar/Thiès in Senegal on a more than 3,000 kilometre round trip. Their particular cachet is their skill in traditional medicine, which is much prized.

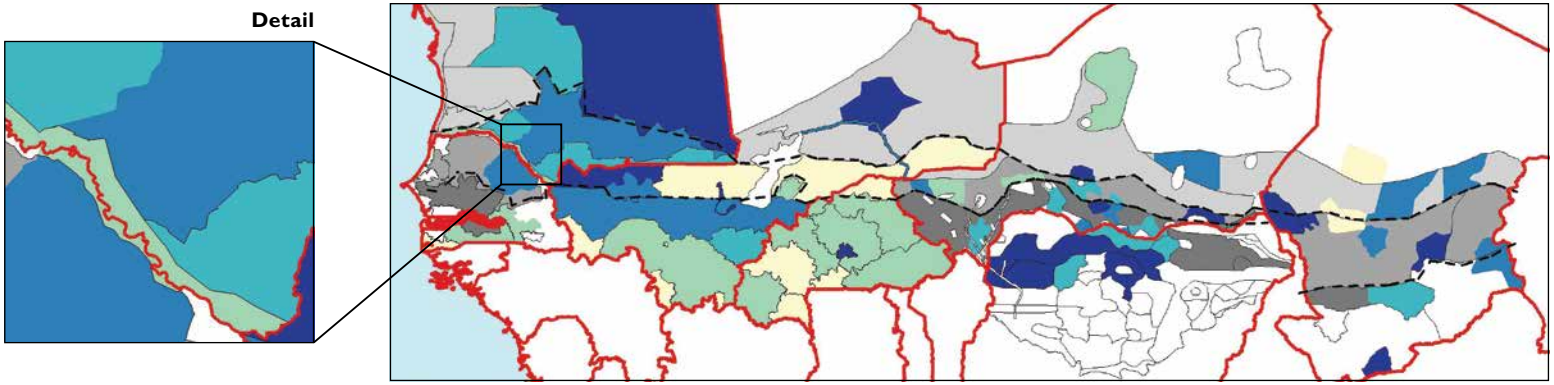
MAP 21: TOTAL INCOME FROM LABOUR (FOOD + CASH)

(% 2,100 KCALS PER PERSON PER DAY)

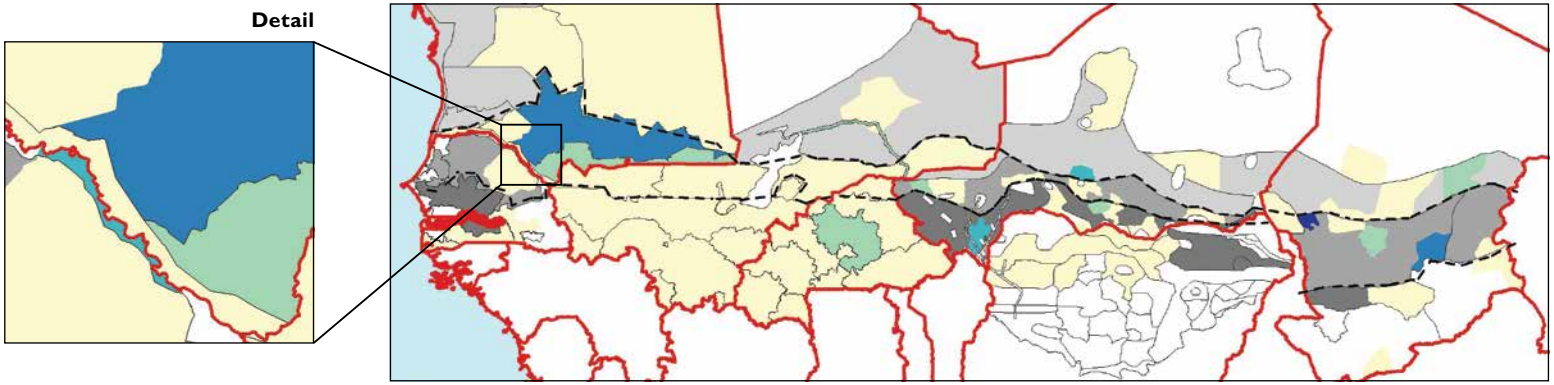
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

% kcals

- 0–20
- 21–40
- 41–60
- 61–80
- >81

MAP 21: TOTAL INCOME FROM LABOUR (FOOD + CASH)[5]

The map details show that in-kind payment is combined with local and migrant labour earnings (including food 'savings' from migration, as described for Map 20). There appears to be no substantial difference from the local labour maps in Map 18, emphasising the greater importance overall of local earnings as compared to migrant earnings.

PHOTO: JONATHAN HYAMS/SAVE THE CHILDREN

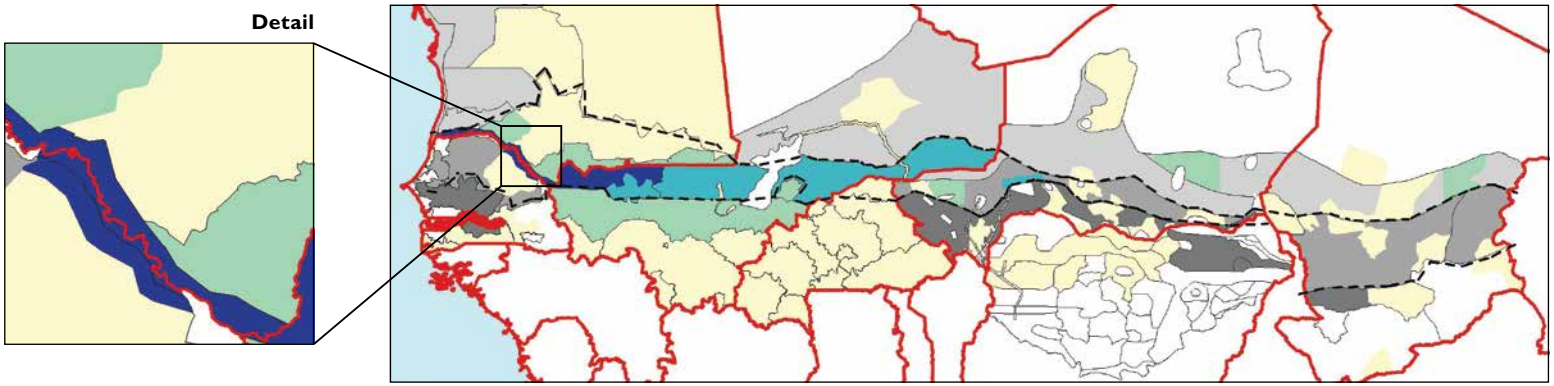
A man selling kola nuts in Ouwala village, Maradi, Niger

[5] See Map 12 for an explanation of 'Total Income'.

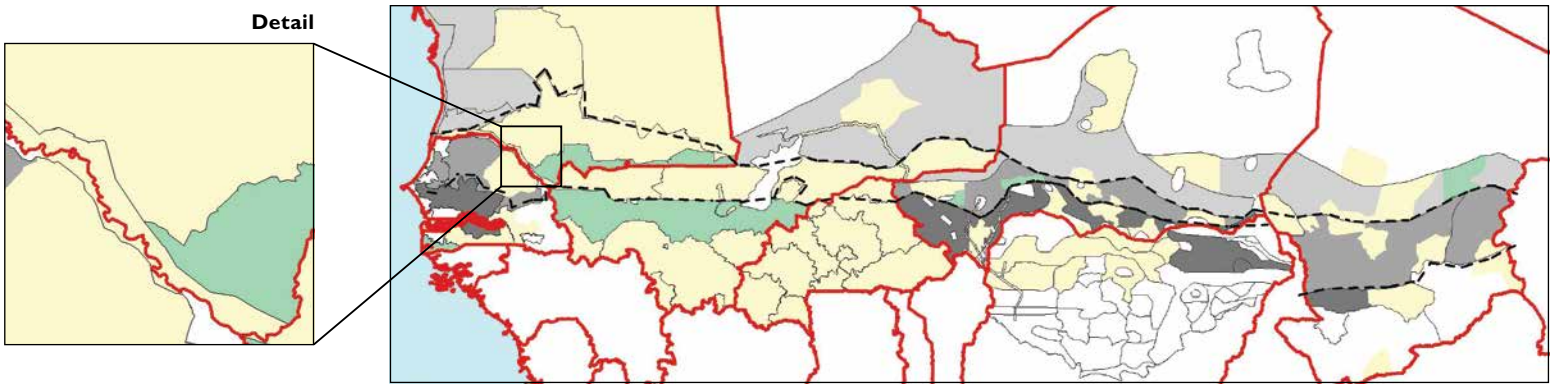
MAP 22: REMITTANCES

(US$ PER PERSON PER YEAR)

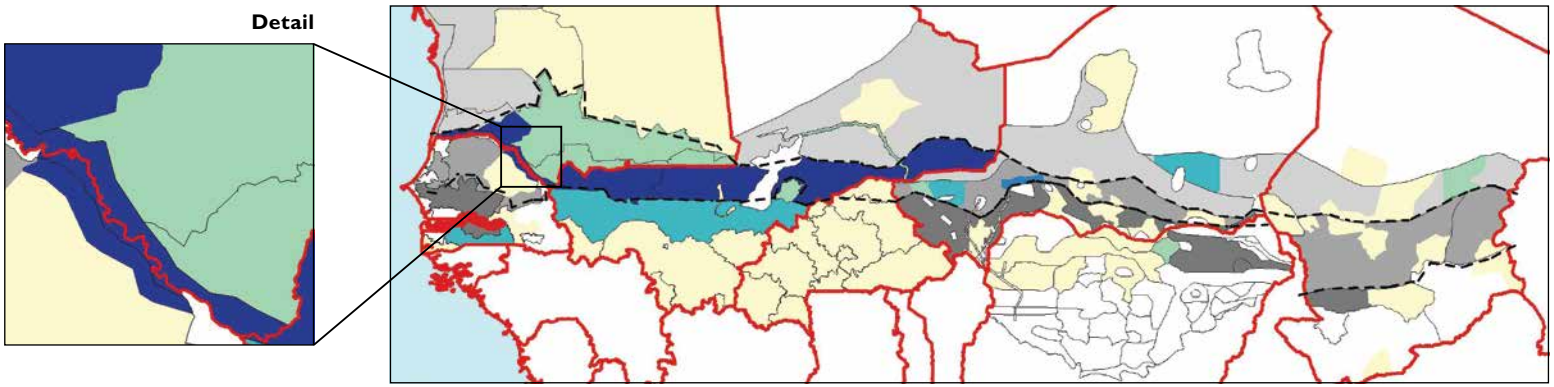
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

US$ per person per year

- 0–15
- 16–30
- 31–45
- 46–60
- >60

MAP 22: REMITTANCES

We have seen in Maps 19 and 20 on migrant labour that Sahelians operate in a much wider economic geography than only their own zones, and this is also true in a different way for pastoralists – who may cover enormous distances on seasonal grazing migration, often crossing into neighbouring countries. But in yet another way, remittances might be seen as an example of the use of the widest geography. Remittances are cash transfers made, with greater or lesser regularity, to the village households by family members residing and working long term elsewhere. 'Elsewhere' may be in the country's capital, or in West African coastal countries, or in the cities of Libya and Algeria. But the major example we see on the map is of people in zones in the vicinity of the Senegal river in Mali, Mauritania and Senegal. There is a long tradition among these people of migration to Europe, especially to France, where men stay and work for years, even decades, before returning to their home country, often to retire – to a home built, and a family long maintained, by remittances.

Other zones where remittances are sufficient to bring colour to the map are the Dogon Plateau in Mali (BAN), three in agropastoral west Niger (TLP, TON, OUA, TAP) where seasonal work migration is also a particular feature, and in the Brakna part (BRA) of the agropastoral zone in Mauritania.

There are two general observations to be made. First, remittances are a minor phenomenon overall in the Sahel. This is perhaps surprising, given the millions of Sahelians who have settled in the coastal cities of West Africa. It suggests that the great majority of such migrants do not earn more than they need just to maintain their own households where they are living. Also, remittances are markedly associated with wealthier households. There may be a chicken-and-egg question here: do wealthier households tend to be the ones whose members do best on long-term migration because they have the means and the contacts and/or because they can pay for the secondary or higher education that gives a migrant more advantages (even if they end up doing menial jobs in Paris)? Or, alternatively, are these households wealthy precisely because they have received remittances?

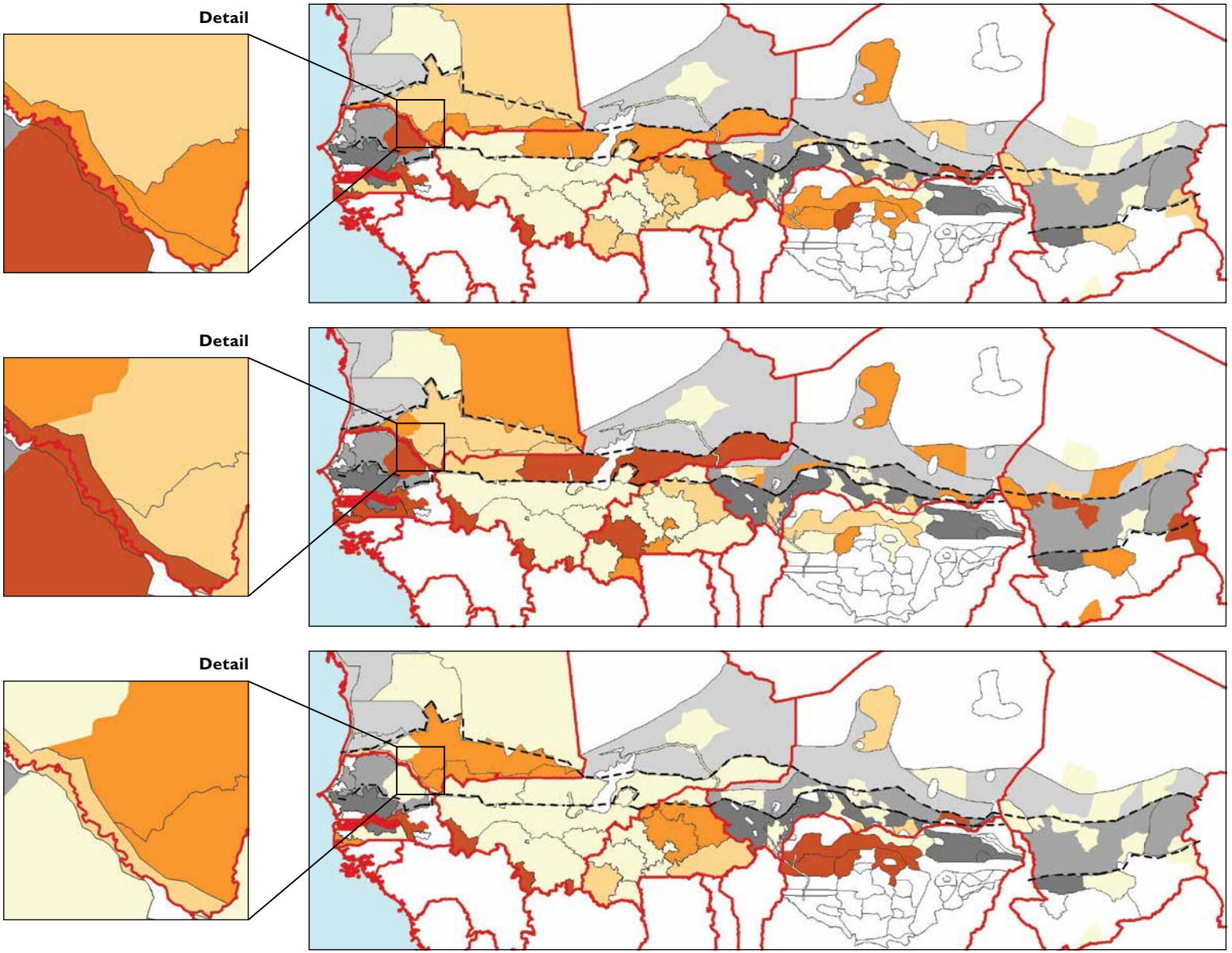
MAP 23: CASH INCOME FROM SELF-EMPLOYMENT

(US$ PER PERSON PER YEAR)

AVERAGE HOUSEHOLDS

VERY POOR HOUSEHOLDS

BETTER-OFF HOUSEHOLDS



LEGEND

US$ per person per year

- 0–15
- 16–30
- 31–45
- >45

MAP 23: CASH INCOME FROM SELF-EMPLOYMENT

If local agricultural or other daily employment is usually the biggest single source of cash earnings for poorer people, it is often followed closely by self-employment. Poorer people need to find as many ways as possible to make the best of their capacity to work. They look beyond the fields to any opportunity they can seize, and the following account of such activities testifies to their sheer busyness and enterprise.

By far the most common activity is cutting and selling firewood, or converting it to charcoal for sale. There is demand for firewood and charcoal in both rural and urban areas, but it is the expanding urban market that seems to drive the business most. Piles of firewood and bags of charcoal are sold at rural markets, but more, perhaps, are sold by the roadside to truck drivers who may retail it at higher prices in town, or, like car-driving purchasers, use it at home. This allows rural people quite distant from main towns to trade there indirectly. The problem is getting your product to the roadside if you are cutting wood far away from the few main routes, and indeed this must limit the local geography of wood cutting. A good number of rural wood sellers take their product straight into cities by donkey cart or ox cart, travelling as much as a day and a night to get there. But it is of concern that ever-greater market demand, and therefore ever more wood-cutting, will progressively outstrip nature's capacity to regenerate the supply, despite legal restrictions to cutting on the one hand (often ignored) and some reforestation projects on the other.

Wood is one 'free' resource offered by nature (although at the price of some labour). Depending on the ecology, other cut or collected items are: fodder grasses, basketry reeds and bamboo. Among wild foods and products are: baobab leaves and fruit (insofar as they are sold as well as consumed at home), other edible leaves, shea-nuts (karité), locust-bean (néré), jujube, tamarind, mangoes, gum arabic, and wild fonio (very small grains of the *Digitaria* genus collected in the northern sahelian areas). In certain localities there is natron salt to cut out and sell as salt lick for livestock. There is river and lake fishing, and fish drying and smoking. At the secondary level of processing, men make mud-bricks, women and men make various handicrafts (reed mats and baskets, rope-making), and women hull grain and process groundnuts for oil and cake. Then there are skilled minority occupations: pottery, tanning, dying, cotton-spinning and weaving, hair braiding, embroidering, carpentry for beds and chairs, etc, as well as specialist skills such as well-digging and, in certain localities, village-level bread baking. At the weekly markets we see still more activities: transport (from ordinary fetching and carrying to oxcart services), women frying and selling donuts (galettes), and men brokering livestock sales (usually categorised under 'trade').

Some of the less onerous activities, or those requiring a certain capital, are sometimes performed by members of Middle and even Better-Off households. This brings us to the maps – with some reluctance, because we must confess that we can discern no general patterns. Looking at particular cases, people in the Central Plateau zone (ZME5) of Burkina Faso and in the neighbouring North and East Livestock and Cereals zone (ZME7) are especially involved in surface (artisanal) gold mining; this involves even the Better Off, but why it should not affect the Very Poor in ZME7 we cannot say. In the Ferlo Transhumant Pastoralist and Cereals (FER) zone in Senegal the major resources for the Very Poor are wild products. Next door in the riverine zone, collecting and selling fodder grasses is big for the poorer households, presumably because there are many customers who keep milking cows in the urban and semi-urban area by the river. But here, several of the other activities listed above are also carried out, and in Tambacounda (TAM) too it is the plethora of activities rather than a specialism that makes self-employment somewhat more important to household income than even local daily employment. By contrast, at the other end of the Sahel, in the three contiguous study areas in eastern Chad (MAN, RDS, HDS) it is quite specifically firewood and fodder grass that bring in the self-employment income.

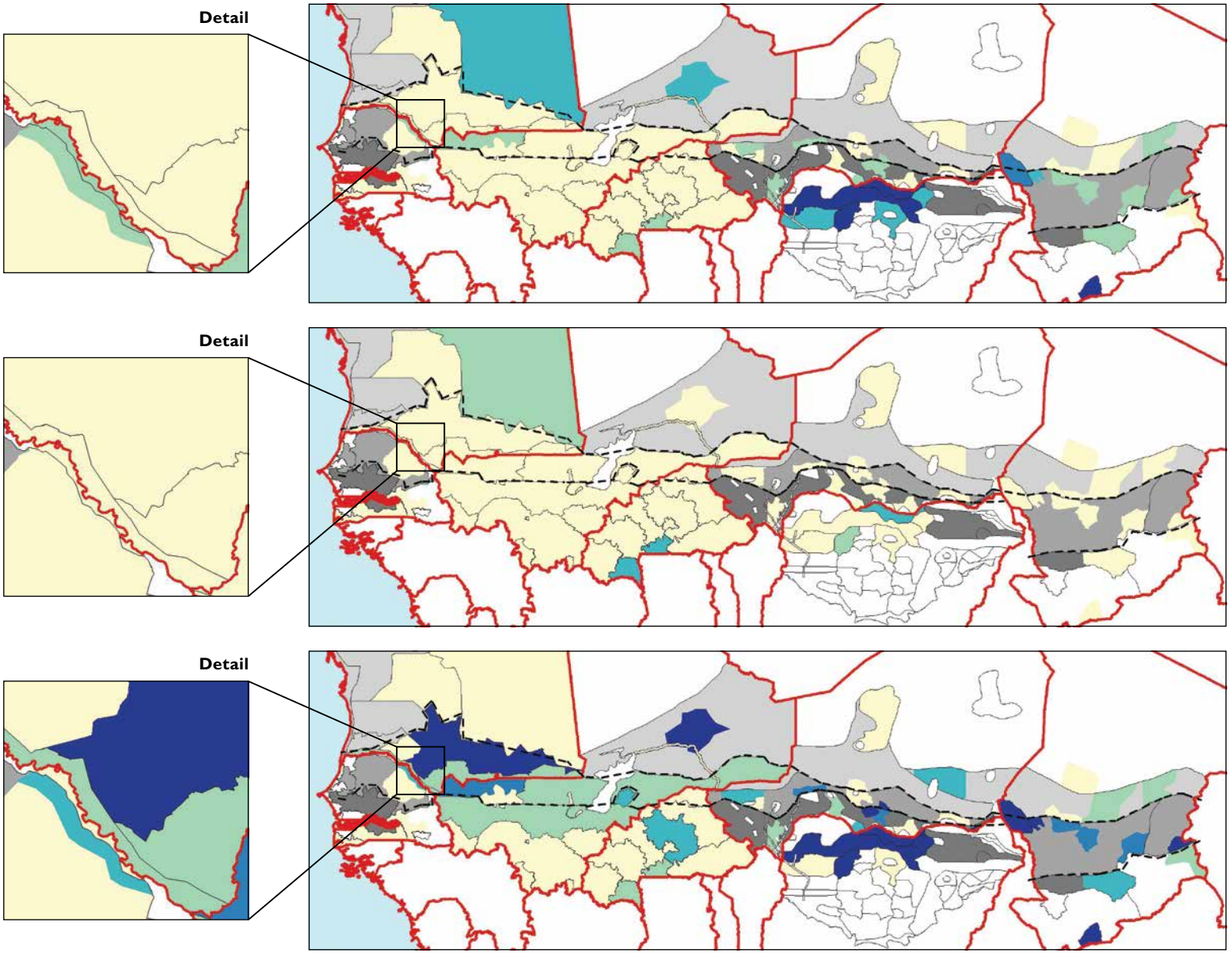
MAP 24: CASH INCOME FROM TRADE

(US$ PER PERSON PER YEAR)

AVERAGE HOUSEHOLDS

VERY POOR HOUSEHOLDS

BETTER-OFF HOUSEHOLDS



LEGEND

US$ per person per year

- 0–15
- 16–30
- 31–45
- 46–60
- >60

MAP 24: CASH INCOME FROM TRADE

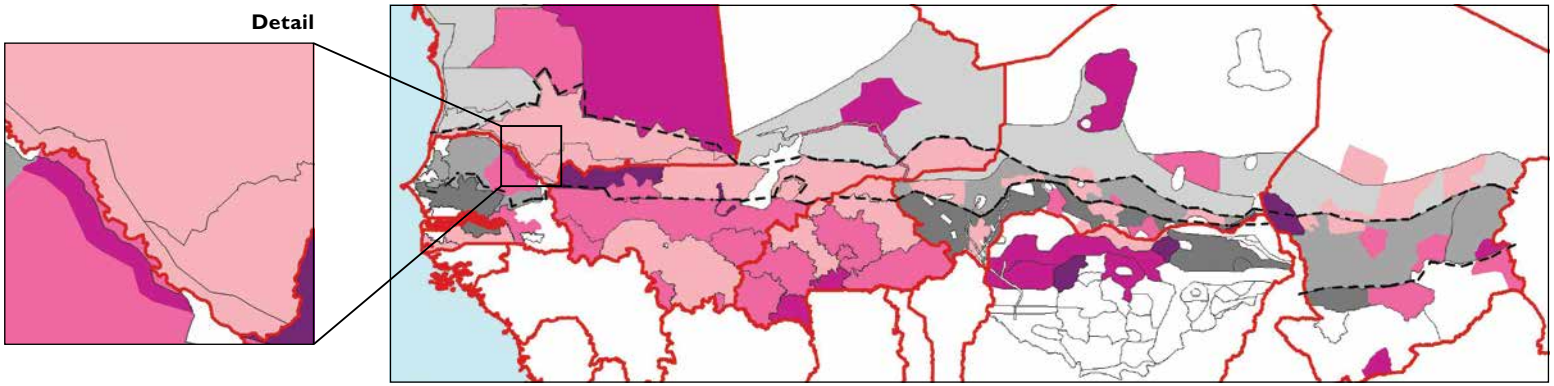
Trade here means the selling of items that are not produced by the seller. It can be on a very small scale, for instance carrying a small retail commodity between local markets to make a minimal profit on the difference in prices. Or for someone else in the same village it can be far larger, for instance a Better-Off farmer buying grain from poorer neighbours at low prices immediately after harvest when they need to sell to pay pressing bills, and then selling later in the year at local markets as prices rise, or even organising transport to a more distant market centre where prices are still higher. The general message from the maps is that poorer people make little money from trade, wealthier people more, because they have the capital, time, attitude and sometimes basic education to give them major advantages. They may also be less risk averse than poorer people. Petty traders may have to decide whether their venture, with the risk of loss, and the effort required to gain a small profit, is worth pursuing as against the availability of a day's paid employment on someone else's field: guaranteed profit, however hard the work, and perhaps with a meal thrown in.

Other than the glaring difference between Better Off and Very Poor in terms of income from trade, there is no clear pattern in the maps, even if there are many zones where trade earnings are minimal across the board. But we can look at individual zones to see what we may learn. For the pastoralists of Aïoun (AIP) in Mauritania, the Average is evidently brought up by one or both of the wealth groups not shown: in fact, it is the Middle group who make significant money as livestock brokers, that is, they mediate transactions between livestock sellers and buyers and collect a commission. In an economy that essentially exists on the basis of livestock sales, there is evidently much work for brokers. This form of income might equally have been categorised as 'self-employment', which is the subject of the previous map.

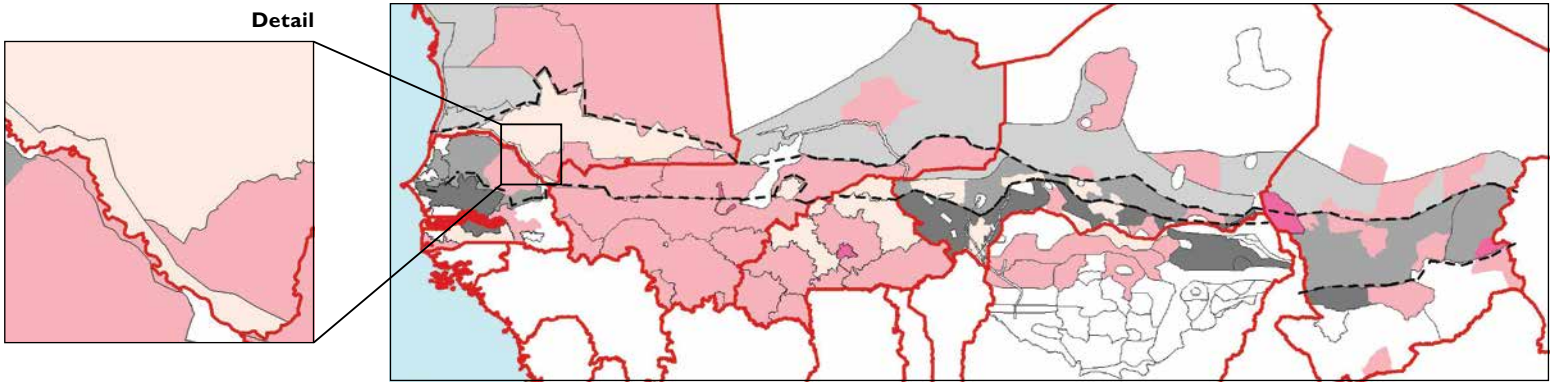
MAP 25: TOTAL INCOME FROM ALL SOURCES

(% 2,100 KCALS PER PERSON PER DAY)

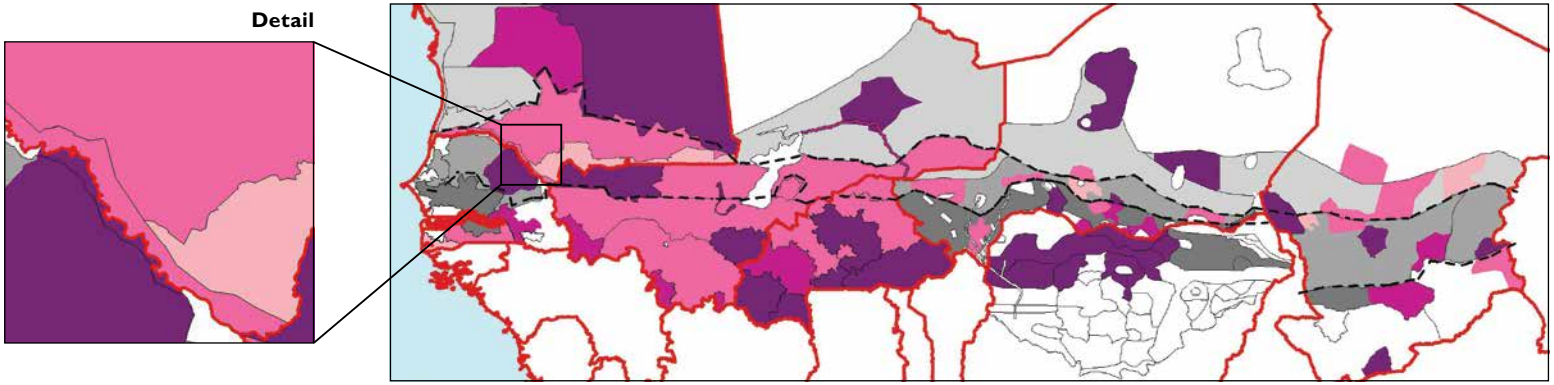
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

% kcals

- <150
- 151–250
- 251–350
- 351–450
- >450

MAP 25: TOTAL INCOME FROM ALL SOURCES

The pattern for Very Poor households is more or less flat. We might point to some tendency for the poorest areas to be in the agropastoral band, but there are several exceptions that are not easily explained: for instance, two large zones in Burkina Faso – Western Cereals and Remittances (ZME04) and North and East Livestock and Cereals (ZME07) – or the Riverine Rice and Transhumant Pastoralism zone (TEM) in Mali. At the same time, there are two slightly wealthier zones, highly contrasted: Ouagadougou Peri-Urban in Burkina Faso (ZME06) and the Lake Chad (LAC) zone in western Chad where poorer people have the advantage of a balanced income: they produce significant amounts of crops for consumption and sale, they find substantial employment on the irrigated or flood-retreat 'polders', and they even engage in share-cropping.

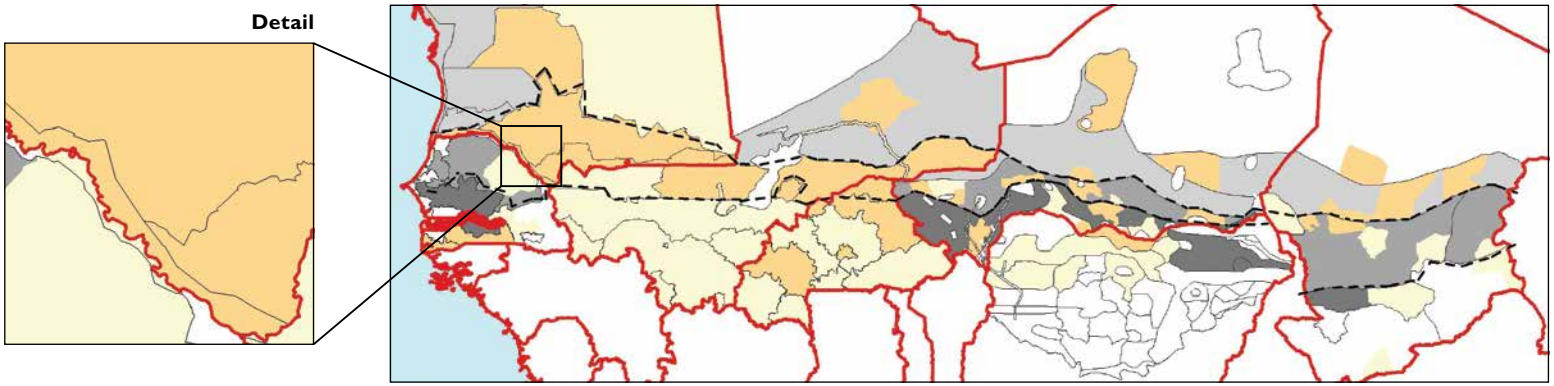
For the Better Off, the pattern clearly reflects their two chief strengths: crop and livestock production. But it is interesting to note the north and south accent: in general, this seems to show that the best-off people are those who have a particularly heavy involvement in *either* livestock *or* crops, while a mix of both is less profitable. In Mauritania the pastoralists of Ayoûn (AIP) are far enough south to have very substantial cattle holdings as well as camel holdings; but it may be that the picture for the whole zone would still stand if another more northerly study was made in the zone where camels would be entirely dominant. However, it is perhaps surprising to see that the Better-Off camel nomads of Salale (SAL) in northern Chad are not in the maximum income band. But, as we have noted above, they show a pattern of livelihood that seems to hail from a previous era: the income of the poorer households quite as much as the wealthier households comes almost entirely from selling their own livestock – unlike pastoral groups elsewhere whose poorer households have so few livestock that they must live essentially by contract herding for wealthier stock owners. In addition, both poorer and wealthier households consume far more milk than their counterparts in other pastoral groups. In Senegal in the Ferlo zone (FER) the people are Fulani cattle herders practising transhumance (they also produce some crops); the Better Off here have the highest cattle holdings among all the Sahel zones studied. At the other end of the Sahel in western Chad, wealthier households of the Lake Chad zone (LAC) have the advantage of high food production on irrigated/flood retreat land, but in fact their biggest income is from their livestock, with very high cattle holdings.

Turning to the crop-dominated south, the outstanding areas in Mali and Burkina Faso and southernmost Chad are no surprise. But the Nigeria zones cannot so easily be fitted into this north-south, livestock vs crops divide. It is true that the Better Off are substantial crop producers, but livestock figure greatly in their income, because in addition to cattle and small-stock sales they benefit very significantly from taking part in the livestock trade as middlemen mediating individual transactions and collecting together animals for traders to take to southern cities. And it is the huge meat demand of the south that adds so much value to the livestock trade. Looking further north again there are one or two anomalies in the Better Off map. In south-central Niger, the Tarka Valley (CMS) stands out: this is the centre of the irrigated production of onions, which are exported far around the neighbouring countries. Further north in Niger, there is likewise an irrigation economy in the Aïr mountains zone in which onions take first place. In western Mali the Yelimane zone (YEL) is characterised by the extremely high remittance income of the wealthier households.

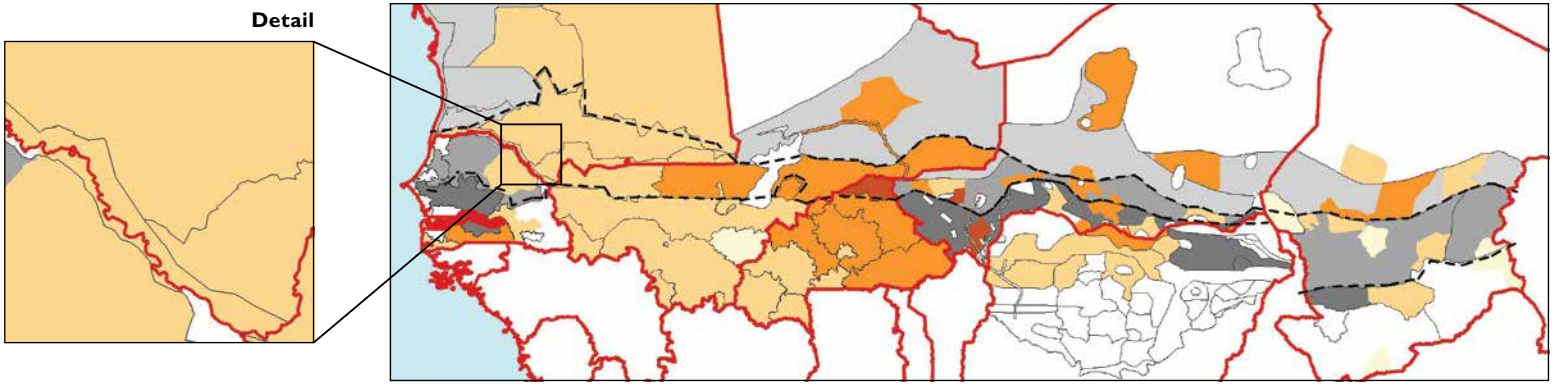
MAP 26: EXPENDITURE ON STAPLE FOODS

(% TOTAL CASH EXPENDITURE)

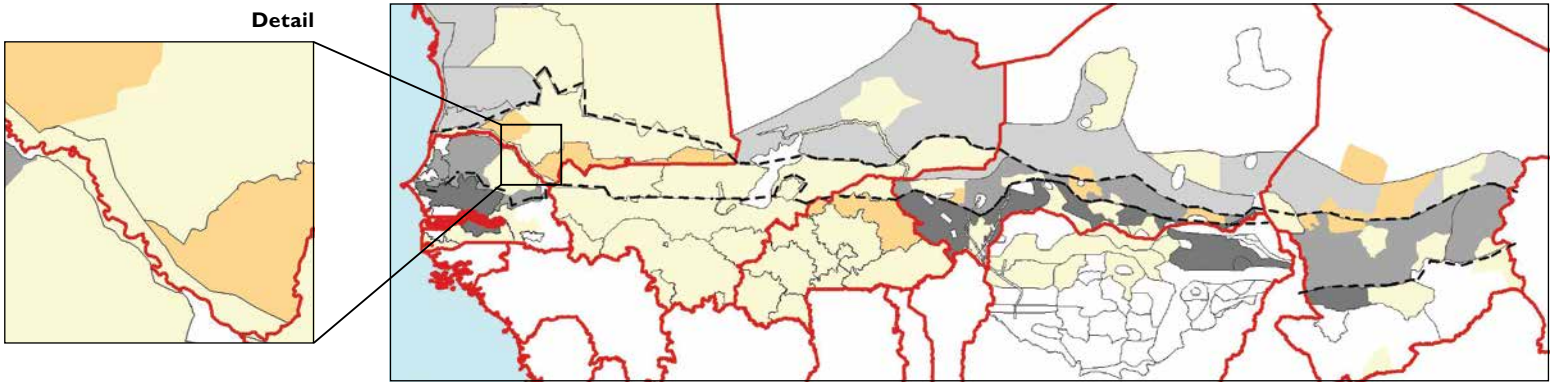
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

% total cash expenditure

- **0–20**
- **21–40**
- **41–60**
- **>60**

MAP 26: EXPENDITURE ON STAPLE FOODS

At first glance these maps seem to belie the very first map of the set concerning dependence on the market for food. Why aren't the Very Poor, at least, spending nearly all their money on basic food? The short answer is that the prices of the common staples (ie, not imported rice) allow them to fill the food gap from the market without usually spending more than around 50% of their total annual budget, and very generally nearer to 30%. That is just as well, because the rest of their very marginal budget is needed for the other basic essentials of life, starting with non-staple foods for a minimally acceptable diet (see Map 27 below).

Looking at the zones where the Very Poor spend 40–60% of their budget on staples, it is easy to understand why they are concentrated in the pastoral and agropastoral bands where there is no or constrained cereals production, as also in the Aïr mountain zone (ACM) in northern Niger. But we find no ready explanation for the appearance here too of the majority of zones in Burkina Faso; and although zone ZME8, North Transhumant Pastoralism and Millet, is in the agropastoral zone, it is not clear why this should be almost the only zone on the map showing the Very Poor spending more than 60% of their budget on staples. Turning to the west of the agropastoral band in Mauritania and Senegal, we see that here the Very Poor spend rather less on staples than their counterparts to the east, ie, 21–40% of their total budget, even though they are relatively low producers of staples for themselves. On the Senegal side, a good part of the explanation must be that across the wealth groups cash incomes are considerably higher than elsewhere: the two riverine zones in the Walo and Dieri of Matam – MTW and MTD – where the high remittances received by the wealthier have a positive knock-on effect on the wages of their poorer employees, and the cattle-rich Ferlo zone (FER) where poorer people are relatively well paid for contract herding and also make money from selling wild products. In Mauritania the explanation is not so clear; but it is true that there is a certain amount of payment-in-kind, and otherwise one might speculate that in these relatively remote areas the cost of other essentials is particularly high compared with staple food costs (one can include the Transhumant Pastoralist, Oasis and Wadi zone (AOU) further north as well as the Nomadic Pastoralists zone (AIP) in this respect). This seems true even though a quite substantial portion of purchased staples, even for poorer households, is in the form of rice, which is relatively expensive compared with the local sorghum and imported wheat that make up the major part of staples purchased.

The role of payments-in-kind in substituting for market purchase must also provide at least part of the explanation for the handful of zones where the Very Poor spend only 20% or less of their total budget on staple foods. In southern Mali, in the Yorosso Millet, Sorghum and Cotton zone (YOR) the Very Poor obtain nearly 25% of the calories they consume from payments-in-kind on top of consuming nearly 50% of their calories from their fields, in itself an unusually high proportion for this wealth group. Similarly, in the two lake zones in Chad, at Fitri (FIT) and on Lake Chad itself (LAC), there is a relatively high proportion of payment-in-kind for the Very Poor and Poor alongside cereal production from the combination of rainfed and flood-retreat cultivation, giving 40–60% of annual calorie requirements.

For the Better Off it is clear that their incomes are high enough to make staple food purchase a relatively low proportion of their total budget. In agricultural areas there is also the influence on this of their own food production. But even in pastoral areas, where no or very little food is grown, and nearly all food consumption apart from milk comes from the market, spending on staples is fairly modest: this testifies to their high earnings, especially from livestock sales, joined to the fact that, after all, there is a limit to the consumption requirement for staples, while there are more open-ended choices about non-staple food and other expenditure.

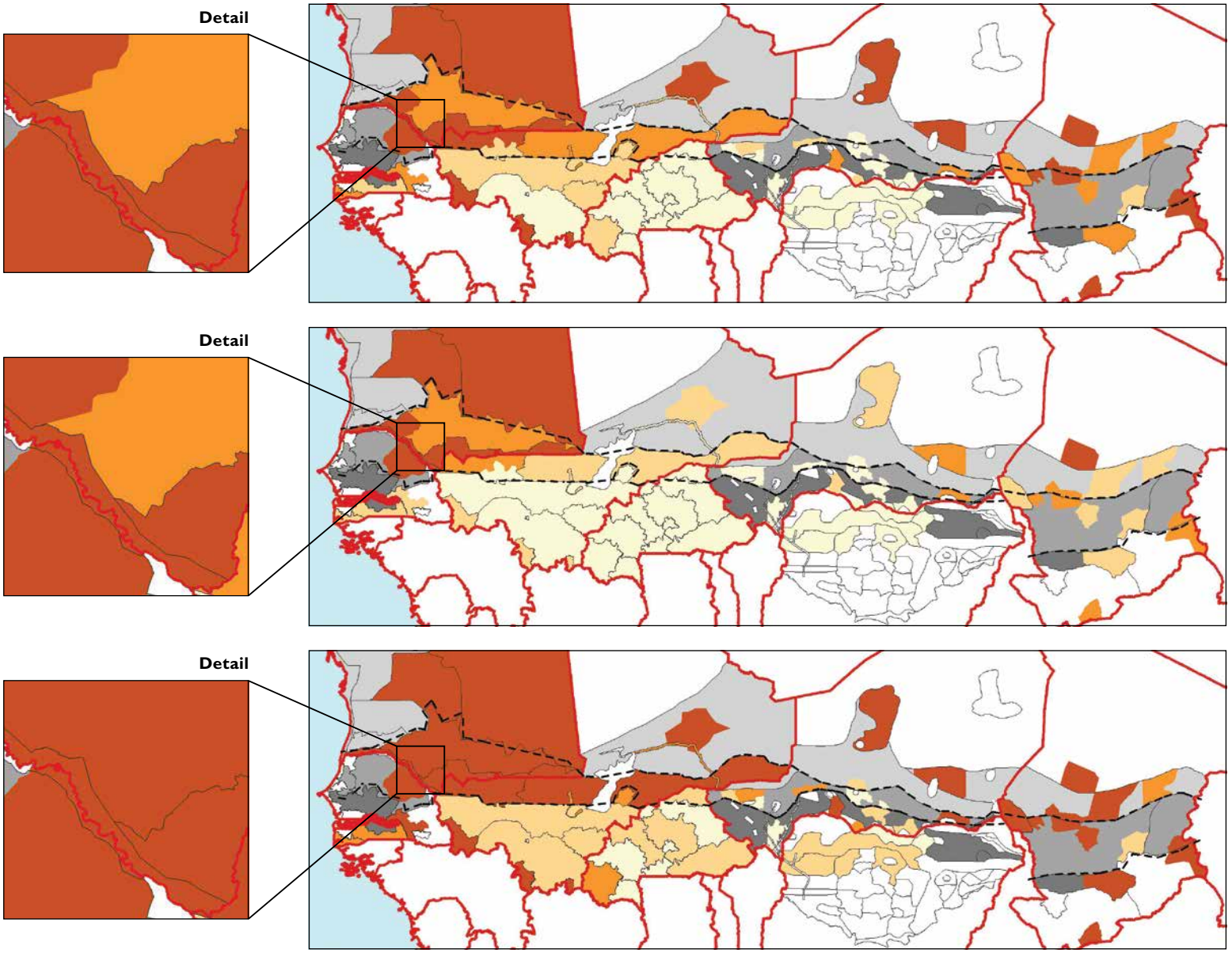
MAP 27: EXPENDITURE ON NON-STAPLE FOODS

(US$ PER PERSON PER YEAR)

AVERAGE HOUSEHOLDS

VERY POOR HOUSEHOLDS

BETTER-OFF HOUSEHOLDS



MAP 27: EXPENDITURE ON NON-STAPLE FOODS

People cannot live by staple foods alone except in an emergency. Non-staple foods are crucial for a healthy diet and for palatability – for living as a human being. Non-staple food items include vegetables and fruits, pulses, meat, dried fish, oil and sugar. The lower expenditure by poorer people, though hardly surprising, is an indication of a less than adequate dietary balance[6] and of a lower quality of life. In general, the proportion of poorer households' budgets devoted to non-staple foods is lower than among wealthier households, but it is a far from negligible expense for them.

Geographically, we see a north-south divide in the amount people spend on non-staple foods. It is true that prices in the markets of remoter areas tend to be higher than in markets nearer the centres of commerce, but the pattern is not consistent between commodities and locations, and not all localities of high expenditure in the maps are remote from big markets. The main drivers of the difference in expenditure are the amounts of sugar and oil consumed. Sugar consumption is especially prodigious among some, but not all, pastoralists: in the Salale (SAL) study in Chad, among the Better-Off sugar consumption typically provided upwards of 20% of total household calories (from some 50kg per month), and in Aïoun (AIP) in Mauritania it is 16%. Even the Very Poor in Salale obtain 9% of their calories from sugar. But there is also a major tendency towards high sugar consumption along the Senegal river (the high-remittance complex) and here the record of 19% is held by the Better Off in the Senegal River Valley Outmigration and Remittance Walo livelihood zone (MTW) in Senegal.

In general, high oil consumption follows the sugar geography, and in this case the same Senegal zone holds the record at 19% of household calories for the Better Off. But meat expenditure can be very high, too, although this is not consistent across the geography; even poorer households may sometimes spend significant sums (for them) on meat, although the actual amounts are very small, given their tight budgets. Rural high-remittance areas have an almost urban feel to them in the way wealthier people spend money on non-staple items. In Yelimane (YEL) in Mali their expenditure on meat (2% of household calories) is 80% of the cost of sugar and oil combined (19% of calories), while expenditure on bread (baguettes purchased from bakers, again 2% of calories) very nearly matches that on oil (9% of calories).

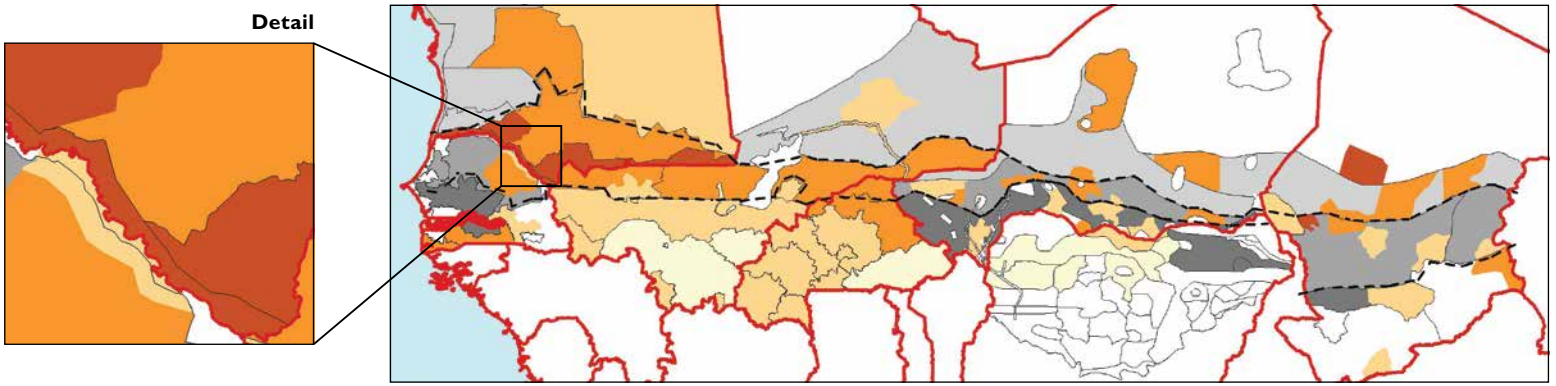
These figures compare with 1–3% of calories from sugar or oil consumption among the Better Off in ordinary agricultural locations further south. It is true that they may have their own oil seeds (groundnuts, soya, sesame). And in terms of overall non-staple food expenditure they tend to have an advantage over northerners in terms of vegetables, at least: unlike in semi-arid areas, in the more humid agricultural areas even poorer people tend to grow some of their own vegetables and condiments, often in a small kitchen garden maintained by women who have a certain amount of land for their own production and potential profit. In many localities too there are important areas of depressions (*bas fonds*) that keep moisture into the cooler dry season and which are devoted to market gardening, aimed at an urban market where transport will allow, but also offered locally at cheaper prices to avoid losses of this perishable produce. Dried vegetables, notably tomatoes and okra, as well as dried chillies and sweet peppers, find their way north on the market, to be sold by traders at a price reflecting transport costs and local scarcity.

[6] This balance is quantified in nutrient terms in Cost of Diet studies available from Save the Children UK, and measured in a different way in various World Food Programme food security surveys.

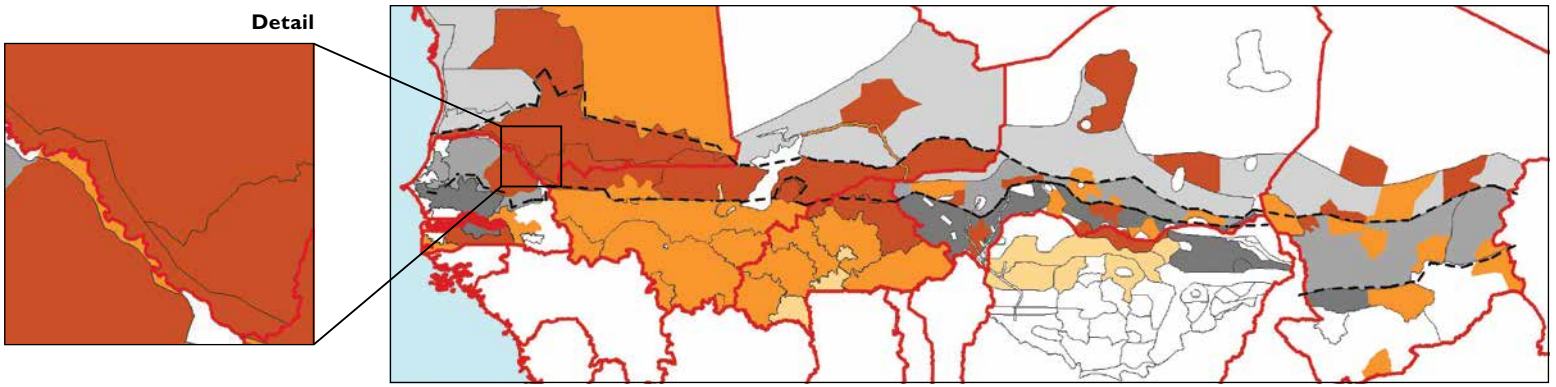
MAP 28: TOTAL EXPENDITURE ON FOOD

(% TOTAL CASH EXPENDITURE)

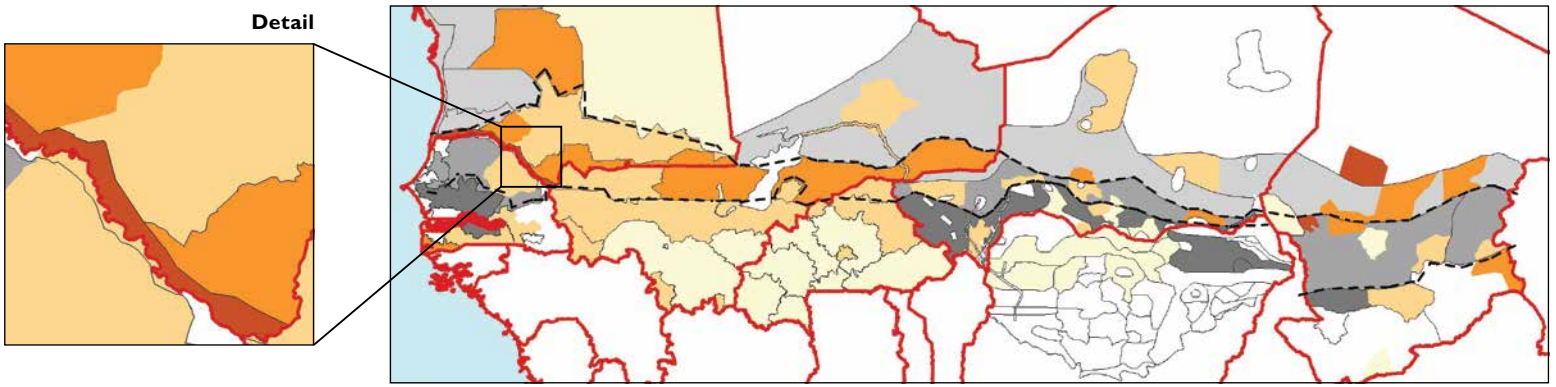
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

% total cash expenditure

- **0–20**
- **21–40**
- **41–60**
- **>60**

MAP 28: TOTAL EXPENDITURE ON FOOD

If we take account of the previous two maps on staple and non-staple foods, the combined picture in Map 28 seems to be substantially influenced by non-staple food expenditure, notably in the northern parts. But at all events the Average map shows a clear and expected northern pattern for higher total expenditure on food, and this is accentuated in the Very Poor map for both pastoral and agropastoral areas. However, in the Burkina Faso part of the rainfed agriculture band, the ZME07 North and East Livestock and Cereals zone stands out also as a high food expenditure zone for the Very Poor, and in view of their relatively modest expenditure on non-staple foods the main influence here ought to come from their staple food expenditure. This is a rather large zone by Burkina standards, and it straddles millet-based production in the north and sorghum-based production in the south. In the surveyed area, in Gnagna province, the accent is more on sorghum than on millet and food production is quite substantial, with 40–50% of calories for the Very Poor and Poor households coming from their own production.

Another outstanding zone where the Very Poor have particularly high food expenditure is in northern Nigeria, the Millet and Sesame zone (MAS), the northernmost and most sahelian of the studied Nigerian zones. On the other hand, the zones south of MAS stand out for relatively low total expenditure on food; part of the explanation of this contrast is certainly that the Very Poor in these zones are able to be twice as dependent on their own cereal production as the Very poor in MAS. Here there is a generous mix of food crops by comparison with most zones in the sahelian belt of the region: ie, sorghum, millet, maize, rice, groundnuts and cowpeas.

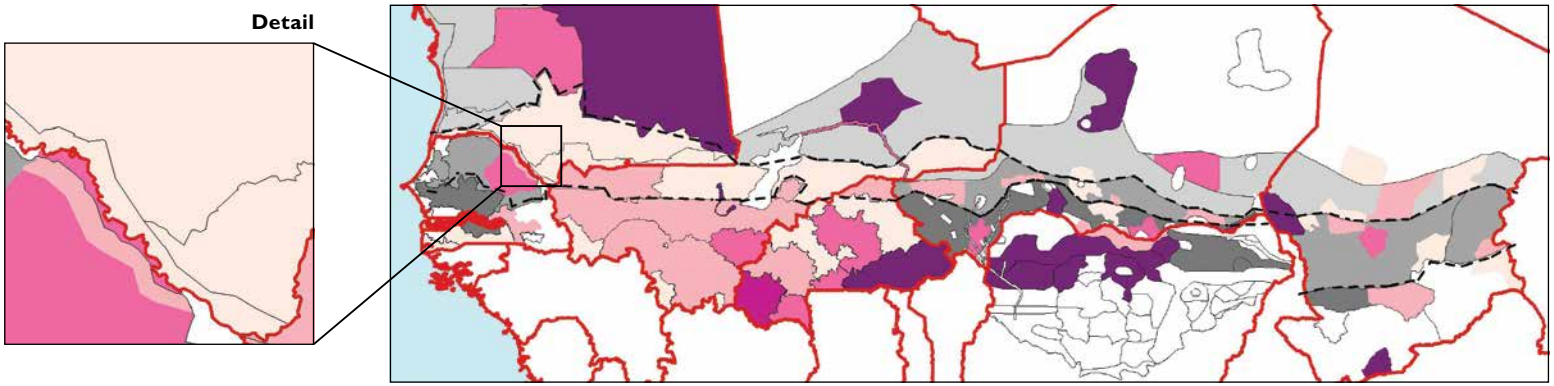
PHOTO: RAINER SCHWENZFEIER/SAVE THE CHILDREN

The cereal crop sorghum growing near Dara Tchama village, Niger

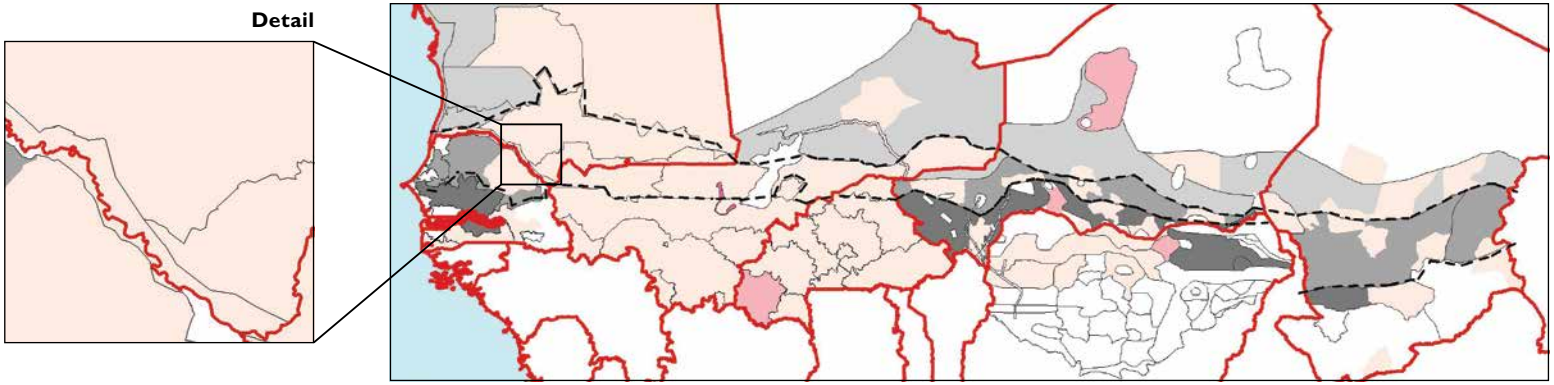
MAP 29: EXPENDITURE ON INPUTS

(US$ PER PERSON PER YEAR)

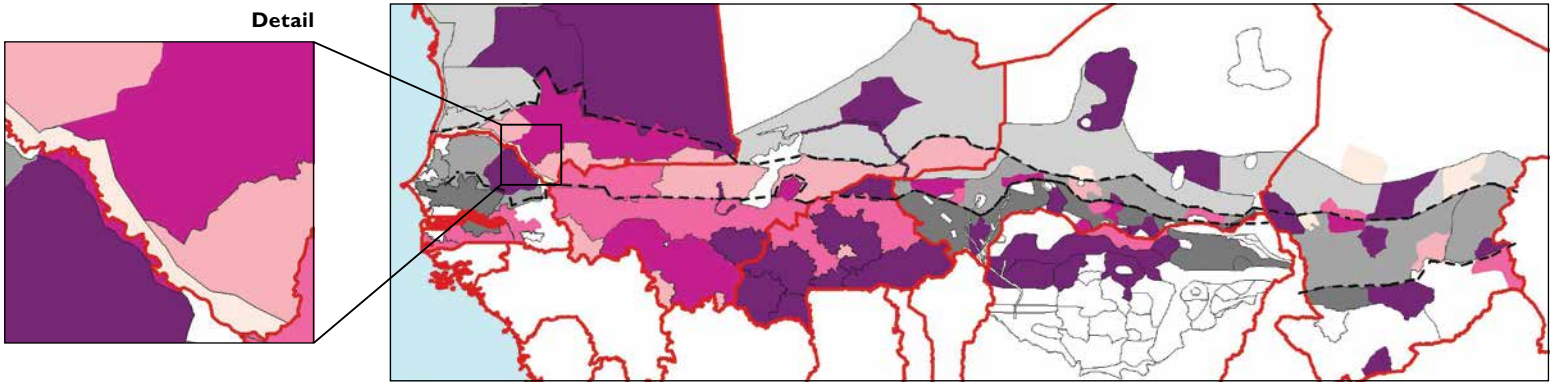
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

US$ per person per year

- 0–15
- 16–30
- 31–45
- 46–60
- >60

MAP 29: EXPENDITURE ON INPUTS

Among the maps on all the subjects, it is here that we see the most stark difference across the whole geography between poorer and wealthier people. This is undoubtedly because poorer farmers have less land and far fewer livestock to spend money on than wealthier farmers, and the poorer pastoralists similarly have far fewer animals than the wealthier. Very generally, the *proportion* as well as the absolute amount of expenditure by poorer people is distinctly smaller than among the wealthier; and this is an indication that their own opportunity cost calculations make them unwilling to invest more than the essential minimum in such land and livestock as they have. This seems to be the case from the far south-east of the maps in the Southern Staples and Cashcrop zone (MDL) of Chad to the far north-east in the Mixed Pastoral, Oasis and Wadi zone (AOU) of Mauritania (where the Better Off irrigate their precious date-palms using motorised water-pumps).

Going for a moment beyond the maps, we may look for more detail in the database. We take the case of Dosso (ADC) in south-west Niger, a part of the general rainfed agriculture belt where production conditions are reasonably favourable by the standards of the Sahel and in the reference year rainfall was satisfactory. We find that comparing the Poor (as opposed to the Very Poor) with the Better Off, there is a clear story of extreme differences in expenditure on inputs. The typical household size of the Better Off is 20, that of the Poor is nine, and so the differences seen in the map need to be about halved if a 'per capita' view is taken. But it hardly matters given the disparities. In the reference year, the Better Off cultivated five times more land than the Poor. They spent 17 times more money on agricultural inputs, of which by far the greater part went on hiring workers, who certainly included some of the Poor, who in turn spent nothing on hiring workers. The Better Off spent over seven times more on livestock upkeep than the Poor, or 18% of their total annual expenditure compared with 4% for the Poor. But there is one further element: the typical Poor household in the reference year did not increase its number of livestock, which amounted to a handful of goats. But the Better Off upgraded their cattle by selling two of their herd and spending extra money on buying a couple of more valuable ones; and with births, deaths and slaughter included, they ended the year with 16 instead of 14 cattle. In fact, their sales income from livestock was considerably greater than that from crops.

The story is, therefore, of the Better Off apparently operating in a benign cycle where input investment in cultivation promotes profits from the harvest (savings through high self-sufficiency in food, and cash from surplus sales), and these profits are put *inter alia* into cattle as a productive repository of wealth. Of course, the cycle may be interrupted in a year where rainfall is unsatisfactory, and there is always the possibility of losing cattle through illness or even theft. The Poor have no net profit, it seems, either from cultivation or from livestock. They are not necessarily in a vicious cycle, but in farming terms rather in a 'stuck' cycle only temporarily altered by better or worse production years. Any improvement in their income is far more likely to come from the activities off-farm that bring in the overwhelming bulk of their annual earnings: ie, local and migrant work and self-employment.

It is not clear why expenditure on livestock inputs is so weak in Chad among the big herders: the statement in the Profile for Salale (SAL) is that it is a sign of the 'very traditional character of livestock raising', but this might not quite explain why the Ayoûn pastoralists (AIP) in Mauritania spend some ten times more on inputs although they have only around twice the number of big stock. There may be a difference here between pastoralists who have cattle and those who have only camels, but with the evidence to hand that is only a guess.

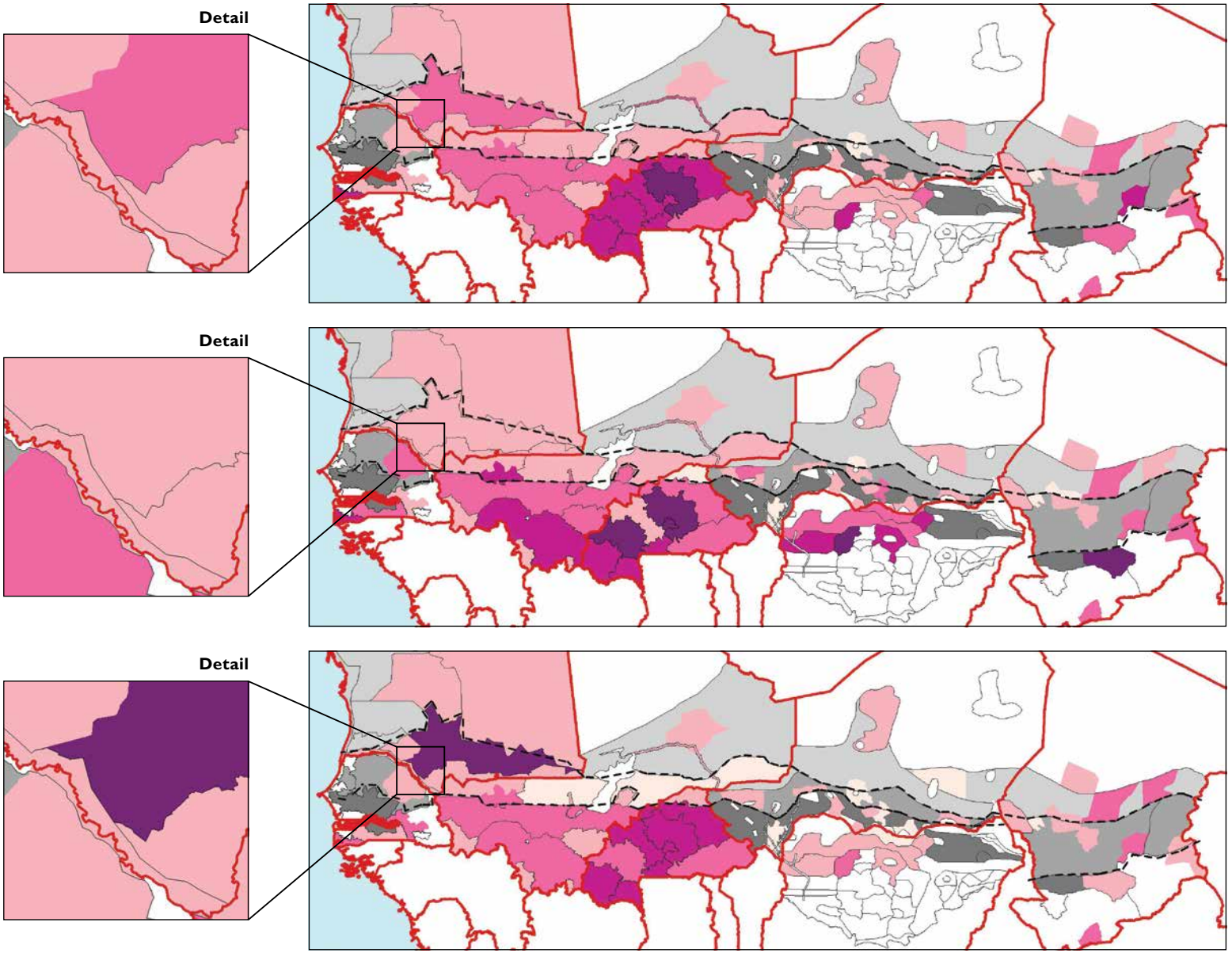
MAP 30: EXPENDITURE ON HEALTH AND EDUCATION

(% TOTAL CASH EXPENDITURE)

AVERAGE HOUSEHOLDS

VERY POOR HOUSEHOLDS

BETTER-OFF HOUSEHOLDS



MAP 30: EXPENDITURE ON HEALTH AND EDUCATION

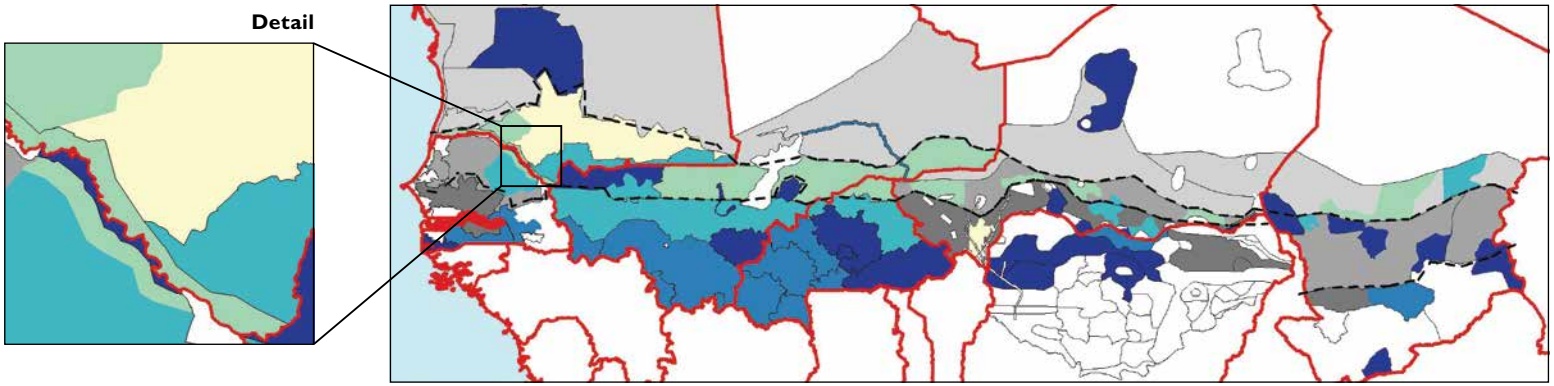
It is not easy to discern a strong geographical pattern here, although there is a general indication that pastoralists and agropastoralists tend to spend a lesser proportion of their total budget on health and education than ordinary agriculturalists. Why this might be so is not clear, unless it is a matter of access in that they may be more remote from schools or clinics than agriculturalists; there is certainly no reason to think that they are less in need of medical treatment or less interested in educating their children, nor to think that service costs are less for them than for agriculturalists. There are anyway several exceptions on either side, notably in agropastoral Mauritania. And within the agricultural areas it is notable, but not easily explicable, that Burkina Faso zones stand out for higher proportions of expenditure by richer and poorer alike. Again, it is not the case that the Very Poor in zones where they spend a high proportion on these services are simply poorer than their counterparts in other zones (ie, the same costs would make a bigger dent in their budget). In agropastoral Mangalme (MAN) in central Chad their income is virtually equivalent to the Very Poor in the southern zone (MDL): they spend more on services in absolute as well as proportional terms.

There is a considerable variation, without evident geographical pattern, in relative spending on education versus health, although the general tendency is to spend more on health than on education. Taking the total expenditure on services, it is possible to say that, overall, the Very Poor tend to spend a greater proportion of their budgets on this than the Better Off, although again with several local exceptions. This would not be surprising if the basic costs of services were similar for all, except that one would expect in that case that there would be a more marked difference in relative proportional expenditures, given the substantial difference in household incomes even per capita. In fact, in absolute terms the poorer do generally spend less – often far less – than the wealthier on services. But not always. To take a couple of contrasting examples: in the West-Central Millet and Sorghum zone (STO) of Mali, the Very Poor spend 6.4% of their total budget on health and education (3.8% and 2.5% respectively); the Better Off spend a very similar proportion of their budget on these services: 6.9% (2.6% and 4.3% respectively). But the Better Off spend twice as much per capita as the Very Poor (and in fact spend a bit under twice as much per capita in terms of total budget). In the Sorghum, Cowpeas and Groundnuts zone (SCG) in northwest Nigeria, the Very Poor spend 11% of their total budget on health and education, the Better Off 2.7%; and the Very Poor actually spend 7% more per capita. Yet in this case, the total per capita expenditure budget of the Better Off is nearly four times that of the Very Poor.

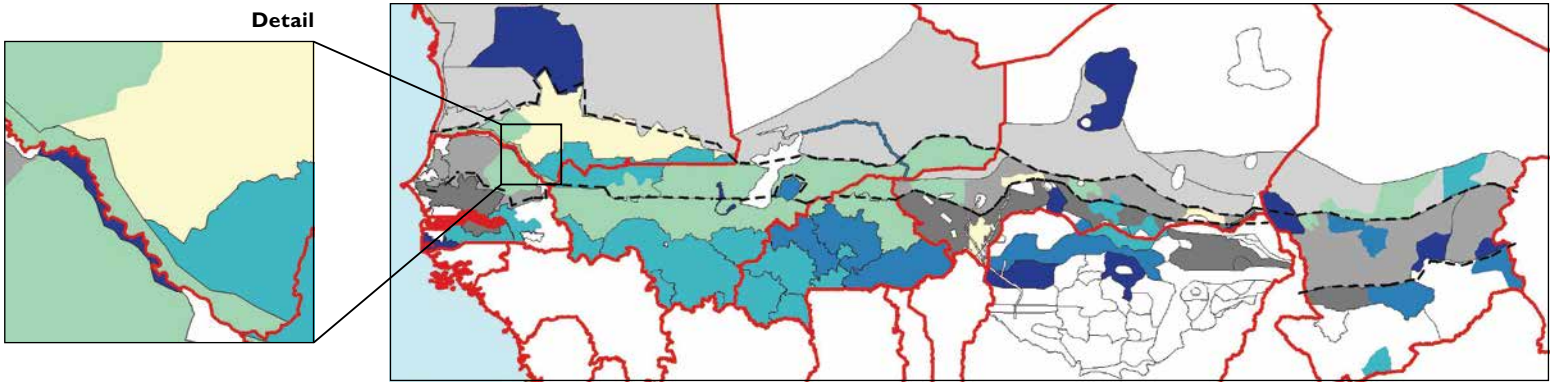
It ought to be recognised that for poorer people, with their extremely marginal budgets, to spend even 5% of their budget on these services represents a considerable sacrifice, sometimes even competing with their purchase of enough basic food to get them up to the threshold of their minimum energy requirements. In a sense, it may be thought that medical expenditure is less voluntary than education expenditure (where it is not compulsory to send children to school). In the extremely constrained circumstances of the Very Poor, the decision to spend even 3% of their total budget on school costs is a major affirmation of faith in education as an avenue out of poverty for their children. Despite improvements in educational provision across the region, it still often remains the case that even that 3% expenditure is not enough to send children to secondary school where the nearest such school is too far from the village to walk, and so transport and/or accommodation costs become necessary. Yet for children of the poor no less than of the wealthier, it is the threshold of secondary education that needs to be crossed in order to gain far greater life chances.

MAP 31: CROP YIELDS AS % MINIMUM HOUSEHOLD FOOD NEEDS GENERATED PER HECTARE CULTIVATED – FOOD + CASH

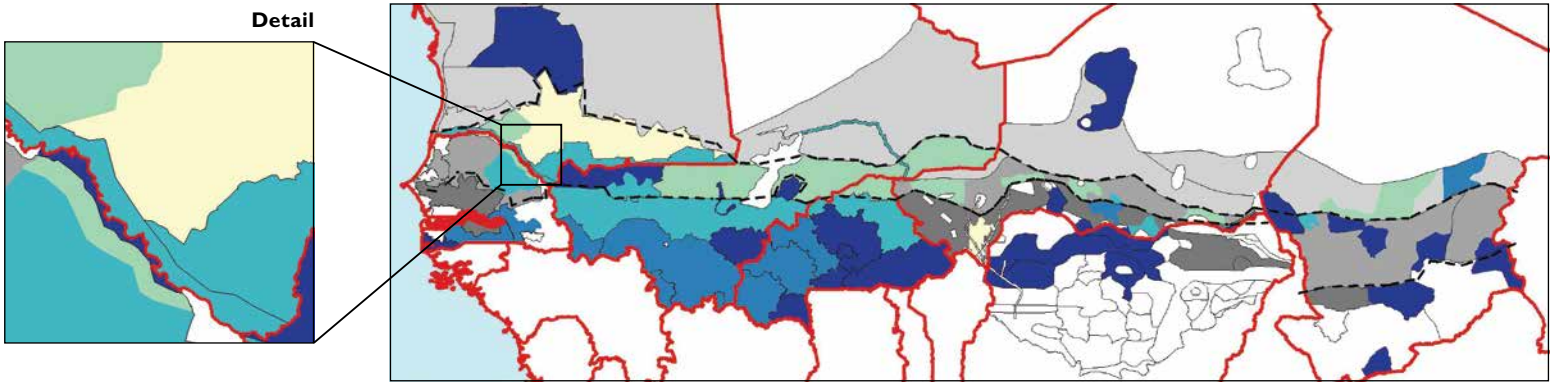
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



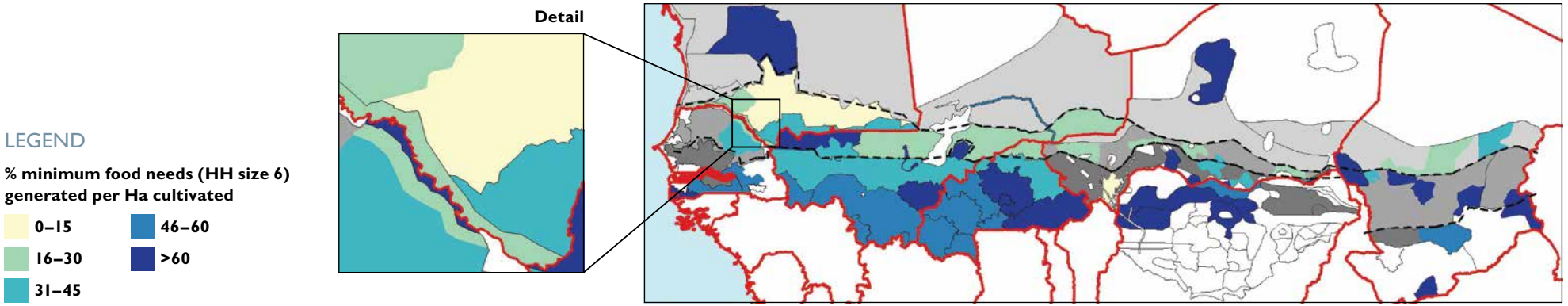
LEGEND

% minimum food needs (HH size 6) generated per Ha cultivated

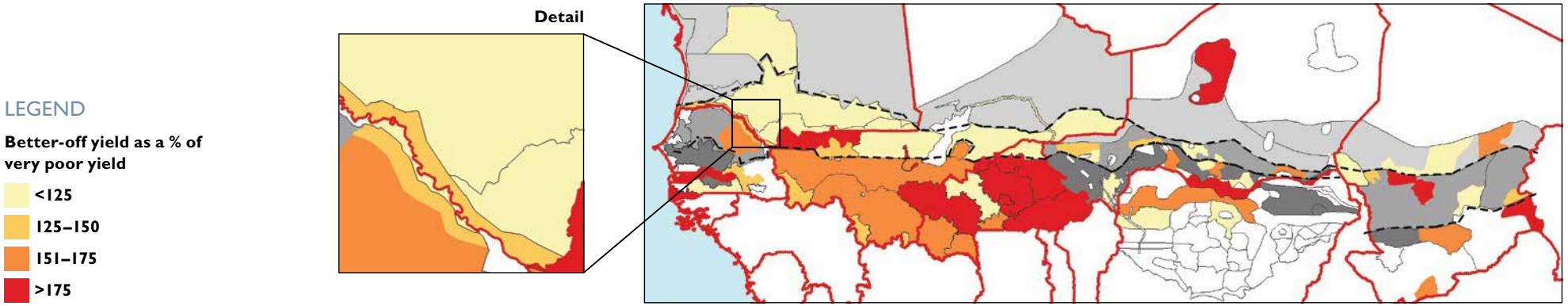
- 0–15
- 16–30
- 31–45
- 46–60
- >60

MAP 32: CROP YIELDS – DIFFERENCES BETWEEN WEALTH GROUPS

YIELD FOR AVERAGE HOUSEHOLDS



BETTER-OFF YIELD AS A % OF VERY POOR YIELD

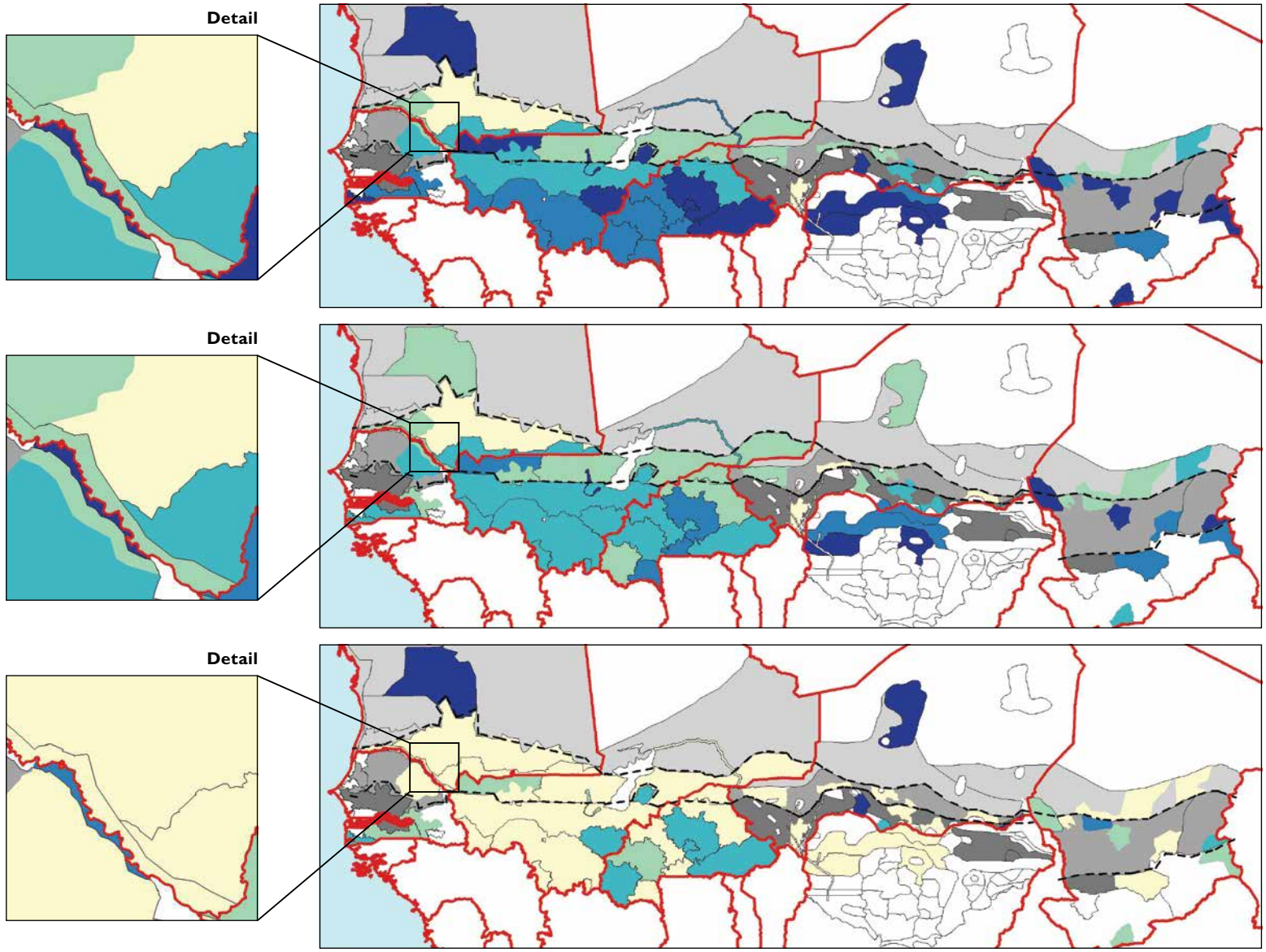


MAP 33: CROP YIELDS – CONTRIBUTION OF FOOD AND CASH CROPS

YIELD – ALL CROPS
(AVERAGE HOUSEHOLDS)

YIELD – FOOD CROPS

YIELD – CASH CROPS



LEGEND

% minimum food needs (HH size 6) generated per Ha cultivated

- 0–15
- 16–30
- 31–45
- 46–60
- >60

Note: Food and cash crop yields are based upon the total income (food plus cash) from these crops divided by the *total* area cultivated (not the area given to each type of crop).

MAP 31: CROP YIELDS AS % MINIMUM HOUSEHOLD FOOD NEEDS GENERATED PER HECTARE CULTIVATED – FOOD + CASH

MAP 32: CROP YIELDS – DIFFERENCES BETWEEN WEALTH GROUPS

MAP 33: CROP YIELDS – CONTRIBUTION OF FOOD AND CASH CROPS

The differences in input expenditure discussed for Map 29 lead to the question of the effect on crop yields. HEA data is not the first place to look if one is seeking a detailed agronomic account of crop production in the Sahel, including evidence for levels of increased production resulting from farmers' application of different inputs. But the HEA databases do include information on landholdings and production, and consumption and sales, and on household sizes. It is of interest, therefore, to treat the 'yield' question to the particular HEA form of analysis used several times for other themes, namely the value of production in terms of direct food consumption and cash income combined (see the explanation of the 'total income' concept given for Map 12). This 'total income' approach allows us to consider whether expenditure on inputs seems worthwhile in the more complex sense of the value of production per hectare to *households* in terms of direct consumption and of cash earnings expressed as potential consumption. We use the term 'yield' in that sense in what follows.

In this set of maps the calculations are made to apply to a household of six members so that Very Poor and Better Off can be compared taking account of the actual differences in household sizes between the wealth groups, and similarly an average yield calculation can be made.

In Map 31 there is a clear and expected overall pattern of higher yields for the Better Off compared with the Very Poor (and, in a general way, of higher yields in the higher producing areas, mostly to the south). As so frequently, the Aïr Mountains zone of northern Niger (ACM) goes against the grain, with unusually high yields for the Very Poor. But there is no fundamental mystery here: in this special situation, with unusually limited income options other than from cultivation, poorer farmers could not survive without achieving high yields from their small, irrigated plots, including modestly more expenditure on inputs than is generally found among their counterparts elsewhere. There are one or two other anomalous cases. The riverine Matam Walo (MTW) zone in Senegal also stands out for high yields for the Very Poor, and here we can look especially to their production of the valuable rice and the high local demand for all products from remittance-based wealthier households (rather surprisingly, the Better Off do not sell rice but specialise in sweet potatoes as their big cash crop).

Map 32 sharpens the difference in yields between Better Off and Very Poor. It is interesting to see that in the Aïr Mountains, despite the unusually high yields noted for the Very Poor, the Better Off, with their more numerous or better wells and animal draught power for irrigation, far outstrip the Very Poor in yields. But again there is not the same result in those eastern Chad zones. Meanwhile, the Mixed Pastoral, Oasis and Wadi zone (AOU) in northeast Mauritania is a case apart. Aside from some cowpeas grown using the residual moisture in the seasonal watercourses (wadis) between the dunes, the big crop here is dates grown in the oasis areas. Although these are primarily a cash crop, they are also a food crop that, for instance, gives the Better Off about 17% of their total calorie intake. Per hectare, the direct food consumed and cash generated give a high 'yield' whether for wealthy or poor people.

We highlighted inputs as the factor that is most likely to affect production per hectare. But in the present 'yield' terms, there are further questions about the value of the types of crops produced. We are not in a position to delve into this in detail, but we can compare the contribution of food crops versus cash crops (Map 33). Yield is calculated in relation to the total area cultivated rather than the area planted with each type of crop. Cash crops play their part, notably in the cotton, fruit and market gardening zones of southern Mali and central and southern Burkina Faso; and where the yield of cash crops is high, the average yield is also high. In northern Nigeria in the Sorghum, Cowpeas and Groundnuts zone (SCG) the particular combination of direct consumption and sales of these crops makes also for high 'yields' across the wealth groups. In two agricultural/agropastoral zones in Kimiti in eastern Chad (RDS, HDS) a powerful combination of cereal crops, pulses and market gardening also gives high 'yields' across the board. A little further east in Mangalme,

however, it is not clear why a more ordinary cereal-based economy should have the same effect.

But the overall dominating factor does seem to be food crops. This is interesting in relation to the relative position of food and cash crops in *total* cash income as presented in Maps 9 and 10, where cash crops tend to win. Here, we seem to see that, nevertheless, farmers tend to rely more on food crops when we combine direct consumption and sales. This reflects the comment for Map 7 that farmers throughout the Sahel are serious about food crop production, even in most of the prominent cash crop areas. The date economy of AOU is, as we have said, a case apart: no other product, including livestock, begins to rival date sales as the engine of the economy, and their consumption as food is a bonus rather than a reason for production.

PHOTO: LUCIA ZORO/SAVE THE CHILDREN

A subsistence farmer in northern Nigeria harvests sorghum, which he grows along with sesame and millet

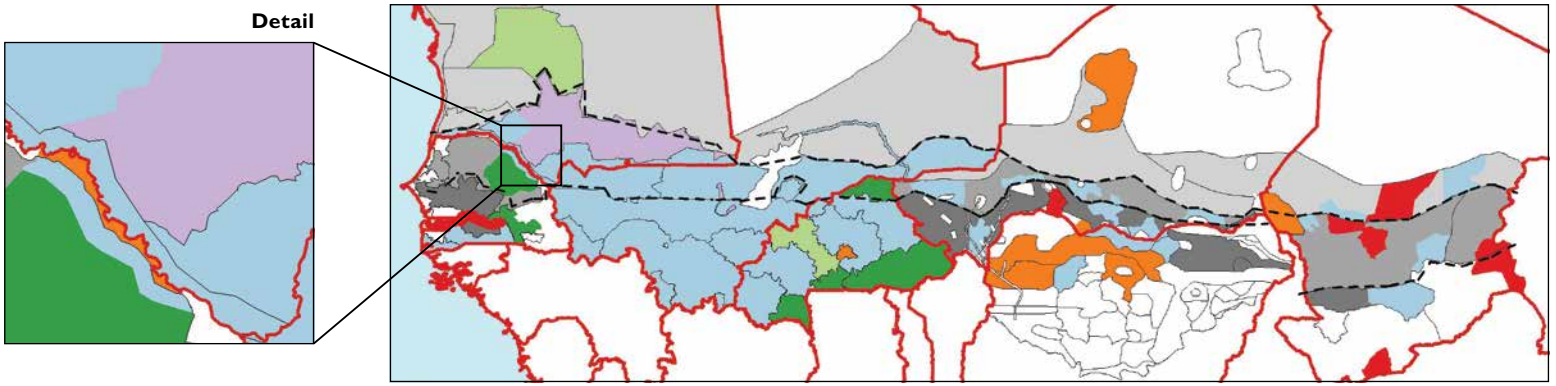
MAP 34: MOST IMPORTANT HAZARDS AFFECTING AGRICULTURE AND LIVESTOCK

HAZARDS AFFECTING AGRICULTURE

LEGEND

Most important hazard (as perceived by rural households)

- **Drought/erratic rainfall**
- **Flooding**
- **Pest outbreaks**
- **Disease outbreaks**
- **Conflict with herders**
- **No data**

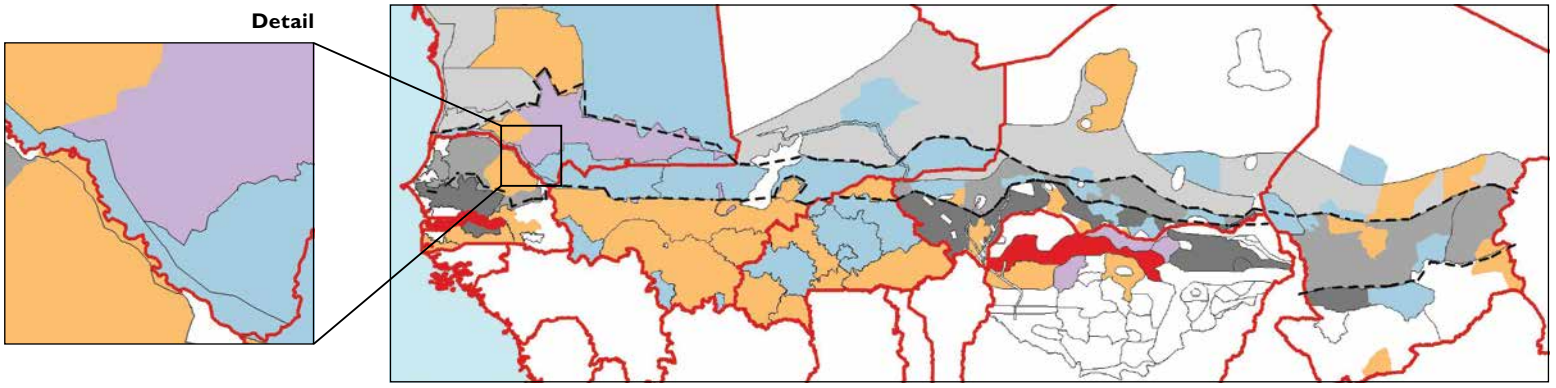


HAZARDS AFFECTING LIVESTOCK

LEGEND

Most important hazard (as perceived by rural households)

- **Drought/erratic rainfall**
- **Disease outbreaks**
- **Theft**
- **No data**



MAP 34: MOST IMPORTANT HAZARDS AFFECTING AGRICULTURE AND LIVESTOCK

This information, and that in the subsequent hazard-related maps, represents the judgements of village respondents in the HEA baseline surveys. They were asked to state the main hazards they face in crop and livestock production, and to rank them in importance. Two levels of hazards to production are usually distinguished: those that occur virtually every year on a general scale, such as low-level pest damage to crops, and those that occur only periodically, such as a serious or epidemic crop-pest outbreak. Both kinds of hazards were referred to in the responses, but for these maps it is the periodic hazards that we have selected as best we can: the events that make a substantial difference between one year and another. We should admit that there may well be some 'noise' in the data. It is not clear in each and every instance whether a response is about a permanent or a periodic hazard. In terms of ranking, it is likely that people found it easier to identify the most important hazard than to precisely rank the others, and in the subsequent maps we offer an account of 'most important' and 'secondary' ranking, where 'secondary' carries no implication that the hazard in question is not also important. It is possible that on occasion the answers about the most important hazard were influenced by a recent event rather than representing the most important periodic hazard over a period of years; but on the whole we trust that a genuine pattern is offered over the spread of HEA studies.

This information, combined with that on coping shown in further maps and with current situation information, is essential for the practical use of the HEA methodology in enumerating scenarios to help predict the food security and livelihood effect of a given event or events within the period of up to a year. Here, we map the baseline data as a matter of record, and for the most part they speak for themselves; we limit ourselves to a light commentary.

Rain failure is a well-known hazard to production in the Sahel, and it is no surprise that the light blue colour that represents this hazard is almost the default shading on both the agricultural and the livestock maps. It is perhaps all the more interesting, therefore, to look at those zones where something else is reported as most important. In the agricultural hazard map we note the frequency of crop pest/disease outbreaks as the most important hazard, even in such areas as the 'sylvo-pastoral' zone in Senegal where rain failure is certainly a frequent phenomenon. This seems to contain a message that rain failure is not the single, overwhelming hazard. It reflects anxieties expressed in any village about crop losses due especially to pest infestations, usually with a plea for more official help in combating this scourge, which indeed is known to significantly reduce national food production.

It is perhaps surprising that flooding should be the most important hazard anywhere in this region where rain failure is the dominant threat. But each is a particular local case. The rice agriculture along the Senegal river in north-east Senegal is especially vulnerable to water surges over the riverbank. The spot in the centre of Burkina Faso is in fact peri-urban Ouagadougou, where farmers were also hit in the deluge of 1 September 2009, which caused enormous

flooding inside the city. In northern Niger, where annual rainfall is modest and the all-important but delicate onion cash-crop depends on irrigation from wells, a single, excessive downpour that causes water to stand in the plots for any length of time can wreak great damage.

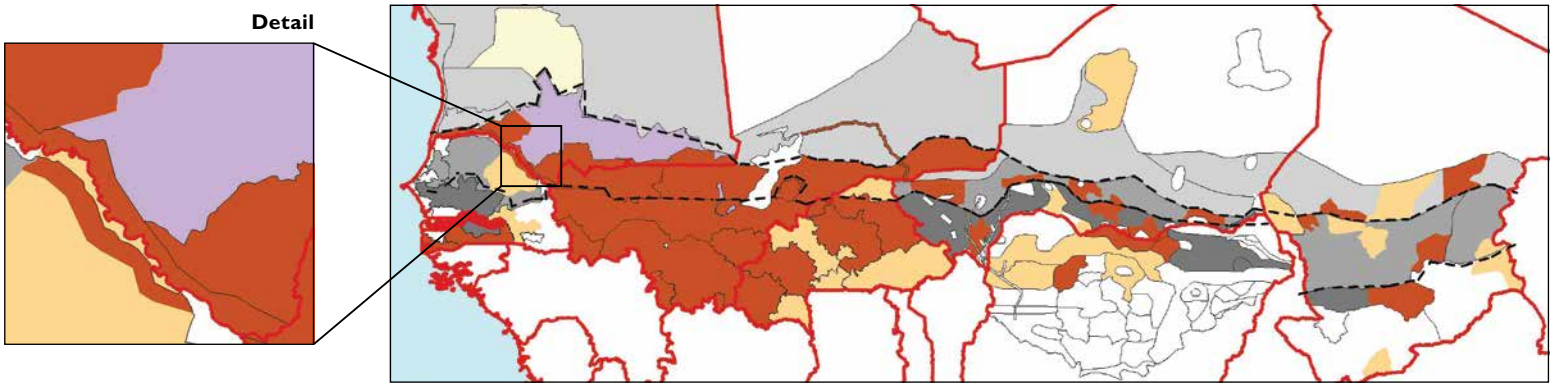
'Conflict with herders', the red patch, here has to do with damage to crops caused by the cattle of herders, often migrating through or staying temporarily in an agricultural area on seasonal grazing migration. In fact, one important reason for that migration from some areas is precisely to keep animals off local fields, and cattle-owning farmers commonly send off their own stock with professional herders for this purpose as well as to benefit from far grazing. Along the main migration routes there are traditional 'corridors' ('parcours') maintained formally for safe passage through cultivated areas, and intense arguments usually arise when animals are allowed to stray from these corridors. This sometimes happens because part of the corridor has been ploughed over and planted by farmers; and elsewhere, on the fringes between the northernmost millet cultivation and the grazing-grounds of pastoralists, encroachment of cultivation onto pastures has become an increasing source of conflict in recent years. The particular value of the onion crop that characterises the Southern Irrigated Cash-crops zone (CMS) in south-central Niger probably explains the particular sensitivity of farmers there to trampling by animals and therefore the prominence of conflict with herders as a hazard. But we do not know what special circumstances might have made farmers in the zones in eastern and southern Chad also signal this hazard as the most important.

Rain failure is again the greatest threat overall to livestock owners as seen in the lower map, including settled farmers who depend partly on grazing on local common land. The threat of rain failures reducing seasonal pastures has a northern bias, and of course is the greatest preoccupation of pastoralists. But again it is significant that in large areas, admittedly mainly southerly, livestock disease outbreaks are seen as the top hazard. In fact, as for crop pests, the message comes from livestock keepers everywhere that they crave greater official help against the scourge through expanded veterinary intervention. This is not just a problem for the wealthier cattle keepers: poor households with just a handful of goats – or indeed of poultry – can lose the best part of this capital, modest but very precious to them, in the space of a week.

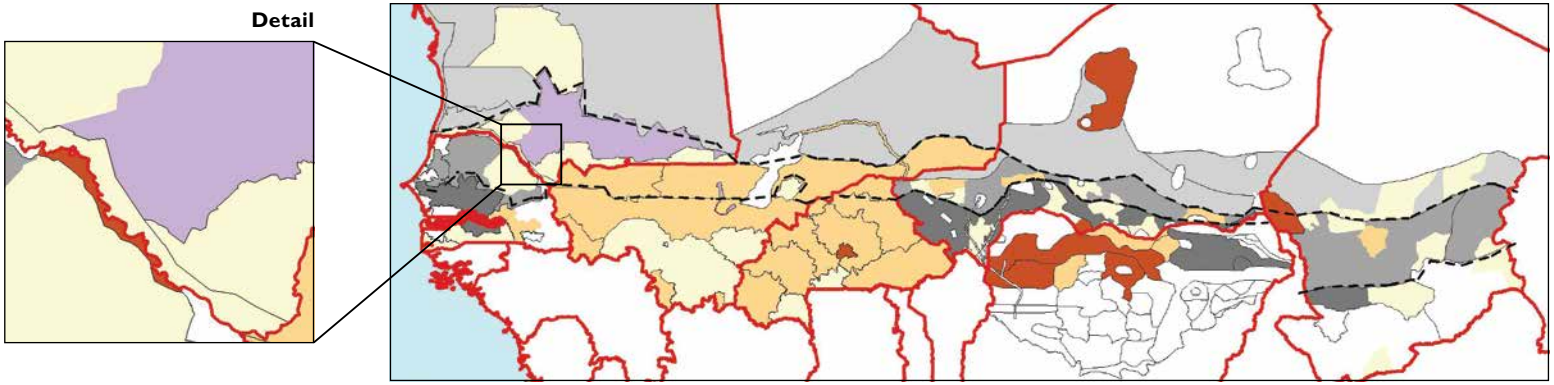
Livestock theft was frequently reported as a problem, albeit ranking third or fourth. But in northern Nigeria we see it reported as the most important hazard in the extensive Millet, Cowpea and Groundnut zone (MCG); in fact, this arises from an unusually severe event of widespread banditry in the reference year of the study (2012) when owners lost many animals – even whole herds.

MAP 35: HAZARDS AFFECTING AGRICULTURE

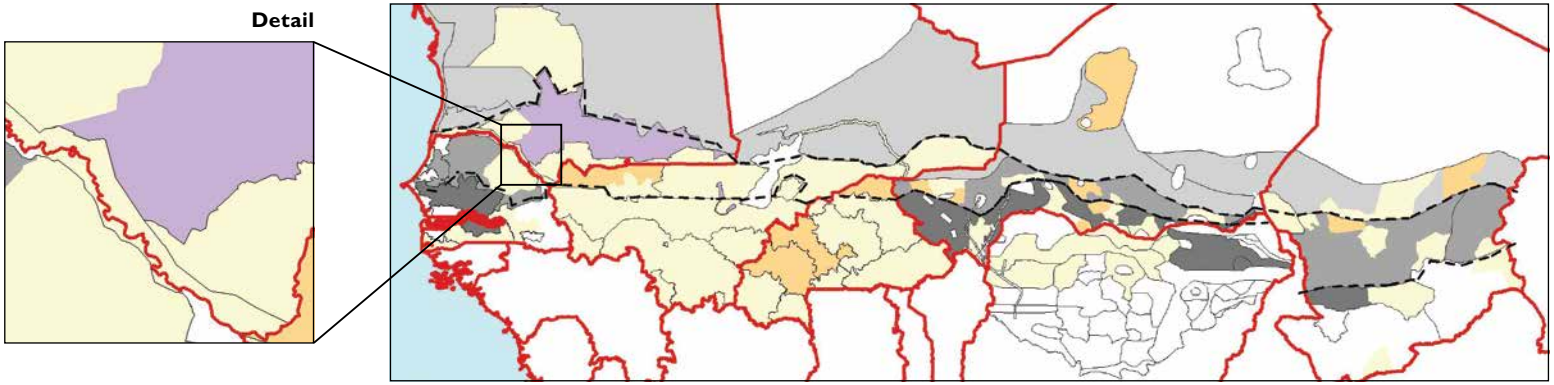
DROUGHT/ERRATIC RAIN



FLOODING



WIND/SANDSTORM

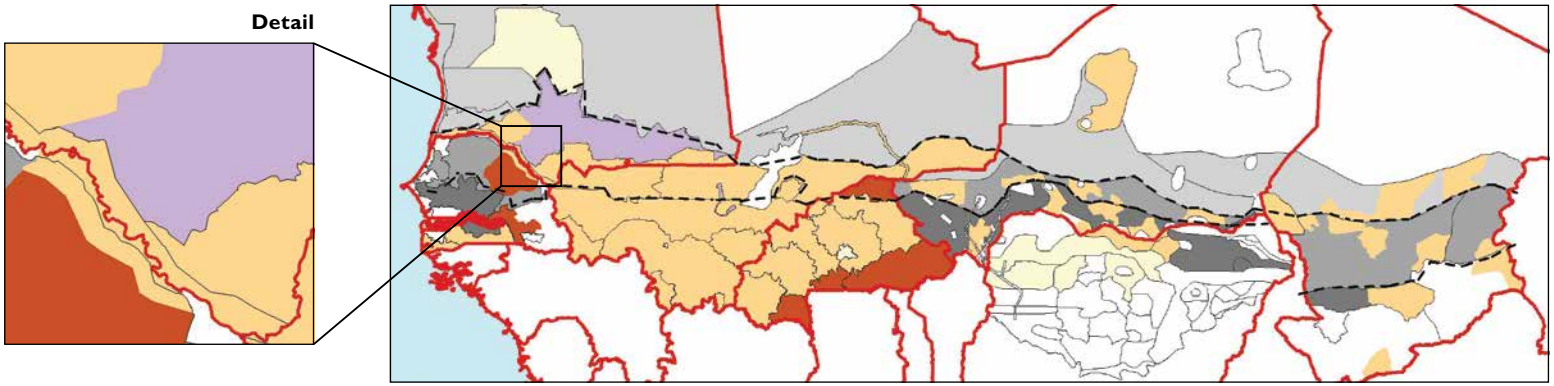


LEGEND

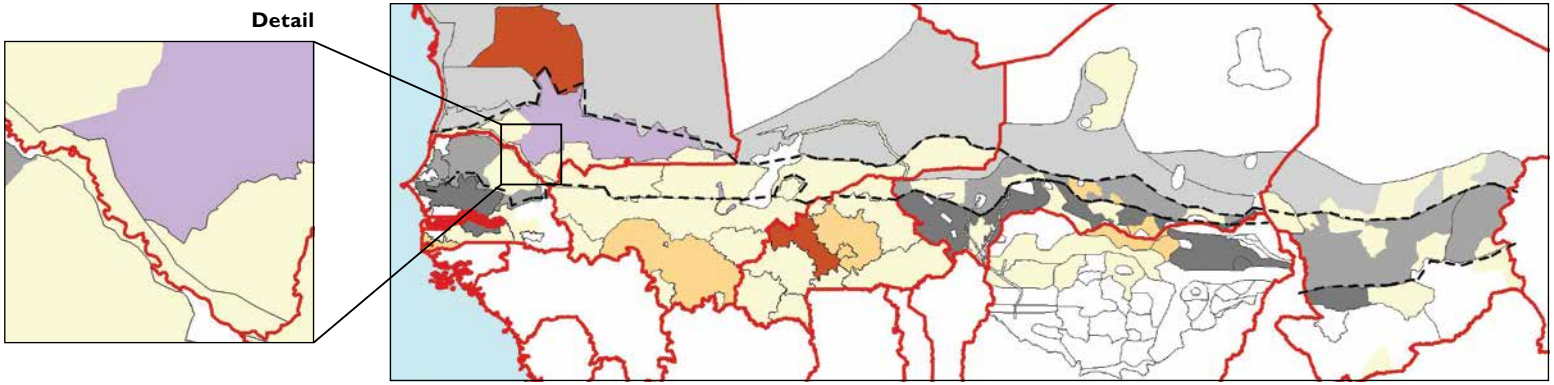
- Most important
- Secondary importance
- Not reported
- No data

MAP 36: HAZARDS AFFECTING AGRICULTURE

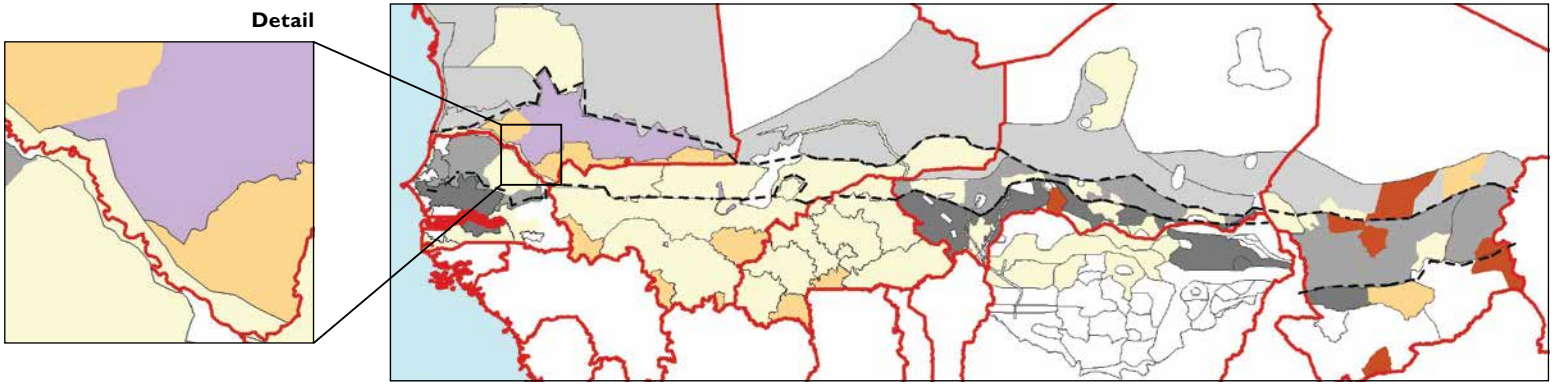
PEST OUTBREAKS



DISEASE OUTBREAKS



CONFLICT WITH HERDERS



LEGEND

- Most important
- Secondary importance
- Not reported
- No data

MAPS 35 AND 36: HAZARDS AFFECTING AGRICULTURE

Here single hazards are mapped by whether they are reported as most important or secondary, or not listed among main hazards. Rain failure is always listed, and is generally the most important hazard. But, reinforcing the points made for the previous map, where it is not rain failure that comes first, it is crop pests (Map 36). Flooding is surprisingly widespread as a secondary threat, even if as a first hazard it is localised. It is not clear, however, why it is seen as such a ubiquitous hazard in Burkina Faso in particular. Windstorms carrying sand are a general phenomenon in the Sahel, and even carry down to the coast; here it seems they show up as a threat mainly to grain-crop based areas, especially those growing mostly millet. We do not have the information to tell us why crop disease should be the most important hazard uniquely in the Western Cereals zone in Burkina Faso (ZME4); perhaps a recent, severe outbreak might have influenced the responses on this occasion.

MAP 37: HAZARDS AFFECTING LIVESTOCK

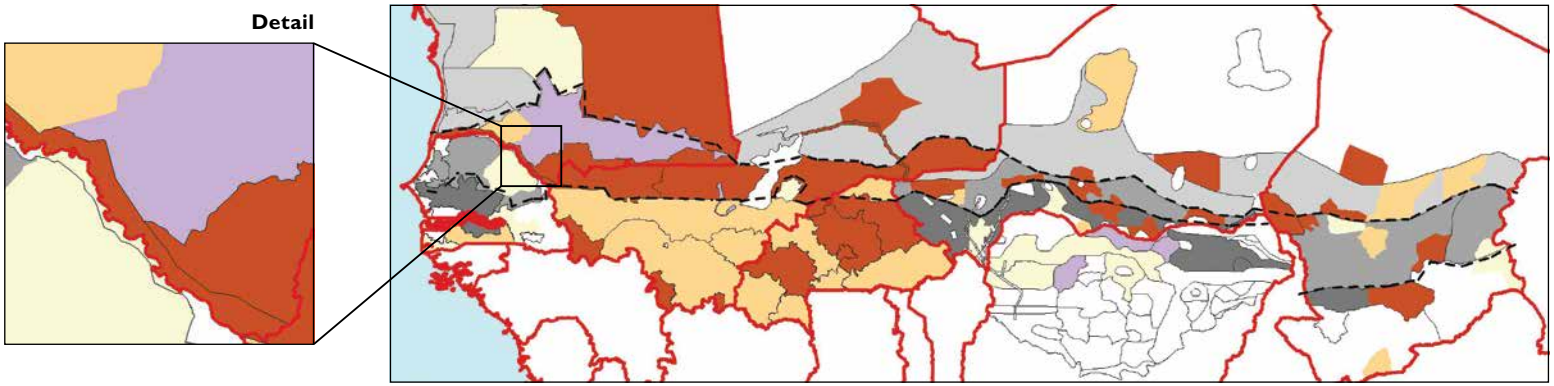
We have commented above on the primacy of rain failure and disease outbreaks. Bushfires as a reported phenomenon do not show a particular geographical pattern, but evidently in some years in some places they are widespread enough to seriously damage pastures – perhaps bush browse as much as grasses.

PHOTO: KATIE SEABORNE/SAVE THE CHILDREN

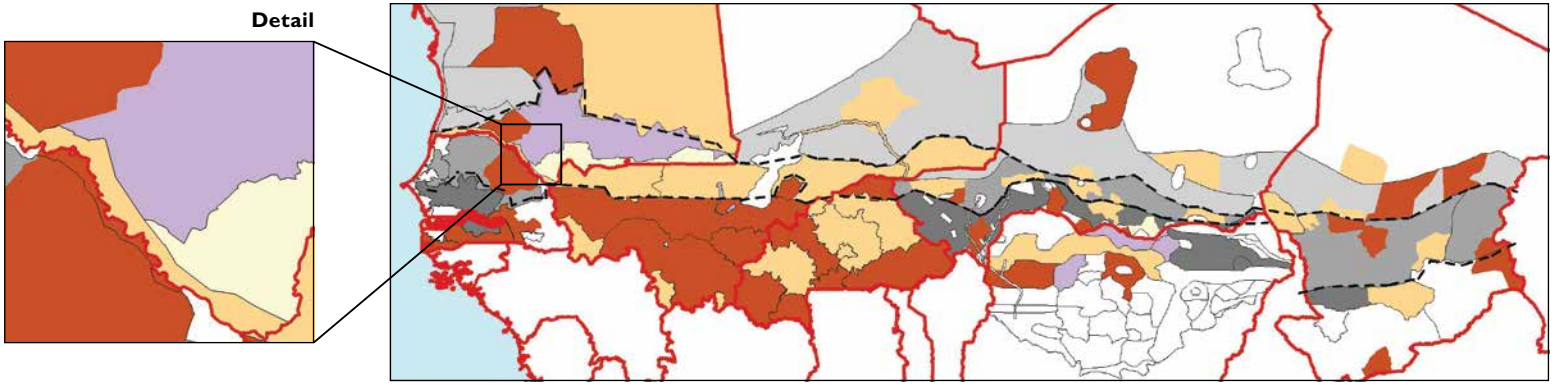
Preparing maize in Kayes region, Mali

MAP 37: HAZARDS AFFECTING LIVESTOCK

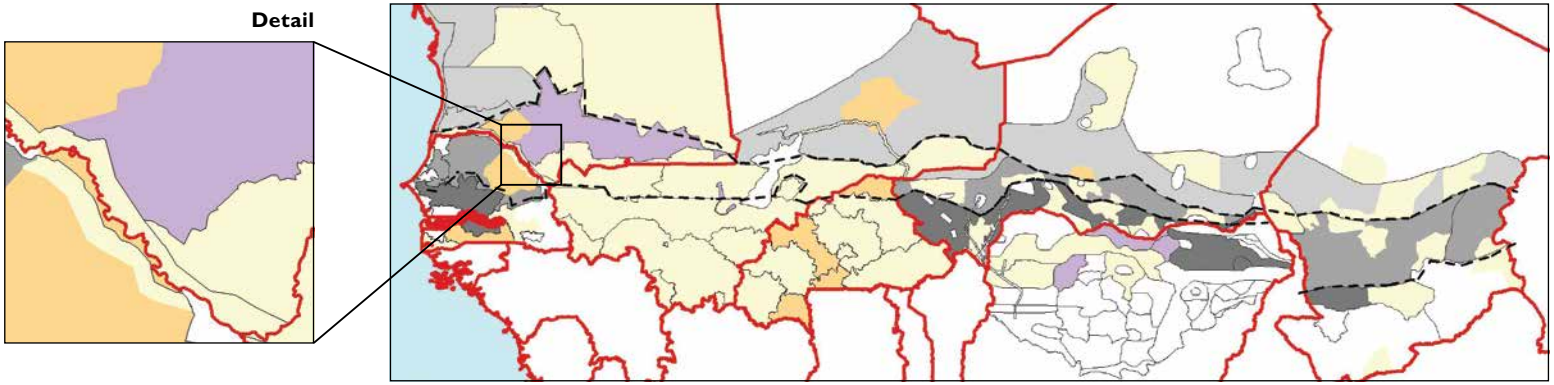
DROUGHT/ERRATIC RAIN



DISEASE OUTBREAKS



BUSH FIRES

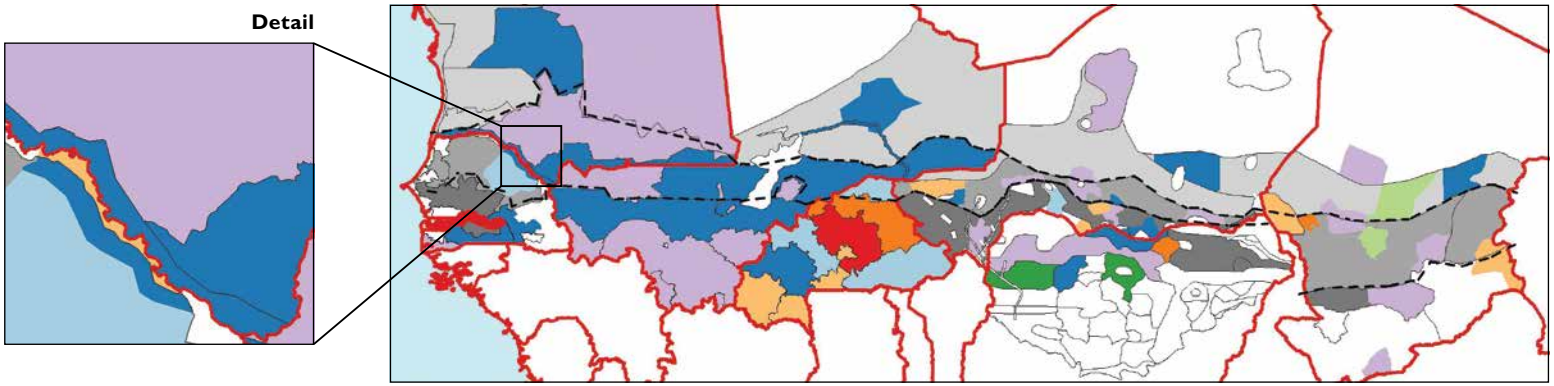


LEGEND

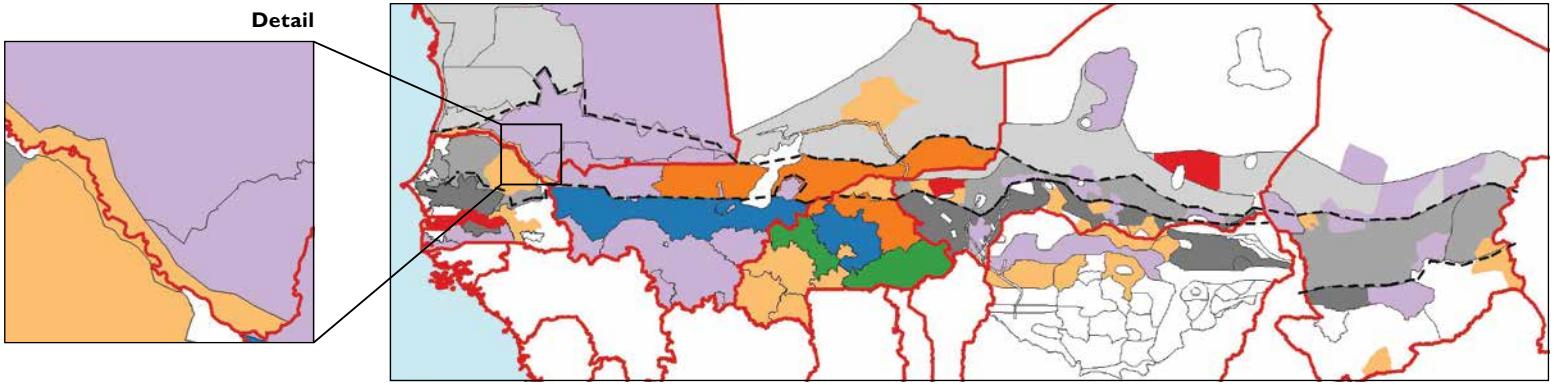
- Most important
- Secondary importance
- Not reported
- No data

MAP 38: MOST IMPORTANT COPING STRATEGIES IN A BAD YEAR

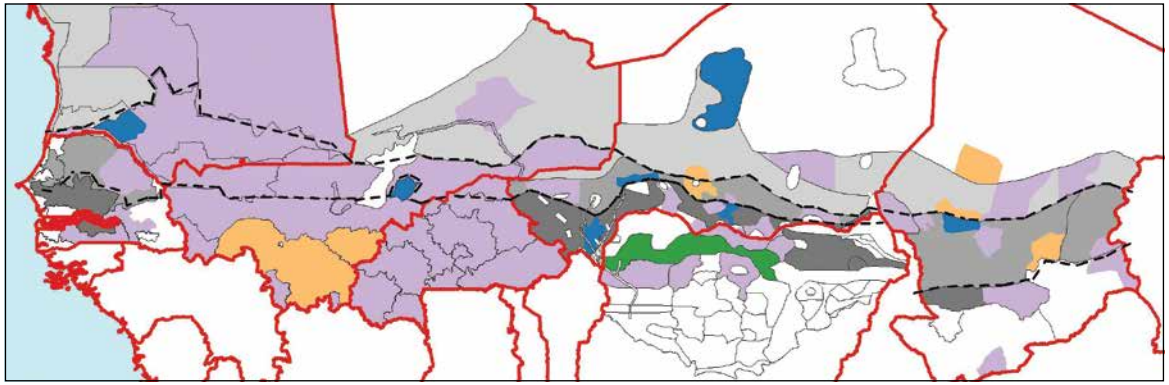
STRATEGIES FOR VERY POOR



STRATEGIES FOR BETTER OFF



GENERAL STRATEGIES



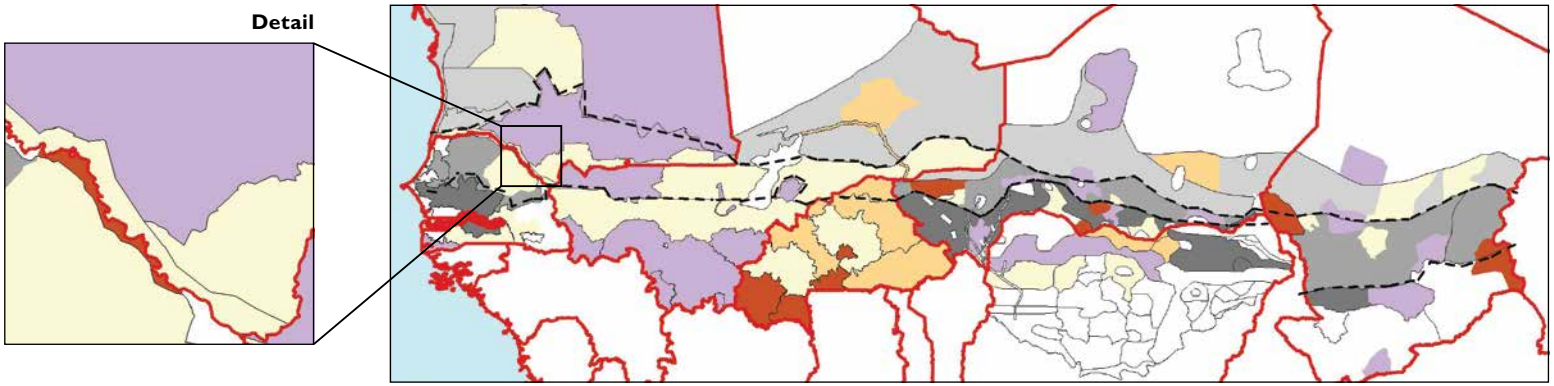
Note: In most livelihood zones, informants were asked about strategies for the Very Poor and for the Better Off (see above maps). In other cases, data on strategies was not differentiated by wealth group (right-hand map).

LEGEND

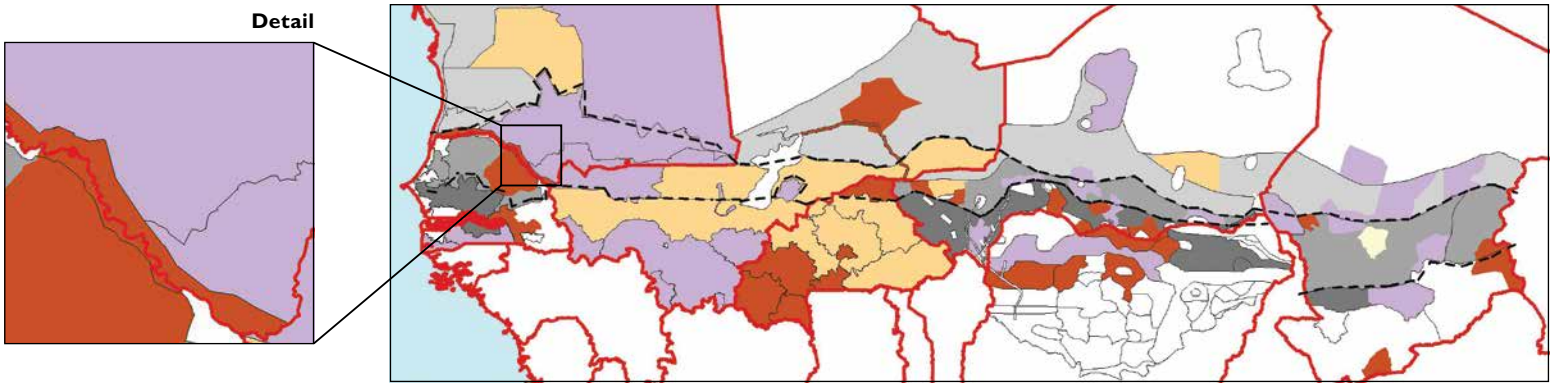
- Livestock sales
- Labour (local)
- Labour (migrant)
- Self-employment
- Trade/petty trade
- Crop diversification
- Credit
- No data

MAP 39: COPING STRATEGIES IN A BAD YEAR – LIVESTOCK SALES

VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS

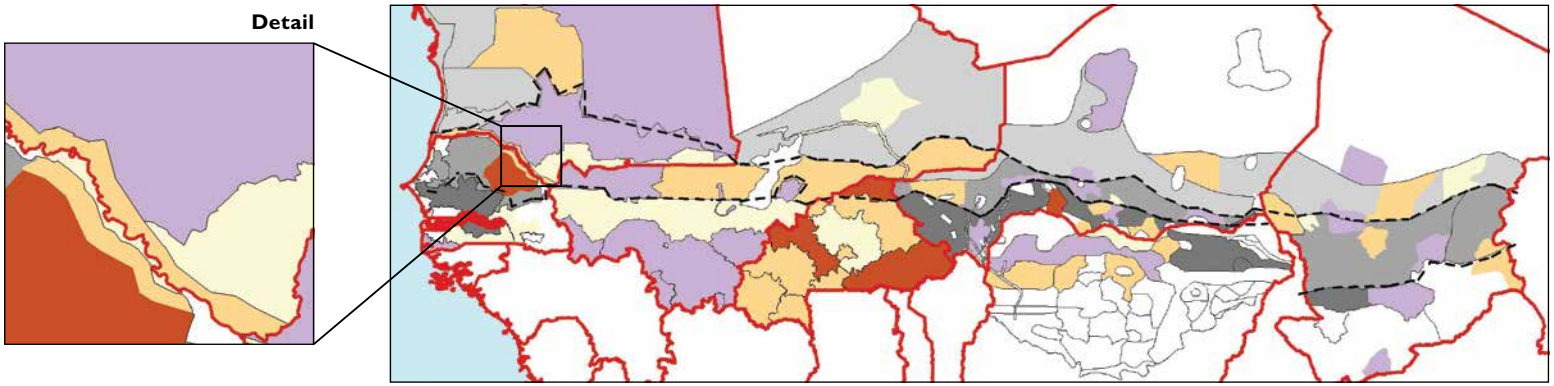


LEGEND

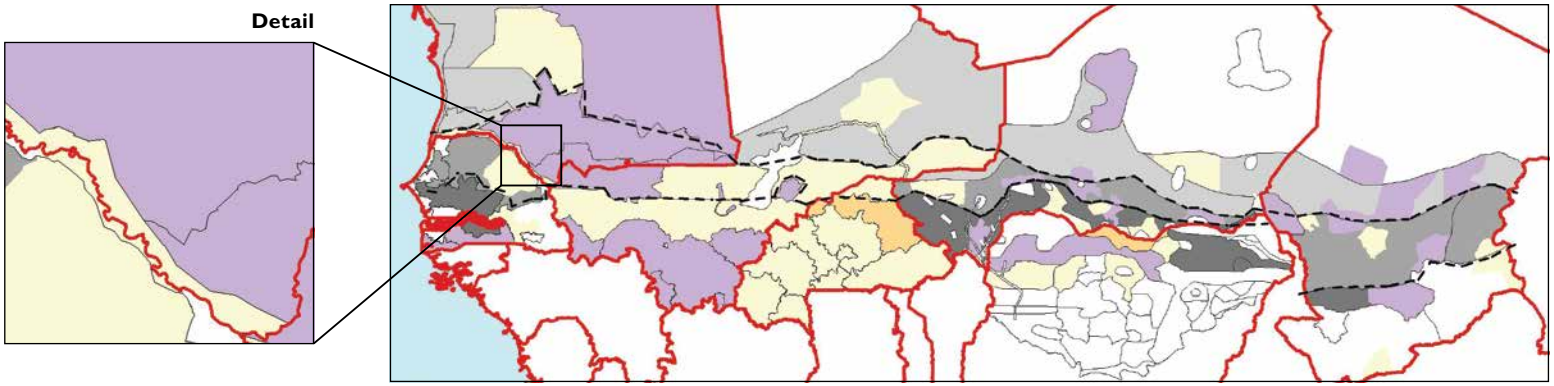
- **Most important**
- **Secondary importance**
- **Not reported**
- **No data**

MAP 40: COPING STRATEGIES IN A BAD YEAR – LOCAL LABOUR

VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS

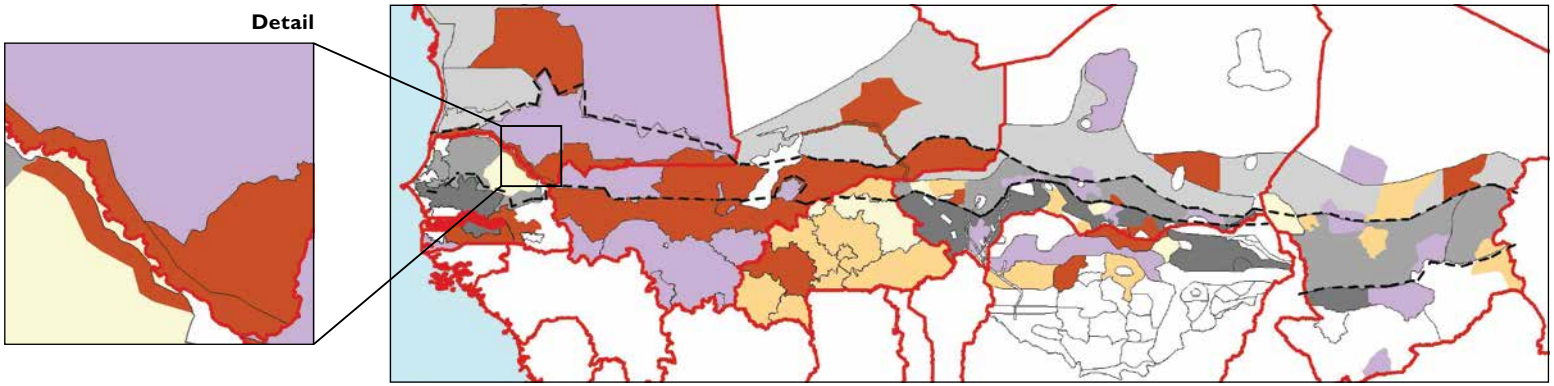


LEGEND

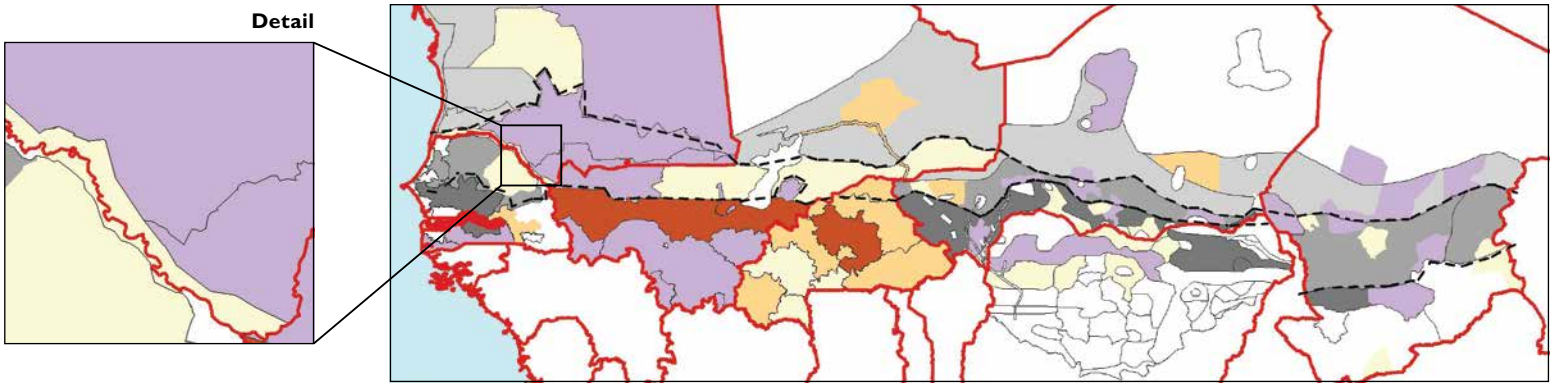
- **Most important**
- **Secondary importance**
- **Not reported**
- **No data**

MAP 41: COPING STRATEGIES IN A BAD YEAR – MIGRANT LABOUR

VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS

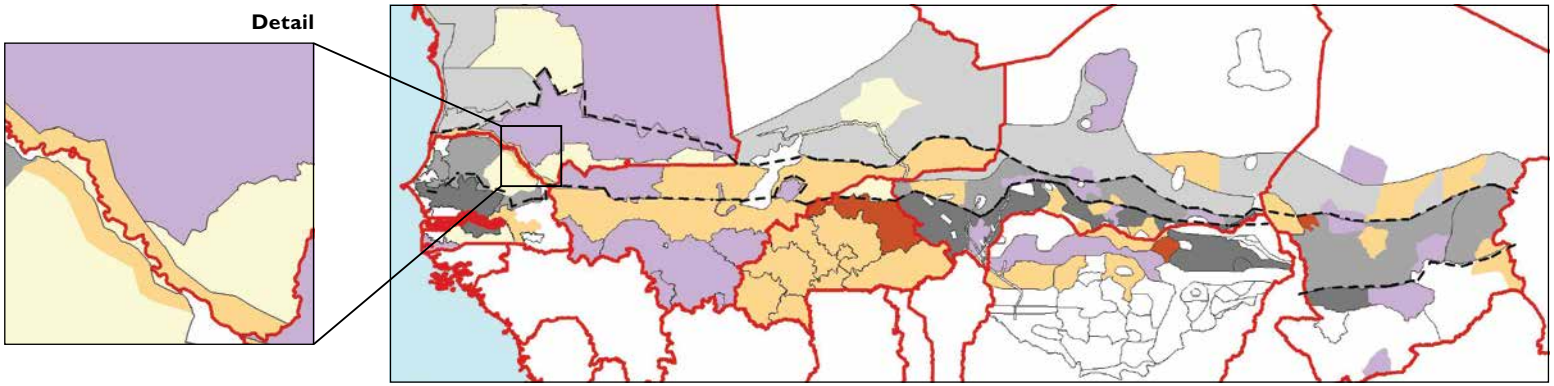


LEGEND

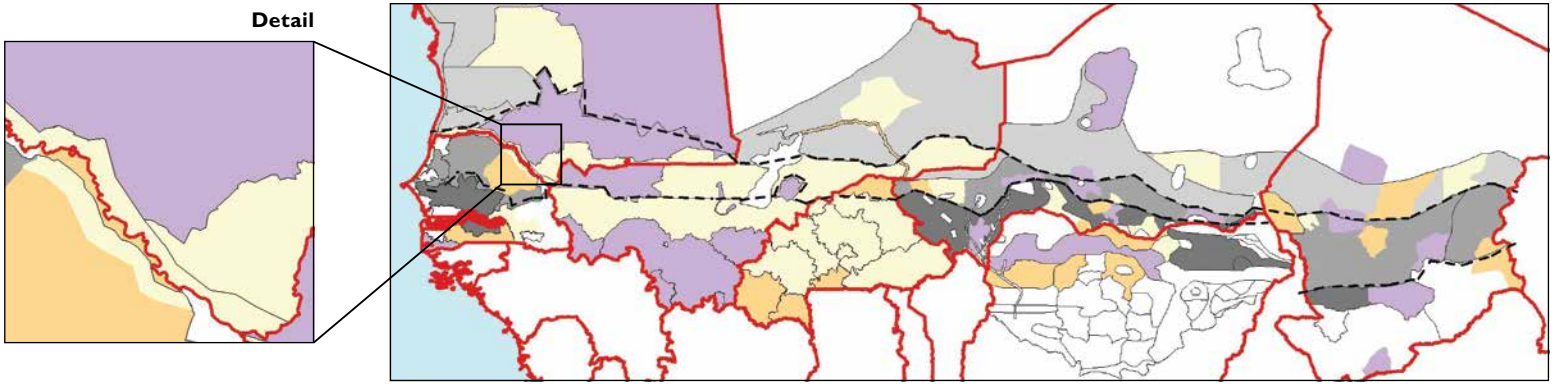
- **Most important**
- **Secondary importance**
- **Not reported**
- **No data**

MAP 42: OTHER COPING STRATEGIES IN A BAD YEAR – VERY POOR

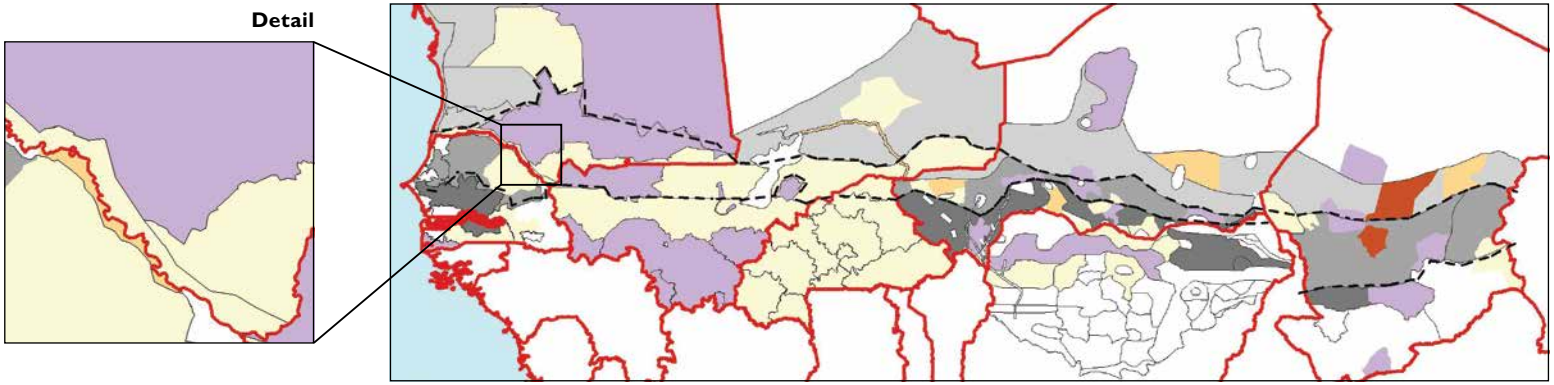
SELF-EMPLOYMENT



WILD FOODS



CREDIT

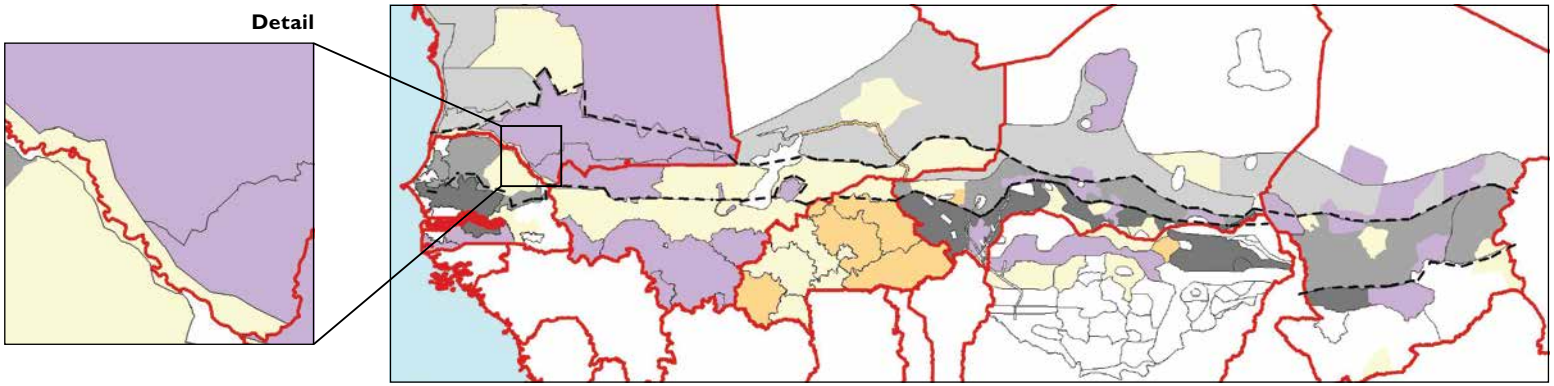


LEGEND

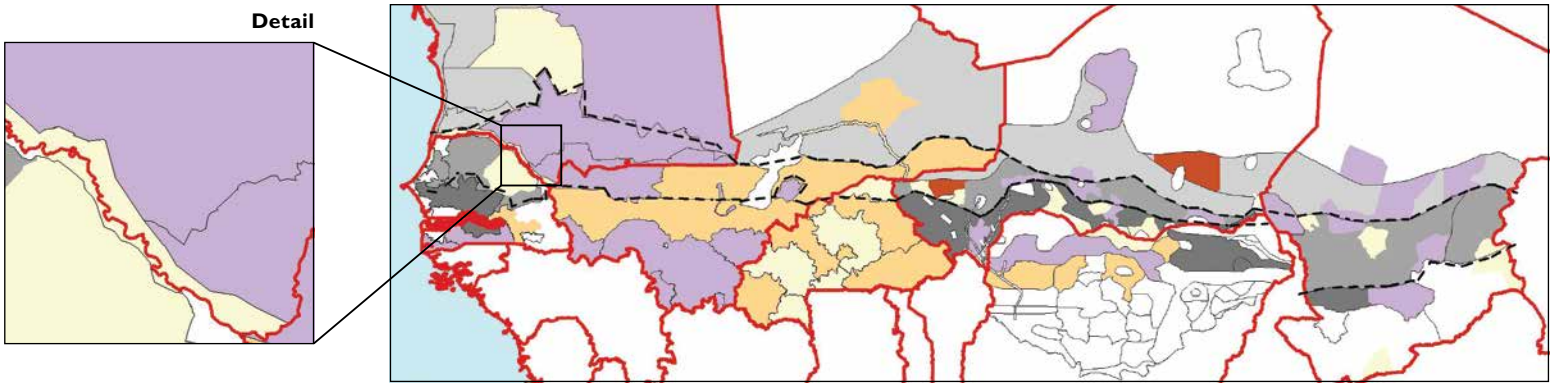
- Most important
- Secondary importance
- Not reported
- No data

MAP 43: OTHER COPING STRATEGIES IN A BAD YEAR – BETTER OFF

SALE OF MILK



TRADE/PETTY TRADE



LEGEND

- Most important
- Secondary importance
- Not reported
- No data

MAPS 38–43: COPING STRATEGIES IN A BAD YEAR

We have not attempted to map certain coping strategies because they are ubiquitous geographically and common to all wealth groups, if at different intensities, for example: reducing 'luxury' expenditure (sugar, meat, cola nuts, condiments); reducing other 'non-essential' household expenditure (even, for instance, the purchase of soap); reducing social expenditure (eg, on baptisms, memorials, weddings); reducing education costs; reducing basic food consumption, first in terms of food quality, finally in number of daily meals.

We have concentrated on strategies concerned with the search for extra income, summarised in Map 38. For poorer households, looking for extra paid employment is the most widespread primary recourse; and because local possibilities are least expandable in a bad year, a good part of the search involves seasonal migration to where work is available (Map 41). But on the limited information we have, dominated by Burkina Faso, local employment (Map 40) is nevertheless an important element, and in the far-north agropastoral zone (ZME8) the primacy of local employment for the Very Poor includes a strong element of gold mining. Returning to Map 38, we cannot explain why Better-Off people from the Central Plateau zone (ZME05) engage so heavily in 'migrant work' unless, in fact, this is also to do with gold mining. In the Mixed Pastoral, Oasis and Wadi zone (AOU) in Mauritania, labour migration stands out as the most important coping strategy for the Very Poor, and this is essentially to the capital, Noukchott. But in normal years, poorer households do not typically have anyone going on work migration.

Crop diversification usually means that when the main crop shows signs of substantial failure, perhaps because of rain failure in the first part of the season, households will try a late, shorter cycle crop, whether grain, pulse or field melon for seeds, or they will concentrate on market gardening where local conditions allow.

Livestock sales (Map 39) are a common first recourse for wealthier people, perhaps starting with small stock but rising to cattle or camels as soon as the need for cash reaches a greater scale. Unfortunately, pastoralists and agropastoralists are poorly represented in this particular set of data, although we would assume that increased sales of livestock must be a prime recourse for the wealthier, at least. With the information we do have, it is interesting to note that poorer people too quite generally attach some importance to livestock sales, although they usually have exceedingly few livestock and virtually

no cattle or camels. If the terms of trade for animals against grain have not collapsed in a 'panic' selling market, even the sale of a couple of goats can stave off the worst hunger for a household for some weeks.

The pastoralists of Goure (GPA) in north-east Niger seem to pose an anomaly, in that for the Better Off, it is trade (Map 43) rather than livestock sales (Map 39) that come top. However, in this instance the trade is particularly about acting as brokers in camel sales for a commission, an activity that becomes particularly remunerative when transactions multiply in a bad year. But it may also be that in this particular instance some confusion arose between profits from intermediary trading and from sales of own animals.

Otherwise, poorer people tend to rely on self-employment (Map 42), including the sale of firewood, cut fodder grass, and artisan products such as mats and basketry, while Better-Off people tend to try to expand earnings that do not require work with their hands, notably trading (Map 43).

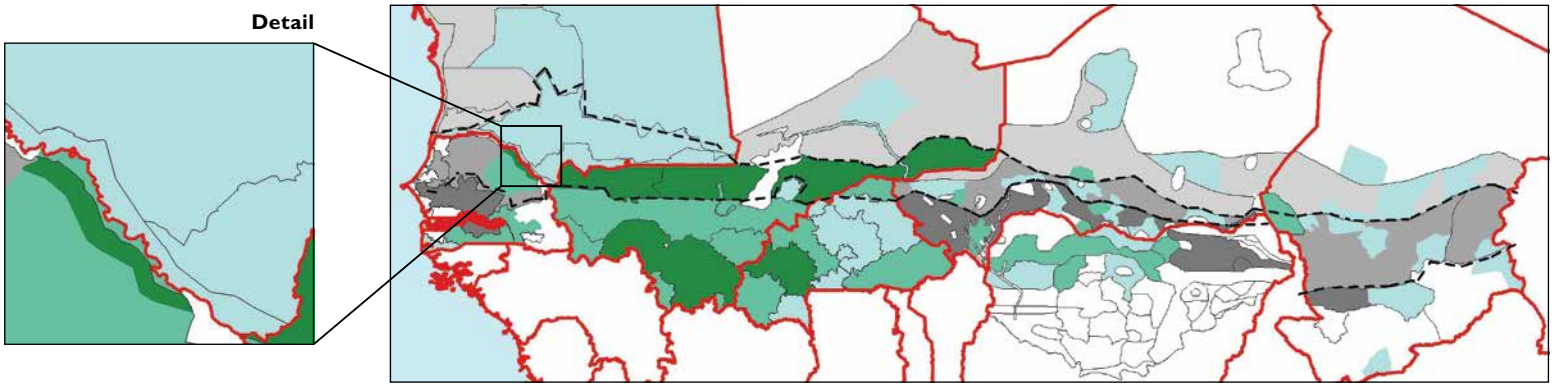
PHOTO: HEDINN HALLDORSSON/SAVE THE CHILDREN

Severe drought in 2011–12 left farmers in Burkina Faso and across the Sahel without crops to feed their families or animals, forcing many to sell their livestock

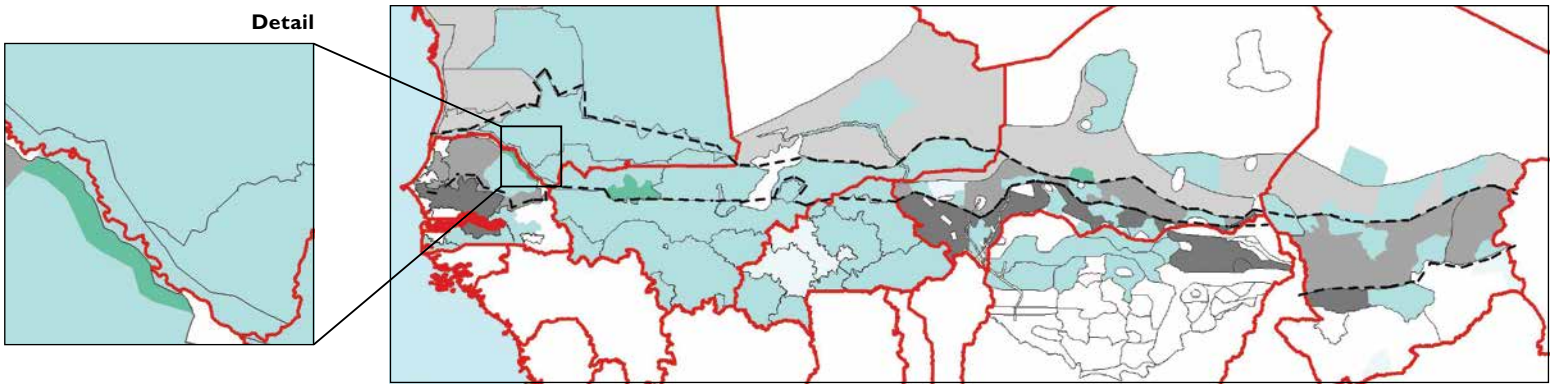
MAP 44: AVERAGE HOUSEHOLD SIZE

(NUMBER OF PEOPLE IN HOUSEHOLD)

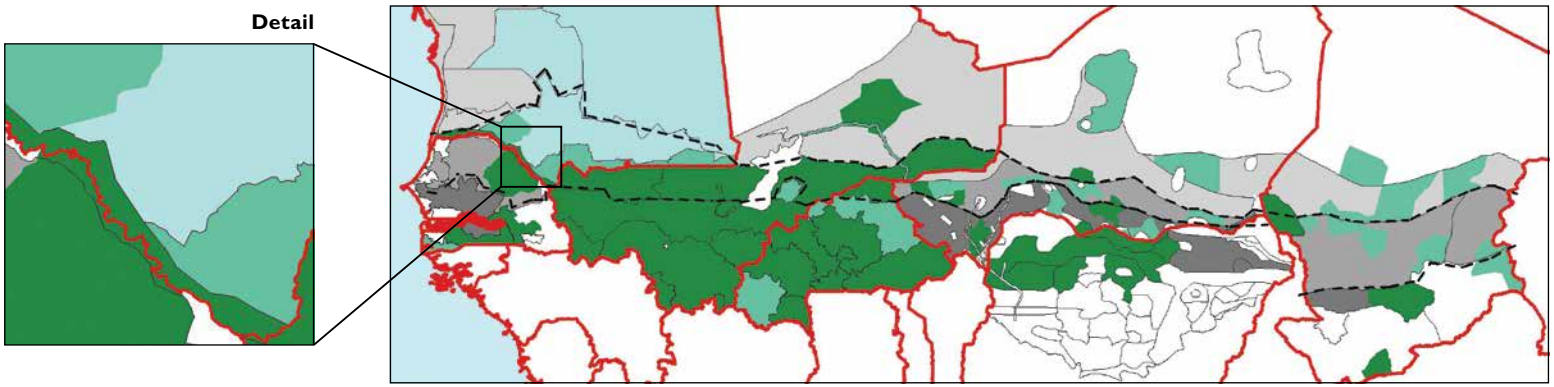
AVERAGE HOUSEHOLDS



VERY POOR HOUSEHOLDS



BETTER-OFF HOUSEHOLDS



LEGEND

Number of people per household

- 1–5
- 6–10
- 11–15
- >15

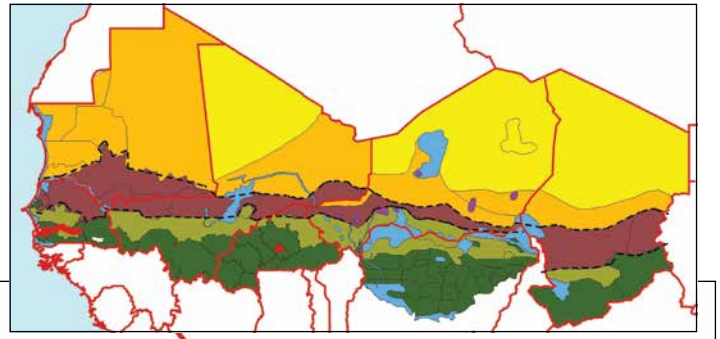
MAP 44: AVERAGE HOUSEHOLD SIZE

The HEA methodology takes the household as its unit of reference because that is the universal unit of asset-holding, production, pooled income, and cash expenditure and consumption. Households in this sense may consist of one person (rare in rural Africa) or more than 20 people. In the Sahel where polygamy is common, when there is more than one wife how 'household' is defined depends on whether the quasi-nuclear family of each wife and her children operates separately, or whether there is sharing of the household economy. Very frequently it is the latter – they 'eat from the same pot' – so that such households may be very big, even upwards of 25 members, living in separate dwellings within a compound but sharing the same assets and granary and even meals prepared on a rota basis. Unmarried or elderly kin (especially the widowed) often live with one or other 'nuclear' family. The identification of household size in the fieldwork in a given area is not a calculated mean, but refers to the 'typical' household within a wealth group, as estimated by focus groups, to which then the economic information refers, in the knowledge that in any wealth group the full variation is wide.

The Average map shows a definite tendency for larger households to be found towards the southern half, where the majority farming population live, and the Better Off map accentuates this pattern, although there are exceptions in both the agropastoral and pastoral bands. But what looks more like a rule than a tendency is that the Very Poor households are smaller, mostly markedly smaller than the Better Off. We are not in a position to make an analysis of this phenomenon, except to say that of course higher landholdings feed more people and that it seems that wealth attracts more members to households and maybe thrives on the solidarity of the many. But the differences in land *per capita* are by no means as great as the differences in livestock per capita. As regards the Very Poor, it is common to be told in villages that 'they have many children': but given the small absolute sizes of their households, it looks as though this should be translated as having a higher proportion of young children, ie, a high dependency ratio, rather than larger households.

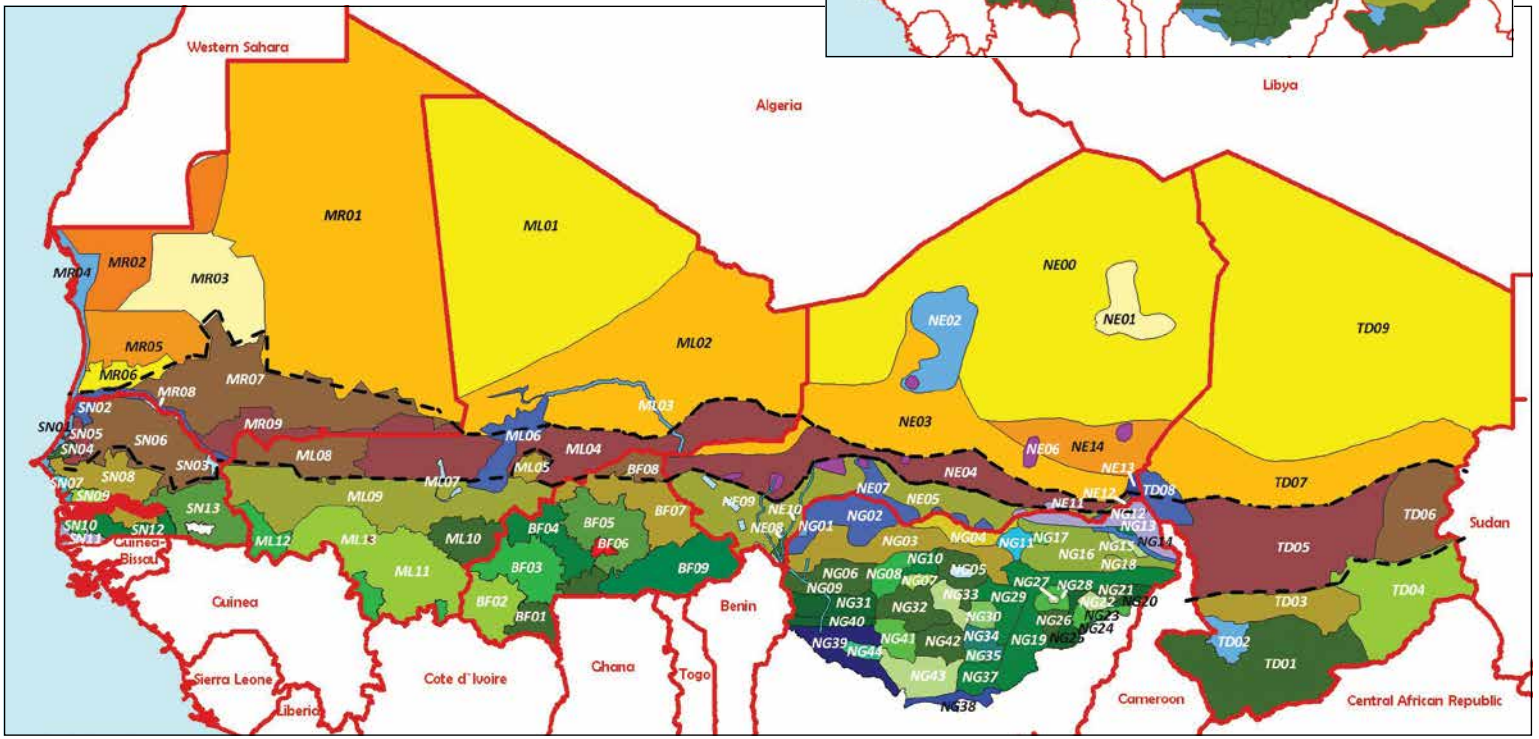
APPENDIX 1: LIVELIHOOD ZONES IDENTIFICATION

WESTERN AFRICA – LIVELIHOOD ZONES (DETAIL)



LEGEND

- Desert
- Pastoral
- Agropastoral
- Rainfed agriculture (sahelian)
- Other agriculture
- Irrigated/Riverine/Coastal/Lake
- Out-migration – Niger
- Urban/Peri-Urban



WEST AFRICA – HEA BASELINE COVERAGE

LEGEND

Livelihood Zones (and parts of LZs) with full baseline

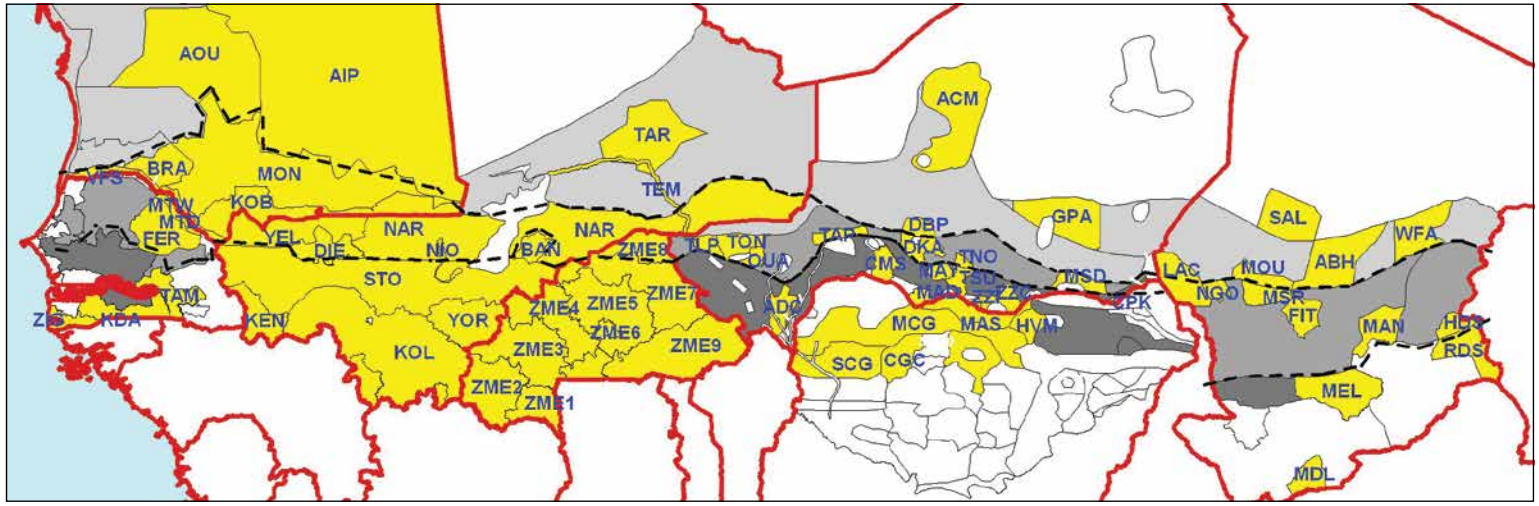
Grey-shading indicates livelihood zones that are part of the following general sahelian zones:

Pastoral

Agropastoral

Rainfed agriculture (sahelian)

--- Dotted lines indicate boundaries between these three general zones.



MAURITANIA – LIVELIHOOD ZONES

LEGEND

- **Region boundaries**
- **MR01 – Nomadic pastoralist**
- **MR02 – Mine and pastoral**
- **MR03 – Mixed pastoral, oases and wadis**
- **MR04 – Littoral coastal fishing**
- **MR05 – Pastoral and trade**
- **MR06 – Transhumant pastoralism**
- **MR07 – Agropastoralism**
- **MR08 – Senegal valley agriculture**
- **MR09 – Rainfed agriculture**

SOURCE: USAID/FEWS NET

MAURITANIA – HEA BASELINE COVERAGE

LEGEND

Livelihood Zones (and parts of LZs) with full baseline

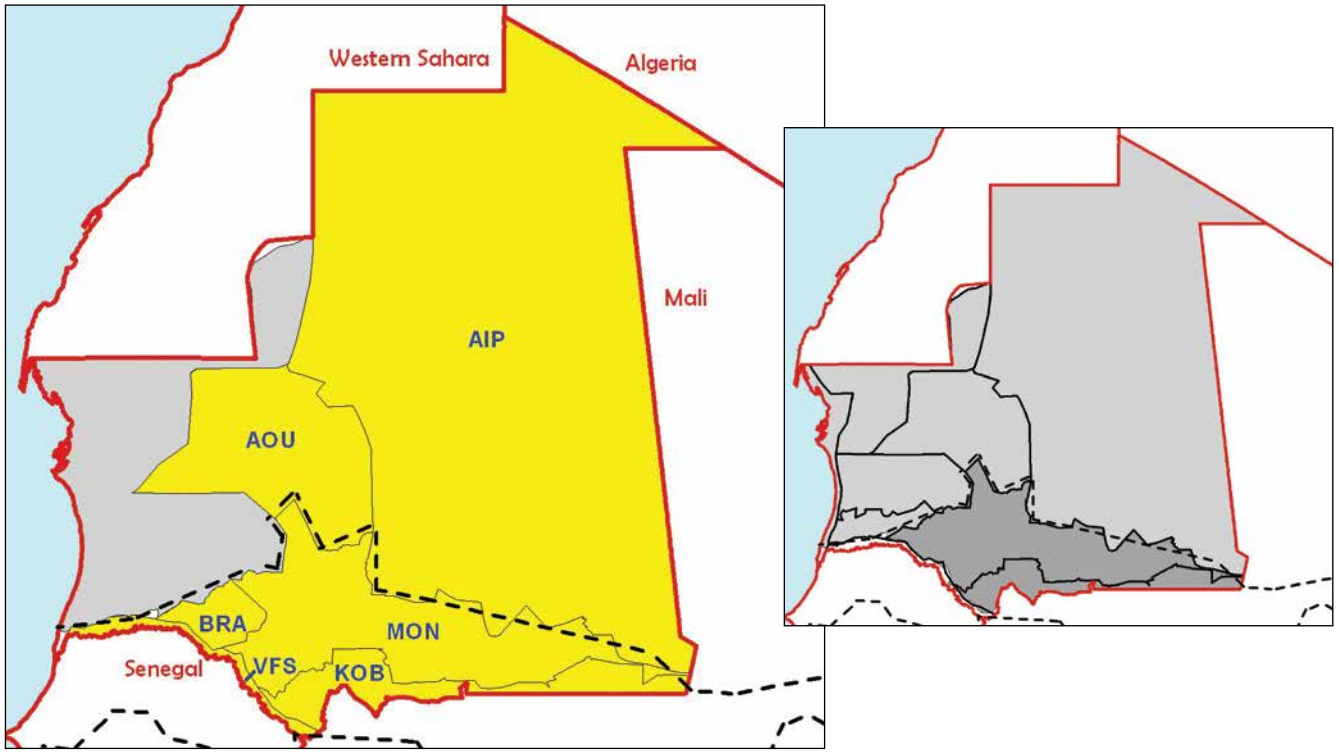
Grey-shading (see main map and inset) indicates livelihood zones that are part of the following general sahelian zones:

Pastoral

Agropastoral

Rainfed agriculture (sahelian)

--- Dotted lines indicate boundaries between these three general zones.



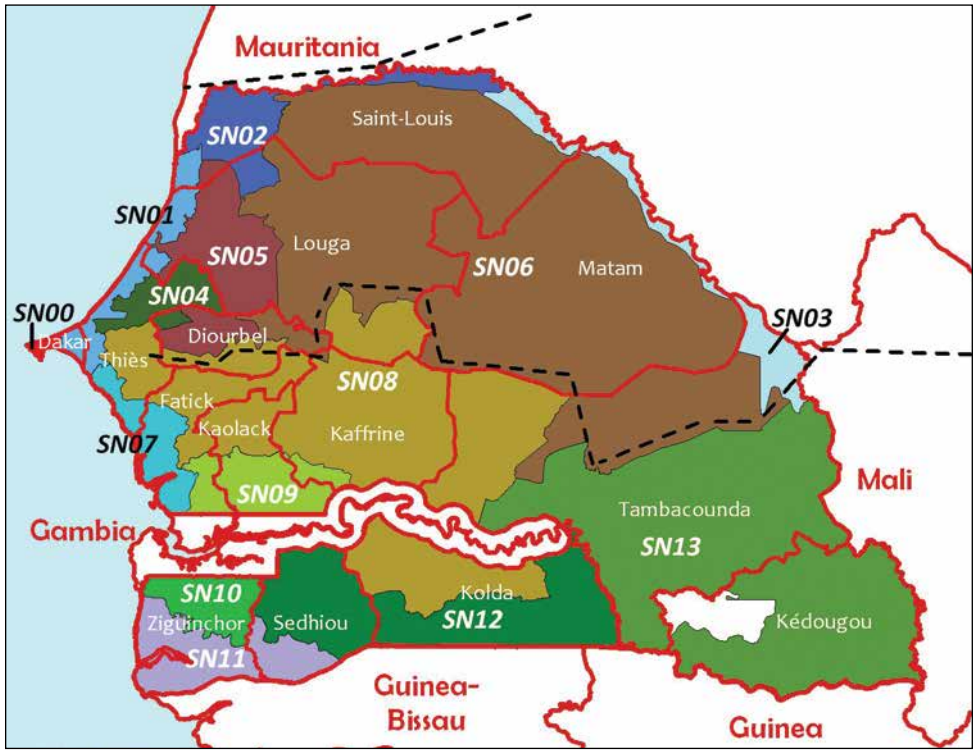
LZ code	New?	LZ name/description
AOU	new	Transhumant Pastoralists and Oasis and Wadi Agriculture
AIP		Nomadic Pastoralists (Ayoûn el Atroûs)
MON		Agropastoral Monguel

LZ code	New?	LZ name/description
BRA	new	Agropastoral Brakna
VFS		Senegal River Valley: Rice, Cowpeas, Sorghum and Maize
KOB	new	Agropastoral Kobeni

SENEGAL – LIVELIHOOD ZONES

LEGEND

- Region boundaries
- SN00 – Urban: Dakar
- SN01 – Niayes Horticulture and Fishing Zone
- SN02 – Senegal River Valley: Rice and Gardening Zone
- SN03 – Senegal River Valley: Out-mig. and Remittance
- SN04 – Agropastoral: Cassava Zone
- SN05 – Agropastoral: Cowpea Zone
- SN06 – Sylvo-pastoral Zone
- SN07 – Peate-Côte: Fishing, Tourism and Arboriculture
- SN08 – Agropastoral: Peanut Zone
- SN09 – Agriculture Zone
- SN10 – Food Crops and Forestry Zone
- SN11 – Agroforestry, Fishing and Tourism Zone
- SN12 – Agro-sylvo-pastoral: Peanuts and Cotton Zone
- SN13 – Agro-sylvo-pastoral: Food Crops Zone



SOURCE: USAID/FEWS NET

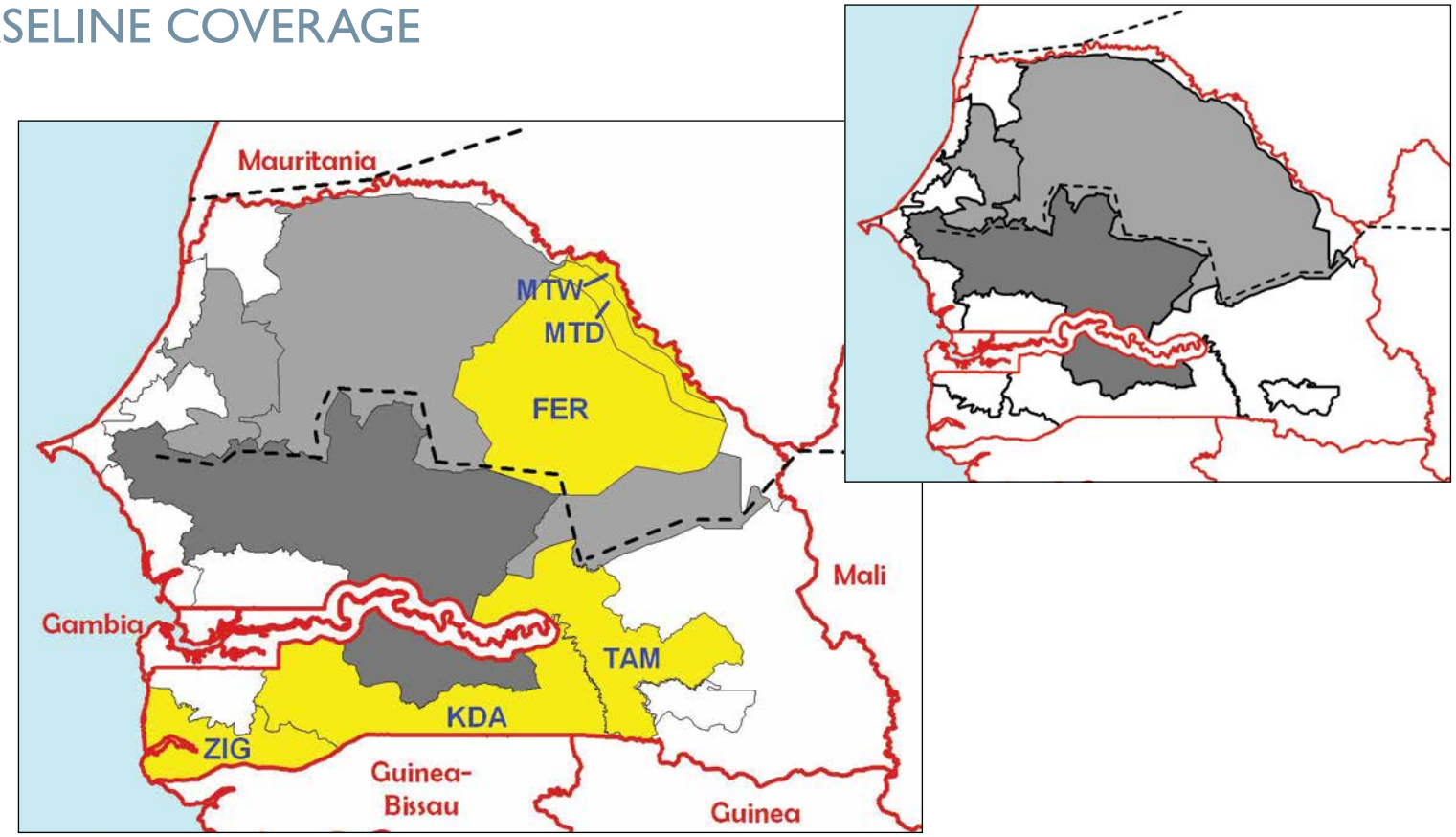
SENEGAL – HEA BASELINE COVERAGE

LEGEND

Livelihood Zones (and parts of LZs) with full baseline

Grey-shading (see main map and inset) indicates livelihood zones that are part of the following general sahelian zones:

- **Pastoral**
- **Agropastoral**
- **Rainfed agriculture (sahelian)**
- **--- Dotted lines indicate boundaries between these three general zones.**



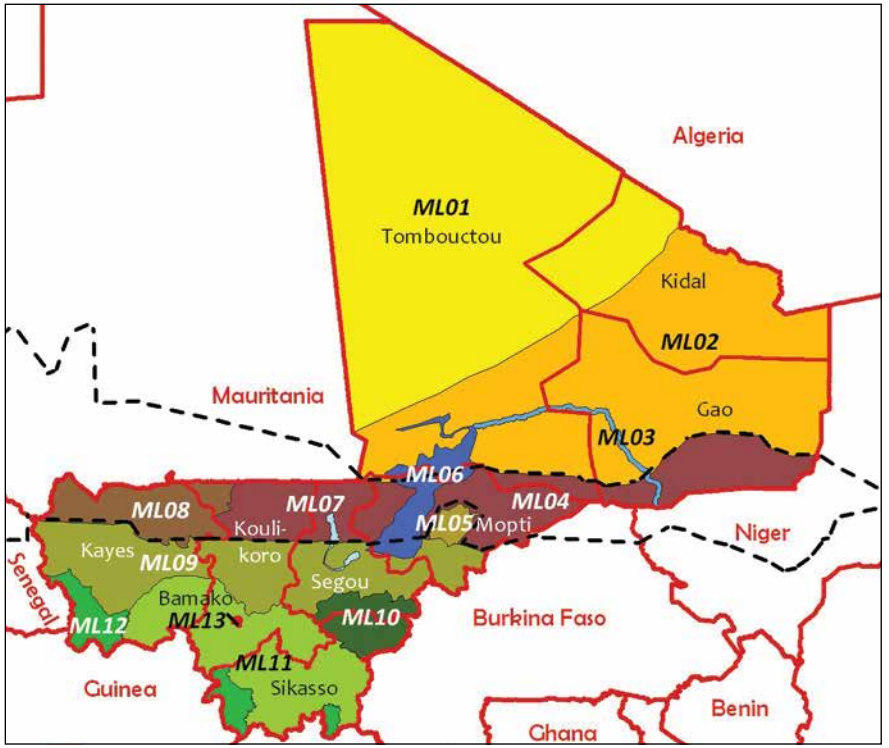
LZ code	New?	LZ name/description
MTW		Senegal River Valley Walo: Agropastoral, Outmigration and Remittances (Matam)
MTD		Senegal River Valley Dieri: Agropastoral, Outmigration and Remittances (Matam)
FER		Sylvo-pastoral Ferlo: Agropastoral with Transhumant Pastoralism

LZ code	New?	LZ name/description
TAM		Agro-Sylvo-Pastoral: Cereals, Groundnuts and Forestry (Tambacounda)
KDA	new	Agro-Sylvo-Pastoral: Groundnuts and Cotton (Kolda-Sediou)
ZIG	new	Agro-Forestry, Fishing and Tourism (Ziginchor)

MALI – LIVELIHOOD ZONES

LEGEND

- Region boundaries
- ML01 – Nomadism and trans-Saharan trade
- ML02 – Nomadic and transhumant pastoralism
- ML03 – Fluvial rice and transhumant livestock
- ML04 – Millet and transhumant livestock
- ML05 – Dogon plateau – millet, shallots and tourism
- ML06 – Niger delta/lakes – rice and livestock
- ML07 – 'Office du Niger' – irrigated rice
- ML08 – NW remittances, sorghum, and livestock
- ML09 – West and central rainfed millet/sorghum
- ML10 – Sorghum, millet, and cotton
- ML11 – South maize, cotton and fruits
- ML12 – South-west maize, sorghum and fruits
- ML13 – Bamako urban



SOURCE: USAID/FEWS NET

MALI – HEA BASELINE COVERAGE

LEGEND

Livelihood Zones (and parts of LZs) with full baseline

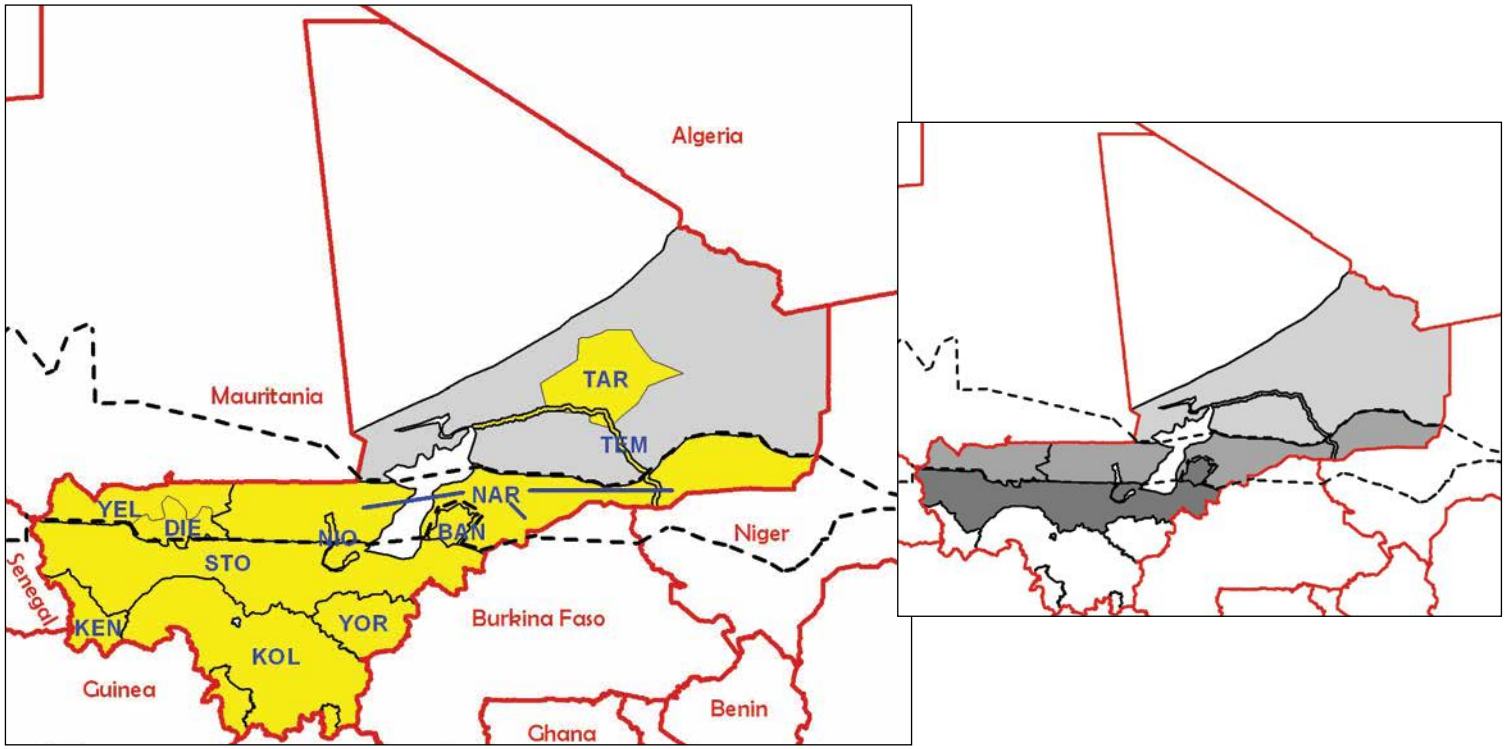
Grey-shading (see main map and inset) indicates livelihood zones that are part of the following general sahelian zones:

Pastoral

Agropastoral

Rainfed agriculture (sahelian)

--- Dotted lines indicate boundaries between these three general zones.



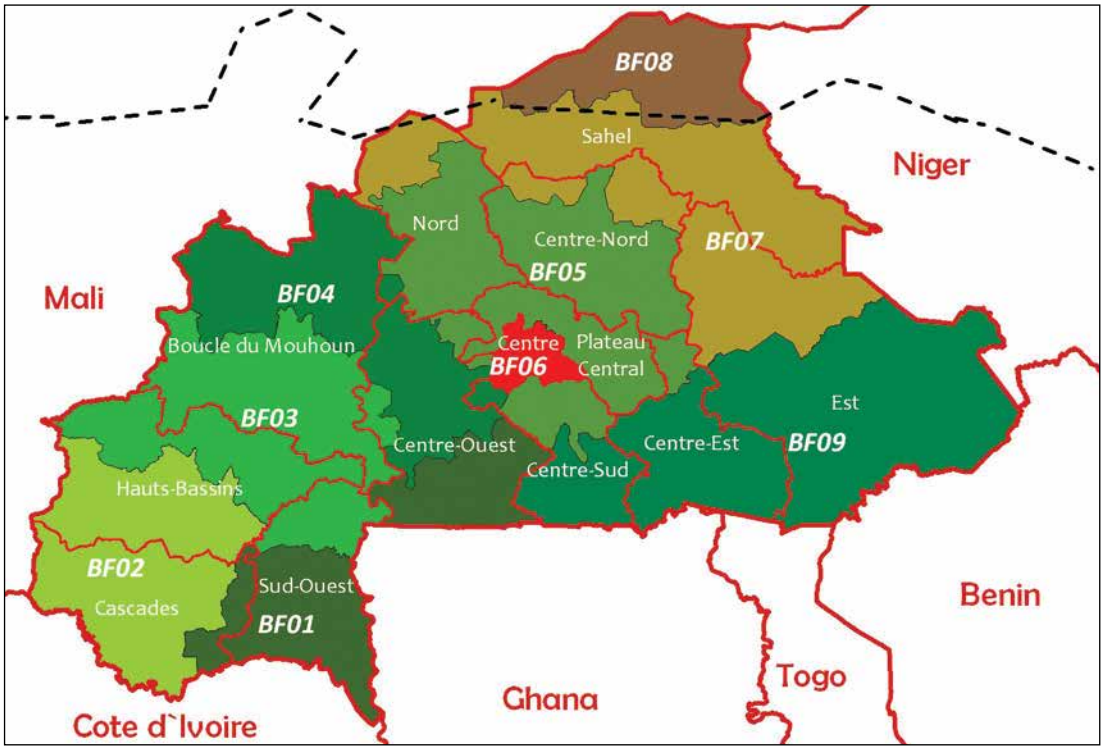
LZ code	New?	LZ name/description
TAR		Nomadic Pastoralists (Tarkhint)
TEM		Riverine Rice and Transhumant Pastoralism (Temera)
NAR	new	Millet, Transhumant Pastoralism and Remittances (Nara)
YEL		Northwest Millet, Livestock and Remittances (Yelimane)
DIE		Millet, Transhumant Pastoralism and Remittances (Diema)
BAN		Dogon Plateau Millet, Shallots and Tourism

LZ code	New?	LZ name/description
NIO		Office du Niger Irrigated Rice
STO	new	West and Central Sorghum and Millet (Tominian)
YOR		Millet, Sorghum and Cotton (Yorosso)
KOL		Maize, Cotton and Fruit (Kolondieba)
KEN	new	Maize, Sorghum and Fruit (Kenieba)

BURKINA FASO – LIVELIHOOD ZONES

LEGEND

- Region boundaries
- BF01 – South tubers and cereals
- BF02 – Southwest fruits, cotton, and cereals
- BF03 – West cotton and cereals
- BF04 – West cereals and remittances
- BF05 – Central plateau cereals and market gardening
- BF06 – Ouagadougou peri-urban
- BF07 – North and east livestock and cereals
- BF08 – North transhuman pastoralism and millet
- BF09 – Southeast cereals, livestock, forestry and fauna



SOURCE: USAID/FEWS NET

BURKINA FASO – HEA BASELINE COVERAGE

LEGEND

Livelihood Zones (and parts of LZs) with full baseline

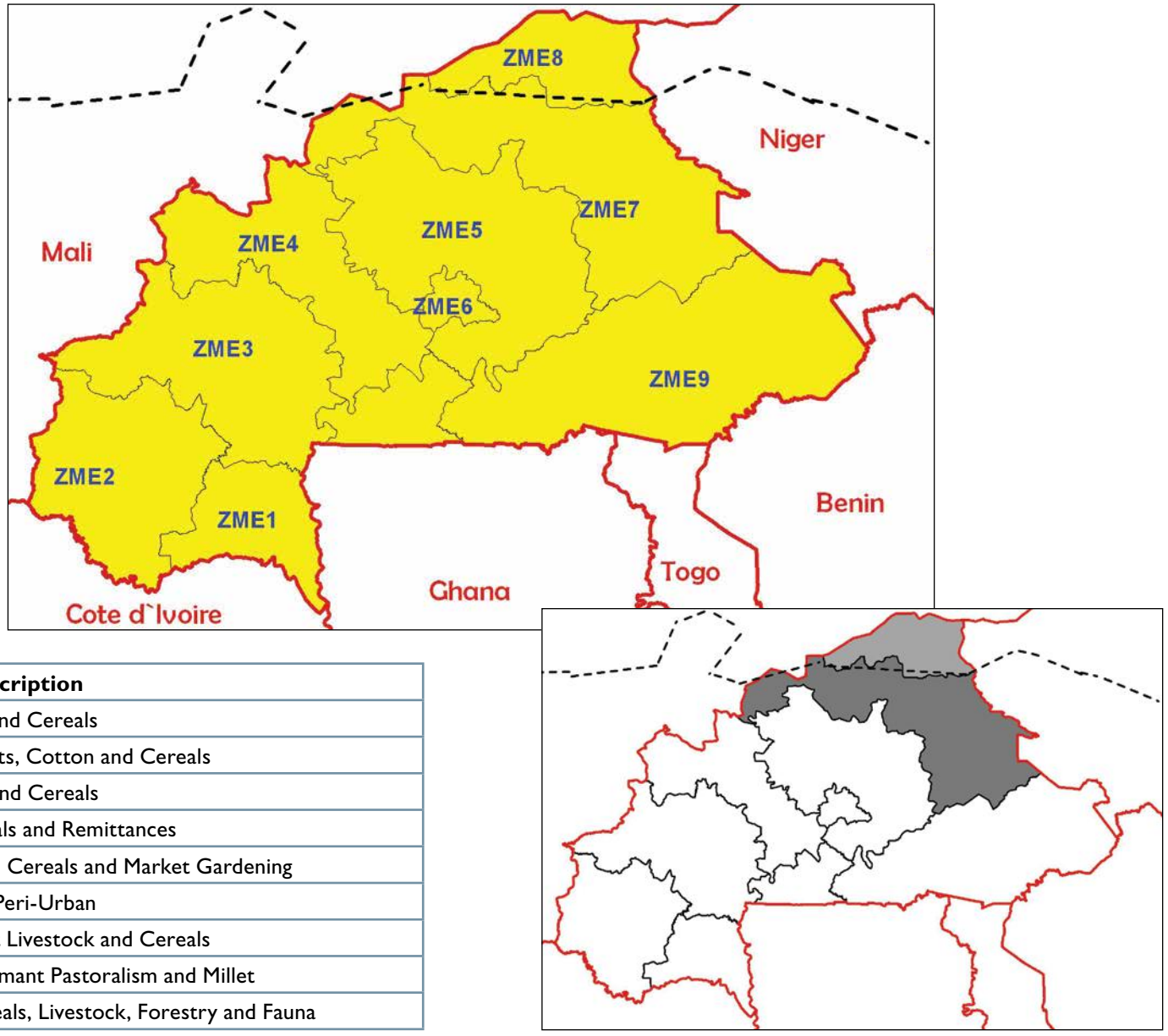
Grey-shading (see main map and inset) indicates livelihood zones that are part of the following general sahelian zones:

Pastoral

Agropastoral

Rainfed agriculture (sahelian)

--- Dotted lines indicate boundaries between these three general zones.

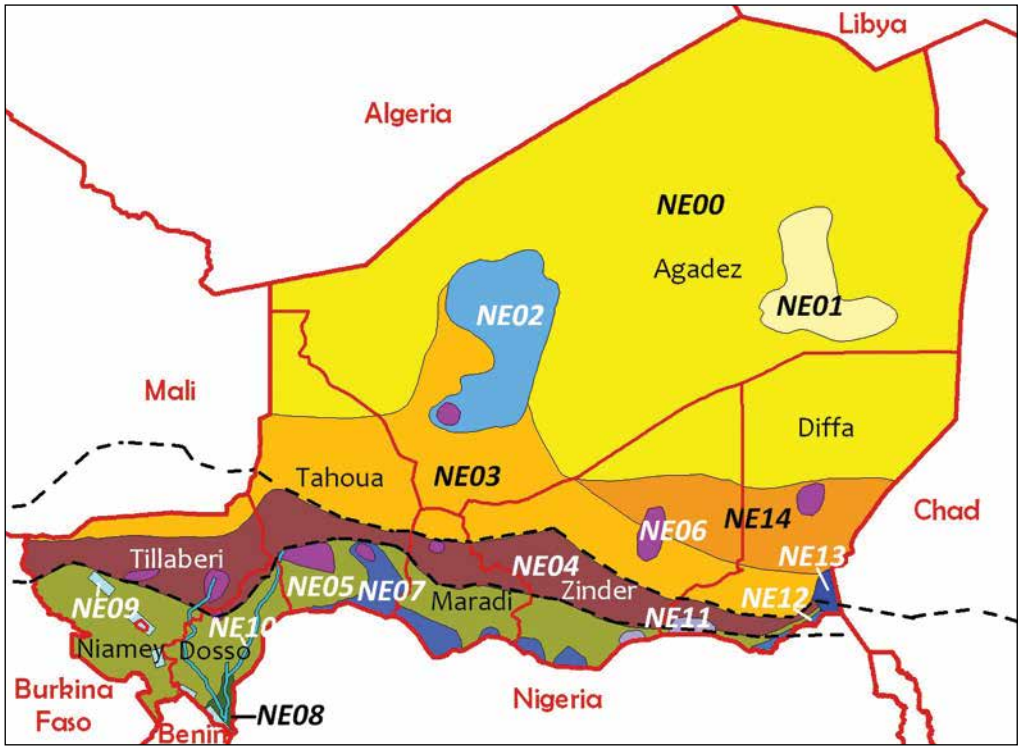


LZ code	New?	LZ name/description
ZME1		South Tubers and Cereals
ZME2		Southwest Fruits, Cotton and Cereals
ZME3		West Cotton and Cereals
ZME4		Western Cereals and Remittances
ZME5		Central Plateau Cereals and Market Gardening
ZME6		Ouagadougou Peri-Urban
ZME7		North and East Livestock and Cereals
ZME8		North Transhumant Pastoralism and Millet
ZME9		Southeast Cereals, Livestock, Forestry and Fauna

NIGER – LIVELIHOOD ZONES

LEGEND

- Region boundaries
- NE00 – Not Zoned (Desert)
- NE01 – North-east Oases: Dates, Salt and Trade
- NE02 – Aïr Massif Irrigated Gardening
- NE03 – Transhumant and Nomad Pastoralism
- NE04 – Agropastoral Belt
- NE05 – Rainfed Millet and Sorghum Belt
- NE06 – Cropping/Herding with High Out-migraaon
- NE07 – Southern Irrigated Cash Crops
- NE08 – Southwestern Cereals with Fan-Palm Products
- NE09 – Niger River Irrigated Rice
- NE10 – Dallols – Seasonal Water-Course Irrigated Crops
- NE11 – SE Natron Salt and Small Basin Irrigated Dates
- NE12 – Komadougou Irrigated Peppers
- NE13 – Lake Chad Flood-Retreat Cultivation and Fishing
- NE14 – Transhumant and Nomad Pastoralism – Camels



SOURCE: USAID/FEWS NET

NIGER – HEA BASELINE COVERAGE

LEGEND

Livelihood Zones (and parts of LZs) with full baseline

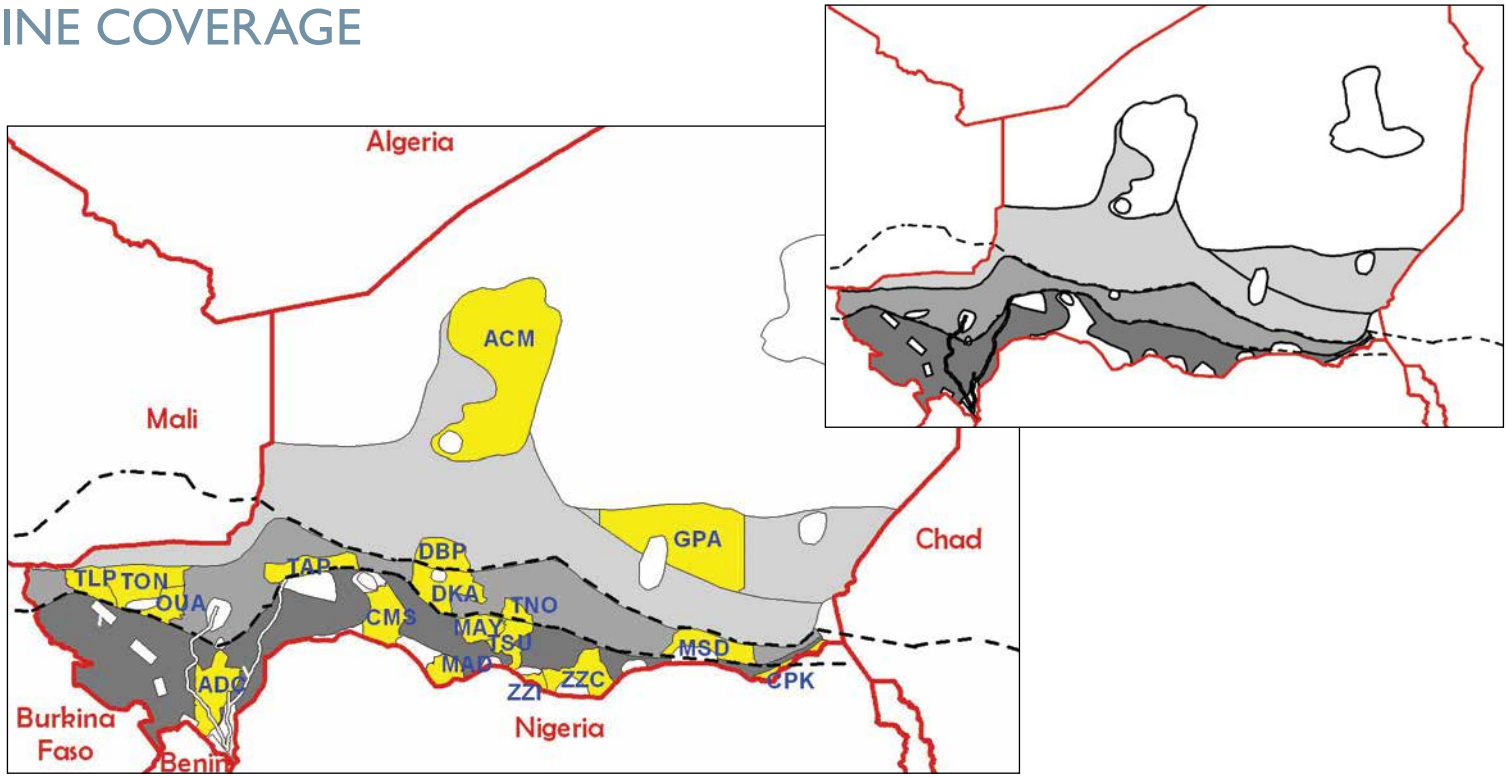
Grey-shading (see main map and inset) indicates livelihood zones that are part of the following general sahelian zones:

Pastoral

Agropastoral

Rainfed agriculture (sahelian)

--- Dotted lines indicate boundaries between these three general zones.



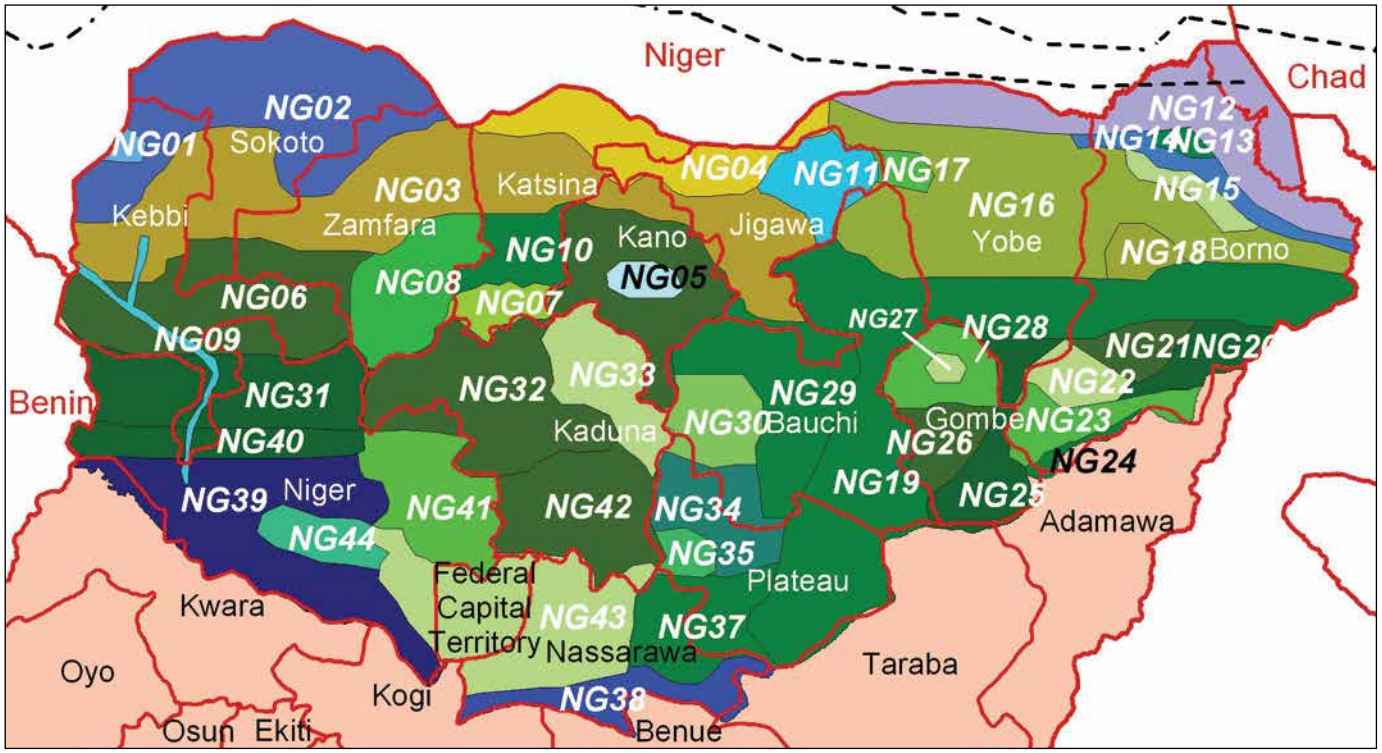
LZ code	New?	LZ name/description
ACM		Aïr Mountains Irrigated Gardening
GPA		Goure Pastoralists
DBP		Dakoro Bororo Pastoralists
MSD		Southeast Livestock, Natron Salt and Small Basins (Cuvettes) cultivation
TNO		Tessaoua North Agropastoral
DKA		Dakoro Katsinawa Agropastoral
TAP		Tahoua Agropastoral
TON		Tondikiwindi Agropastoral
TLP		Tilaberi Agropastoral

LZ code	New?	LZ name/description
OUA		Oualam Agropastoral
ADC		Dosso Central Agricultural
CMS	new	Southern Irrigated Cash-crops (Tarka Valley)
MAY		Mayahi Agropastoral
TSU		Tessaoua South Agricultural
MAD		Southern Irrigated Cash-Crops (Madarounfa)
ZZC		Central Zinder Agricultural
ZZI		Zinder Irrigated Agriculture
CPK	new	Komadougou River Irrigated Peppers

NORTHERN NIGERIA – LIVELIHOOD ZONES

LEGEND

- State boundaries
- NG01 – NW Fishing and Rice
- NG02 – Rimasokoto Irrigated Rice, Millet, Vegetables
- NG03 – NW Millet, Cowpeas and Groundnuts
- NG04 – NW Millet and Sesame
- NG05 – NW Irrigated Wheat and Vegetables
- NG06 – NW Sorghum, Cowpeas and Groundnuts
- NG07 – NW Cotton, Maize, Rice
- NG08 – NW Cotton, Groudnuts and Mixed
- NG09 – Niger River Rice Dominant
- NG10 – NW Cotton and Maize
- NG11 – Hadejia Valley Mixed Economy
- NG12 – NE Fishing Dominant
- NG13 – NE Rice and Chilli Peppers
- NG14 – NE Fishing, Maize and Cowpeas
- NG15 – NE Wheat and Chili Peppers
- NG16 – NE Millet and Cowpeas
- NG17 – NE Yobe Lowland Rice
- NG18 – NE Millet, Cowpeas and Groundnuts
- NG19 – NE Sorghum, Millet and Cowpeas
- NG20 – NE Maize and Sorghum
- NG21 – NE Sorghum, Groundnuts and Cowpeas
- NG22 – NE Maize, Cotton and Soybeans
- NG23 – NE Vegetables and Maize
- NG24 – NE Rice, Maize and Sorghum
- NG25 – NE Sorghum, Cotton and Cowpeas
- NG26 – NE Maize, Cowpeas and Cotton
- NG27 – NE Special Grazing Area
- NG28 – NE Maize and Groundnuts
- NG29 – NE Sorghum, Maize and Cowpeas
- NG30 – NE Rice and Sweet Potatoes
- NG31 – NC Maize and Sorghum
- NG32 – NC Maize, Groudnuts and Rice
- NG33 – NC Maize Dominant, Sorghum, Tubers
- NG34 – NC Yams, Cassava and Sorghum
- NG35 – NE Rice, Sweet Potatoes and Cotton
- NG36 – NC Sweet Potatoes Dominant
- NG37 – NC Sorghum, Sesame, Rice
- NG38 – River Benue Fishing Dominant
- NG39 – Niger River Floodplain Rice, Sorghum
- NG40 – NC Maize and Yams
- NG41 – NC Yams, Maize and Sorghum
- NG42 – NC Ginger, Sorghum, Maize, Tubers
- NG43 – NC Cassava and Sorghum
- NG44 – NC Rice, Sorghum, Melon, Cassava



SOURCE: USAID/FEWS NET

NORTHERN NIGERIA – HEA BASELINE COVERAGE

LEGEND

Livelihood Zones (and parts of LZs) with full baseline

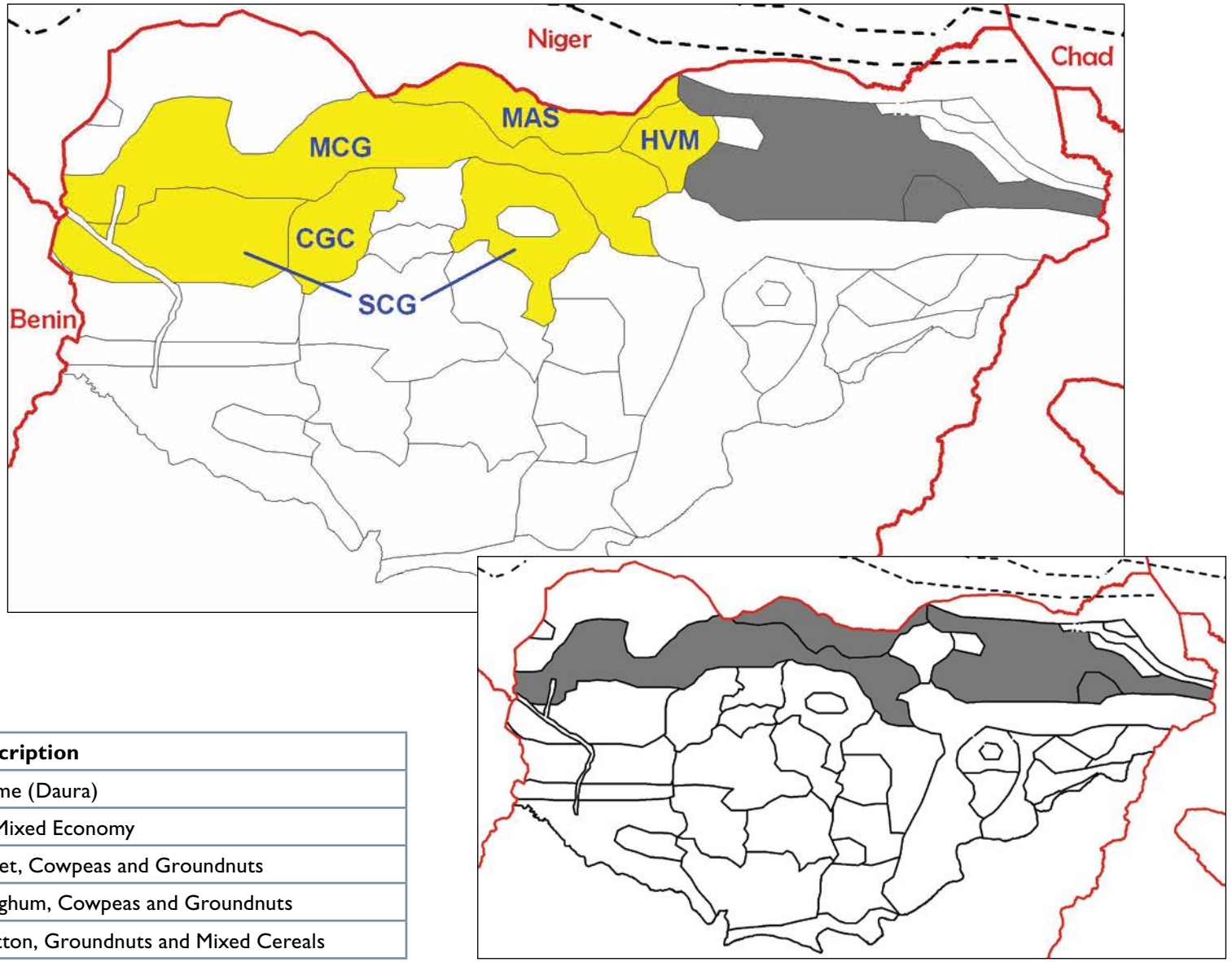
Grey-shading (see main map and inset) indicates livelihood zones that are part of the following general sahelian zones:

Pastoral

Agropastoral

Rainfed agriculture (sahelian)

--- Dotted lines indicate boundaries between these three general zones.

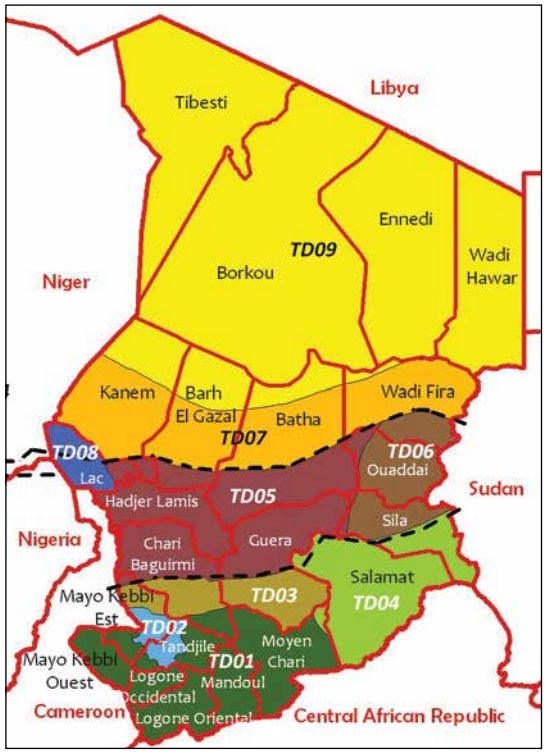


LZ code	New?	LZ name/description
MAS		Millet and Sesame (Daura)
HVM		Hadejia Valley Mixed Economy
MCG	new	Northwest Millet, Cowpeas and Groundnuts
SCG	new	Northwest Sorghum, Cowpeas and Groundnuts
CGC		Northwest Cotton, Groundnuts and Mixed Cereals

CHAD – LIVELIHOOD ZONES

LEGEND

- **Region boundaries**
- **TD01 – Southern Staple and Cash Crops**
- **TD02 – Southwest Rice**
- **TD03 – South-central Cereals**
- **TD04 – Southeast Flood Retreat and Gum Arabic**
- **TD05 – Central Agropastoral**
- **TD06 – Eastern Rainfed Cereals and Market Gardening**
- **TD07 – Transhumance**
- **TD08 – Western Agropastoral and Fishing**
- **TD09 – N Oasis Cultivation with Camels and Natron**



SOURCE: USAID/FEWS NET

CHAD – HEA BASELINE COVERAGE

LEGEND

Livelihood Zones (and parts of LZs) with full baseline

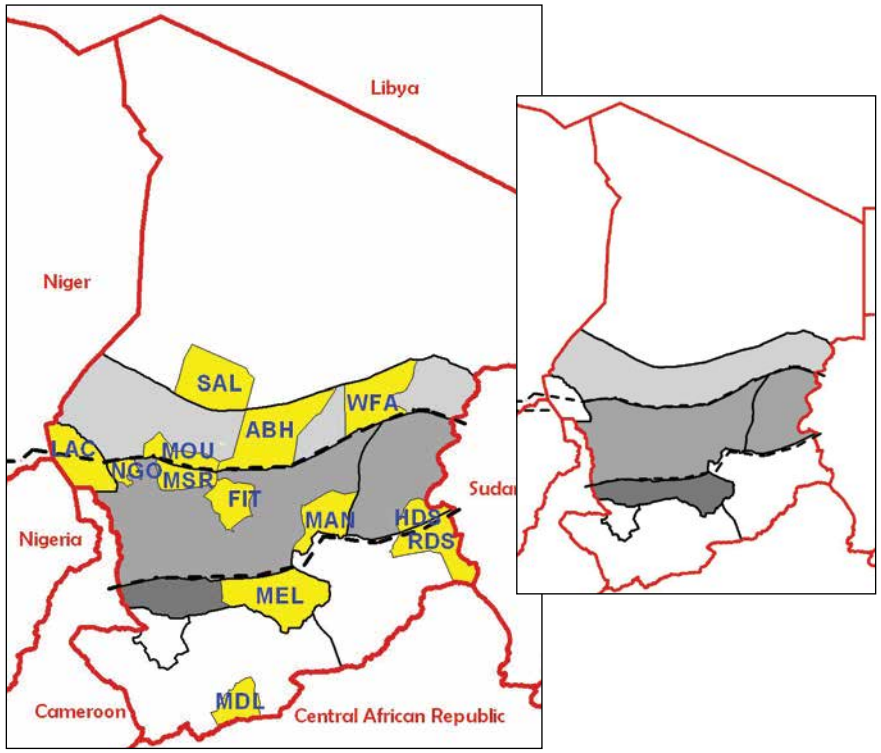
Grey-shading (see main map and inset) indicates livelihood zones that are part of the following general sahelian zones:

Pastoral

Agropastoral

Rainfed agriculture (sahelian)

--- Dotted lines indicate boundaries between these three general zones.



LZ code	New?	LZ name/description
SAL		Salale Camel Pastoralism
WFA		Wadi Fira Agropastoralism with Transhumance
ABH	new	Agropastoralism with Camel Herding
MOU		Moundjoura Agropastoral
LAC	new	Western Agropastoral and Fishing
NGO	new	Central Agropastoral (Ngouri)
MSR	new	Moussoro Agropastoral

LZ code	New?	LZ name/description
FIT	new	Lake Fitri Agropastoral
MAN		Mangalme Agropastoral
HDS		Kimiti Agricultural (Host area to Sudanese refugees)
RDS		Kimiti Agropastoral (Host area to Sudanese refugees)
MEL	new	South-central Cereals
MDL	new	Southern Cereals and Cash-Crops

APPENDIX 2: WEALTH GROUP BREAKDOWN BY PERCENTAGE OF POPULATION BY LIVELIHOOD ZONE

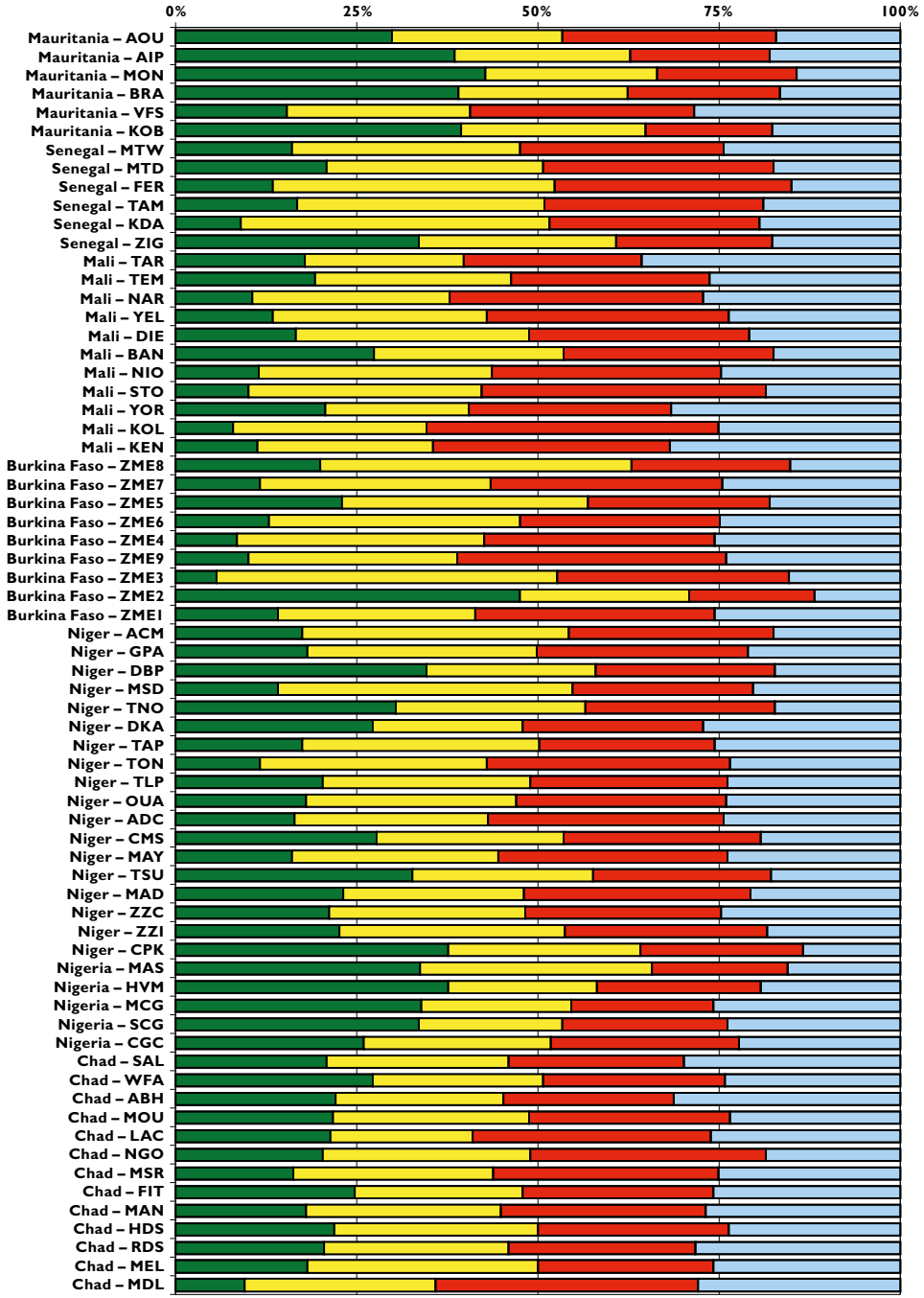
Livelihood Zone	Very Poor	Poor	Middle	Better Off
Mauritania – AOU	30%	23%	30%	17%
Mauritania – AIP	39%	24%	19%	18%
Mauritania – MON	43%	24%	19%	14%
Mauritania – BRA	39%	23%	21%	17%
Mauritania – VFS	15%	25%	31%	28%
Mauritania – KOB	39%	25%	18%	18%
Senegal – MTW	16%	31%	28%	24%
Senegal – MTD	21%	30%	32%	18%
Senegal – FER	13%	39%	33%	15%
Senegal – TAM	17%	34%	30%	19%
Senegal – KDA	9%	43%	29%	19%
Senegal – ZIG	34%	27%	22%	18%
Mali – TAR	18%	22%	25%	36%

Livelihood Zone	Very Poor	Poor	Middle	Better Off
Mali – TEM	19%	27%	28%	26%
Mali – NAR	11%	27%	35%	27%
Mali – YEL	13%	30%	33%	24%
Mali – DIE	17%	32%	30%	21%
Mali – BAN	27%	26%	29%	17%
Mali – NIO	11%	32%	32%	25%
Mali – STO	10%	32%	39%	19%
Mali – YOR	21%	20%	28%	32%
Mali – KOL	8%	27%	40%	25%
Mali – KEN	11%	24%	33%	32%
Burkina Faso – ZME8	20%	43%	22%	15%
Burkina Faso – ZME7	12%	32%	32%	25%
Burkina Faso – ZME5	23%	34%	25%	18%

Livelihood Zone	Very Poor	Poor	Middle	Better Off
Burkina Faso – ZME6	13%	35%	28%	25%
Burkina Faso – ZME4	9%	34%	32%	26%
Burkina Faso – ZME9	10%	29%	37%	24%
Burkina Faso – ZME3	6%	47%	32%	15%
Burkina Faso – ZME2	48%	23%	17%	12%
Burkina Faso – ZME1	14%	27%	33%	26%
Niger – ACM	17%	37%	28%	17%
Niger – GPA	18%	32%	29%	21%
Niger – DBP	35%	23%	25%	17%
Niger – MSD	14%	41%	25%	20%
Niger – TNO	30%	26%	26%	17%
Niger – DKA	27%	21%	25%	27%
Niger – TAP	18%	33%	24%	26%
Niger – TON	12%	31%	34%	23%
Niger – TLP	20%	29%	27%	24%
Niger – OUA	18%	29%	29%	24%
Niger – ADC	16%	27%	33%	24%
Niger – CMS	28%	26%	27%	19%
Niger – MAY	16%	29%	32%	24%
Niger – TSU	33%	25%	24%	18%
Niger – MAD	23%	25%	31%	21%

Livelihood Zone	Very Poor	Poor	Middle	Better Off
Niger – ZZC	21%	27%	27%	25%
Niger – ZZI	23%	31%	28%	18%
Niger – CPK	38%	26%	23%	13%
Nigeria – MAS	34%	32%	19%	16%
Nigeria – HVM	38%	20%	23%	19%
Nigeria – MCG	34%	21%	20%	26%
Nigeria – SCG	33%	20%	23%	24%
Nigeria – CGC	26%	26%	26%	22%
Chad – SAL	21%	25%	24%	30%
Chad – WFA	27%	23%	25%	24%
Chad – ABH	22%	23%	23%	31%
Chad – MOU	22%	27%	28%	24%
Chad – LAC	21%	20%	33%	26%
Chad – NGO	20%	29%	33%	19%
Chad – MSR	16%	28%	31%	25%
Chad – FIT	25%	23%	26%	26%
Chad – MAN	18%	27%	28%	27%
Chad – HDS	22%	28%	26%	24%
Chad – RDS	21%	25%	26%	28%
Chad – MEL	18%	32%	24%	26%
Chad – MDL	10%	26%	36%	28%

WEALTH GROUP BREAKDOWN BY PERCENTAGE OF POPULATION BY LIVELIHOOD ZONE



LEGEND

- Very Poor
- Poor
- Middle
- Better Off

APPENDIX 3: HEA DATA GRAPHED

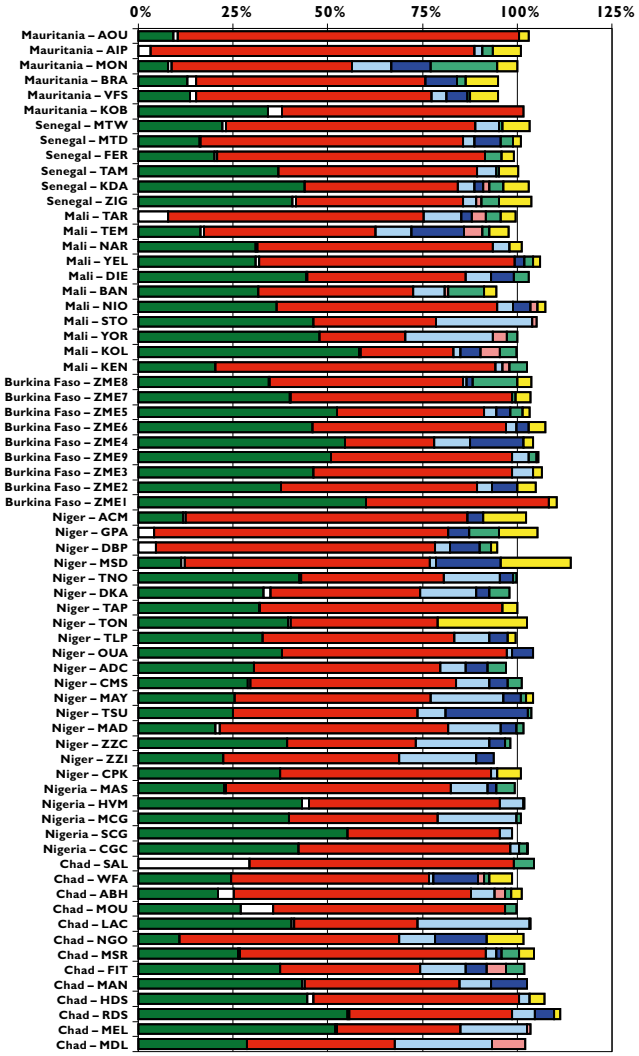
The purpose of mapping data is evidently to see it more clearly in spatial terms, so that geographical comparisons can be made. However, a readable map cannot contain a plethora of variables, and so the maps show one variable or composite variables in terms of percentage thresholds or divisions of absolute amounts in the case (only Map 34, summarising production hazards, shows five variables). It may be of interest to readers to see the essential data graphed out. Below, we offer composite graphs for all the 68 HEA baselines across the region, according to the four 'pillars' of HEA baseline analysis: Sources of Food, Sources of Cash, Sources of Expenditure, and Total Income – Food + Cash.

Of course, the variables shown in these graphs are themselves composed from a great amount of information. For instance, where we see the red 'purchase' bar in the graphs on food sources on the first page, this represents a conversion of the many different types of purchased food consumed – cereals, pulses, vegetables, fruits, oil, sugar, dairy, meat, etc – into calories as a percentage of household requirements. If details of these constituents of a given bar were wanted, the information is to be found among the roughly 600 data variables contained in each HEA Baseline Spreadsheet for a zone.

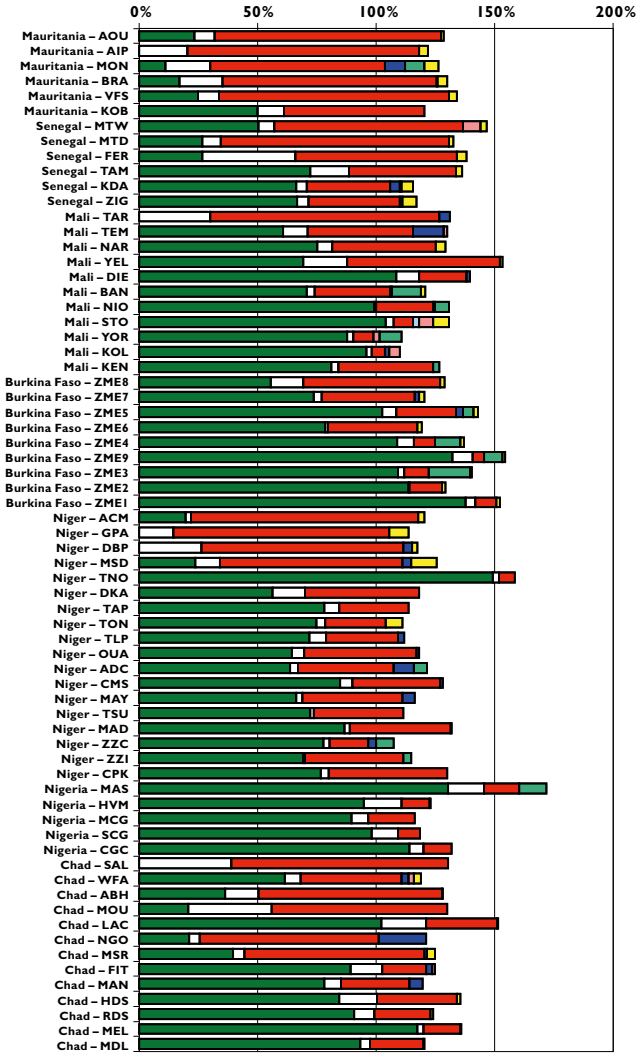
The Average graphs refer to all four wealth groups in the databases – Very Poor, Poor, Middle, Better Off – and the values are weighted to take account of the different proportions of the total number of households represented by the number of households of each wealth group.

SOURCES OF FOOD (% 2,100 KCALS PER PERSON PER DAY)

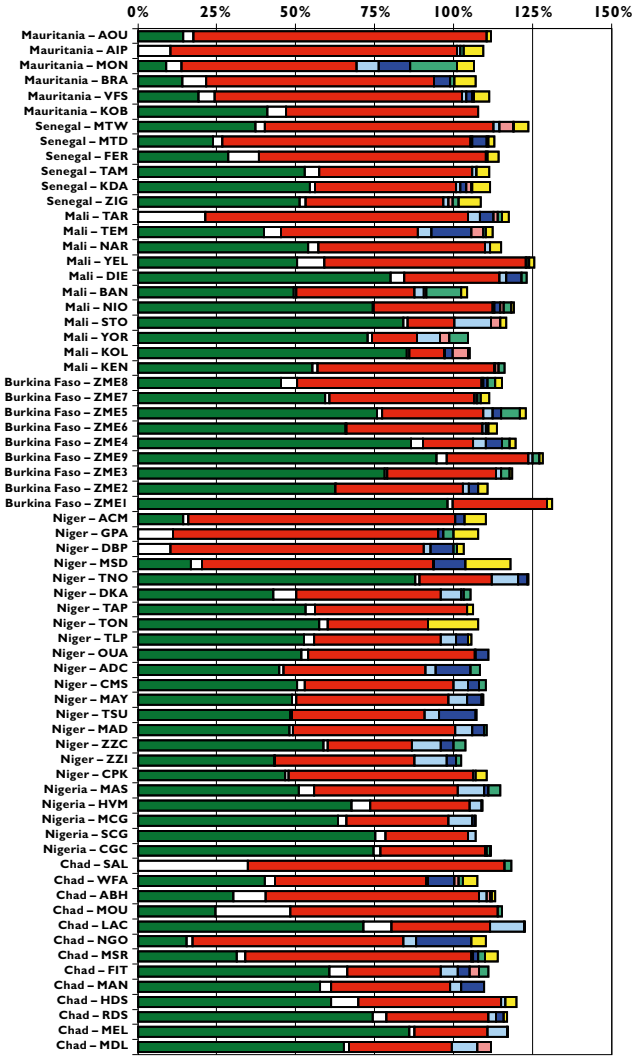
VERY POOR



BETTER OFF



AVERAGE



LEGEND

- Crops
- Milk/meat
- Purchase
- In-kind – local labour
- In-kind – migrant labour
- In-kind – self-employment/ environmental products
- Gifts, other
- Food aid

SOURCES OF FOOD

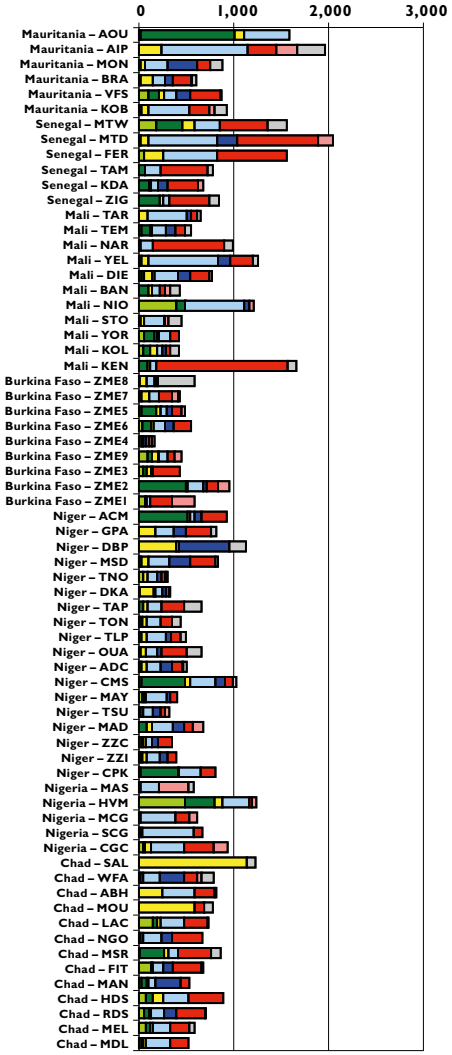
The big pattern offered to the eye in these graphs is the relative importance of own-crop consumption (the dark green bar) and purchased food (the red bar). The purely pastoral areas are easy to distinguish as they show no green bar, and the only consumption of own food is the milk and meat indicated by the white bar. Among these, it is noteworthy that this direct consumption from herds and flocks is, on average, remarkably limited for people who live by raising livestock, and only among the camel pastoralists of Salale (SAL) in Chad does consumption reach 30% of calories. One or two agropastoral groups – in the cattle-rich Ferlo (FER) zone of Senegal and in Moundjoura (MOU) in Chad with its cattle and camels together – rival the pastoralists in this consumption, at least for wealthier stock-owners. The main message is twofold. First, given the pasture and water resource limits of the pastoral ecology, the natural increase of pastoralist populations has long and by far outstripped the carrying capacity of the land for the number of livestock it would require to allow for a human diet mainly of milk. The value of their animals lies principally in their sale value live, and specifically in the meat they finally provide to town and city dwellers living hundreds if not thousands of kilometres away. With these earnings, even the richer pastoralists live substantially by purchased grain, as do their poorer neighbours, who live more by cash from contract herding for the wealthy than by their own very limited numbers of animals.

Among the crop cultivating populations, a majority reach, on average, 50% of consumption from their own crops, but far fewer reach 75%. The implications for purchase are splashed across the graphs in red, especially of course for the Very Poor. Burkina Faso, with its complete HEA coverage, looks the most productive country, but most of the population here live somewhat south of the sahelian band proper. Elsewhere, the areas so far selected for HEA studies are somewhat biased towards food insecurity, although with exceptions such as southern Mali. On the whole, the sahelian zone looks far from self-sufficient in food. Apart possibly from Mauritania, and despite rice importation mainly destined for the wealthier half of urban populations (and to some extent, for wealthier villagers who prefer to vary their millet/sorghum-based diet), Sahel countries are not big net importers of grain. Generally, the net staples-importing parts of the countries are supplied from higher-producing areas within the country. These are usually in the south where rainfall is higher, but there are one or two surprisingly high producers even in northern sahelian latitudes (within the general agropastoral band). For instance, Diema (DIE) in western Mali is something of a millet basket, and the sort of areas represented by north Tessaoua (TNO) in central Niger produce very substantial surpluses in the minority of years when rainfall is favourable, as was the case in the reference year here.

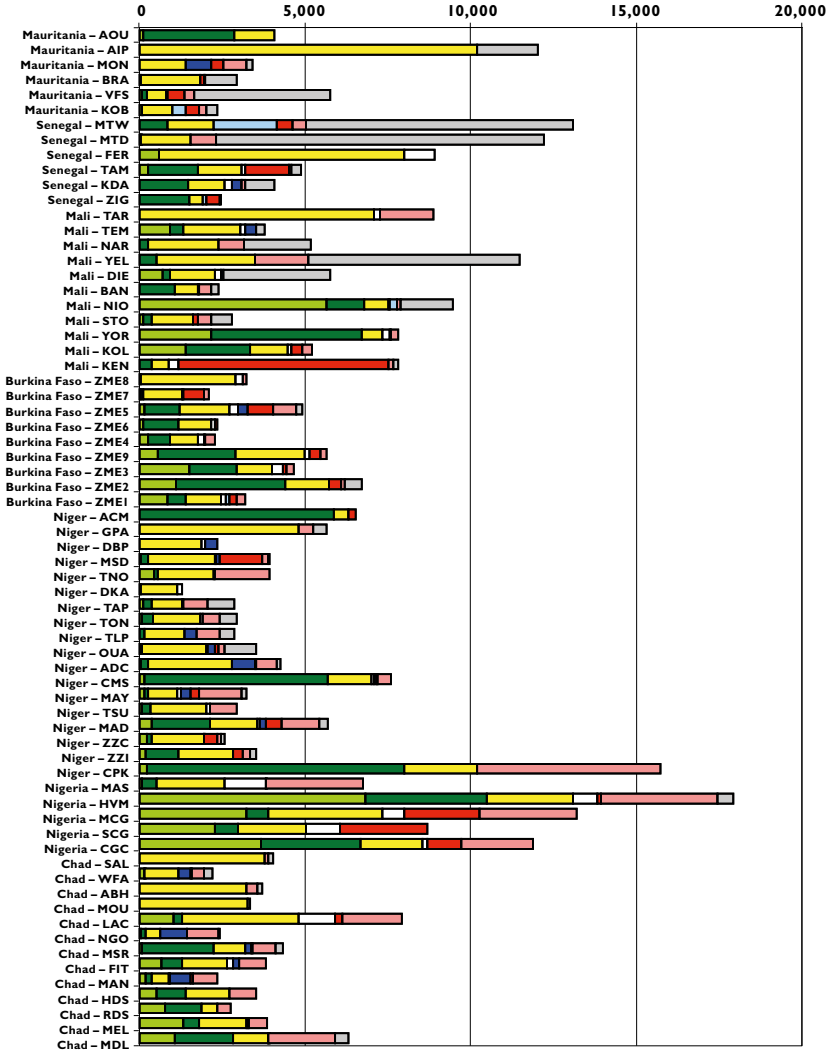
A good part of the balance of food comes from different in-kind transactions. Only the light blue bar represents in-kind wages as we normally think of them, ie, wages for field labour paid directly in grain. The dark blue bar mainly represents the 'saving' on home consumption during the time that one or more household members are away on migrant work; occasionally, it may include the bag or two of grain that they return home with. Finally, the pink bar represents collected wild foods (environmental products – gained by a form of self-employment). Clearly these sources are mainly associated with the poorer households. So is food aid. Some of this is food-for-work under development/social protection programmes. Some simply reflects the addition to the household consumption provided by school-feeding programmes for one or two members. In Niger in Maine-Soroa (MSD) and Tondiwiki (TON), drought relief extends the yellow bar. Elsewhere, the reference years very largely began with normal or 'satisfactory' harvests.

SOURCES OF CASH (US$ PER HOUSEHOLD PER YEAR)

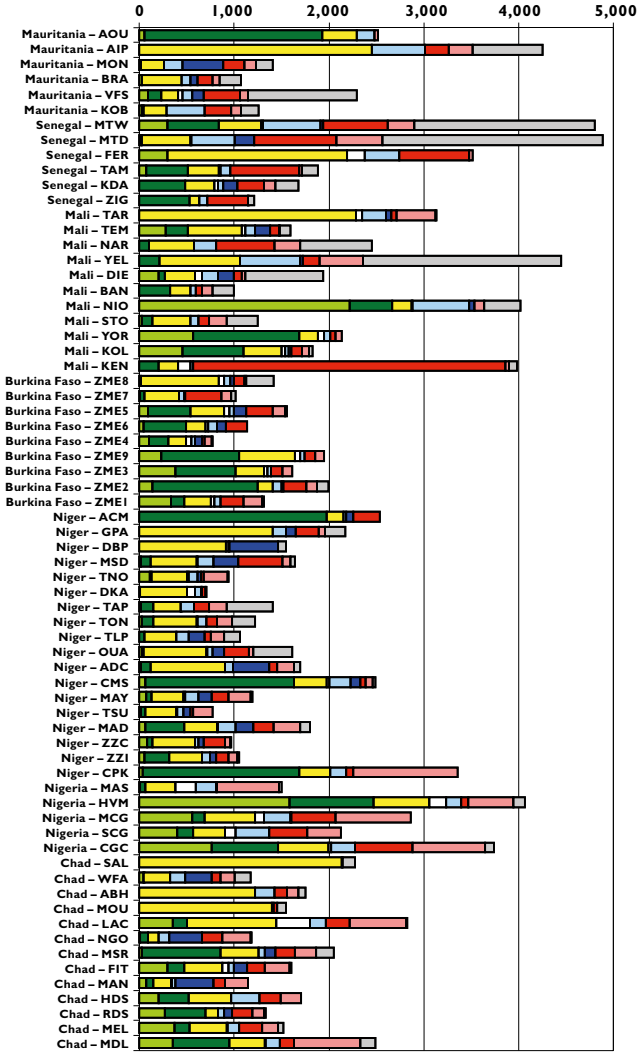
VERY POOR



BETTER OFF



AVERAGE

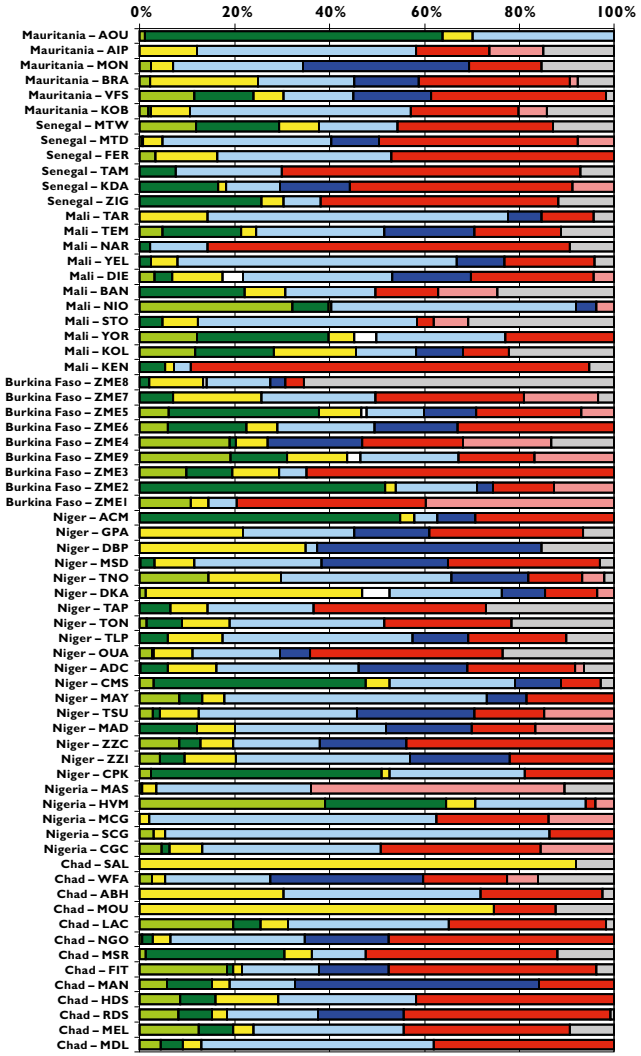


LEGEND

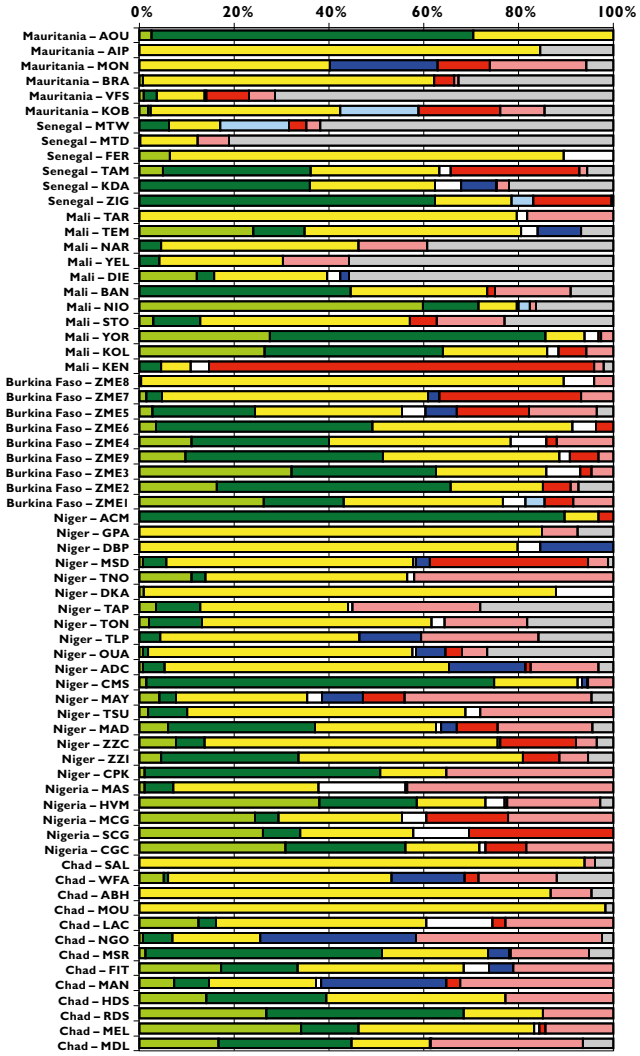
- Other crops
- Cash crops
- Livestock
- Livestock production
- Labour – local
- Labour – migrant
- Self-employment/environmental products
- Petty trade
- Other

SOURCES OF CASH BY PROPORTIONS (%)

VERY POOR



BETTER OFF



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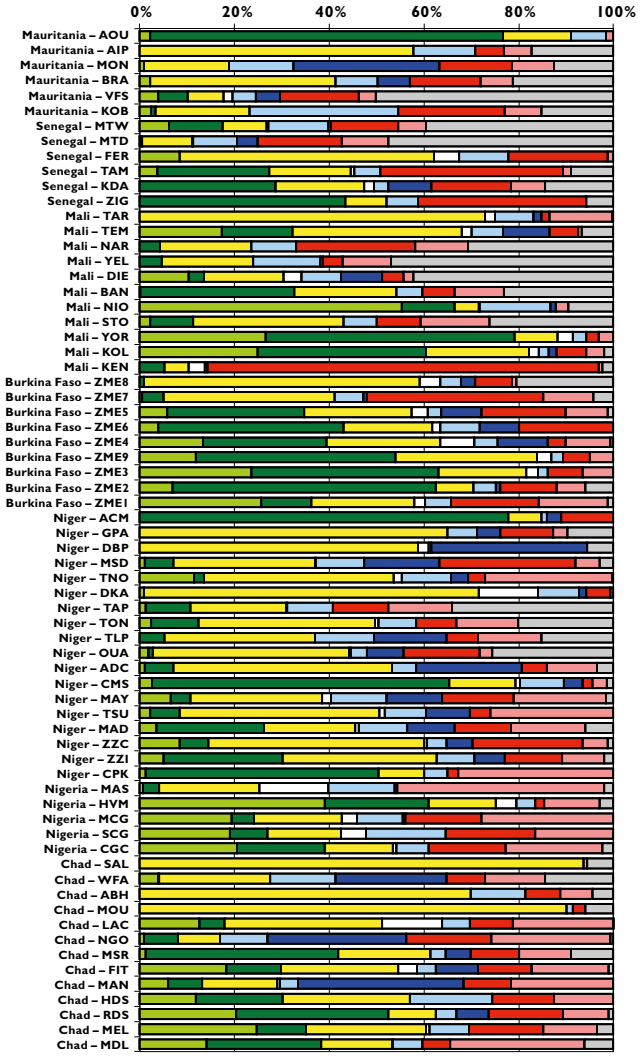


LEGEND

- Other crops
- Cash crops
- Livestock
- Livestock production
- Labour – local
- Labour – migrant
- Self-employment/environmental products
- Petty trade
- Other

SOURCES OF CASH

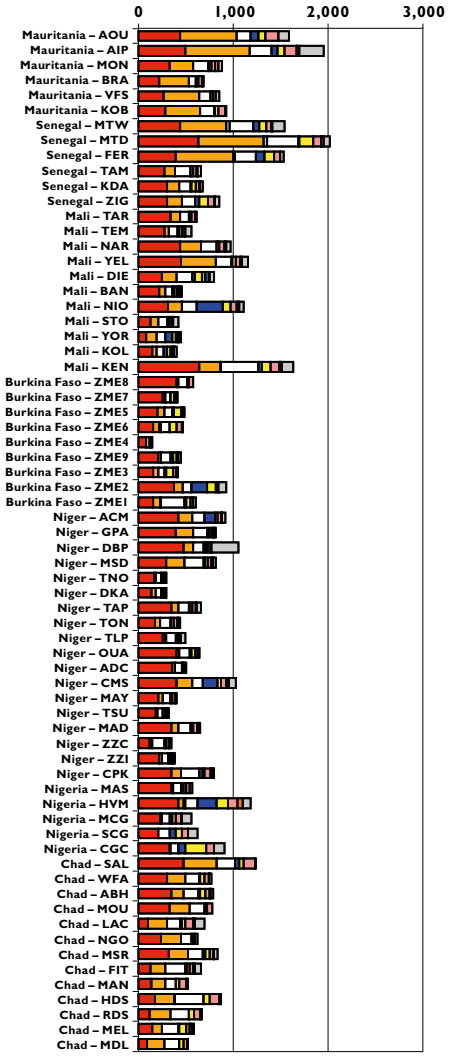
Having noted the critical importance of food purchase to at least the poorer households (other essential expenditure is shown in the third set of graphs, below) the next step is to see where they get the money from. Looking at the first set on absolute income, it is striking how much higher incomes are in certain areas on average. In fact, the pattern holds clearly enough for the Very Poor as well as the Better Off, suggesting that some livelihood zones are wealthier in this sense than others, and that if the Better Off have comparatively high earnings, so do the rest of the households. However, any further analysis of this question would have to take account of the comparative cost of living, whether in terms of local prices or, for instance, in relation to the fact that all pastoralists, unlike cultivators, have to purchase the great bulk of their food. Of the outstandingly high-earning zones (above US$3,000 per capita per year on average), AIP (Ayoun) in Mauritania is pastoral as is TAR (Tarkhint) in Mali; FER (the Ferlo) in Senegal is technically 'agropastoral' but essentially they are herders with the greatest cattle holdings of any of the studies across the region); MTW (Matam Walo) in Senegal and YEL (Yelimane) in Mali are part of the high-remittance complex along the Senegal river (remittances being the bulk of the 'other' grey bar, noticeable for AIP too); and NIO (Niono – irrigated rice scheme) in Mali, and in Nigeria HVM (the Hadejia Valley part-irrigated economy) and CGC (Zamfara cotton, groundnuts and cereals) are particularly successful crop-sellers. As regards pastoralists, it is perhaps surprising that those in SAL (Salale) in Chad, with their great wealth in camels, do not join the upper echelon. It seems that, like pastoralists of a former era, they drink a great deal of milk and sell what animals they need to, but otherwise do little else to earn money – even among the Very Poor. The livestock-rich agropastoralists of MOU (Moundjoura) also in Chad show the same pattern. Turning to the second set of proportional graphs, the most significant message here in terms of food security is to be seen in the combination of light blue, dark blue and red bars so prominent for the Very Poor. These are the bars for casual employment (near and far) and for self-employment such as cutting and selling firewood but including also collecting and selling wild foods (environmental products). The message is that as farmers they cannot nearly live financially by selling crops and livestock (green and yellow bars), just as we have seen above that they cannot nearly manage to eat from their fields. The same is in fact true for the Poor (if not quite as starkly as for the Very Poor) so that across the Sahel a good half of farming households need to get much more than half of their cash income from activities off their own farms.

Next, our eyes are perhaps particularly drawn to the great splash of yellow in the Better Off graph, well reflected also in the Average graph – the bars representing income from livestock sales (to which we can add the white bars for dairy sales). Here, we are not just looking at substantially herding-based zones (which do have the longest yellow bars) but at a whole range of farming zones. In Burkina Faso, with its complete HEA coverage, apart from the more livestock-oriented northerners (ZME 7 and 8) we see important livestock earnings for Western Cereals farmers (ZME4), for Central Plateau mixed farmers (ZME5), even for farmers of the more humid forest area in the far south-east (ZME9). Livestock is crucial to household budgets across the region, except where there is simply too little room to keep them, as in the otherwise very different irrigation economies of NIO (Niono) in Mali and ACM (Aïr Mountains) in Niger. The yellow bars among the Very Poor are generally short, as we would expect, but we should note that these people nearly everywhere are almost always living on the thinnest budget margins, and so their livestock earnings, comparatively modest as they are, are often crucial to them making it through the year for food purchase.

We have seized on the livestock earnings to point to something perhaps surprising as well as significant. But we must not underestimate the importance of crop cultivation, especially food crops, even if crop earnings on this showing do not generally exceed livestock earnings. Apart from the pastoral areas, the selection of zones for HEA studies to date has, to an extent, had a bias towards more food insecure areas, and on the whole therefore a northern bias reflecting especially sahelian rainfall and soil fertility problems. Given this, as can be seen by comparing the light green (essentially food crops) with the dark green (cash crops), although in certain zones cash crops are dominant, overall food crops are a greater source of cash than cash crops (see the definition of both under Map 4 in the main text). And this is after home consumption.

SOURCES OF ANNUAL HOUSEHOLD EXPENDITURE (US$ PER HOUSEHOLD PER YEAR)

VERY POOR



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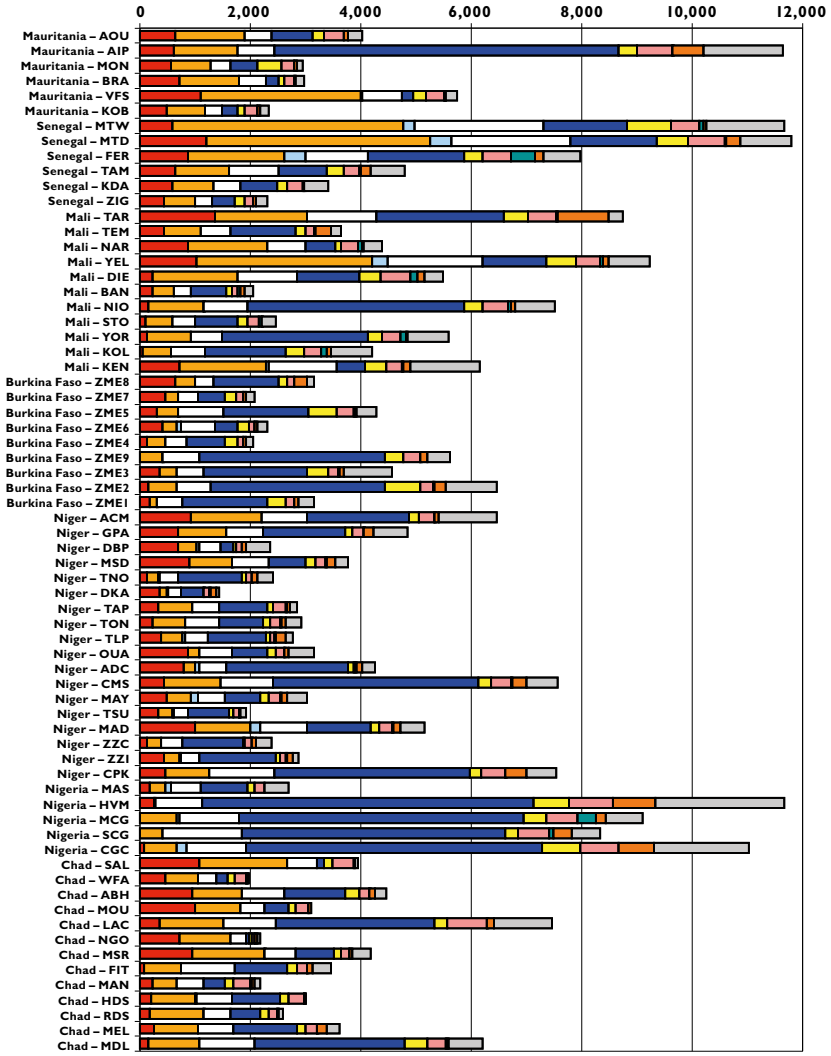
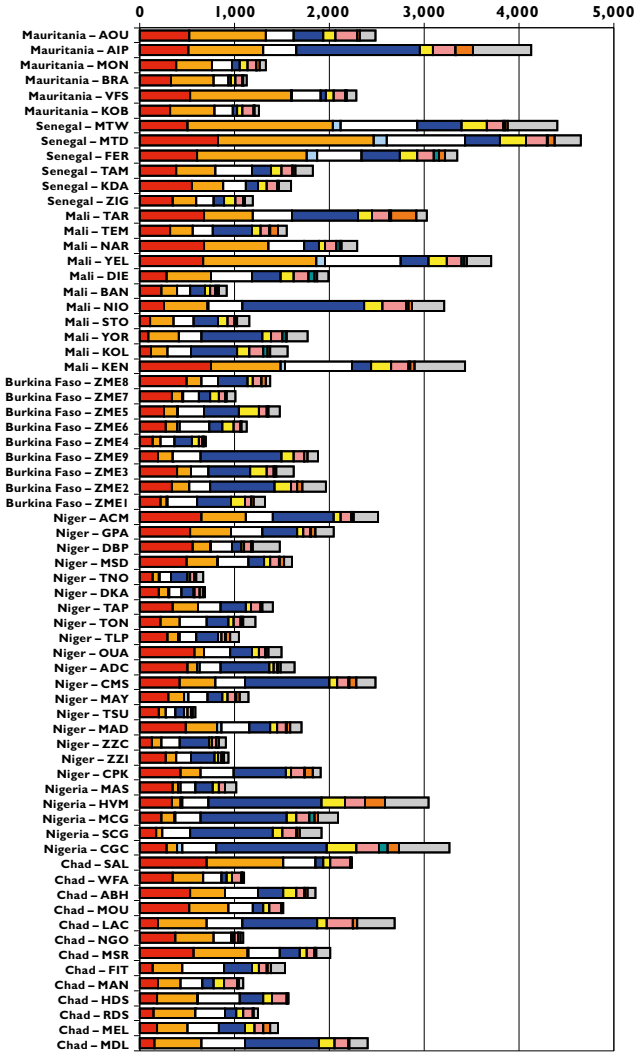


AVERAGE

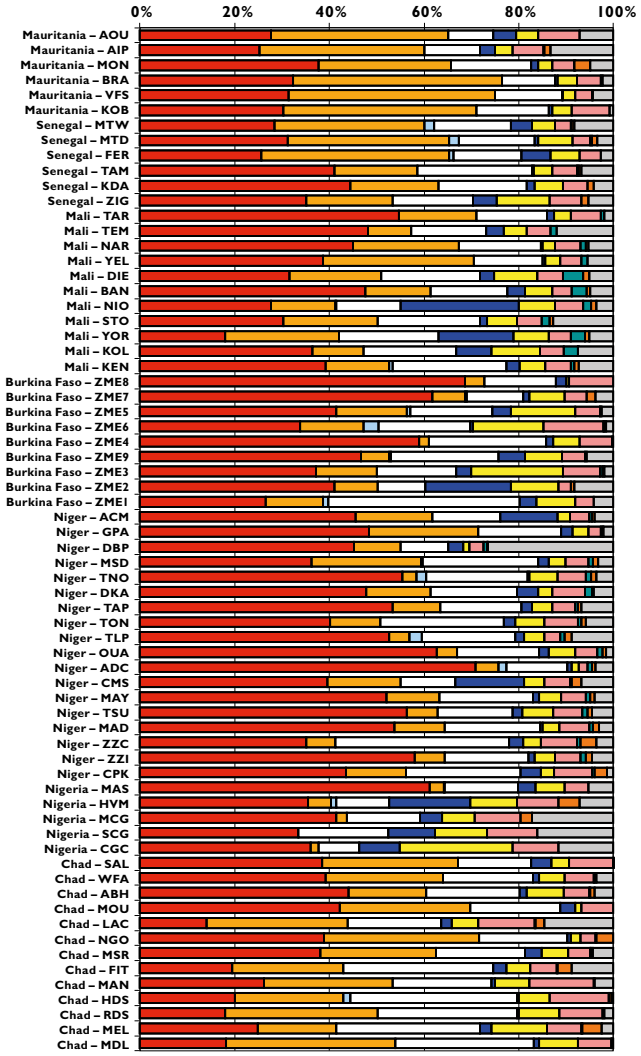


LEGEND

- Staple food
- Non-staple food
- Water
- Household items
- Inputs
- Social services
- Clothes
- Tax
- Gifts
- Other

SOURCES OF ANNUAL HOUSEHOLD EXPENDITURE (BY PROPORTION – %)

VERY POOR



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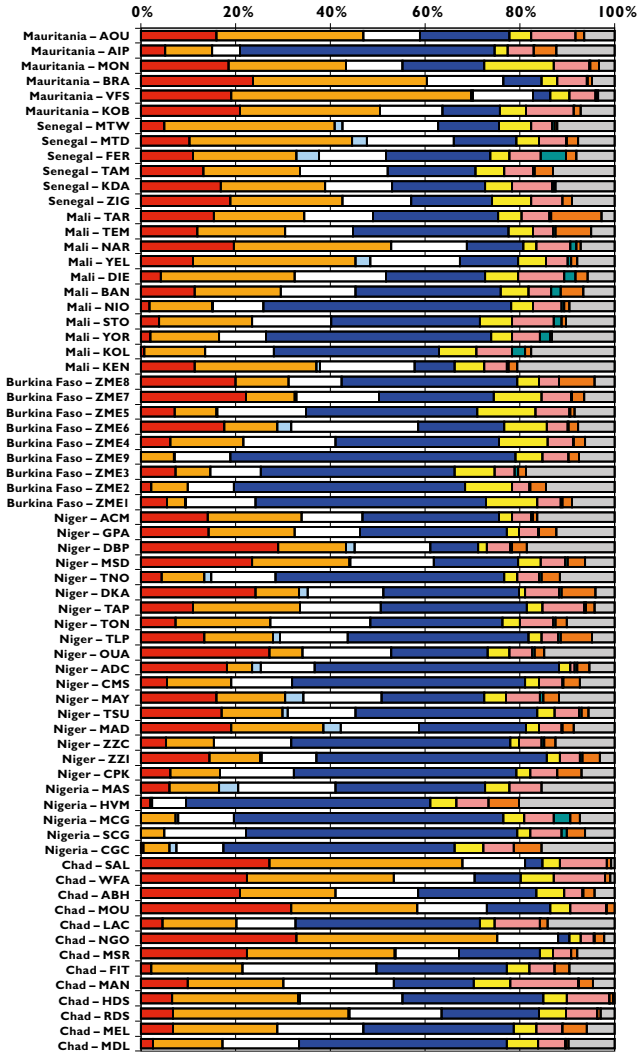

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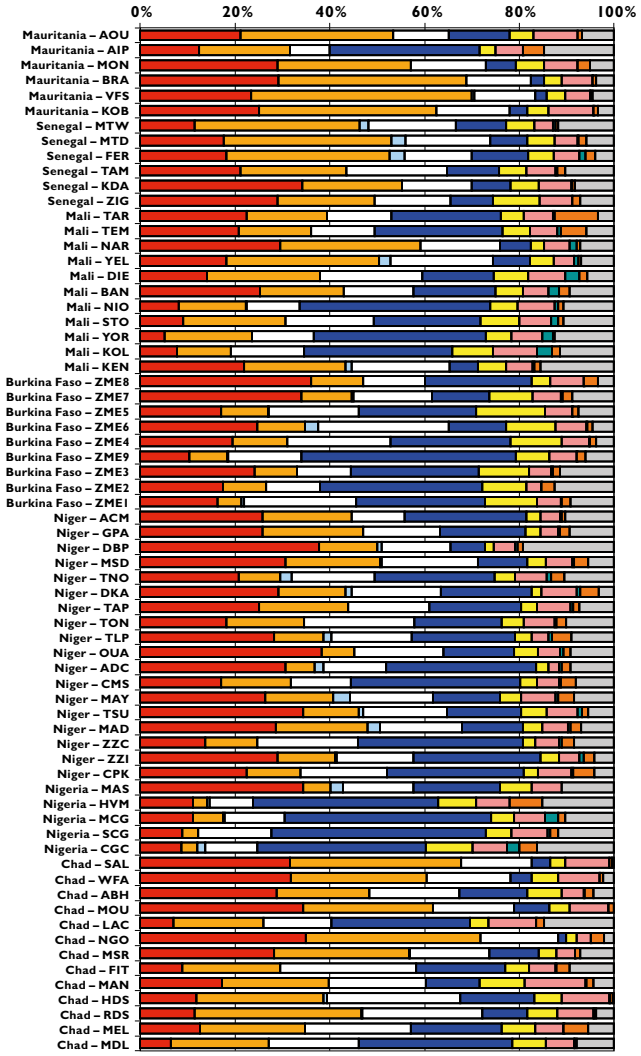


LEGEND

- Staple food
- Non-staple food
- Water
- Household items
- Inputs
- Social services
- Clothes
- Tax
- Gifts
- Other

SOURCES OF ANNUAL HOUSEHOLD EXPENDITURE

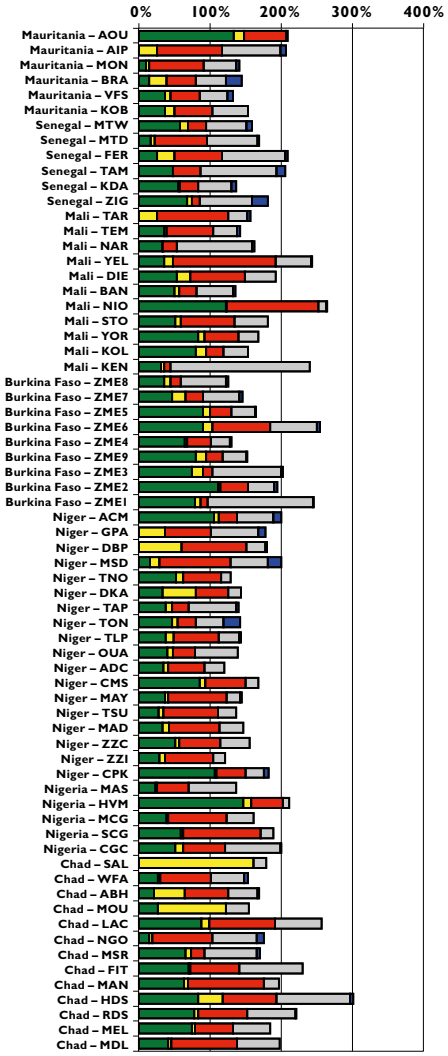
Levels of annual expenditure basically match levels of annual income. It is still rare for even Better-Off villagers to keep savings in bank accounts. Profits from one year to the next are essentially kept in the form of livestock purchased or grain stored, although the storing of grain from one year to another seems much less practised today than in a former era – perhaps not only because of declining per capita production but also because of a greater and more reliable market network.

'Staple food' (red bar) means staple cereals, and non-staple food (orange bar) is anything else. Non-staple foods for most people most of the time are the common items from the ubiquitous cowpeas to vegetables to oil. Poorer households rarely stretch beyond this: meat, for instance, is consumed at festivals (sometimes as a gift from wealthier kin or neighbours) but is otherwise rarely consumed, even poultry, unless it is the treat of a kebab (brochet) bought on market day. Indeed, for poorer people, even vegetables – even onions – are not purchased without thought, because they have to compete with other needs, for instance daily/weekly household purchases (white bar), which include a plethora of items from condiments to matches to soap – which, as we see for the Very Poor, collectively amount to a substantial proportion of total household expenditure. This leaves little room for other basic expenditure, whether on clothes (pink bar), or education and medical treatment (yellow bar), let alone more elective expenditure on, for instance, social obligations – transport for visits to kin, contributions to baptisms, etc (under the 'other' grey bar).

It leaves especially little for expenditure on inputs for production (dark blue bar) – fertilisers, hired labour, veterinary care, purchase of animals to increase/replenish the stock. By contrast, expenditure on inputs is generally a big part of the spending of Better-Off farmers. One quite visible, almost symbolic, result here is the strong tendency that the longer the dark blue bar, the shorter the red bar for staples purchase. Better-Off people spend at least as big a proportion of their budget on non-staple foods as do the Very Poor. But here we must remember that, given their level of income, the absolute amounts may be five or six times more per capita. This means that wealthier people in villages can effectively afford what in rural terms is a far higher standard of living, although to the outsider it may not look like it. They can buy more vegetables, pulses, milk and meat for a more balanced and simply more pleasurable diet; they can buy more clothes, etc, and as a particular element in a benign cycle, more education for their children, at least through secondary school if not beyond. It is true that they are also expected to spend very much more on social obligations, but this underpins their status and secures them some insurance in the goodwill of others if they find themselves in need at any time.

TOTAL INCOME – FOOD + CASH (% 2,100 KCALS PER PERSON PER DAY)

VERY POOR



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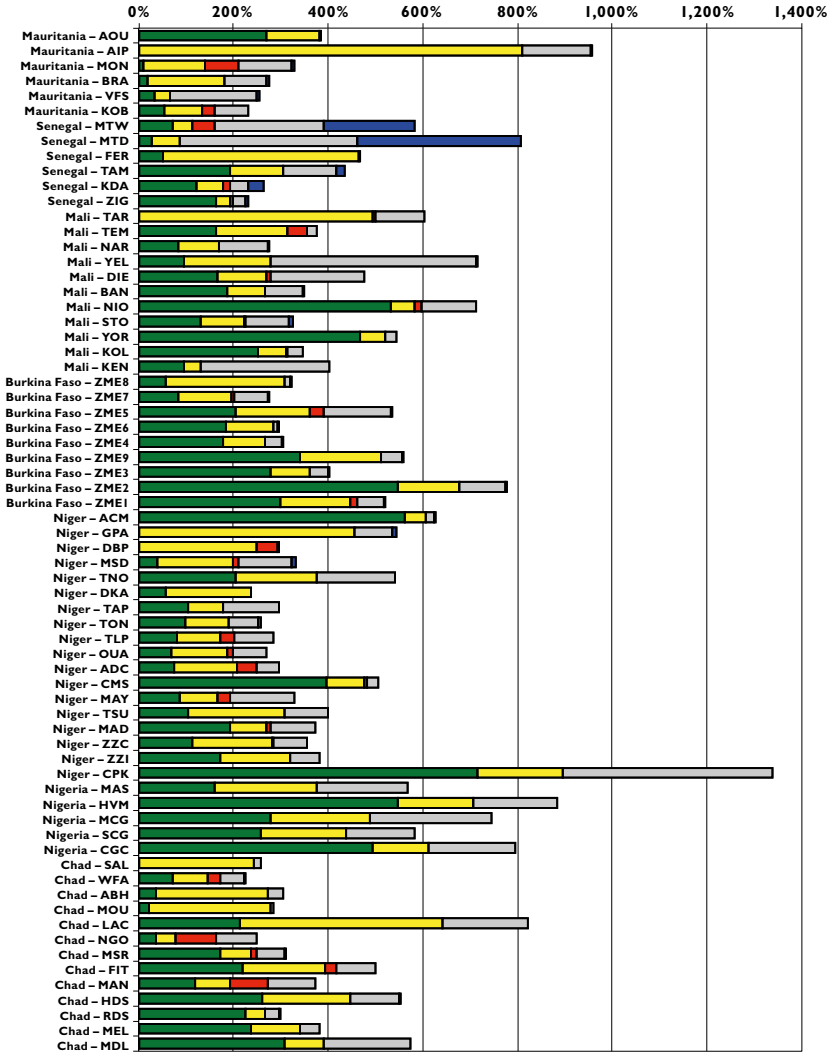

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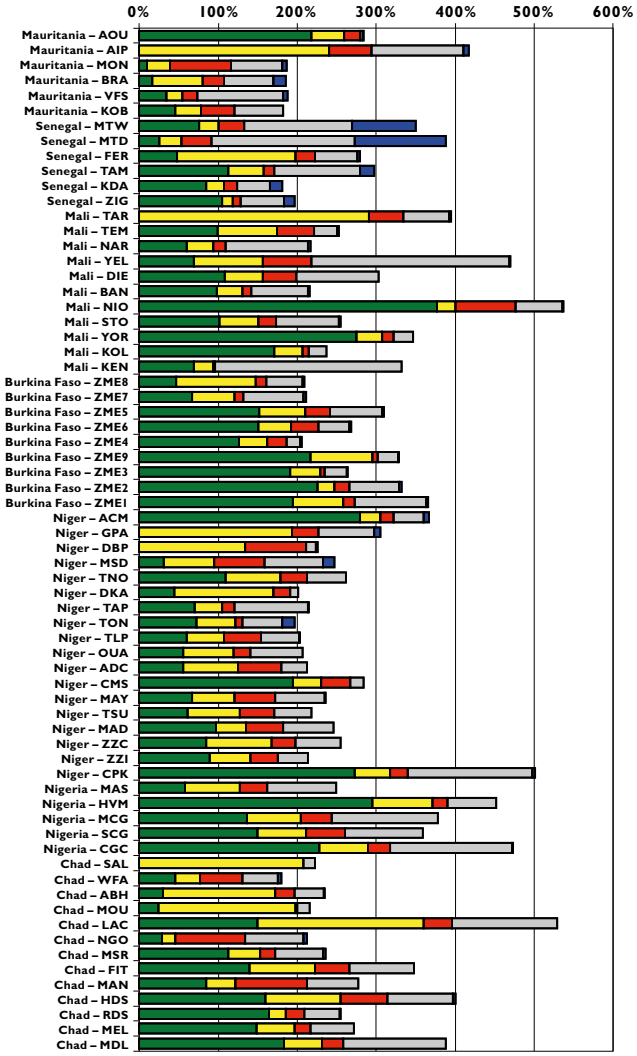
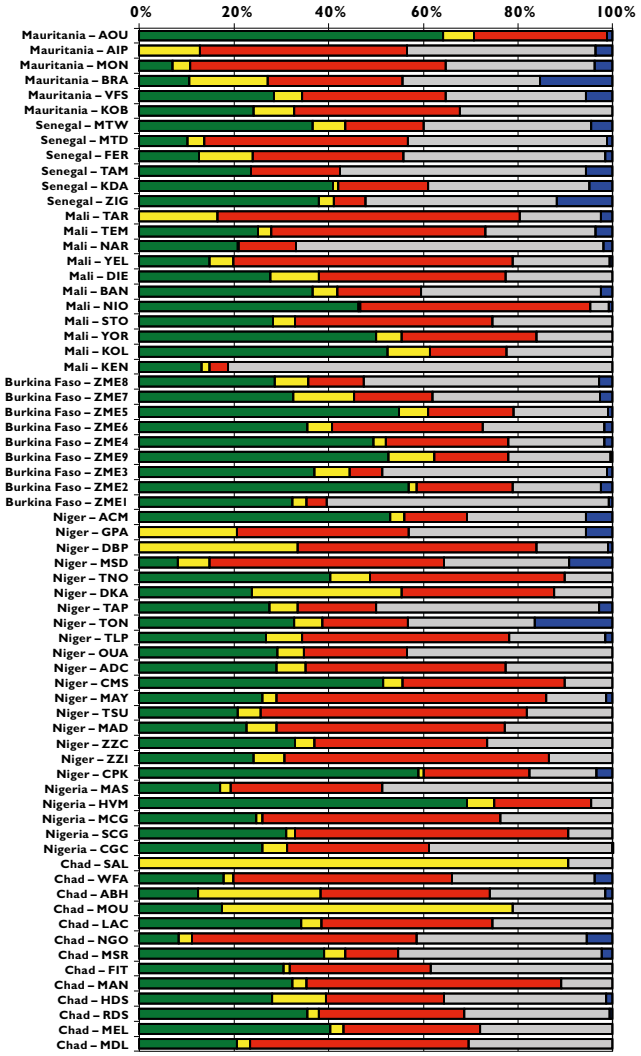


LEGEND

- Crops
- Livestock
- Labour
- Other
- Aid

TOTAL INCOME – FOOD + CASH (BY PROPORTIONS – %)

VERY POOR



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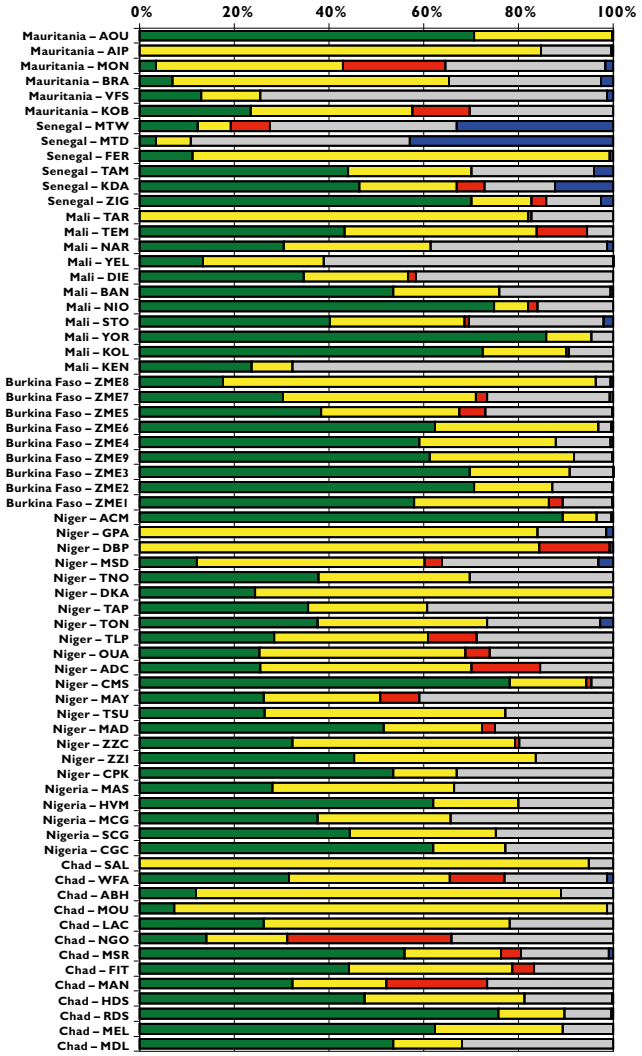

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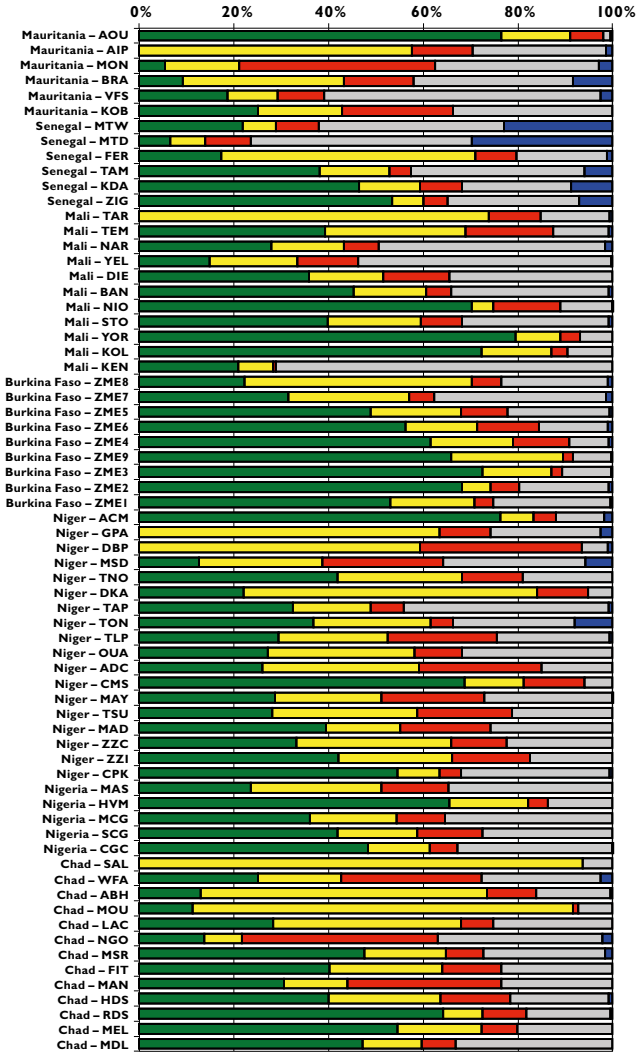

LEGEND

- Crops
- Livestock
- Labour
- Other
- Aid

TOTAL INCOME – FOOD + CASH

Households have cash income but also food income in the food they consume directly from their fields. How can we compare the value to households of these different elements? To do this, we need a way of combining cash earned from crop sales, livestock sales, employment, etc with home consumption of their own food crops. The method is to convert all to a single unit value of reference, in this case calories. Thus, what is calculated is the actual calories consumed directly from own production, plus the calories that could be purchased if all the cash earnings, from all sources, were converted into the commonest staple cereal at local reference prices. Then the total of all these calories is expressed as the percentage satisfaction of the requirement of 2,100 kilocalories (kcals) per person per day (pppd). This gives a way of showing and comparing the overall value of a household's economic activity – the 'total income'.

Under the cash income graphs we highlighted the prominence of livestock earnings but also indicated the importance of crops. Here, that importance is underlined, because it includes the value from own consumption. This does not by any means eclipse the contribution of livestock, but it does redress the balance on average as well as for the Better Off. For the Very Poor it at least impressively reduces the imbalance – but in this case in relation to their income from earnings off their own farms (labour in red, self-employment as the big component of the grey 'other'). These earnings are still paramount, but own harvest consumption is a surprisingly significant element overall, given their usually very small land holdings, their lack of expenditure on inputs, and, indeed, their tendency to reduce their attention to their cultivation in favour of paid work on other people's fields and even sometimes to leave for migrant work before the family harvest is in – decisions forced on them by the pressing need for cash to see them through to that harvest. Compared with their sources of cash graphs, the Very Poor here look a little less like a rural 'salariat' and a little more like farmers.

The grey 'other' bar is important across the graphs, but it means very different things for the Very Poor and the Better Off. For the poorer, it means adding whatever value they can through their capacity for physical work and manual skills, especially in exploiting the free gifts of nature: eg, firewood to sell or convert into charcoal, grasses to cut and sell to cattle-owners in the depths of the dry season, other grasses and reeds to use for basketry handicrafts for sale, wild foods and products like gum arabic to collect and sell, and clay-heavy soils with water in proximity to make and sell bricks. For the wealthier, it denotes a more commercial set of activities, including petty trade and even wholesale grain trade, ox-and-plough hire, ox-cart hire for carrying people, and commodities, brokering livestock transactions in the market – an important money-earner among pastoralists. The grey bar also includes remittances, which are received very much more by wealthier than by poorer households.

AN ATLAS OF HOUSEHOLD ECONOMY ANALYSIS INFORMATION ACROSS THE SAHEL

Updated and expanded September 2014

This atlas provides a visual representation of livelihood patterns across the different ecologies and local economies that make up the Sahel region of West Africa. Updating a 2013 *Pilot Atlas*, it includes data from 68 Household Economy Analysis (HEA) baseline studies in seven countries.

The atlas is composed of maps on a set of livelihood themes, showing differences between poorer and wealthier households in the various 'livelihood zones'. It deals with crop and livestock production, households' access to food, and their cash income and expenditure. It also provides insights into production hazards for crop cultivation and livestock-raising, and people's coping strategies in a bad year.

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