

# Rwanda Livelihood Zone Profile:

## North Highlands (Burera)

Save the Children UK - November 2011<sup>1</sup>

### The Context

With a rural population density of 500 people per square kilometre, high even by the standard of Rwanda - the most densely populated country in Africa - the North Highland (Burera) zone presents a particular challenge to understand how people make ends meet. The livelihood zone has an overwhelmingly rural population, with urban residents estimated to represent less than 10% of the total, and the rural population must primarily seek to make a living directly from the land, since there are very few other livelihood opportunities for the majority of the population. There are fishing resources in the area's lakes, and mineral resources, and cross-border trade with Uganda; but although these elements are important for nearby villages, they do not significantly affect livelihoods in the majority of villages in the wider geography of the zone. The main timber resource belongs to the government or a small minority of richer people. The plots of land cultivated by the great majority of households are small, mostly well under half-a-hectare, yet the Burera District is not an area reported as especially food insecure by comparison with other districts. A Household Economy Analysis was conducted to understand the story of local food security and livelihoods at the household level. The reference year for the field data was mid-November 2010 to mid-November 2011. This report aims to present a holistic view of livelihood patterns in Burera including household productive assets, crop and livestock production, and consumption, sale and purchasing patterns.

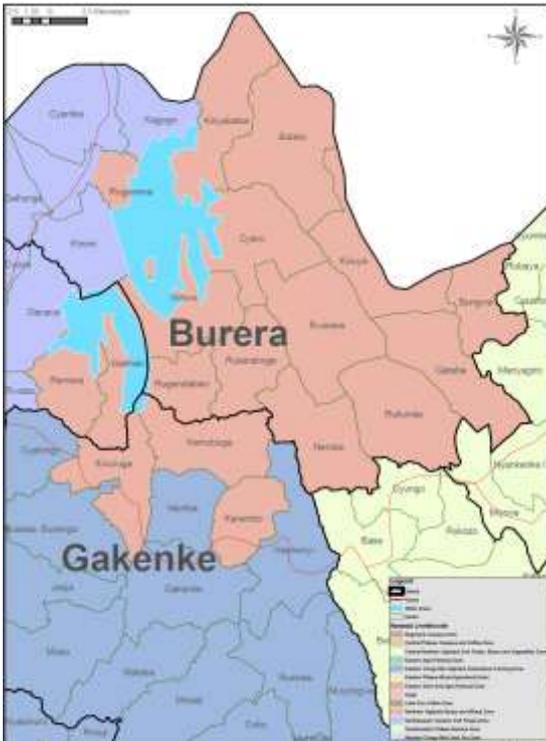
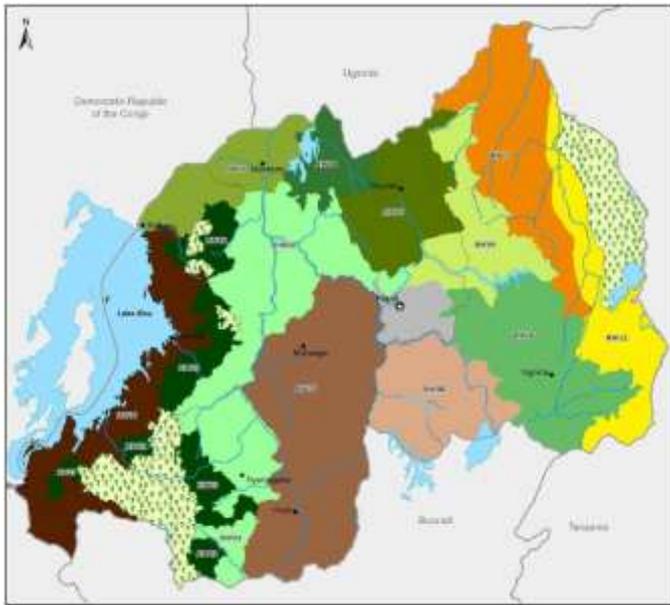
The North Highlands Wheat and Beans livelihood zone is located in Burera District in the North of Rwanda, along the border with Uganda. Figure 1 offers two maps: the first shows the location of the North Highlands Wheat and Beans Livelihood Zone, which contains the greater part of Burera District, in relation to the other livelihood zones of the country as identified by FEWS NET; the second map shows the zone's boundaries in terms of districts and sectors. The nine sample villages of the present survey were chosen as representative of the majority of villages in the Burera part of zone, and these were not in the proximity of the special resources/trade advantages mentioned above.<sup>2</sup>

Figure 1 FEWS NET National Livelihood Zones Map 2011 & Outline and sector boundaries of the North Highlands Wheat and Beans livelihood zone

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<sup>1</sup> Field work for the current profile was undertaken in November 2011. The information presented refers to mid-November 2010-mid November 2011, a normal year by local standards (i.e. a year of average production and rural food security, when judged in the context of recent years) despite rising food prices and some excess rainfall affecting the A harvest. Provided there are no fundamental and rapid shifts in the economy, the livelihood pattern shown in this profile is expected to remain valid for at least five years (i.e. until 2016).

<sup>2</sup> The North Highlands Wheat and Beans Livelihood Zone identified by FEWS NET covers 14 sectors of Burera district, three of Gakenke district and two of Nyabihu district. The nine sample villages of the HEA survey were all located in Burera district, in Cyeru, Rwerere, Rusarabuge and Nemba sectors. Wheat is a distinctive but in fact relatively minor crop in the district.



## Overview of Burera District

### Demography

The Burera District statistical bulletin gives a population of 320,130, with 54% females and 46% males. The bulletin also states that there are 67,257 households, therefore an average household size of roughly 5 people. The village focus group respondents in the current survey estimated the typical household in each of the wealth groups (see below) as having 6 members. The National Agricultural Survey (NAS) of 2008 gives 48% of the population under 15 years of age and 10% 50 years and over; it further reports 25% of households as being female-headed<sup>1</sup>.

<sup>1</sup> More men than women lost their lives, and men also fled to Uganda or elsewhere, leading to separation from their wives even if they returned. Men were also in the great majority of those imprisoned in the aftermath.

### Education

The 2008 NAS shows literacy rates in Burera at a bit lower than the average for Rwanda's rural population, with 53% of people aged 15 years and above who are literate (able to both read and write) and a further 7% who are able to read only. As regards school education, only one in seven of the children who attend primary school continue to secondary school; this is highly influenced by the cost of sending children to secondary school when the school is not in or near the village. Secondary school attendance also appears to be biased by gender; although there are roughly equal numbers of males and females attending primary school ( 51% female, 49% male), secondary school attenders are 58% male.

#### **Agro-ecology:**

The Burera district bulletin puts the total area of the district at 644.5 square kilometres (64,450 hectares), of which 7% is under planted forest (mostly eucalyptus), 5% is natural forest, and 13% lakes/surface water. The terrain is hilly, located around 2100 metres above sea level (rising to 2400 metres on hill-tops) with planted tree cover on the higher reaches. Below this, there is cultivation on every possible stretch of land. The highland ecology disfavours the perennial food crops such as matoke, bananas, or cassava, found so widely elsewhere in the country and so the land is almost exclusively put under annual field/garden crops (apart from some stands of eucalyptus, and a few individual fruit trees, notably avocado.)

#### **Agriculture production**

Sweet potatoes are the main staple and Irish potatoes are the main crop sold, although they are also consumed at home. Beans are by far the most important crop to go with the consumption of sweet potato, so that as elsewhere in Rwanda they must be considered a staple food. Beans are the major source of protein since cereals – maize, sorghum (wheat and purchased rice for some of the wealthier population) – form a lesser part of the diet, and animal products a very small part: most people consume a small amount of purchased dried fish, but they have virtually no milk or meat of their own. By far the main type of bean produced and consumed are climbing varieties. Poorer people tend to consume a considerable part of the beans they produce at the green stage, and also eat the leaves from the plants.

Annual production figures provided by the Burera Agricultural Service for 2010 suggest that production of Irish potatoes, maize, beans and wheat already represent over 100% of the district population's minimum calorie requirement, without including sweet potatoes whose volume is not recorded.<sup>1</sup> Given that sweet potatoes are the main staple consumed, this would imply that there is significant sale of food commodities outside the area, led by Irish potatoes.

With their small landholdings, farmers have to make particularly fine decisions on how much land to use for the production of the major staple, how much to allocate to secondary staples and how much of each food-crop to sell. Our information from villagers suggests that the less land people have, the more of it they are likely to devote to the production of the staple sweet potato. Beans, a secondary staple, are both intercropped with tubers and grown on separate patches. Amongst the four wealth groups represented in the survey, the poorest households do not typically sell sweet potatoes or beans, indeed they depend heavily on buying them from the market. Other wealth groups do sweet potatoes to meet cash requirements at given moments, even though this means 'buying back' staples at a later stage in the year.

Livestock are relatively few, because in this crowded landscape, in line with government policy animals must be hand fed rather than put out to graze. The 2008 NAS states that mean livestock ownership is 1.17 cattle per household, although this is higher than the district statistics, of 0.6 per household. The local Ankole race accounts for 88% of the cattle and hybrid/exotic races for the remaining 12%. With government encouragement of the latter for improved milk production, including the *Girinka* scheme for donating milking-cows to poor villagers, the percentage of hybrid cattle is expected to have increased since 2008. In that year, the NAS reported that 20% of cattle were cows (i.e. grown females), and 23% of these were lactating during the year. Milk production computes at 466 litres per lactating cow per year, with twice as much produced in the season September to February, than the season March to August. The 2008 NAS figures for smallstock are somewhat lower than in the statistical bulletin, but in either case sheep and goats together number about one per household. In the survey villages goats were hardly to be seen, and they seem

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<sup>1</sup> Production of Irish potatoes 118,023 tonnes; maize 24,767 tonnes; beans 13,535 tonnes; wheat 3,187 tonnes. Calorific value of Irish potatoes fresh = 750 kilo-calories per kilogramme; all cereals and pulses dry-weight = c3500 kcals per kg. Population 320,130. Average calorie requirement: 2100 kcals/person/day. On the other hand, the 2008 NAS figures (*including* sweet potatoes which are at a little under half the volume of Irish potatoes) compute to about 80% coverage of the population's calorie requirement, but with nine times less maize. It is true that since 2008 the government has encouraged the production of maize, and has targeted the Village Land Consolidation process in this respect; nevertheless the discrepancy invites further evidence than is to hand.

to be concentrated in certain sectors, including some 40% of the district total in Cyanica alone, which although situated in Burera district, is outside the livelihood zone under consideration.

Pigs and rabbits are also kept in some numbers in the district, although they were not typical in the villages surveyed as part of the HEA assessment. There is surprisingly little poultry in the district: a mean of less than one bird per household, although in fact they are concentrated amongst those who have a poultry 'yard'. According to official statistics honey is widely produced, with a mean of 3.4 kg per household per year. Donkeys and horses are not kept, for lack of free grazing.

Not only are livestock distinctly thin on the ground, but their ownership is distinctly skewed. The 2008 NAS shows that 33% of rural households in the district have no livestock at all, not even poultry; 3% percent have poultry only; 32% have smallstock (sheep/goats) with or without poultry; and 33% possess cattle with or without other animals. It is however notable that 12% of households possess only cattle (i.e. nearly 40% of people with cattle have *only* cattle). Elsewhere this would be an inexplicable choice, for anyone with cattle could and would also have smallstock. But here the need to hand-feed livestock rather than graze them leads to such decisions. The value of a single milking cow, or of a bull for sale, is so high that it is worth applying exclusive effort to keeping the animal healthy and well-fed.

### **Markets**

There are established markets located in about half of the sectors in Burera, and more numerous trade 'centres' with a few boutiques and smaller stalls. The Northern Province of Rwanda is known to be the national market's largest source of Irish potatoes, and Burera is a key source area. In the reference year the average price of Irish potatoes was a little over twice that of sweet potatoes per unit weight. According to our market information and FEWS NET figures, beans and maize are also exported from the district, and while the area appears to be in minor production deficit for sweet potato, there is some exportation of these also, implying some importation from neighbouring zones. The main direction of outward trade of commodities is south, notably to the capital Kigali.

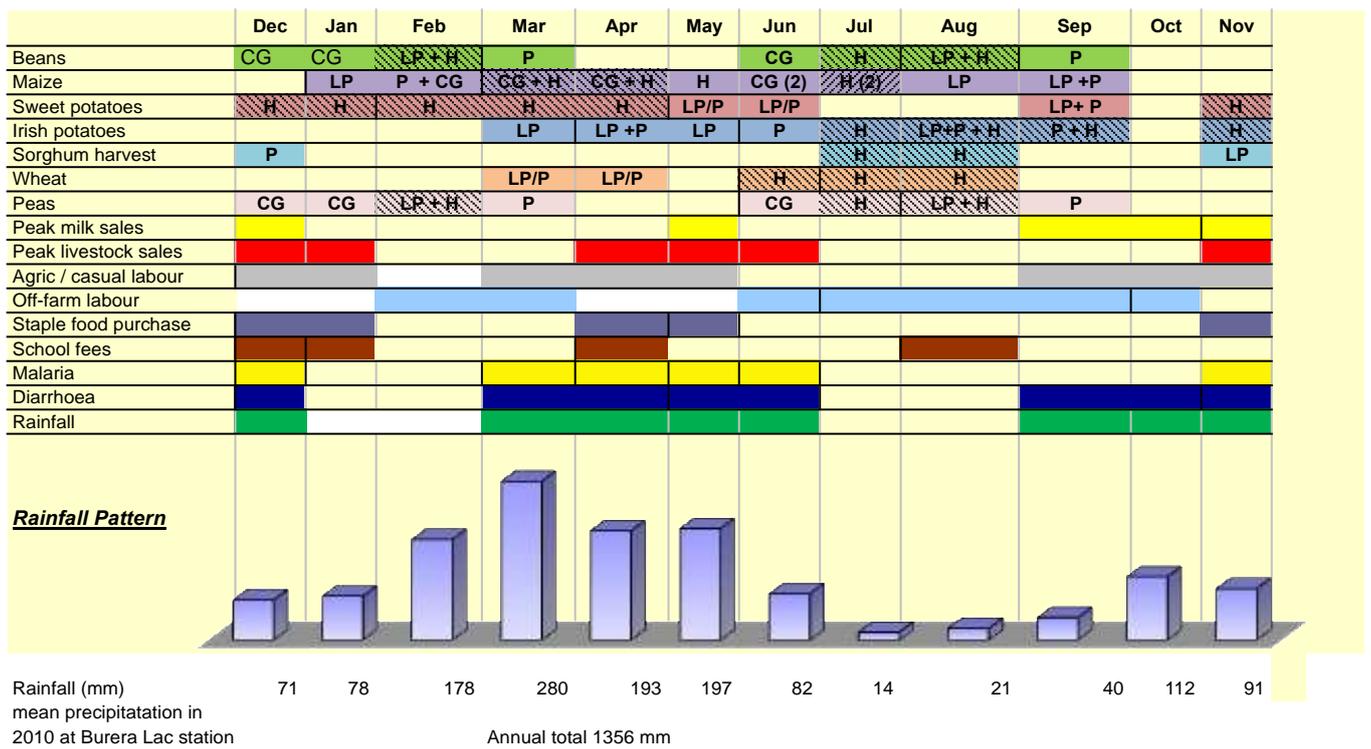
Food price inflation mediated by the market has been high in some recent years: for instance FAO statistics for bean prices at the national level give 100,000 frw per tonne in 2001, rising by less than 10% up to 2005, but in 2006 going up by 90%, then another 33% in 2007, a further 16% in 2008, and then decreasing by 12% in 2009.

### **Seasonal activity calendar**

The calendar below presents a seasonal analysis of food and income acquisition strategies. An understanding of the food harvests in Burera is particularly important given the reliance on agriculture. Sweet potato, the main staple, can be harvested over 6 months or more and there are few months without some food harvest, since sweet potato can be continuously harvested and replanted. During the year there are two bean harvests, two Irish potatoes harvest periods in July-August when the sweet potato harvest fades and a secondary harvest in November (much of the Irish potato harvest is sold, as the principal 'cash crop'); two harvests of maize; and a sorghum harvest also in July-August, (although modest in volume and much of it destined for beer brewing.) Wheat is not typically cultivated by the wealth-groups surveyed, and peas are also rare. There are two periods for staple food purchase that might indicate some food stress, in November-January when the sweet potato harvest is not in full swing, and April-May when it fades. But there is no identified 'lean season' as in semi-arid regions where there is a single main harvest of cereals and pulses for the whole year. Off-farm paid labour is mainly on such activities as house construction and maintenance; there is also a certain amount of work migration by members of Poor households. Malaria hits in several of the peak agricultural work months for land preparation and planting (and weeding) and must take its toll on optimal activity in the fields.

Figure 2 Seasonal activity calendar

CG = green consumption; LP = land preparation; P = planting/sowing; H = harvest. Season 'A' is Sept-Feb; season 'B' is Mar-Aug



### The wealth breakdown

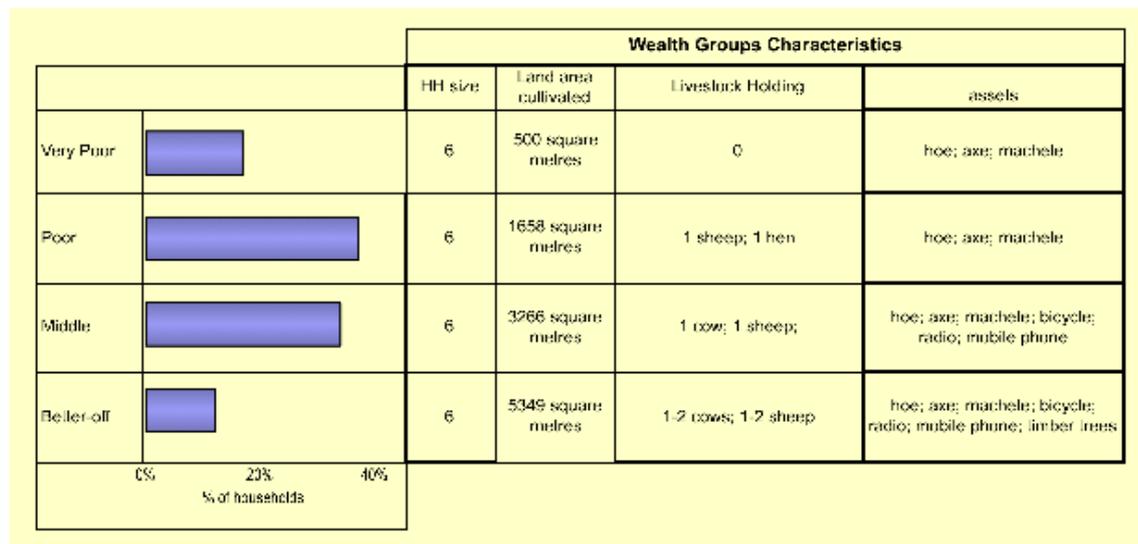
The investigation of differences between households is central to building a meaningful analysis of food security and therefore HEA seeks to characterise typical households within each zone according to wealth group. The wealth group classification is based on local villagers' identification of the attributes and proportion of four groups – Very Poor, Poor, Middle, Better Off – which cover all village households except those who are not economically active due to age or other factors. In Rwanda, however, there is a very small minority of people who are considered rich and very rich and are counted as villagers because they have local landholdings, but who tend to live partly or fully in town, and may be salaried people or business people. It was not the aim of this survey to represent these households: the Better Off were the upper category of fully resident villagers.

The HEA wealth classification is separate to the national *Ubudehe* classification for the country's c15,000 villages under the Vision 2020 Umurenge Programme (VUP). In this wealth classification there are 6 categories, which can roughly be rendered as the Destitute (unable to work) who make up 3% of households in Burera district; the Very Poor who have very little or no land or livestock but are able to work (23%); the Poor who have a bit more some land but no livestock and otherwise low assets and income (61%); the Middle who have more land, and some livestock, but still little savings (12%); the Wealthy who have more land and livestock, are self-sufficient in food and have a markedly higher income (0.15%); and the Very Wealthy who have an urban profile and are mainly absentee landowners (0.02%). We may estimate that the HEA groups fall somewhere between the second and fourth categories.

The characteristics of the four wealth groups as defined by the HEA are shown in Figure 3. These figures are for a 'typical' household in each wealth group, and this is therefore not the whole story. For instance, for a minority of the Poor, a cow may be loaned to the household by a wealthier relative or neighbour and be a source of milk, in return for the labour of feeding the cow and keeping her safe and healthy. The young will be either the property of the

owner or, less likely, shared between the owner and the keeper. The government *Girinka* scheme, which has so far only reached a minority of households, gives hybrid-race cows to individual farmers primarily for milk and the young tend to be taken to give to poor households not yet in receipt of a cow. Also, a minority of households in different wealth groups have a pigs or rabbits that aren't represented in these wealth characteristics.

**Figure 3: Wealth groups identified in Burera**



The household (HH) sizes of 6 people as shown in Figure 3 are for typical households as identified by wealth-group interviews. The community-level interviews suggested generally somewhat larger households on average, although a wide range of household sizes were noted.

The land areas presented are also determined using the wealth-group interviews. Of the land cultivated by the Poor, 100 square metres are rented from wealthier neighbours; for the Middle and the Better Off, 500 square metres are rented either from richer landowners or in the marshlands controlled by government which comprise less than 10% of overall land. Community interviews revealed a broad range of land sizes between some of the Very Poor who are landless or have only 100 square metres of land and some Better Off who might have around 8000 square metres.

The most striking aspect of the table is undoubtedly the fact that land was more easily stated by interviewees in square metres than in hectares or fractions of hectares (1 hectare = 10,000 square metres). So crowded is this zone that, as elsewhere in Rwanda, local people talk in terms 'ares', that is 10 x 10 square metres, even when they are not referring to hillside terraces. However, with a two-season rainfall regime and local growing conditions, even 500 square metres is by no means an entirely negligible amount of land, and the Very Poor manage to grow enough staple food to cover one-third of their calorie requirement (see below).

Typical livestock holdings are also strikingly small; but it should be borne in mind that the government imposes a 'zero-grazing' (i.e. cut-and-carry) regime in order to prevent conflict over damaged crops inevitable with free grazing where almost every inch of cultivable land is tilled. Apart from crop residues, there are grasses and leaf-plants on the margins of fields in this relatively lush environment, including fodder grass species promoted by the government. A poorer person with no animals, or at least no cow, may sell grass to a wealthier neighbour. But fodder shortage or its cost, as well as the labour of hand-feeding animals, highly constrains the potential for building a flock or herd. It was not entirely clear why poultry are such a rarity. Explanations included the low quantities of grain produced and so little excess with which to feed poultry; the high risk of mortality from disease and losses from eagle-strikes; and that in this crowded environment they need to be kept away from gardens in covered 'yards' for which extra land is not available. Nevertheless there is no doubt that some people do keep a number of hens, and the government livestock service has provided foreign strains to improve egg-laying.

### Sources of food

Figure 4 presents sources of food by wealth group in terms of the proportion of the minimum energy requirement (calories) each food provides. The requirement is taken as an average of 2100 kilo-calories per person per day amongst household members over the 12 months of the reference year.

Figure 4: sources of food for consumption by wealth group

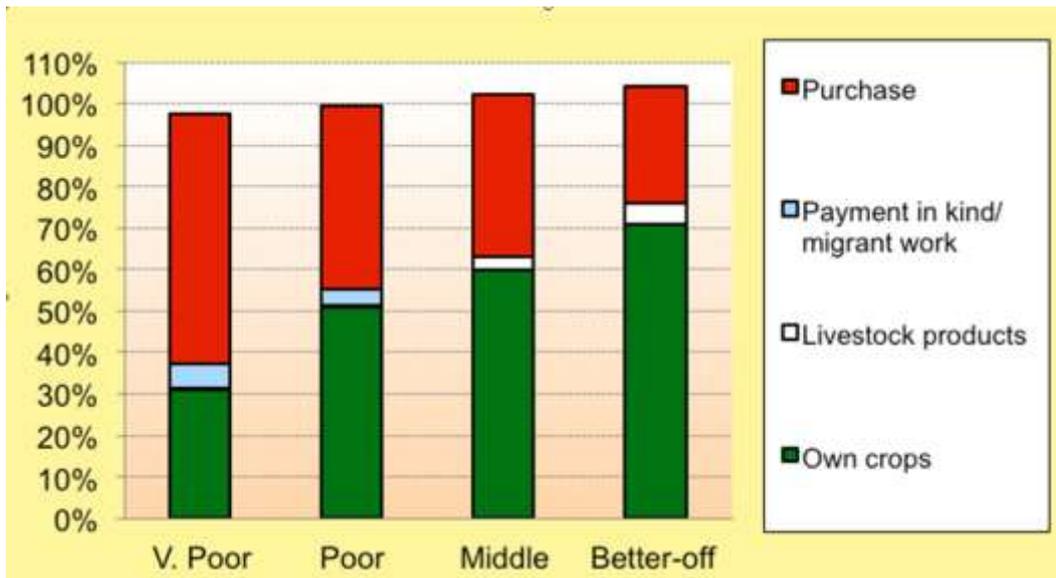


Figure 4 shows that households in Burera do not produce the majority of their calorie needs and therefore portrays that the population isn't near self-sufficiency in food. In one sense however, this is a false picture as the middle and better off do not consume all they produce: if the Middle and Better Off – roughly 45% of the total number of people in question - were to consume all that they produce, the Middle would be roughly self-sufficient in calories and the Better Off would have about 50% extra. The poorer households by contrast are not able to be self-sufficient, and their dependency on the market is great: one might say that the poorer you are, the more you need cash in hand. (Although cash is required across all wealth groups for more than staple food: for other foods that they do not grow, condiments, essential non-food household items, clothes, school costs, medicine etc.)

Livelihood security and food security are closely intertwined, if not nearly synonymous: if what you have to sell is principally food crops, then that must be taken into consideration when we speak of 'food.' Poorer people have evidently been vulnerable to the steep food-price rises in recent years, in particular the Very Poor who were unable to quite fulfil their minimum calorie requirement even in a reasonably satisfactory year for local food production.

The Very Poor receive some payment for labour as staple food (Payment in Kind), which may even occasionally include 'exotic' foods such as cassava or matoke, presumably from a stock bought on the market by the employer. In Burera food payments amount to 6% of the total annual calorie requirement for the Very Poor.

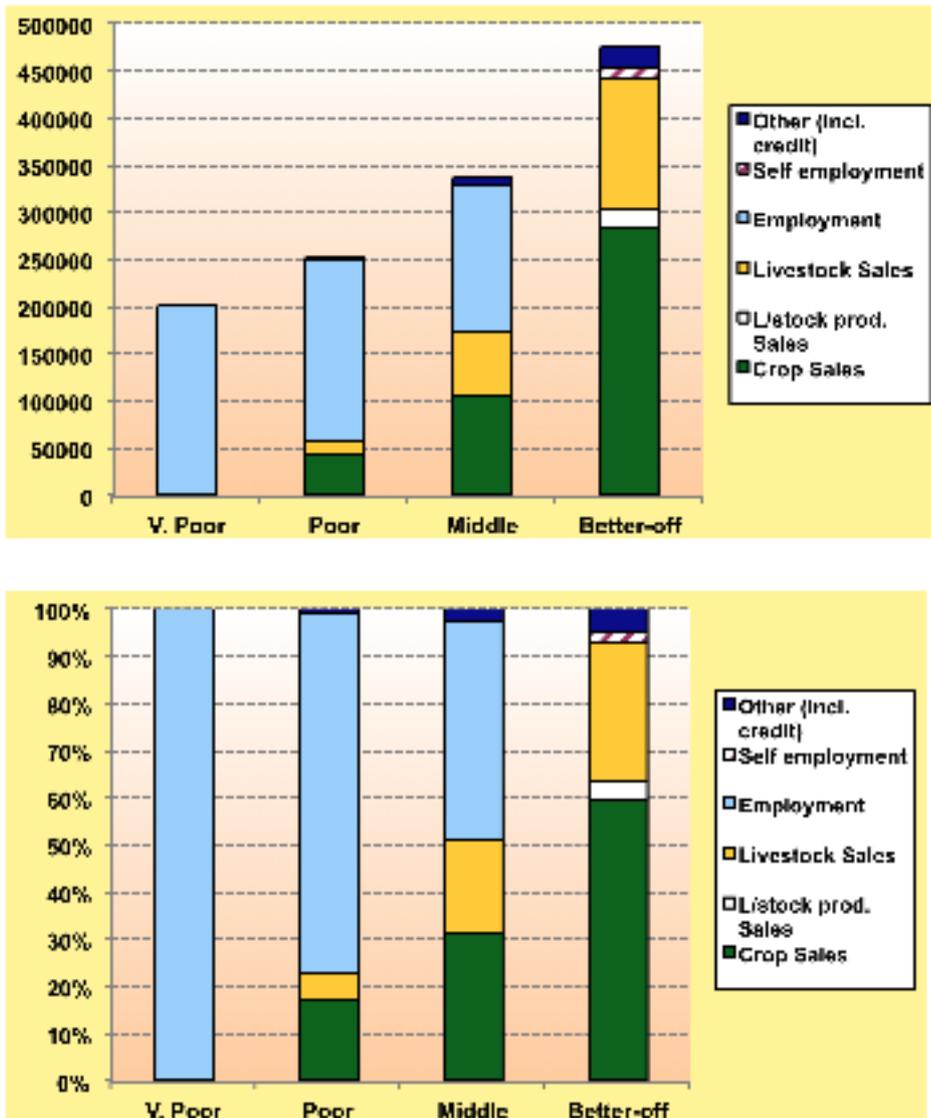
The Poor also source some food from 'Migrant work.' In the case of Burera, workers do not bring back food to the family (as opposed to cash) but their absence over 2-3 months saves 4% of household calorie consumption, expressed here as a contribution to the household calorie total.

For the wealthier groups who are able to maintain a cow, consumption of milk is a small (3-5%) addition to calories but may be a significant addition to the quality of the household diet.

### Sources of cash income

Figure 5 presents the amount of cash income by wealth group for the 12 months of the reference year by source. All figures are in the local currency; Rwandan francs (US\$1 = c600 FRw.) The second graph shows sources of income in terms of proportion.

Figure 5: Sources of cash income



The Better Off earn nearly 2.5 times the cash earned by the Very Poor, but the differentials here are not by any means as wide as may be found in other African countries. The Better Off here are hardly 'rich' even in a local rural sense. The key explanation may lie in the lack of livelihood opportunities. In such a crowded place, with so little land even for the wealthy, and no highly valuable cash crop, nor any capacity to maintain more than a very few animals, there are limited opportunities to make significant income.

Wealth groups are defined not so much by total income as by differences in income source. Even with the difference in land size of just one-quarter of a hectare between wealthier and poorer groups there is a wide difference in income from crop sales, which include sweet potatoes and beans as well as the Irish potato 'cash crop.' This is also reflected in the variation in degree of food self-sufficiency as shown above. Livestock sales also contribute greatly to household income for some households. Given the great constraints in keeping animals, for those who do have them the proportion of income received though livestock sale is also striking due to their high market value: the sale of a couple of sheep or a pig or a calf or bullock, let alone a more mature bovine by the Better Off, makes a significant difference in income, and even Poor households are able to sell a lamb and a couple of hens to give them 6% of their income. It is equally clear that the degree of poverty is directly reflected in how far the household budget is based on working for others.

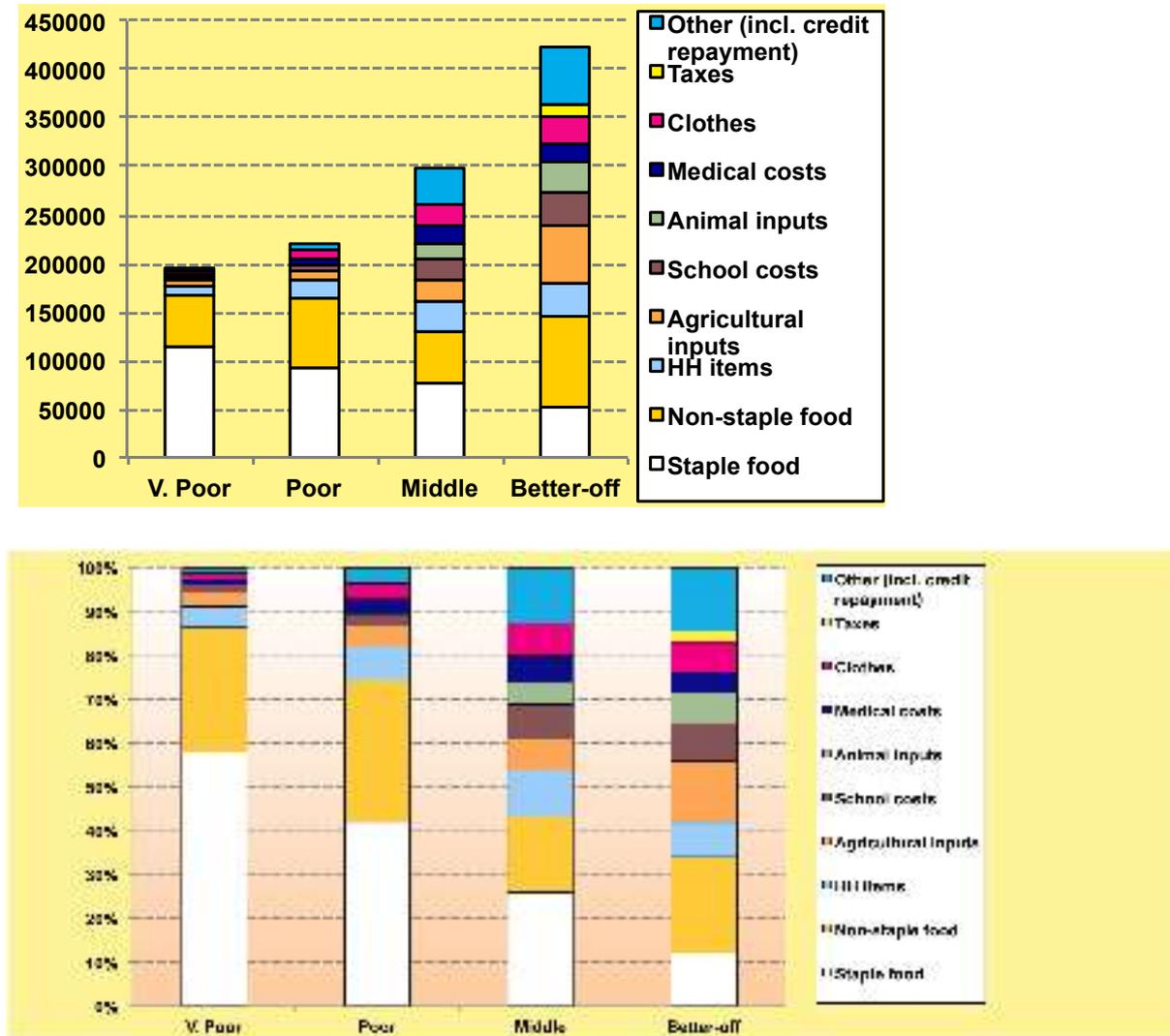
The Very Poor do grow a certain amount of food for themselves, but otherwise they are essentially a rural work-force. The main work is in local agriculture\_ including the creation or maintenance of hillside terraces, local house construction and maintenance work off-season. Migrant work is a minority pursuit, mainly in three directions: to the eastern agro-pastoral areas of Rwanda where local people pay workers to cultivate their soil; to Kigali and other larger

towns; and into Uganda. The main local employers in the highland zone are not amongst the wealth groups represented here. On the whole the villages sampled are not amongst the highest Irish potato producers in the district, and people walk or ride to other sections where that harvest is greater and demands more labour. The Poor are also highly dependent upon wages, although their capacity to sell at least some agricultural produce and livestock, as well as producing half of the food they consume, means that they are to be considered as much farmers as rural workers. On the other hand, even the Middle wealth group do a substantial amount of casual work for pay. Finally, the lack of significant self-employment – selling firewood or fodder grasses, selling handcrafts, portering etc. – is noteworthy: apparently in this environment, with this demography, households do not have to go far to find wood for themselves, and fodder-cutting is equally localised. The Better Off 'self-employment here is mainly brewing, also some land rental and petty trade. A few people also sell manure. But on the whole the picture here is of a relatively self-contained but poor rural economy with little diversification of income and little commercial dynamism.

## Household expenditure

Figure 6 shows the pattern of annual cash expenditure of typical households by wealth group.

Figure 6: Household expenditure by wealth group (in Rwandan Francs and proportionally)



Four things in particular stand out regarding household expenditure patterns in Burera. First and most striking is the proportion of household expenditure of the very poor and poor being spent on basic staples including beans. (Of the amount spent on staple food, beans account for 28% of the total for the Very Poor, 37% for the Poor, 23% for the Middle and 38% for the Better Off.)

Secondly, production inputs for cultivation and livestock together account for 25% of the budget of the Better Off and 15% for the Middle, compared to just 5% for the Poor and 3% for the Very Poor. As this *proportionate* difference

cannot be accounted for by difference in land size, it suggests that wealthier households are more productive and reinvest more income (including in livestock) than poorer households. However, it is likely that there is still a low threshold for increasing production in these constrained circumstances particularly in future generations with family division of land.

Thirdly, a substantial proportion of the 'Other' expenditure category is credit repayment, and the rest is transport, mobile phones and a few other costs. One may speculate that this gives a hint of at least some economic dynamism amongst the Better Off and Middle wealth groups, and may be people borrowing to invest in production or trade. It may also provide evidence that people are moving and talking in a wider sphere than the village.

Fourthly, the relative absolute expenditure on school costs is highly significant. Even the poorest household show evidence of investing in education as it provides opportunities for the future. However, there is a divide between the Middle and Better Off who can afford to send their children on to secondary school (which requires bed and board away from the village) and the Poor and Very Poor who are greatly disadvantaged if, as is usual, there is no secondary school at or near the village.

## Hazards

As a predictive approach, HEA is concerned with understanding the effect that a particular shock or change will have on household access to food and income. The first step in analysing how the baseline household economy will be affected by a particular hazard is to analyse the hazard itself. During community-level interviews, key informants were asked to rate the years from 2007 to the present in terms of outcome for food security and to recall factors that influence food security thus revealing hazards specific to Burera.

Informants were asked to use the following scores to assess food security for a particular year:

- 5 = Excellent (e.g. due to bumper yields, good rains, good prices, etc)
- 4 = Good / Above Average
- 3 = Average
- 2 = Poor/ Below average
- 1 = Crisis / Very poor (e.g. due to drought, flooding, pest attack)

Responses from the nine study villages were as follows:

(A relates to season 1 September to February, and B related to season 2 March to August)

Year	2011	2010	2009	2008	2007
Season	A - B	A - B	A - B	A - B	A - B
Village					
	3	4 - 3	3 - 3	4 - --	4 - 5
	3 - 2	3 - 4	3 - 3	3 - 2	3 - 4
	4 - 2	4 - 2	4 - 3	5 - 5	5 - 5
	5 - 5	5 - 4	4 - 4	4 - 4	4 - 4
	3 - 1	1 - 2	2 - 2	3 - 3	3 - 2
	1 - 1	2 - 2	2 - 1	3 - 3	2 - 1
	5 - 4	1 - 1	3 - 2	2 - 2	--
	2 - 3	4 - 4	2 - 3	4 - 4	3 - 2
	4 - 3	4 - 4	5 - 4	3 - 3	--

-- = no data

The factors that were cited by key informants as relating to food security are as follows:

### ***Good factors cited that were associated with food security***

- Terracing ensures land stability by preventing landslides in heavy rains
- If one crop fails (e.g. sweet potato) there is the opportunity to fall back on maize and beans
- Excellent rains combined with fertile soil

### ***Bad factors cited that were associated with food security***

- Too much rain reduces sweet potato / Irish potato harvests
- Too many local cows – difficult to adjust – some people migrated to Uganda ((this apparently refers to the effect of a government policy favouring hybrid races))
- Hail affects beans (hail effects in one case merit a grade 1 year)
- Drought affected crops (but as the season was given grade 3 rating by the same commentators, this seems to translate as rather lesser rainfall problems)
- Epidemic crop disease
- Lack of seeds
- Soil washed away / landslides
- Land consolidation caused problems (a government policy of cooperative joining-up of small plots for efficient agricultural inputs)
- Epidemic livestock disease (merits a grade 1 year)
- Long period of strong sunshine in growing season

The conclusion that might be drawn from these results is that there are varied hazards experienced by different localities in the same season during the same year due to localised problems, but there is no year that clearly stands out overall as better or worse than others. In this ecology, as opposed to semi-arid climes, there is rarely, if ever, a real drought, even though there is some variation in rainfall between years: more recently this has been in the direction of excess causing local water-logging, flooding or landslides. This is not an area with experience of climatic crises, and so probing regarding coping mechanisms received little response as informants had little experience of such crises. Food insecurity still occurs due to localised problems, during which periods individuals will try to increase their days of agricultural or other employment, or be forced to sell any available livestock. But there is no reference to general, district- or province-wide crises. In this respect it is surprising that periods of steep food-price rises are not cited. However, it is probable that hazard questions were understood to refer to production problems rather than to the market.

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