Global Summary of CCAFS Household Baseline Survey Results Version 2

Working Paper No. 56

CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

Patti Kristjanson
Cathy Garlick
Laura Cramer
Wiebke Förch
Philip K Thornton
Antony Ndungu

CGIAR

RESEARCH PROGRAM ON
Climate Change, Agriculture and Food Security

CCAFS

Working Paper

Global Summary of CCAFS Household Baseline Survey Results
Version 2

Working Paper No. 56

CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

Patti Kristjanson
Cathy Garlick
Laura Cramer
Wiebke Förch
Philip K Thornton
Antony Ndungu

Correct citation:
Kristjanson P, Garlick C, Cramer L, Förch W, Thornton PK Ngungu A. 2014. Global Summary of Baseline Household Survey Results. Version 2. CCAFS Working Paper no. 56. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark. Available online at: www.ccafs.cgiar.org

Titles in this Working Paper series aim to disseminate interim climate change, agriculture and food security research and practices and stimulate feedback from the scientific community.

This document is published by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), which is a strategic partnership of the CGIAR and Future Earth.

Contact:
CCAFS Coordinating Unit - Faculty of Science, Department of Plant and Environmental Sciences, University of Copenhagen, Rolighedsvej 21, DK-1958 Frederiksberg C, Denmark. Tel: +45 35331046; Email: ccafs@cgiar.org

Abstract

This report summarises the results of a baseline household-level survey, designed by the CCAFS team and implemented in late 2010/early 2011 in 3 regions: East Africa, West Africa and South Asia.

This survey was designed with the intent of developing simple, comparable cross-site household level indicators, for which changes can be evaluated over time, of food security, households assets, agricultural production diversity, agricultural sales diversity, changes being made in farming practices for adaptation, innovation, and/or to help reduce emissions or store greenhouse gases (mitigation), and gender indicators (e.g. men's versus women's reception of weather-related information).

A standardised survey, guidelines and training materials were implemented across 12 countries in West Africa (Senegal, Mali, Burkina Faso, Niger, and Ghana), East Africa (Kenya, Uganda, Ethiopia, and Tanzania), and South Asia (India, Nepal and Bangladesh). Thus we have a total of 15 core sites covering 108 villages and 2095 households.

This summary report gives an overview of the farming practices, and asset, livelihoods and food security status of rural households in these sites. It describes what changes farmers have been making in recent years with respect to crop management, livestock practices, use of inputs and other agricultural practices. We explore what kinds of weather/climate and associated information these households are receiving, how and by whom. This information provides important baseline information, as these households will be revisited in 5-10 years' time in order to evaluate the changes in these indicators. This will give us important information as to if, how, and which households are adapting to a changing climate while improving their food security status.

Keywords

Household baseline survey; adaptation; mitigation; climate change; Africa; South Asia; agriculture; food security.

About the authors

Patti Kristjanson is an agricultural economist with the World Agroforestry Centre.

Cathy Garlick is a data management consultant based at University of Reading's Statistical Services Centre.

Laura Cramer is a food security consultant working with CCAFS.

Wiebke Förch is a science officer with CCAFS specialising in food security, resilience and vulnerability research and governance, based at the International Livestock Research Institute.

Philip Thornton is a systems analyst and leader of the Flagship Program 'Policies and Institutions for Climate Resilient Food Systems' with CCAFS, based at the International Livestock Research Institute.

Antony Ndungu is a statistician at the World Agroforestry Centre.

Acknowledgements

The standardised tools, including the questionnaire, guidelines and trainings were jointly developed and implemented with the Statistical Services Centre at the University of Reading. Within the countries, we want to acknowledge the great work of the site teams that lead survey implementation. Joash Mango in Kenya, Florence Kyazze and Drake Mubiru in Uganda, Charles Lyamchai and George Sayula in Tanzania, Solomon Desta, Getachew Gebru, and Seyoum Tezera in Ethiopia, R.P.K. Singh in India, Dwijen Mallick and Aminur Rahman in Bangladesh, Chiranjibi Adhikari in Nepal, Keffing Sissoko coordinating in West Africa, Lamissa Diakité and Aichatou Diarra in Mali, Leopold Some in Burkina Faso, Moussa Boureima in Niger, Moussa Sal and Yacine Ndour in Senegal and Jesse Naab in Ghana.

Overall responsibility for the CCAFS household baselines coordination at regional level has been with regional program leaders and science officers: Robert Zougmore and Abdoulaye Moussa in West Africa, James Kinyangi and Maren Radeny in East Africa, and Pramod Aggarwal and Gopal Bhatta in South Asia.

Contents

1.0 Introduction

A standardised CCAFS baseline was designed at three levels. In addition to the household baseline survey, a village baseline study and an organisational baseline questionnaire were also implemented across all sites. The household baseline survey designed by the CCAFS team and its partners was implemented in 2010 – 2012[1] in the 3 initial CCAFS regions: East Africa, West Africa and South Asia.[2] Maps showing the locations of these sites are found at: http://www.ccafs.cgiar.org/regions.

This household baseline survey was designed with the intent of developing simple, comparable cross-site household level indicators, for which changes can be evaluated over time, of the following:

- Food security
- Assets/wealth
- Production diversity
- Selling diversity
- Adaptation/innovation
- Mitigation behaviour
- Gender differences in receiving weather and climate information

All baseline tools, questionnaires and reports are freely available and have been archived through the CCAFS website at http://ccafs.cgiar.org/resources/baseline-surveys. The same approach was implemented in 5 countries/sites in West Africa (Senegal, Mali, Burkina Faso, Niger, and Ghana); 4 countries/6 sites in East Africa (Kenya, Uganda, Ethiopia, and Tanzania); and 3 countries/4 sites in South Asia (India, Nepal and Bangladesh). The survey exercise covered 108 villages and 2095 households. For more detailed site characterisations, visit http://cgspace.cgiar.org/bitstream/handle/10568/10203/Site%20Portfolio%20FINAL.pdf for a summarised site portfolio document and http://ccafs.cgiar.org/atlas-ccafs-sites for site atlases.

[1] A staggered approach was used across regions for implementation of baselines, with some sites added later on.

[2] Two additional regions were added to the CCAFS portfolio in 2013 (Latin America and Southeast Asia). The baselines in these regions are being carried out in 2014 and will be added to the archive of data.

Here, we report on the results of a comparison of the indicators developed within each region. The complete CCAFS household baseline data has been archived for public use on Dataverse (http://thedata.harvard.edu/dvn/dv/CCAFSbaseline). For a detailed description of the tool, training materials, and initial analyses of the household baseline data collected within each site, individual site reports and other information, see the link above.

This cross-site analysis report provides a comparative overview of the farming practices, and assets, livelihoods and food security status of rural households in the CCAFS sites. It examines what changes farmers have been making in recent years with respect to their agricultural and land management practices. We explore what kinds of weather, climate and associated information these households are receiving, from which sources and who is receiving it. Highlights of the household level findings were shared with the communities involved in each site survey during the follow-up village level baseline study.

The CCAFS baseline has been designed to track changes over time, and these same households will be revisited in 5-10 years after the baseline in order to evaluate the changes in these indicators. This will give us important information as to if, how and which households are adapting to a changing climate and improving their food security status.

The CCAFS baseline dataset is publicly available at http://thedata.harvard.edu/dvn/dv/CCAFSbaseline and has been used by a range of researchers for various analyses and publications. Examples include "Are food insecure smallholder households making changes in their farming practices? Evidence from East Africa" (available at http://link.springer.com/article/10.1007%2Fs12571-012-0194-z), "Smallholder farmer cropping decisions related to climate variability across multiple regions" (available at http://www.sciencedirect.com/science/article/pii/S0959378013002410), and a paper on the process of implementing the baselines, entitled "Back to baselines: measuring change and sharing data" (available at http://www.agricultureandfoodsecurity.com/content/3/1/13).

1.1 The Indices

1) Food security indicator

Households were asked about each month of the year, for a 'normal' year (i.e. not a drought or exceptional rainfall year) – first, whether the food they access normally comes from their own farm/stores during that particular month, or mainly from other sources (e.g. purchased,

food aid, gifts). Second, they were asked which months of a typical year they struggle to find sufficient food to feed their families, from any source (the 'hunger months'). The food security indicator categorises the number of hunger months reported into: zero, 1-2, 3-4, 5-6, and more than 6 hunger months. The index was designed to give insight into the length of hunger period; we would like to see fewer hunger months for these households over time.

2) Asset/wealth indicator

Households were asked about what assets they had, from a set list. The assets include the following: *Energy*: generator, solar panel, biogas digester, large battery (as for a car); *Information:* radio, television, cell phone, internet access, computer; *Production means:* tractor, mechanical plough, thresher, mill; *Transport:* bicycle, motorbike, car or truck; *Luxury items:* fridge, air conditioning, fan, bank account, improved stove. The assets were subdivided into different categories to make cross-indicator comparisons later on. For example, indicators of production means can be linked to the use of adaptive land management practices.

The total number of assets in all categories was added up and the following asset indicator created:

0 = none of these household assets (basic level)

1 = 1-3 assets from the list (intermediate level)

2 = 4 or more assets from the list (high level)

It is important to note that this indicator is not intended to include every possible type of asset, and that the checklist includes some indicators that we expect to see becoming more important in the future than they may be at present. It also does not include a critical asset for resource-poor households: livestock assets. The index provides information on a few key assets that can help track changes in the level of household welfare over time.

3) Production diversification indicator

The production diversification indicator was created by adding up the total number of agricultural products/items (including food crops, cash crops, livestock, fruit, vegetables, fodder, fish, tree products; a total of 15 in all) produced on respondents' land/farms:

1 = 1-4 products (low production diversification)

2 = 5-8 products (intermediate production diversification)

3 = more than 8 products (high production diversification).

Here we are focusing on diversification of production as a key way that households deal with high levels of uncertainty and climate variability and change, thus the production diversification indicator will allow us to make assumptions about which sub-groups are most vulnerable due to low diversity.

4) Selling/commercialisation diversity indicator

On the selling/commercialisation side, the total number of agricultural products produced on the respondents' farms and then sold was added up:

0 = no products sold (no commercialisation)

1 = 1-2 products sold (low commercialisation)

2 = 3-5 products sold (intermediate commercialisation)

3 = more than 5 products sold (high commercialisation).

Similar to the production diversification indicator, the selling/commercialisation indicator provides insight into livelihood strategies, for instance, indicating whether households are at a subsistence level or earn cash income from their agricultural production.

5) Adaptation indicator

Households were queried about what changes they had made over the last 10 years with respect to a wide range of practices – relating to crop type, variety type, land use and natural resource management practices, and farm animals/fish management practices (59 possibilities in all – see survey for details). The hypothesis is that households that have already been making changes, and introducing new practices, are likely to be more 'adaptive' to weather-related shocks and long-term changes in weather patterns (i.e. climate), than those that have not been able to make adjustments or introduce any new innovations to date.

The adaptation indicator is defined as the following:

0 = zero or one change made in farming practices (i.e. crop, livestock, soil, water, land, and/or tree management practices) over last 10 years (low level)

1 = 2-10 changes made in farming practices (intermediate level)

2 = 11 or more changes made in farming practices (high level)

6) Mitigation-related indicators

Here, we are interested in the introduction of new/improved practices that help sequester greenhouse gases (climate change mitigation measures). These improved farm management practices have not necessarily been employed because of climate change concerns, but they help reduce carbon emissions while at the same time providing other benefits to households.

Tree management indicator. This simple indicator shows whether a household has either protected or planted trees within the last year.

Soil amendment indicator. This indicator shows if the household has used fertiliser in the last year, or have started using fertiliser or manure on at least one crop.

Input intensification indicator. There are 7 'changes in agricultural practices/new practices over the last 10 years' to create an indicator with 3 levels:

No intensification (none of the following)

Low intensification (1-3 of the following)

High intensification (4-7 of the following).

These include starting to: purchase and apply mineral/chemical fertilisers, use manure/compost, use pesticides/herbicides, use integrated pest management techniques, irrigate, or plant higher yielding varieties.

Productivity indicator. This indicator shows if a household has reported achieving a better yield from any crop, or that their land is more productive for any crop over the last 10 years – such households are classified as showing an "increase in productivity".

7) Gender indicators and types, sources and access to weather-related information by gender

We distinguished female-headed versus male-headed households, allowing an analysis of differences in the indicators in areas where there are significant proportions of female-headed households. We also disaggregated agricultural labour inputs by gender (see individual site reports for this information, found at http://ccafs.cgiar.org/resources/baseline-

surveys#household), and in this report we show some of the differences regarding women's versus men's access to various types of climate-related information.

2.0 West Africa

The initial West African CCAFS sites where the household baseline survey was implemented in late 2010/early 2011 are shown in Figure 2.1.

Figure 2.1 Locations of CCAFS sites in West Africa

Yatenga in Burkina Faso is located at 300-350 m above sea level with annual average rainfall of 400-700 mm in the Sudano-Sahelian zone. The area is characterised by high inter- and intra-year rainfall variability, and is drought-prone with low levels of soil fertility and high levels of land degradation. The vast majority of rural households are engaged in subsistence farming and extensive livestock production.

Lawra-Jirapa in Ghana is located at 180-300 m above sea level and receives 750-1250 mm of annual rainfall. The area is characterised by the savannah agro-ecological zone. Small-scale mixed crop-livestock systems are dominant. There are challenges of high population pressure on natural resources and high rainfall variability.

Segou in Mali is characterised by a semi-arid climate with high variability and around 500-600 mm rainfall per year. Relatively high population density results in high pressure on natural resources. Combined with poor soil fertility and high levels of land degradation, this creates high rates of poverty and food insecurity.

Kollo in Niger is located in the central Sahel at 200 m above sea level. It receives 300-600 mm annual rainfall with high variability. There are low levels of soil fertility, high land degradation and high levels of poverty. The dominant livelihood systems include crop farming and pastoralism, both of which are largely subsistence oriented.

Kaffrine in Senegal lies at 15-50 m above sea level and receives 250-750 mm of annual rainfall. It is in the transition zone from the Sahelian to the Sudano-Savannah zone. As with the other sites, there is high rainfall variability and low soil fertility. Groundnuts are grown as a cash crop but markets are difficult to access.

2.1 Food Security Indicator

The food security indicator is based upon the number of months that the household has difficulty getting food from any source (often referred to as the ‘hunger months’), for an average rainfall year. Table 2.1 and Figure 2.2 show the proportion of households in the West Africa sites that reported having difficulty in feeding their family, from any source (e.g. purchased or received as food aid), for different periods.

The five sites show high degrees of food insecurity at the household level. Mali-Segou exhibits the lowest degree of food insecurity, with half of households reporting no ‘hunger

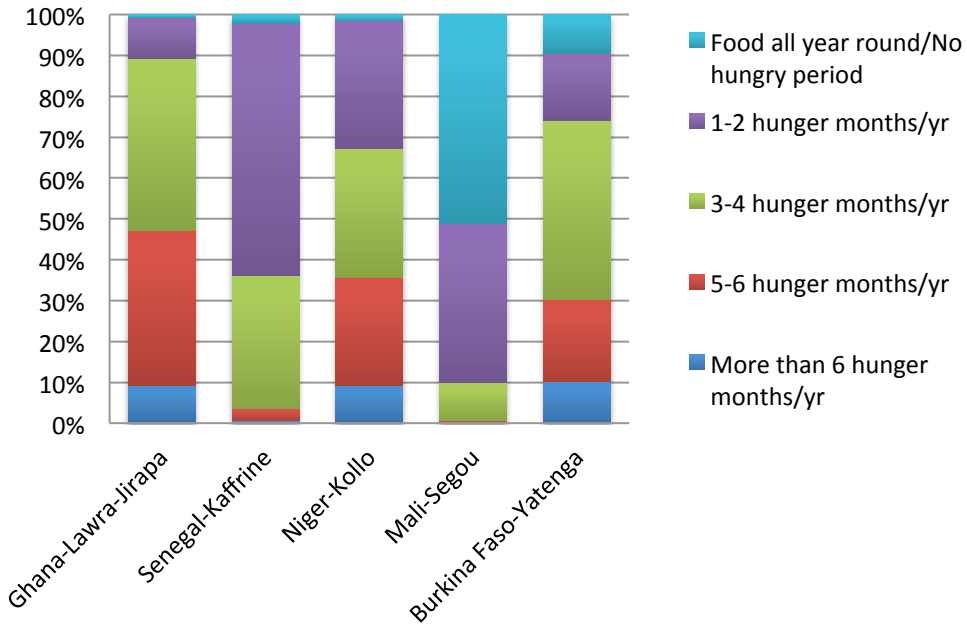
months' during the year. However, even here, 39% experience 1-2 months of struggling to find sufficient food to feed their families (from any source) during an 'average' rainfall year.

We see the highest incidences of food insecurity in Ghana-Lawra-Jirapa. Forty-seven percent of Ghana-Lawra-Jirapa households surveyed reported more than 5 hunger months in an average year. In Senegal-Kaffrine and Mali-Segou, it is rare to find households that experience more than 4 hunger months.

Table 2.1 Number of hunger months for sites in West Africa

Country/Site/Sampling Frame	Percent of surveyed households reporting:				
	More than 6 hunger months/year	5-6 hunger months/	3-4 hunger months/	1-2 hunger months/	Food all year round/No hungry period
Ghana/Lawra-Jirapa/Lawra	9	38	42	10	1
Senegal/Kaffrine/Kaffrine	1	3	33	62	2
Niger/Kollo/Fakara	9	26	31	31	1
Mali/Segou/Cinzana	0	1	9	39	51
Burkina Faso/Yatenga/Tougou	10	20	44	17	9

Figure 2.2 Food security indicator across West African CCAFS sites



Main sources of food by month and hunger months

Delving into the food security situation in a little more depth, in Mali-Segou (Figures 2.3 and 2.4), we see that during the months that food comes mainly from their own land, these

families do not experience food shortages. In other words, few households are accessing food through markets or other sources to achieve food security.

Moreover, in Mali-Segou, we can also observe that the months of food shortages correspond to the months in which households rely on off-farm sources of food, indicating that households rarely have enough cash income to meet their food demands during the months of low on-farm production. This pattern, in fact, holds for all the West Africa sites (data not shown here). It appears that own-farm production is indeed critical for food security for these households across a range of sites and different lengths of hunger periods.

Figure 2.3 Mali-Segou – Main sources of food (% of households; n=140)

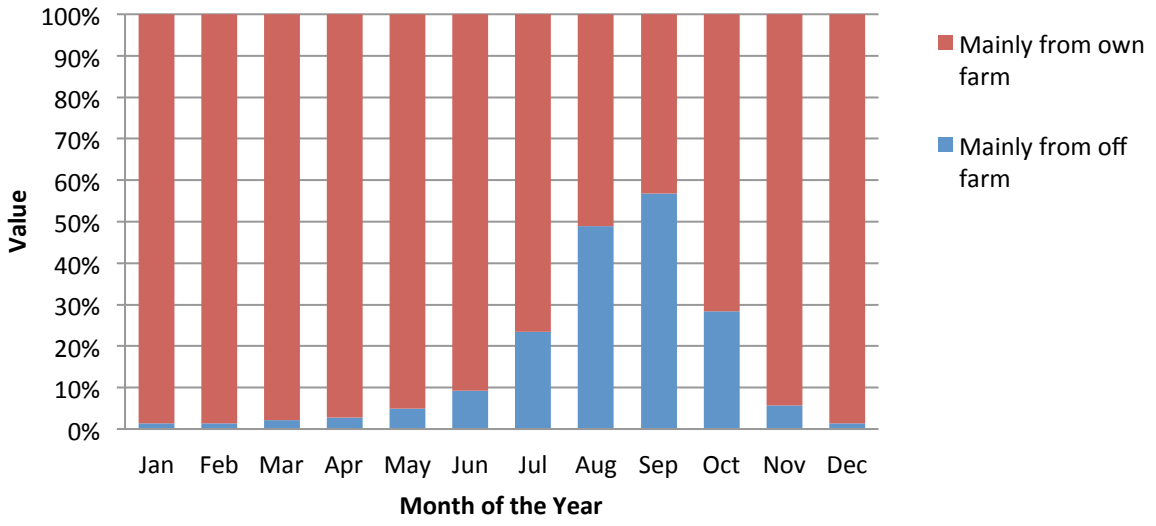
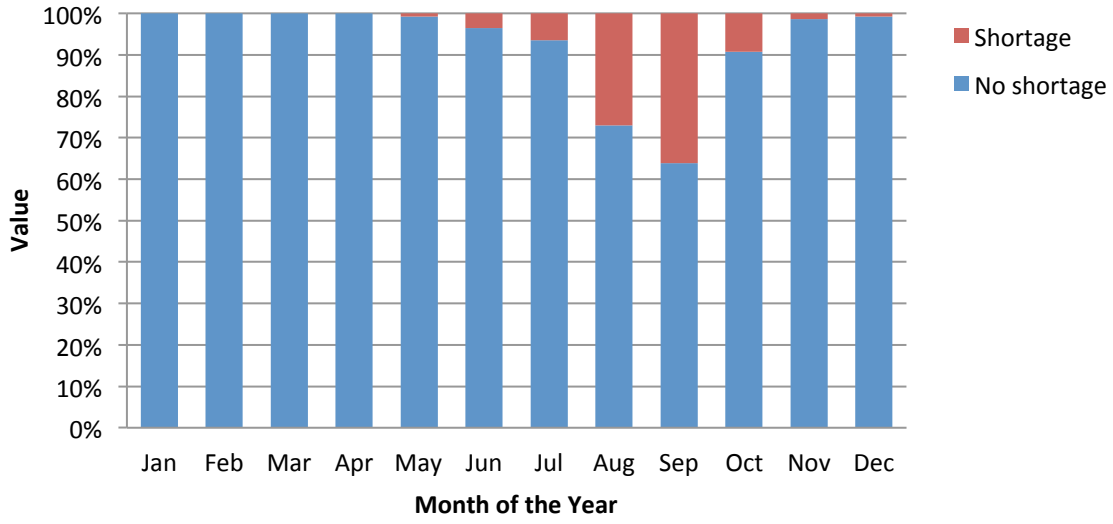


Figure 2.4 Mali-Segou – Food shortage versus no food shortage months (% of households; n=140)



2.2 Asset Indicator

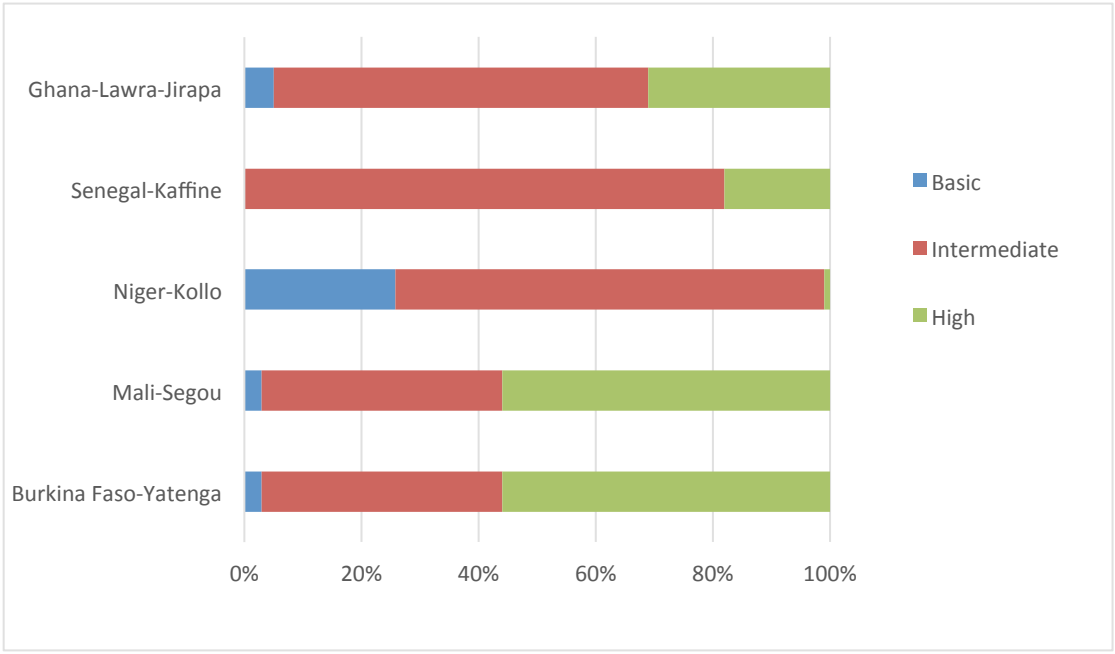
Table 2.2 and Figure 2.5 show how the baseline survey households across West Africa compare with respect to ownership of the standard list of assets they were queried about.

In Mali-Segou and Burkina Faso-Yatenga, we see relatively higher proportions of 'wealthier' households, with 62% and 56%, respectively, of households reporting owning over 4 of these assets. The majority of households in Niger-Kollo, Senegal-Kaffrine and Ghana-Lawra-Jirapa fall in the intermediate level as they own 1-3 of these assets. Niger-Kollo has the highest proportion of very poor households, with 26% of households owning none of these assets.

Table 2.2 Asset indicator for CCAFS West Africa sites

Country/Site/ Sampling Frame	Percent of surveyed households reporting:		
	Basic level	Intermediate level	High level
Ghana/Lawra-Jirapa/Lawra	5	64	31
Senegal/Kaffrine/Kaffrine	0	82	18
Niger/Kollo/Fakara	26	74	1
Mali/Segou/Cinzana	1	38	62
Burkina/Yatenga/Tougou	3	41	56

Figure 2.5 Asset indicator comparison across CCAFS West Africa sites



2.3 Livelihood Diversification Indicators

2.3.1 Production diversity

Table 2.3 shows the degree of diversification in terms of the number of agricultural products the surveyed households are producing across the West Africa sites.

This indicator shows that households in CCAFS sites in Mali-Segou (65%), Ghana-Lawra-Jirapa (46%) and Senegal-Kaffrine (46%) exhibit the highest levels of diversity in production, measured as producing more than 8 different products. The majority of the surveyed households fall into the medium diversity category, producing between 5 and 8 different types of agricultural products on their farms. In Niger-Kollo, 41% of households produce only 1-4 kinds of agricultural products.

Table 2.3 Production diversification indicator

Country/Site/ Sampling Frame	Percent of surveyed households reporting on-farm\production of:		
	Low: 1-4 products	Medium: 5-8 products	High: More than 8 products
Ghana/Lawra-Jirapa/Lawra	1	52	46
Senegal/Kaffrine/Kaffrine	1	54	46
Niger/Kollo/Fakara	41	55	4
Mali/Segou/Cinzana	2	33	65
Burkina/Yatenga/Tougou	2	69	29

2.3.2 Selling diversity

Table 2.4 shows the degree of diversification in terms of the number of agricultural products the surveyed households are both producing and selling.

The lowest levels of diversity in commercialisation of produce from their own farms can be seen in Niger-Kollo, with 44% of households selling nothing and another 47% of households selling only 2 or fewer products. In contrast, the site with the highest percentage of highly commercialised farms (i.e. selling more than 6 products) is Ghana-Lawra-Jirapa, where 29% sell more than 6 products and 51% sell 3-5 products. Senegal-Kaffrine, Mali-Segou and Burkina Faso-Yatenga all show low to intermediate levels of commercialisation.

Table 2.4 Selling diversification indicator

Country/Site/Sampling Frame	Percent of surveyed households reporting selling of:			
	No products sold	1-2 products sold (low commercial-isation)	3-5 products sold (intermediate commercial-isation)	6 or more products sold (high commercialisation)
Ghana/Lawra-Jirapa/Lawra	4	16	51	29
Senegal/Kaffrine/Kaffrine	1	28	63	8
Niger/Kollo/Fakara	44	47	9	1
Mali/Segou/Cinzana	4	31	53	12
Burkina/Yatenga/Tougou	4	37	57	2

2.4 Adaptation Indicator

The degree of adaptability and innovation, as suggested by the number of changes in agricultural practices these households have made in the last 10 years, is shown in Table 2.5 and Figure 2.6 for the West Africa sites.

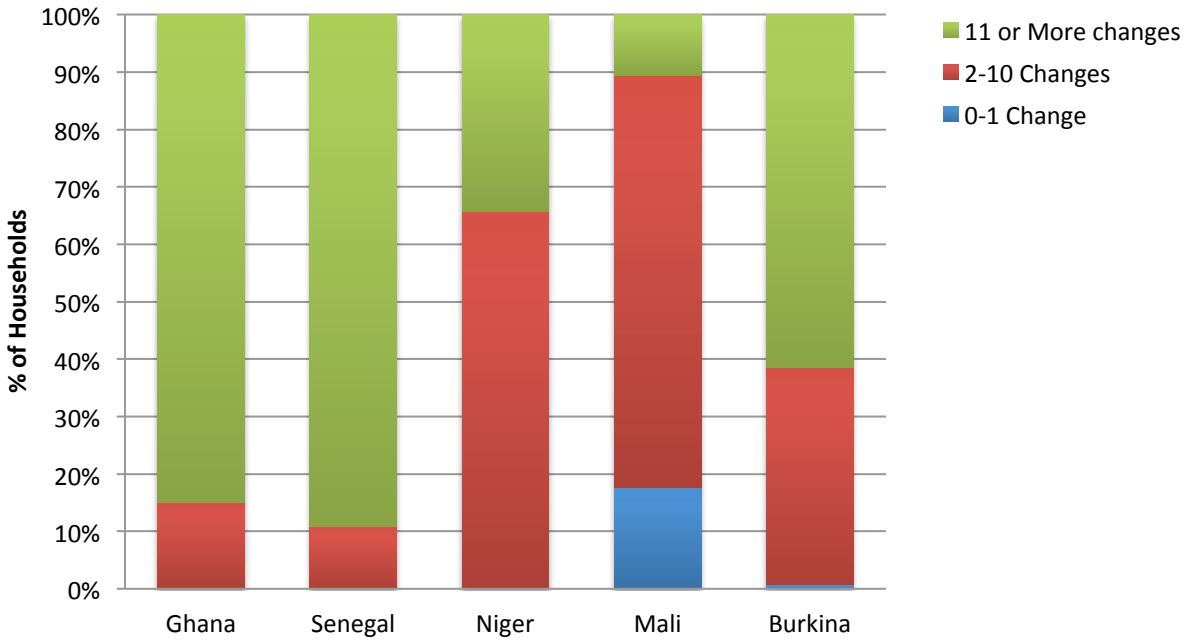
Households were queried about what changes they had made over the last 10 years with respect to a wide range of practices – relating to crop type, variety type, land use and management practices, and farm animals practices (59 possibilities in all). Over 85% of households in the CCAFS sites in Senegal-Kaffrine and Ghana-Lawra-Jirapa appear to be quite innovative and adaptive, at least in terms of the overall number of changes they have made to their farming practices.

Eighteen percent of the surveyed households in Mali-Segou have made zero or only one change to their farming/livestock management practices in the last 10 years.

Table 2.5 Adaptation indicator

Country/Site/Sampling Frame	Percent of surveyed households reporting the following number of changes to their agricultural practices in the last 10 years:		
	0-1 change	2-10 changes	11 or more changes
Ghana/Lawra-Jirapa/Lawra	0	15	85
Senegal/Kaffrine/Kaffrine	0	11	89
Niger/Kollo/Fakara	0	66	34
Mali/Segou/Cinzana	18	72	11
Burkina/Yatenga/Tougou	1	38	61

Figure 2.6 Adaptation indicator for the West Africa sites



2.5 Mitigation Indicators

The mitigation-related indicator, showing changes in behaviour with respect to agricultural-related changes in activities by the surveyed households in West Africa, over the last decade, can be seen in Table 2.6.

The results show that over 80% of households across all the CCAFS West Africa sites planted or protected some trees in the last year on their farms. Introduction of fertiliser or manure in the last year has also been quite high, particularly in Burkina Faso-Yatenga, Senegal-Kaffrine and Ghana-Lawra-Jirapa, where over 90% have made soil fertility amendments over the last 10 years. Niger-Kollo and Mali-Segou have the highest proportions of households, 10% and 27% respectively, which have not pursued any intensification measures. Over half of households in the Ghana-Lawra-Jirapa and Senegal-Kaffrine sites fall in the high intensification category. Over 40% of households in Mali-Segou, Burkina Faso-Yatenga and Niger-Kollo have seen no increases in productivity in the last 10 years.

The results illustrate that the protection or planting of trees has gained quite a bit of traction in West Africa, while other mitigation related activities are more mixed in their application across the sites.

Table 2.6 Mitigation and farming changes related indicators

Country/Site/ Sampling Frame	Tree management		Soil amendments		Intensification			Productivity	
	No	Yes	None	Some	None	Low	High	No increase	Some increase
Ghana/Lawra-Jirapa/Lawra	16	84	3	97	0	46	54	17	83
Senegal/Kaffrine/Kaffrine	19	81	4	96	0	30	70	25	75
Niger/Kollo/Fakara	13	87	19	81	10	61	29	46	54
Mali/Segou/Cinzana	11	89	31	69	27	65	9	47	53
Burkina/Yatenga/Tougou	14	86	7	93	5	51	44	41	59

2.6 Weather-Related Information Access by Gender

The types, sources and access to weather-related information have been analysed by gender and the results for Burkina Faso-Yatenga and Ghana-Lawra-Jirapa are presented in Tables 2.7 and 2.8, respectively.

Forty-four percent of surveyed households in Burkina Faso-Yatenga reported that they had received no weather or climate-related information whatsoever in the last year. Radio, friends/relatives/ neighbours, and extension officers were the most commonly cited sources. Table 2.7 shows the percentage of responses related to women reporting to receive climate-related information versus men in Burkina Faso-Yatenga, by the different types of information. Extreme event forecasts are reported to having been received by half of the surveyed households, followed by predictions as to the start of the rains (36%). It appears that in most of the surveyed households at Burkina Faso-Yatenga, which receive weather-related information, both the women and men have access to the same information, although two-thirds of men hear 2-3 day weather forecasts and only one-third of women have access to these forecasts.

Table 2.7 Types of weather-related information received in Burkina Faso-Yatenga

Type of weather-related information	% of HHs receiving it	Of HHs receiving info, who in the household is getting it (% of yes responses)?		
		Men	Women	Both
Start of the rains	36	50	4	44
Forecast of extreme event	50	61	1	36
Forecast of pest or disease outbreak	20	36	11	54

2-3 month weather forecast	18	40	4	56
2-3 day weather forecast	9	67	0	33

In Ghana-Lawra-Jirapa, only 16% of households said they had not received any weather-related information. Radio, friends/relative/neighbours and own observations are the most frequently cited sources. An extreme event forecast is the type of weather information most frequently accessed by these households (76%), but with the men in the household (64%) more likely than women (34%) to be getting this information.

Close to one-half of the surveyed Ghana-Lawra-Jirapa households heard about the forecasted start of the rains, and of a pest or disease outbreak, again with more men than women receiving these types of information. One-third of households receive 2-3 day weather forecasts, with one-quarter accessing 2-3 month forecasts.

Table 2.8 Types of weather-related information received in Ghana-Lawra-Jirapa

Type of weather-related information	% of HHs receiving it	Of HHs receiving info, who in the household is getting it (% of yes responses)?		
		Men	Women	Both
Start of the rains	44	58	3	39
Forecast of extreme event	76	64	3	31
Forecast of pest or disease outbreak	51	61	7	32
2-3 month weather forecast	26	56	3	42
2-3 day weather forecast	32	56	2	42

In general, not as many households in Burkina Faso-Yatenga and Ghana-Lawra-Jirapa access weather information as we would hope, and within the households that do access such information it is unevenly accessed by more men than women.

3.0 East Africa

The initial East African CCAFS sites where the household baseline survey was implemented in late 2010/early 2011 are shown in Figure 3.1.

Figure 3.1 Locations of CCAFS East Africa sites

Nyando in Kenya is located at 1100-2500 m above sea level and receives 900-1200 mm of rainfall per year. There are risks of droughts as well as floods in this site. The households are largely subsistence agricultural producers within a mixed crop-livestock system. There is high pressure on the land. Reduced returns on crop production due to unreliable weather and land degradation result in the hiring of additional land from neighbouring communities.

Makueni in Kenya is a semi-arid location receiving an average of 500-600 mm of rainfall per year. The elevation is 900-1000 m above sea level. There is a high reliance on maize although the area is not well suited for the crop. There is increasing pressure on resources from growing populations.

The Albertine Rift site in Uganda falls within a range of 620-1600 m above sea level and with 1400 mm of rain per year is relatively moist. Livelihoods include highland agroforestry, mid-hill coffee and tea and mixed farming. It is a relatively lush site with abundant natural resources that are threatened by commercial interests.

Kagera Basin in Uganda is located at 1000-1500 m above sea level and has a range of rainfall from 1000-1400 mm per year. Depending on elevation, farming systems range from agropastoralism to rainfed small-scale systems to mid-hill perennial mixed coffee.

Usambara in Tanzania is in a mountainous landscape, ranging from 900-2250 m above sea level. It receives 1200-1300 mm of rainfall per year, creating good conditions for intensive mixed crop-livestock farming. The lower elevations are characterised by agropastoral farming systems. The area also attracts large numbers of tourists because it is a global hotspot for biodiversity. It is the most densely populated rural district in Tanzania with high levels of soil erosion due to farming on the mountain slopes.

Borana in Ethiopia is located at 1000-2000 m above sea level with 500-600 mm of rainfall per year. It is a semi-arid agro-ecology, extremely drought-prone with nomadic pastoralism and pockets of opportunistic cropping.

3.1 Food Security Indicator

Table 3.1 shows the number of months that the households surveyed in East Africa have difficulty getting food from any source, in an average rainfall year.

All of the sites show high degrees of food insecurity at the household level. The Albertine Rift site in Uganda exhibits the lowest degree of food insecurity, with almost one-third of households reporting no 'hunger months' during the year. However, even here, 35% experience 3 or more months of struggling to find sufficient food to feed their households (from any source) in an 'average' rainfall year.

The Ethiopia-Borana, Tanzania-Usambara and Kenya-Makueni sites experience the highest incidences of food insecurity. Seventy-seven percent of the surveyed Ethiopia-Borana households experience more than 5 hunger months per year. Sixty-two percent of the Tanzania-Usambara households surveyed reported more than 5 hunger months in an average year. In Kenya-Makueni, 78% of households surveyed experience more than 5 hunger months in an average year. In contrast, in the Kenya-Nyando site, none of the households reported experiencing 5 or more hunger months in an average year.

Table 3.1 Number of hunger months for sites in East Africa

Country/Site/Sampling Frame	Percent of surveyed households reporting:				
	More than 6 hunger months/year	5-6 hunger months/year	3-4 hunger months/year	1-2 hunger months/year	Food all year round/No hungry period
Kenya/Nyando/Katuk Odeyo	0	0	17	81	1
Kenya/MakueniWote	44	34	19	1	2
Tanzania/Usambara/Lushoto	35	27	26	7	4
Uganda/Albertine Rift/Hoima	10	9	16	35	31
Uganda/Kagera Basin/Rakai	10	25	39	15	10
Ethiopia/Borana/Yabero	53	24	18	4	1

Main sources of food by month and hunger months

Delving into the food security situation in a little more depth, in the Ethiopia site (Figures 3.1 and 3.2), we see that the number of months where food comes mainly from their own land correspond very well to the months that these families experience fewer food shortages.

Figure 3.1 Ethiopia-Borana main sources of food (% of households, n=140)

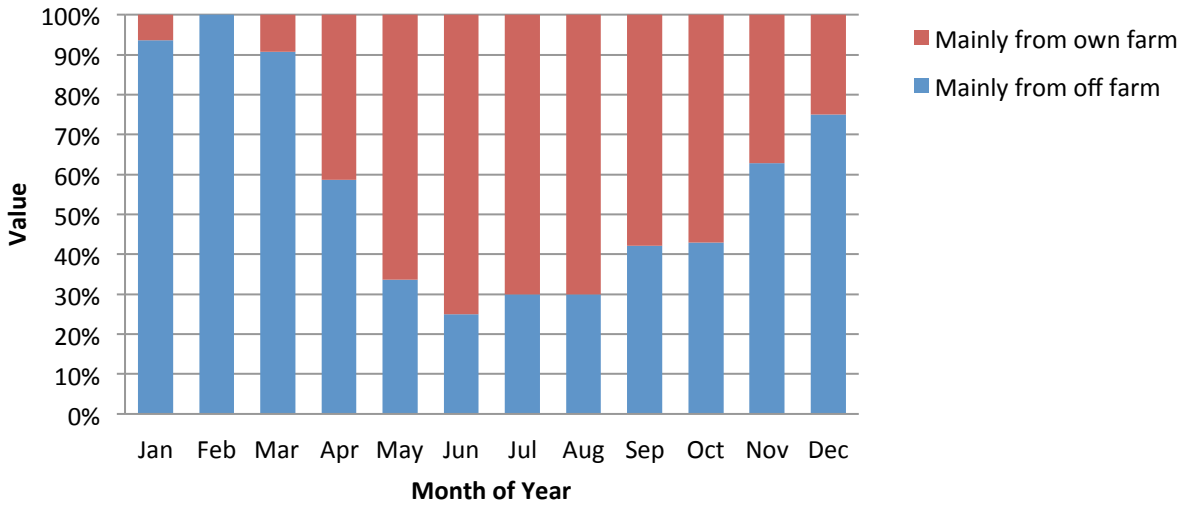
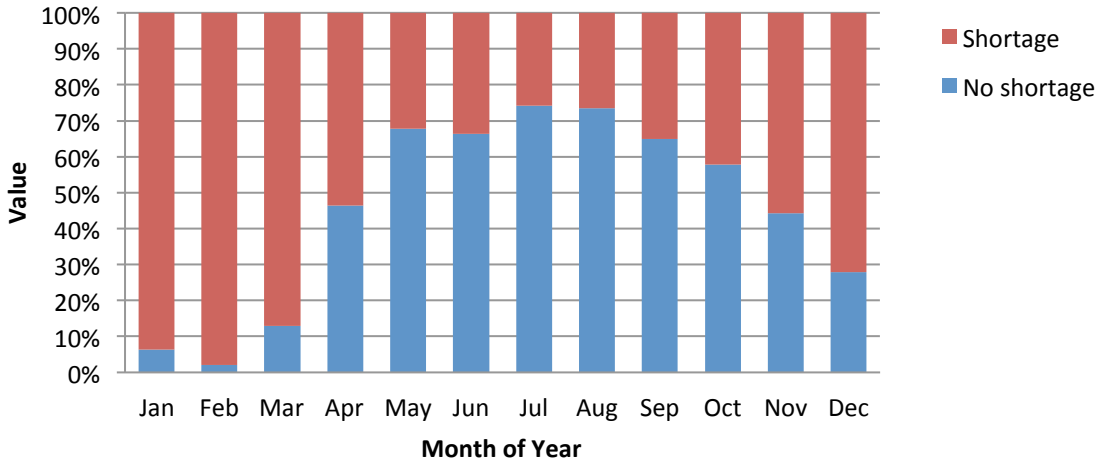


Figure 3.2 Ethiopia-Borana – Food shortage versus no shortage months (% of households; n=140)



3.2 Asset Indicator

The asset indicator is shown for each of the East African baseline survey sites in Table 3.2 and Figure 3.3.

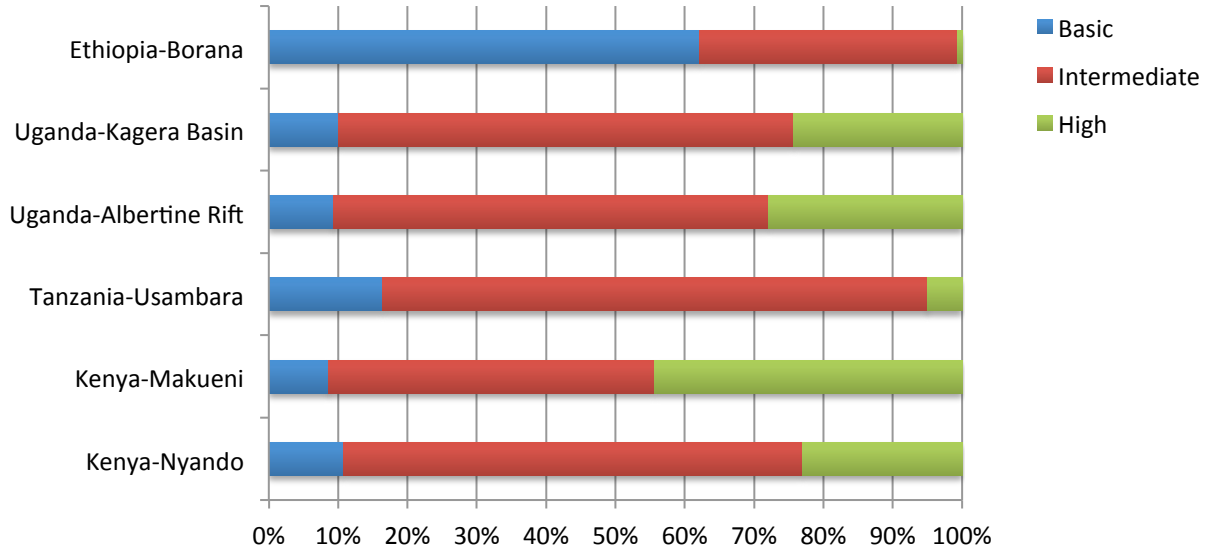
Roughly two-thirds of households fall into the intermediate category of asset ownership across all sites. One exception is Ethiopia-Borana where a staggering 62% of households fall in the low asset/wealth category, and the other 37% of households are at the intermediate level, leaving just 1% in the high category (note that livestock was not considered an asset for this index and the Borana site is a pastoralist area). Forty-four percent of households in Kenya-Makueni own more than 4 of the queried assets, while a relatively high asset indicator

has also been reported in both Uganda sites and Kenya-Nyando, where roughly one-quarter of households own more than 4 of the queried assets.

Table 3.2 Asset indicator: East Africa sites

Country/Site/Sampling Frame	Percent of surveyed households reporting number of assets:		
	Basic (Zero)	Intermediate (1-3)	High (4 or more)
Kenya/Nyando/Katuk Odeyo	11	66	23
Kenya/Makueni/Wote	9	47	44
Tanzania/Usambara/Lushoto	16	79	5
Uganda/Albertine Rift/Hoima	9	63	28
Uganda/Kagera Basin/Rakai	10	66	24
Ethiopia/Borana/Yabero	62	37	1

Figure 3.3 Asset indicator: East Africa sites



3.3 Livelihood Diversification Indicators

3.3.1 Production diversity

Table 3.3 shows the degree of diversification in terms of the number of agricultural products being produced by the surveyed households across the East Africa sites, including food crops, cash crops, livestock, fruit, vegetables, fodder, fish, and tree products (a total of 15 in all).

This indicator shows that 60% of households in Kenya-Makueni exhibit a high level of diversity in production, measured as producing more than 8 different types of agricultural

products. In the Kenya-Nyando and Tanzania-Usambara sites this figure drops to around one-third of households.

With the exception of Kenya-Makueni, the majority of the surveyed households in each site fall into the medium diversity category, producing between 5 and 8 different types of agricultural products on their farms. The site in Ethiopia-Borana has the highest proportion of households in the low level category (just under a quarter) and no households from this site are in the high level category.

Table 3.3 Production diversification indicator

Country/Site/Sampling Frame	Percent of surveyed households reporting on-farm/production of:		
	Low: 1-4 products	Medium: 5-8 products	High: More than 8 products
Kenya/Nyando/Katuk Odeyo	16	52	33
Kenya/Makueni/Wote	5	35	60
Tanzania/Usambara/Lushoto	16	50	35
Uganda/Albertine Rift/Hoima	16	62	22
Uganda/Kagera Basin/Rakai	14	59	27
Ethiopia/Borana/Yabero	23	77	0

3.3.2 Selling diversity

Table 3.4 shows the degree of diversification in terms of the number of agricultural products the surveyed households across East Africa are both producing and selling.

The lowest levels of diversity in commercialisation of produce from their own farms can be seen in the Nyando site in Kenya (26% of households selling nothing) and Ethiopia (14%). The site with the highest percentages of highly commercialised farms (i.e. selling more than 6 products) is Tanzania (31%). In the Uganda sites, roughly one-fifth of surveyed households are highly commercialised.

Table 3.4 Selling diversification indicator

Country/Site/Sampling Frame	Percent of surveyed households reporting selling of:			
	No products sold	1-2 products sold	3-5 products sold	6 or more products sold
Kenya/Nyando/Katuk Odeyo	26	32	33	9
Kenya/Makueni/Wote	11	47	34	8
Tanzania/Usambara/Lushoto	3	18	49	31
Uganda/Albertine Rift/Hoima	7	29	46	18
Uganda/Kagera Basin/Rakai	7	28	45	20
Ethiopia/Borana/Yabero	14	47	39	0

3.4 Adaptation Indicator

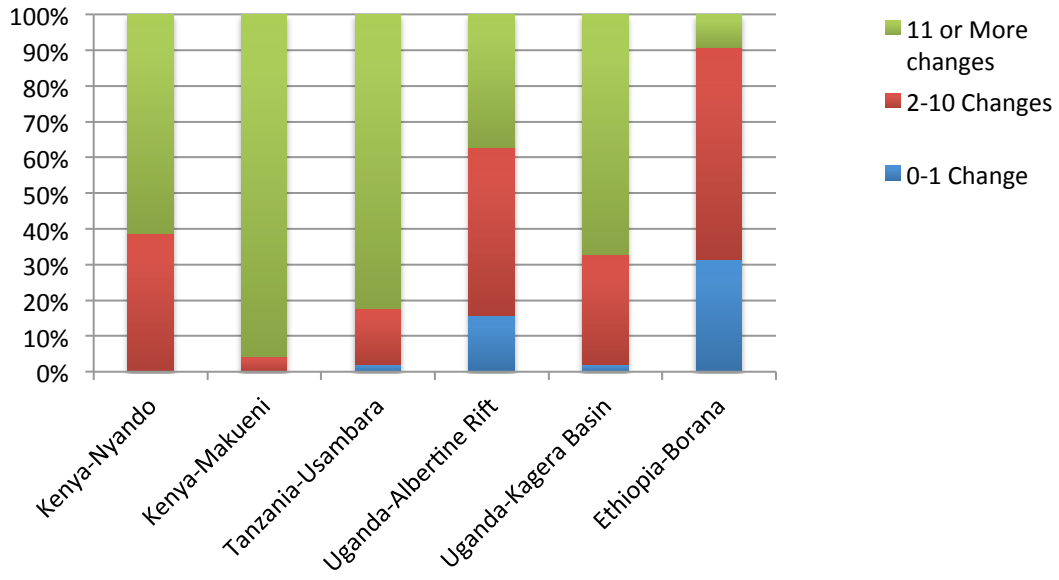
Table 3.5 and Figure 3.4 show the degree of adaptation and innovation, as suggested by the number of changes in agricultural practices these households have made in the last 10 years.

Households were queried about what changes they had made over the last 10 years with respect to a wide range of practices – relating to crop type, variety type, land use and management practices, and farm animals/fish management practices (59 possibilities in all). Over 90% of households in the CCAFS site in Kenya-Makueni appear to be quite innovative/adaptive, at least in terms of the overall number of changes they have made to their farming practices. By contrast almost a third of the surveyed households in Ethiopia-Borana have not made changes to their farming/livestock management practices in the last 10 years.

Table 3.5 Adaptation indicator for East Africa sites

Country/Site/Sampling Frame	Percent of surveyed households reporting the following number of changes to their agricultural practices in the last 10 years:		
	0-1 change	2-10 changes	11 or more changes
Kenya/Nyando/Katuk Odeyo	0	39	61
Kenya/Makueni/Wote	0	4	96
Tanzania/Usambara/Lushoto	2	16	82
Uganda/Albertine Rift/Hoima	16	47	37
Uganda/Kagera Basin/Rakai	2	31	67
Ethiopia/Borana/Yabero	31	59	9

Figure 3.4 Adaptation indicator: East Africa



3.5 Mitigation Indicators

The mitigation indicators, showing changes in behaviour over the last decade with respect to agricultural-related changes in activities by the surveyed households in East Africa, can be seen in Table 3.6.

The results show that over 75% of households across all the villages planted or protected some trees in the last year on their farms. With the exception of Ethiopia-Borana, introduction of soil amendments, e.g. fertiliser or manure, in the last year has also been quite high. Intensification measures are being pursued everywhere but are low in Ethiopia-Borana and highest in Tanzania-Usambara. Surveyed households in Tanzania-Usambara are introducing the most intensification measures in the sample. High percentages of households have achieved productivity increases in both Kenyan sites, Tanzania-Usambara, and Uganda-Kagera Basin. Over half of the households surveyed have seen no increases in productivity in Ethiopia-Borana and Uganda-Albertine Rift.

Table 3.6 Mitigation indicators: East Africa

Country/site	Tree management		Soil amendments		Intensification			Productivity	
	No	Yes	None	Some	None	Low	High	No increase	Some increase
Kenya/Nyando/Katuk Odeyo	9	91	58	42	14	69	17	14	86
Kenya/Makueni/Wote	17	83	9	91	2	69	29	1	99
Tanzania/Usambara/Lushoto	23	77	6	94	1	44	55	10	90
Uganda1/Albertine Rift/Hoima	25	75	69	31	24	68	9	52	48
Uganda2/Kagera Basin/Rakai	6	94	41	59	9	74	17	1	99
Ethiopia/Borana/Yabero	0	100	99	1	82	18	0	61	39

3.6 Weather-Related Information Access by Gender

The types, sources and access to weather-related information have been analysed by gender and the results for Kenya-Nyando and Ethiopia-Borana are presented in Tables 3.7 and 3.8, respectively.

Virtually all (96%) of the surveyed households in the Kenya-Nyando site said they had received some type of weather-related information over the last year. The radio, their own observations, and friends/relatives/neighbours were the most frequently cited sources of all

types of information for these households (Table 3.7). Agricultural extension service and veterinarians were sources of information for pest and disease outbreak forecasts.

Table 3.7 also shows the percentage of responses related to women receiving climate-related information versus men (and when both receive it) in Kenya-Nyando, by the different types of information.

The predicted start of the rains is the most frequently received type of weather information (87% of households get this), and 42% of those households receiving this type of information said that women are the main recipients, while in 31% of households both men and women receive this information, and for 27% of households, only men are getting this information. A similar pattern holds for the other types of weather-related information as well. This could be due to the fact that Kenya-Nyando has a high percentage of female-headed households.

Table 3.7 Types of weather-related information received in Kenya-Nyando

Type of information	% of HHs receiving it	Of HHs receiving info, who in the household is getting it (% of yes responses)?		
		Men	Women	Both
Start of the rains	87	27	42	31
Forecast of extreme event	83	22	43	35
Forecast of pest or disease outbreak	70	21	44	35
2-3 month weather forecast	85	29	39	32
2-3 day weather forecast	83	32	49	19

A different story emerges in Ethiopia-Borana, where only 64% of households reported receiving some type of weather or climate-related information over the past year, and 84% of surveyed households said women had not received any type of weather-related information at all. Indigenous knowledge or traditional forecasters were the most important source of information, followed by radio and friends/relatives/neighbours.

Over half of the surveyed households in Ethiopia-Borana report having received predictions as to extreme weather events such as droughts (Table 3.8). For 79% of these households, it is only the men that receive this information. Only 17% of households hear predictions as to the timing of the start of the rains, and again the majority of the recipients of this information are

men. Only 1-2% of these households receive weather forecasts, or forecasts as to impending pest or disease outbreaks.

Table 3.8 Types of weather-related information received in Ethiopia-Borana

Type of information	% of HHs receiving it	Of HHs receiving info, who in the household is getting it (% of yes responses)?		
		Men	Women	Both
Start of the rains	17	58	13	29
Forecast of extreme event	54	79	8	13
Forecast of pest or disease outbreak	1	100	0	0
2-3 month weather forecast	3	25	25	50
2-3 day weather forecast	2	67	0	33

4.0 South Asia

The four CCAFS core sites in South Asia are shown in Figure 4.1

Figure 4.1 Locations of the CCAFS sites in South Asia

Khulna is in the southwest coastal area of Bangladesh and is at 0-5 m above sea level. It receives 1700-1800 mm of rainfall per year. It is inundated during the monsoon season and faces severe salinity problems and vulnerability to storm surges. Shrimp farming is a big income generator, and paddy rice is the predominant crop. There is limited access to potable water, and water pollution due to commercial chemicals presents a challenge.

Bihar is one of the poorest and least literate states in India. It is located near the Ganges River at a low elevation (45-60 m). It is in a sub-humid dry region with a wide temperature range (hot summers and cool winters) and receives 1100-1200 mm of rainfall per year. Agriculture is the primary source of livelihood, with small land holdings. The main cropping system is rice, which is primarily rainfed. Some cash crops, including sugar cane, are also grown. A large proportion of farmers produce for subsistence. Problems include water logging and flooding, as well as small land sizes and fragmentation.

Haryana is part of the Indo-Gangetic Plains, and is one of the most economically developed regions in South Asia, with agriculture and manufacturing industries. It is 230-250 m above sea level and receives 600-700 mm annual rainfall. Haryana is one of the wealthiest states in India. Rice and wheat are the main crops and farmers enjoy relatively high average yields and are highly commercially oriented. All arable land is irrigated. Over-exploitation of groundwater and lowering water tables are major issues for agriculture, along with salinity and high temperatures.

Mid-Western Terrai is located in the lowland southern plains of Nepal at the foothills of the Himalayas. It is located at 100-1200 m above sea level in a humid/sub-humid climate with 1400-1500 mm of rainfall per year. The Terrai is considered the food basket of Nepal, and follows a rice-wheat cropping system with legumes in rotation. Vegetables and other cash crops are also grown. The area exports food grains to the rest of the country and is considered relatively food secure. Major concerns are landslides as well as droughts and pests and diseases. Glacial melt in the Himalayas is expected to adversely affect water available for irrigation.

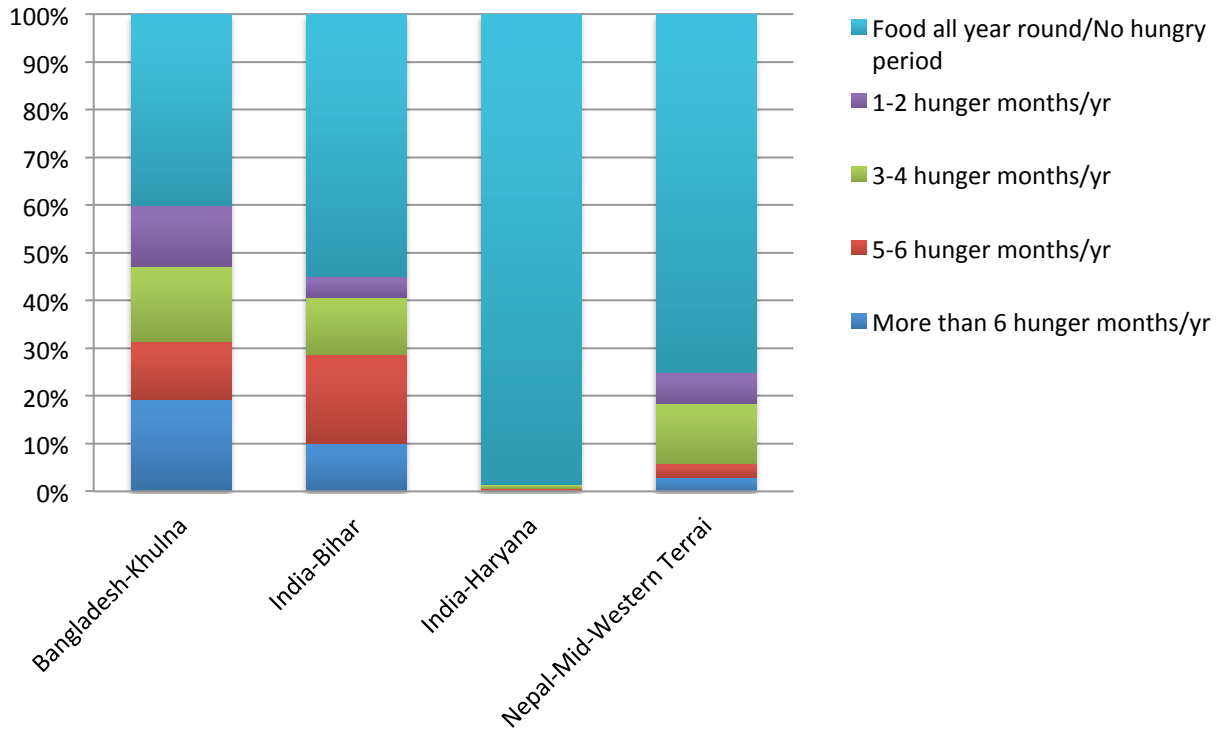
4.1 Food Security Indicator

The food security indicator for the interviewed households across the South Asian sites is reported in Table 4.1 and shown in Figure 4.2.

Table 4.1 Number of hunger months for sites in South Asia

Site	Percent of surveyed households reporting:				
	More than 6 hunger months/year	5-6 hunger months/	3-4 hunger months/	1-2 hunger months/	Food all year round/No hungry period
Bangladesh-Khulna	19	12	16	13	40
India-Bihar	10	19	12	4	55
India-Haryana	0	1	1	0	99
Nepal-Mid-Western Terrai	3	3	13	7	75

Figure 4.2 Food security indicator across South Asian CCAFS sites



From the data these sites appear to show relatively low incidences of food insecurity at the household level. However, we have some doubts as to the validity of the data particularly that coming from the sites in India and believe there may have been some incorrect interpretation of the question asked. For example, the fact that we were inquiring about whether the household itself had the resources to obtain food, not the availability of food in the local markets, might have been misunderstood. In India-Haryana in particular the results appear to be uniform throughout the year.

Main sources of food by month and hunger months

Looking in more detail at Bangladesh-Khulna where almost one-fifth of surveyed households reported 6 or more hunger months, the charts in Figures 4.2 and 4.3 appear to indicate that the months in which more households report food shortages coincide with months with lower food production from their own farms.

Figure 4.2 Bangladesh-Khulna main sources of food (% of households, n=140)

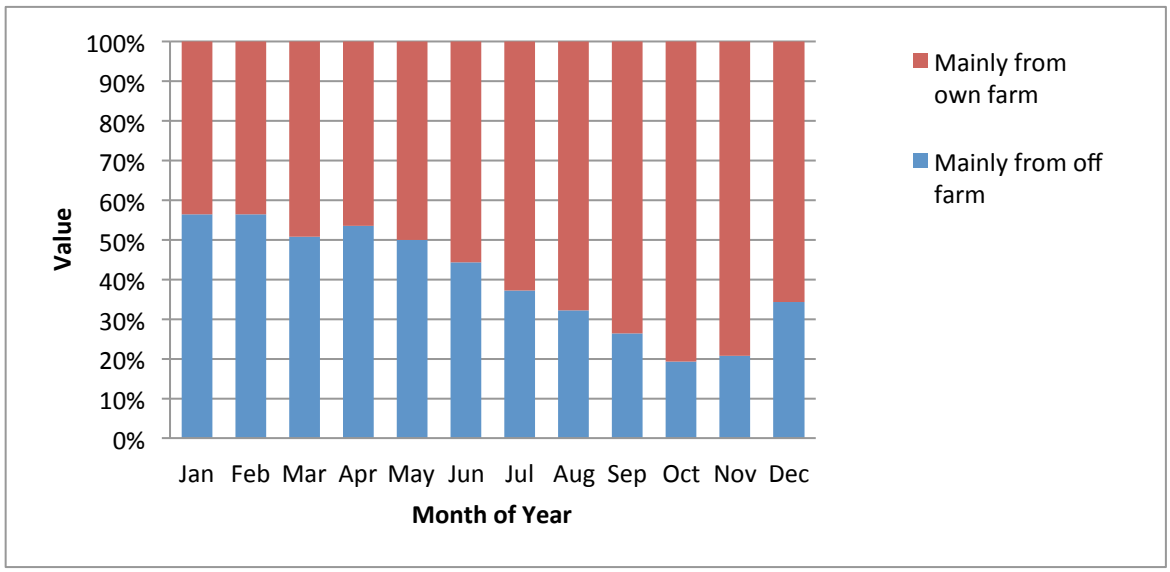
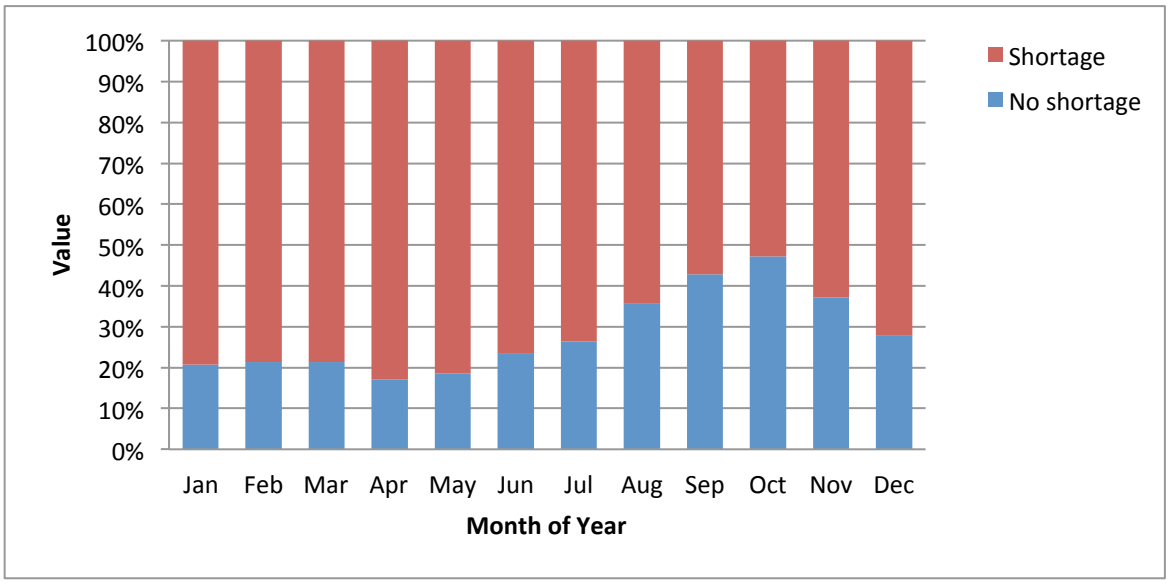


Figure 4.3 Bangladesh-Khulna - Food shortage versus no shortage months (% of households; n=140)



4.2 Asset Indicator

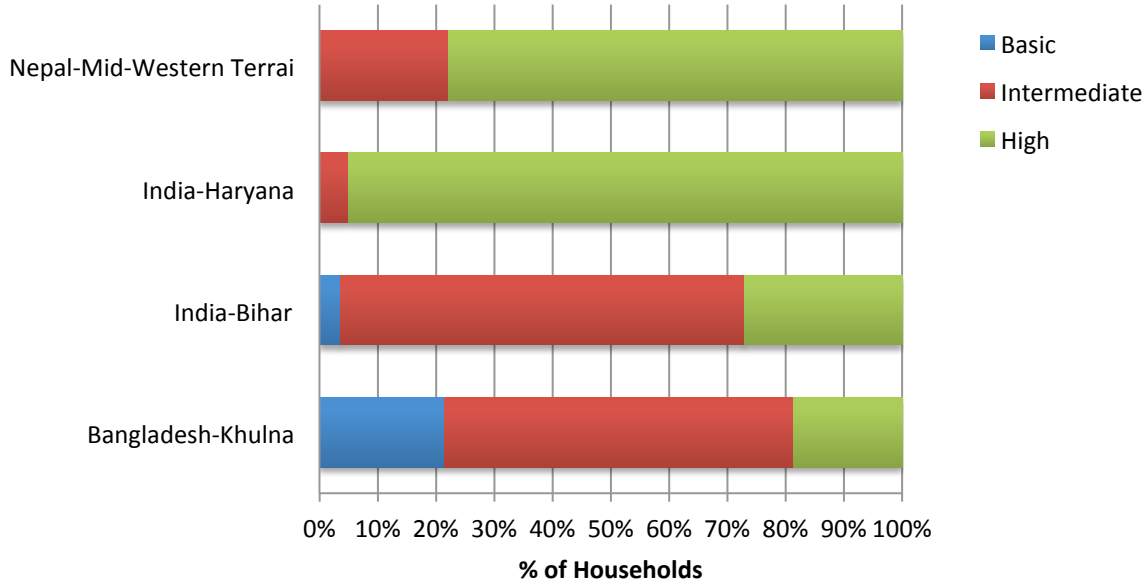
The data appear to show the vast majority of households surveyed in the India-Haryana site owning 4 or more assets. This is an exceptionally high number. In Nepal-Mid-Western

Terrai the figure for this high level of the asset index is 78% of households and for the other two sites in the region it is well below a third of the households. In Bangladesh-Khulna more households are at the basic level (having no assets) than are at the high level.

Table 4.2 Asset indicator: South Asia sites

Site	Percent of surveyed households reporting on number of assets:		
	Basic level (Zero)	Intermediate level (1-3)	High level (4 or more)
Bangladesh-Khulna	21	60	19
India-Bihar	4	69	27
India-Haryana	0	5	95
Nepal-Mid-Western Terrai	0	22	78

Figure 4.6 Asset indicator



4.3 Livelihood Diversification Indicators

4.3.1 Production Diversity

The production diversification indicator for the South Asia sites is shown in Table 4.3. This shows that just over half the households in Nepal-Mid-Western Terrai exhibit the highest levels of diversity in production, measured as producing more than 8 different products on their own farms. Forty percent of households in this site produce between 5 and 8 products.

In the two sites in India very few households are in the high category for production diversification. In India-Haryana, 84% of households are in the medium category.

Table 4.3 Production diversity indicator for South Asia sites

Site	Percent of surveyed households reporting on-farm production of:		
	Low: 1-4 products	Medium: 5-8 products	High: More than 8 products
Bangladesh-Khulna	16	49	35
India-Bihar	33	59	9
India-Haryana	15	84	2
Nepal-Mid-Western Terrai	7	40	53

4.3.2 Selling Diversity

In India-Bihar and Bangladesh-Khulna about a quarter of households are not selling any of the products they produce on their own farms. In India-Haryana this figure drops to just 5% of households. Across the whole region most households are selling between 1 and 5 of the products they produce on-farm, though we should bear in mind that we have no indication as to how much of each product they are selling, just the range of products.

Table 4.4 Selling diversity indicator: South Asia sites

Site	Percent of surveyed households reporting selling of:			
	Zero products	Low: 1-2 products sold	Medium: 3-5 products sold	High: More than 5 products sold
Bangladesh-Khulna	26	31	36	8
India-Bihar	24	56	19	1
India-Haryana	5	45	49	1
Nepal-Mid-Western Terrai	17	46	27	10

4.4 Adaptation Indicator

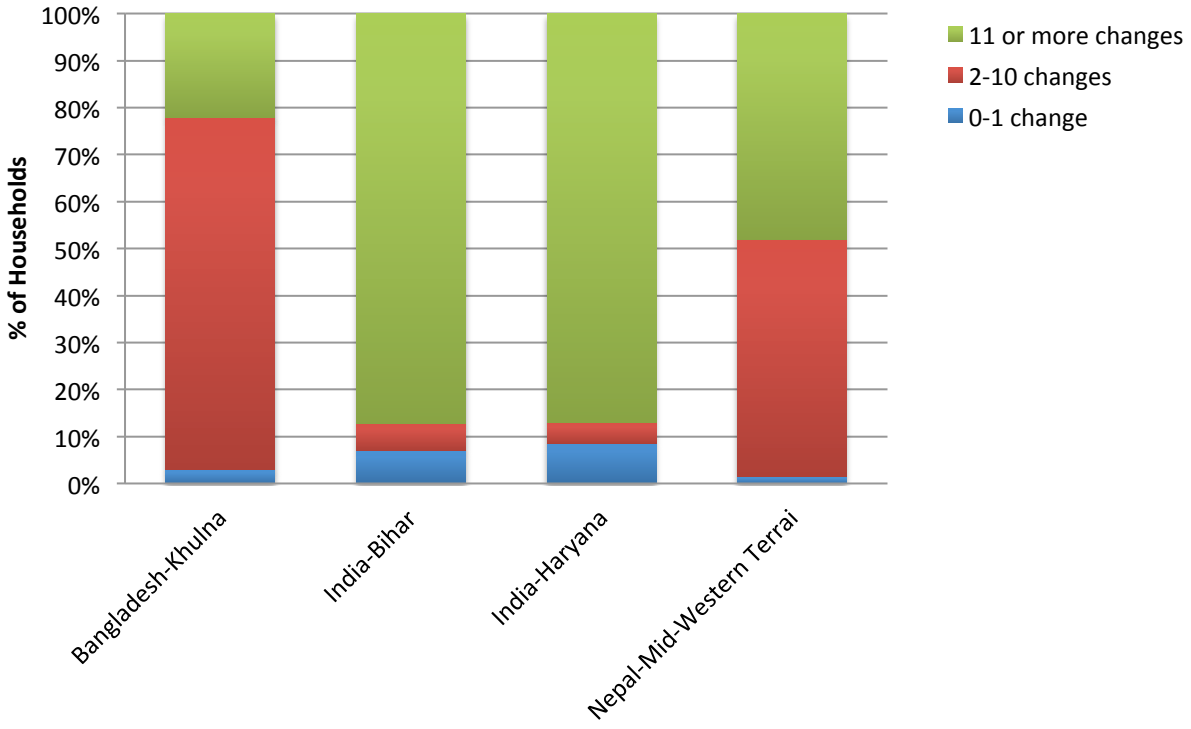
Households were queried about what changes they had made over the last 10 years with respect to a wide range of practices – relating to crop type, variety type, land use and management practices, and farm animals/fish management practices (59 possibilities in all). As seen in Table 4.5 and Figure 4.7, almost 90% of households in the two sites in India appear to be quite innovative/adaptive — at least in terms of the overall number of changes they have made to their farming practices — as they have made more than 11 different changes to some agricultural practice over the last decade. In Bangladesh-Khulna less than a

quarter of households made 11 or more changes but three-quarters of households made between 2 and 10 changes. In Nepal-Mid-Western Terrai half the surveyed households made between 2 and 10 changes in the last decade and just under half made 11 or more changes. Very few households over the whole region did not make any changes.

Table 4.5 Adaptation indicator: South Asia

Site	Percent of surveyed households reporting the following number of changes to their agricultural practices in the last 10 years:		
	0-1 change	2-10 changes	11 or more changes
Bangladesh-Khulna	3	75	22
India-Bihar	7	6	87
India-Haryana	9	4	87
Nepal-Mid-Western Terrai	2	50	48

Figure 4.7 Adaptation indicator: South Asia



4.5 Mitigation Indicators

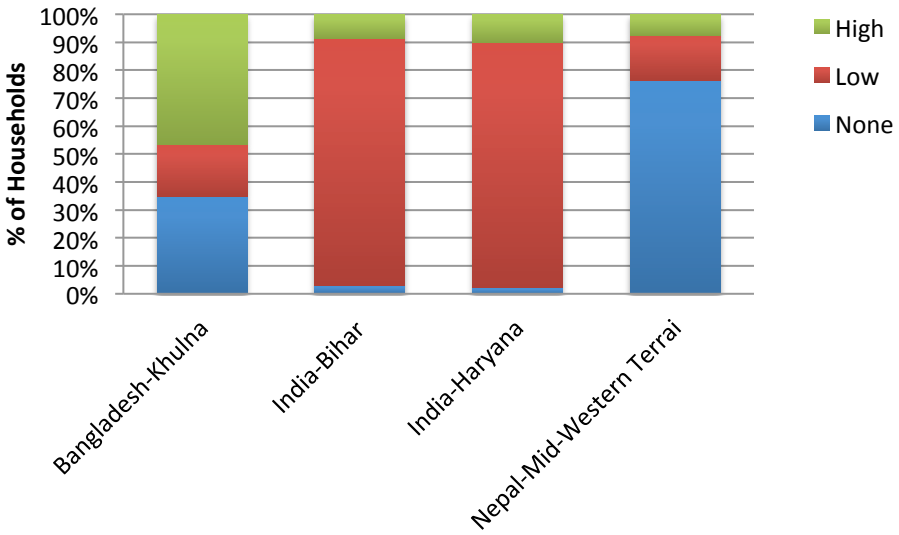
Table 4.6 shows the mitigation-related indices for the South Asia sites. The results suggest the following:

- Mid-Western Terrai in Nepal has the highest level of tree management in the region with 72% of households planting or protecting trees in the last year. This compares with just 14% in India-Bihar.
- Almost all the surveyed households introduced some soil amendments, such as fertiliser, in the last year; the exception is in Bangladesh-Khulna where this figure is 67%.
- Intensification measures are being pursued everywhere, but in Bangladesh-Khulna 30% of households have not intensified their production practices at all. The two sites in India have introduced the highest number of intensification measures in the sample (Figure 4.8).
- High percentages of households have achieved productivity increases in three sites across the region. The exception is again Bangladesh-Khulna where over 60% saw no increase in productivity.

Table 4.6 Mitigation-related indicators: South Asia

Site	Tree management		Soil amendments		Intensification			Productivity	
	No	Yes	None	Some	None	Low	High	No increase	Some increase
Bangladesh-Khulna	41	59	33	67	30	46	24	61	39
India-Bihar	86	14	8	92	8	3	89	9	91
India-Haryana	79	21	10	90	10	2	88	10	90
Nepal-Mid-Western Terrai	29	72	0	100	0	83	18	8	92

Figure 4.8 Intensification indicator: South Asia



4.6 Weather-Related Information Access by Gender

Across the region the proportion of households receiving some kind of weather-related information varied in the last year with just under half of households in India-Bihar (48%), 71% in Nepal-Mid-Western Terrai, 76% in Bangladesh-Khulna and 85% in India-Haryana receiving such information.

For households in the Bangladesh-Khulna and India-Bihar sites receiving each type of information, it is seldom just the women in the household who receive the information. Especially in the India-Bihar site, it is overwhelmingly just the men who are receiving weather-related information. The main sources of information are radio and television in both sites.

Table 4.7 Types of weather-related information received in Bangladesh-Khulna

Type of information	% of HHs receiving it	Of HHs receiving info, who in the household is getting it (% of yes responses)?		
		Men	Women	Both
Start of the rains	11%	75	0	25
Forecast of extreme event	64%	62	1	37
Forecast of pest or disease outbreak	12%	94	0	6
2-3 month weather forecast	0%	-	-	-
2-3 day weather forecast	51%	56	1	42

Table 4.8 Types of weather-related information received in India-Bihar

Type of information	% of HHs receiving it	Of HHs receiving info, who in the household is getting it (% of yes responses)?		
		Men	Women	Both
Start of the rains	44%	94	0	6
Forecast of extreme event	21%	90	0	10
Forecast of pest or disease outbreak	19%	89	0	11
2-3 month weather forecast	21%	87	0	13
2-3 day weather forecast	34%	91	0	9

5.0 Conclusions

The data collected during the household baseline survey of CCAFS sites in West Africa, East Africa, and South Asia reveal insights into a number of characteristics, including food security status, asset ownership, production and commercialisation diversity, adaptation and mitigation behaviours, and receipt of weather information. This information provides a general picture of the conditions and practices at each site, which can be revisited in 5-10 years' time to assess the changes that have occurred.

From the data presented, we can begin to see some interesting correlations. For example, in West Africa, the site in Mali-Segou has the lowest levels of food insecurity, the highest levels of asset ownership, the highest levels of production diversity, and lowest rates of the adaptation index. We might hypothesise that asset ownership and production diversity are tied to better food security among the households at that site. Mali-Segou also has the lowest rates of adaptation among the West African sites. Are households not making as many changes in the Mali-Segou site as households at other sites because they are relatively more food secure and therefore it is less necessary to make changes? Further research is needed to examine the factors limiting uptake of new agricultural practices, particularly the institutional and socio-cultural aspects that a household-level survey of this type does not address.

A similar picture can be seen in the Ethiopia-Borana site – i.e. low asset ownership, low production diversification, and relatively few adaptive changes in agricultural practices alongside high food insecurity. But not so in Kenya-Makueni. Here, we see high levels of asset ownership and production diversity, and more agricultural practice changes taking place, yet also relatively high levels of food insecurity. The relationships between these characteristics are obviously complex and understanding why food insecurity remains so high requires going much deeper with additional qualitative research aimed at better understanding behavioural change by individuals within the household and key drivers of that change.

In South Asia we see the same correlation between food insecurity and asset ownership as in West Africa. Food insecurity is highest in the Bangladesh-Khulna site, while asset ownership is lowest. Conversely, India-Haryana has the lowest levels of food insecurity among the South Asia sites and the highest levels of asset ownership. In this region, however, production

diversity might not be tied to food security. Only 2% of households surveyed in the India-Haryana site are in the high production diversification category. Households in this site might be focused on specialising in a smaller number of crops for commercial purposes. 94% of households surveyed in India-Haryana sell 1-5 products from their farm.

Regarding weather-related information, radio is cited as a popular source of access to forecasts in all three regions. In East and West Africa, friends and relatives also factor highly among the most important sources, while in South Asia the television is regarded as important. The difference in perceived access between men and women varies by site, with relatively few women receiving weather forecast information in Ethiopia-Borana and the two Indian sites, and a relatively higher percentage of women accessing weather forecast information in Kenya-Nyando.

The data collected through the household baseline survey from all 15 sites provide a rich collection of information that can help inform action research planning and provide a basis for further investigations into the relationships between agricultural practices, food security status, and access to weather-related information. Hypotheses developed by examining the data from the household surveys can be tested with additional, more in-depth surveys and qualitative research methods.

Data from complementary village baseline studies and organisational level surveys are also publicly available, along with the full household survey dataset, from http://thedata.harvard.edu/dvn/dv/CCAFSbaseline.

RESEARCH PROGRAM ON

Climate Change, Agriculture and Food Security

CGIAR

CCAFS

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) is a strategic initiative of CGIAR and Future Earth, led by the International Center for Tropical Agriculture (CIAT). CCAFS is the world's most comprehensive global research program to examine and address the critical interactions between climate change, agriculture and food security.

For more information, visit www.ccafs.cgiar.org

Titles in this Working Paper series aim to disseminate interim climate change, agriculture and food security research and practices and stimulate feedback from the scientific community.

CCAFS is led by: CIAT

Strategic partner: futureearth research for global sustainability

Research supported by: CGIAR Fund; Australian Government Australian Centre for International Agricultural Research; Irish Aid; European Commission; IFAD; Ministry of Foreign Affairs of the Netherlands; Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra Swiss Agency for Development and Cooperation SDC; IICT; Government of Canada Gouvernement du Canada; UKaid from the British people; NEW ZEALAND MINISTRY OF FOREIGN AFFAIRS & TRADE MANATŪ AORERE