

# Info Note

## CCAFS midline synthesis – Ghana

*Assessment of changes at household, village and organization levels since the 2011 CCAFS baseline surveys*

*Mathieu Ouedraogo, Prosper Houessionon, Laura Cramer, Samuel T. Partey, Robert B. Zougmore, Philip Thornton, Godfred S. Jasaw, Saaka Buah, Alex Riba, Carlos Barahona*

NOVEMBER 2019

### Key messages

- The demographic characteristics of households changed, showing an increase in household size and an improvement in education level of household members.
- The use of agricultural inputs and credit increased considerably, with more households using fertilizers, pesticides and seeds.
- The food security status improved, with more than half of the households experiencing fewer than four hunger months a year. Climate-smart agriculture practices, including tied ridging, crop rotation, and improved seed varieties promoted through CCAFS activities are improving crop yield outputs thereby contributing to the improved food security status.
- The information networks were improved with the appearance of new sources of information including mobile phones, radio, and Esoko, providing the community with information on rainfall, time of planting and/or fertilizer applications as well as market information for farm inputs and agricultural produce.

In 2011, CCAFS carried out baseline surveys (household survey, a village study and an organizational survey) in 21 research sites across 17 countries within its five focus regions, using standardized baseline tools in each site. Seven years after the implementation of the baseline studies, the CCAFS program carried out surveys again in Lawra-Jirapa, Ghana as a test case to help determine whether a midline assessment in other sites would be worth the substantial investment that will be needed.

The objective of the CCAFS midline surveys was to assess what kinds of changes have occurred and whether these changes are helping the households and villages adapt to and mitigate climate change. It also provided information at the village level about some basic indicators of natural resource utilization, organizational landscapes, information networks for weather and agricultural information, as well as mitigation baseline information, which can be compared across sites and monitored over time. The same tools were used with a few improvements to ensure comparability with the data collected in 2011.

This info note provides a synthesis of the changes at the household, village and organizational levels emphasizing major indicators that have changed.

### Demographic changes

**Household size:** In 2018, the average size of households in the Ghanaian communities where CCAFS operates was found to be relatively big. According to the communities, the improvement of farm productivity due to CCAFS activities contributed to increasing the food security and incomes of households. The improvement of livelihood conditions has triggered a bit of population growth within the households. This has contributed to reducing the migration of young men out of the region.

**Household age:** The household age categories (under 5, between 5-60, over 60) recorded no changes since the baseline survey. This could be due to lowering birth rates or the return of aged migrants due to the improvement in farm productivity since the baseline.

**Level of education:** Level of education has been improving since the baseline study (Figure 1). People are seeing more opportunities and value in education since the baselines. They have found that it is hard to get casual jobs if they are illiterate. Education is key and will increasingly be important. Also, CCAFS interventions provided more incomes which has led to households having more cash for school fees.

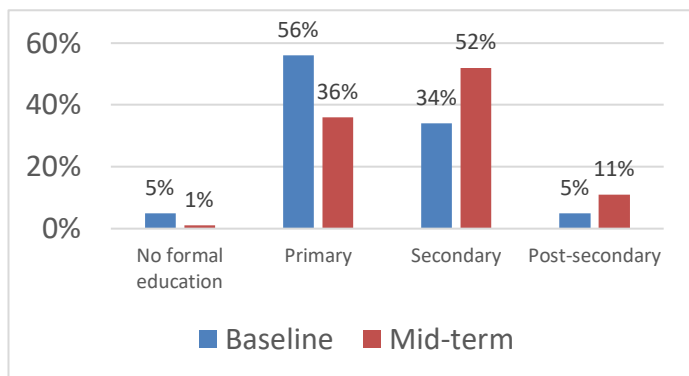


Figure 1. Highest level of education by any household member.

## Changes in farming practices and drivers of natural resource changes

**Households introducing changes:** The ratio of households reporting making changes related to crops is different between the baseline and the midline surveys. The current number of households that reported making changes related to soil, tree/agroforestry and livestock practices are very low compared to the baseline period. The decrease of this number could be explained by the behavioral changes in the farming system and also by the opportunity for innovation. Since the intervention of CCAFS in 2011, people have been sensitized and capacitated for the selection of best-bet agricultural options. This led to an informed and rational choice of technologies and practices by farmers. Some of the new technologies are very expensive (e.g., new varieties, agrochemicals) which means that people need to stick to the practices that they know and can use. The new technologies that are accessible to farmers are addressing their current needs so they do not need to try out many different practices.

**Adaptation:** The adaptation index indicates that households were moving from the high adaptation level to medium and low adaptation levels (Figure 2). This reduction in number could be explained by the opportunity for innovation and by the behavioral change in the farming system. People are more focused on a limited number of technologies and practices that they found successful in terms of production.

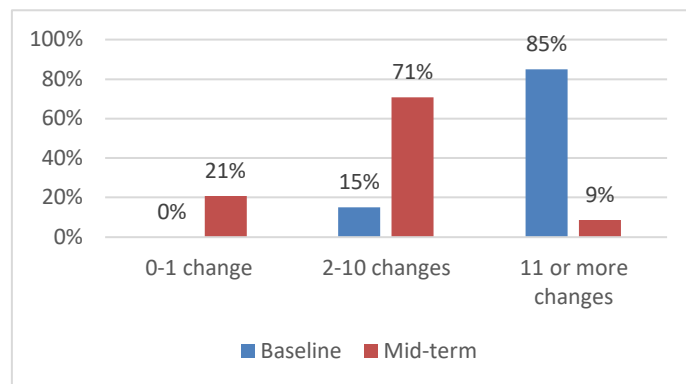


Figure 2. Adaptation index, changes from 2011 to 2018.

**Mitigation:** Households recognize the threats of climate change and have been introducing one or two mitigation measures across the study area. However, we found a decrease of households involved in mitigation practices in 2018 (81%) compared to 2011 (97%).

**Drivers of changes to crop agriculture and land management:** During the baseline, 100% of households reported having made crop-related changes because of weather/climate constraints and soil constraints. In 2018, climate is still 100% a driver of changes to crop, agriculture and land management in the Lawra-Jirapa Climate-Smart Village site of Ghana. This means that the issue of climate change and variability is still current in the area and CCAFS should continue this work in order to strengthen the adaptive capacity of farmers vis-a-vis climate change. The other factors including market, land, labour, project, etc., were much less important as drivers of change to crop, agriculture and management in 2018 compared to 2011. However, Esoko and MOFA provided trainings to farmers in the communities on how, where and when to sell their products. The improvement in market information access contributed to changes in the selection of what crop to grow, resulting in a focus on maize.

**Drivers of change to livestock production:** During the baseline, the top three main drivers of livestock-related changes were pests/diseases (91%); markets (72%) and weather/climate (37%). During the midline, livestock-related changes were made due to weather/climate constraints (100%) and pests/diseases (100%). This shows that weather/climate and pests/diseases are becoming the most important drivers for livestock practice changes in Lawra-Jirapa. CCAFS should strengthen its ongoing activities on goat production in the Climate-Smart Village site, but also introduce new activities related to animal health.

**Changes in the use of inputs and credit:** Our study indicates that the percentage of households using inputs has increased for all the input types. About 63% of the households reported using purchased inputs (pesticides). Fertilizer is also used and has been reported by 79% of

the households and 50% have used improved seed. It appears clearly that households have made more changes in inputs use during the midline compared to the baseline. The increase of inputs is due to the change in cultivation pattern, but also to the new opportunities for inputs markets. The introduction of maize cultivation and the adoption of new varieties requires more fertilizer. The reduction of land size per household (because of population growth) reduced the possibility of crop rotations and it requires more nutrient inputs. All these reasons could explain the increase of the fertilizer use from 27% in 2011 to 79% in 2018.

**Changes in drivers of change:** Population growth, deforestation and soil degradation, rainfall change, and government initiatives were the common drivers of change in the community level during both the baseline and midline surveys. Practices such as production of charcoal for combustion, bush burning for land cultivation, increase of livestock and the religious beliefs reported during the baseline as drivers of change at the community level were no longer drivers of change in 2018. In fact, CCAFS contributed to reduce some of these practices (including charcoal burning/fuel and forest fire/bush burning) within the Climate-Smart Village through sensitization during the past 7 years. Infrastructure has been reported as a new driver of change in the community.

## Livelihood diversification

**Changes in sources of cash:** Employment on someone else's farm (61%) and business (52%) were the main sources of cash income in 2011. During the midline, employment on someone else's farm (76%), remittances and gifts (45%), and informal loan/credit (41%) have become the most important sources of off-farm income for households. The diversity of off-farm income seems to be reduced during the midline. No household received any income from payments for environmental services and other sources in 2018. However, all households received cash income from different sources.

**Product diversification:** In the research site of Lawra-Jirapa, agricultural production is highly diversified among farms. Product diversification has recorded changes since 2011 (Figure 3) albeit still revolving around products from the immediate environment.

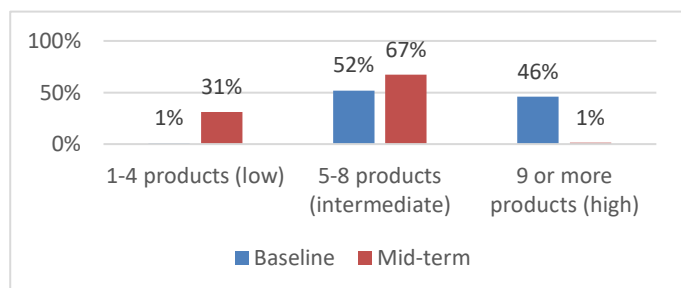


Figure 3. Product diversification index, changes from 2011 to 2018.

**Selling/commercialization diversification:** An immediate livelihood sustenance indicator is income. Part of the income was found to be coming from the agricultural products produced and sold by households. Households are moving towards commercial production (less focus on subsistence) to increase incomes. Farmers are listening more to market signals. According to them, there was a lot of production risk in agriculture in 2011. With CCAFS interventions, that risk has been substantially reduced, allowing some level of increased specialization (or less diversification). Farmers also consider their costs of production as well and limit the number of crops that they can invest in. At some stage, diversification will reduce risk but it may limit what they can really achieve in terms of income from the farm.

## Food security

**Changes in food security:** Food availability, access and quality affect almost all households surveyed with varying lengths of time. It appears that the food security status was improved between the baseline and the midline periods. According to the community members, new technologies and practices are leading to increased yields. Feeding patterns of the households have also changed with education.

**Organizations working on food security in the community:** The analysis of the organizational landscape showed that a number of organizations that were present during the village baseline survey no longer operate in the area. At the same time, there are a number of new organizations that were not present at the time the village baseline survey took place. CCAFS was mentioned as one of the new organizations and that its activities are directly responding to some of the community needs. CCAFS trains farmers on good planting techniques including planting in lines, mixed cropping, composting and tied ridging, among others. CCAFS is also supporting the planting of trees such as moringa and mango and other fruit trees to improve the landscape.

## Collective action on natural resource management

The collective action around natural resources have not really changed since the baseline. One significant dimension is the increasing involvement of female household members in tree nursery management and planting of fruit trees and wood fuel species on the degraded landscapes. This offers pointers to collective action for maximizing impact.

Since the baseline surveys, CCAFS has tested more than ten climate-smart agriculture options with the communities of Doggoh and Bompari including crop rotation maize/cowpea, intercropping, improved varieties

of crop, integrated nutrient management, mulching, home gardens diversification, no/reduced tillage, organic fertilizer, tree planting, water harvesting (earth bund, planting pits and tied ridges) and climate information use. Farmers in these communities can only produce enough food to feed themselves for three months a year and must seek food from other sources for the remaining nine months of the year. The average land productivity is low due to poor soil fertility and the little, unreliable rainfall in the region. Members rely on remittances from their grown children who go to the South to seek employment.

## Organizational membership

**Changes in group membership:** All surveyed households belonged to groups during the midline survey (Figure 4). The proportion of household heads belonging to some groups such as nursery/tree planting groups, soil improvement related-groups, savings/credit-related groups; vegetable production and agricultural productivity enhancement-related groups increased considerably.

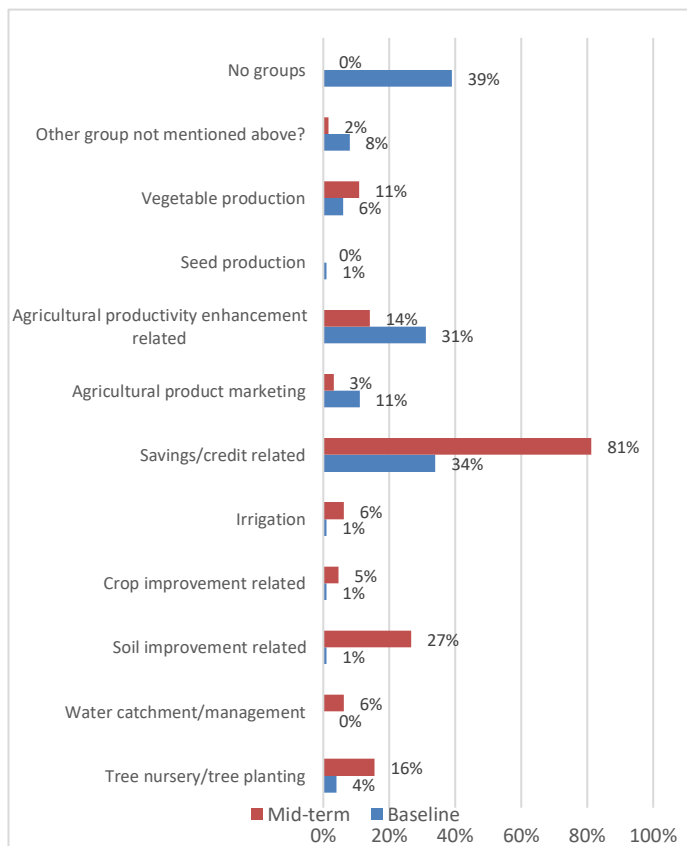


Figure 4. Percentage of households belonging to various groups, changes between 2011 and 2018

## Asset ownership

From 2011 to 2018, there is noticeable improvement of household asset portfolios. The household survey data showed that the asset base has increased. During the midline, a few household members (3%) were found to now own tricycles which are used to cart farm produce and also service transportation needs to neighboring market centers. More people now have a motorcycle (43.6%). There was no change in terms of production

assets and energy facility ownership. Concerning the information, we noticed an increase of household members with cell phones and televisions. According to the community members, the increase of farmer asset base was due to more production and more income from farming activities, allowing people to use the surpluses to buy assets.

## Information access

**Networks of information:** Currently, the type of information community members require includes timing of land preparation, weather information, storage protocols, market information and guidelines to seed selection. The people continue to source this information from family and friends, neighbors, organizations, radio and observation. Recently, farmers are able to call through the mobile phones to the Esoko call centre to access information such as time of planting, fertilizer application, weather forecast in different local Ghanaian languages as well as text alerts. Some community members also report that they are able to source important information from members of the CCAFS project who come to work in the community. New types of information were required during the midlines. They were related to drought period, input supply information, sources of small loan support and post-harvest storage information for men as well as use of chemicals, access to fertilizer, elimination of fall armyworm and market for shea butter and moringa soap for women.

### Changes in households receiving weather-related information:

Currently, most households receive information related to the start of the rainfall compared to the time of the baseline. However, the households receiving the 2-3-day weather forecast were supposed to increase given the efforts developed by CCAFS and partners (Esoko; MOFA and Ghana Met service) to disseminate weather information in Northern Ghana. The percentage of households receiving this forecast decreased from 32% to 26%.

### Changes in household members receiving weather-related information:

During the baseline, the information was mostly received by men. During the midline it is now received by both men and women. We can notice an improvement in women's access to information related to weather and climate forecasts in the research site of Lawra-Jirapa.

## Conclusion

The midlines surveys were useful to generate some indicators at the household level including adaptation, mitigation, intensification, diversification and food security indices that allow tracking the changes in behavior within the Climate-Smart Village. Data from the midline surveys could help to understand processes, effects of interventions, and dynamic nature of climate impacts and adaptations in the study area. For example, they could be used as secondary data for future impact assessment of the Climate-Smart Villages to find out whether observed changes in the area can be attributable to CCAFS interventions.

*This info note is based on the following report:*

*Ouedraogo M, Houessionon P, Cramer L, Partey S, Zougmore R, Thornton P, Jasaw GS, Buah S, Riba A, Barahona C. 2019. CCAFS midline synthesis report- Ghana (GH0108).*

*Authors:*

**Mathieu Ouedraogo** ([m.ouedraogo@cgiar.org](mailto:m.ouedraogo@cgiar.org)) is a Scientist at CCAFS West Africa.

**Prosper Houessionon** is the Science Officer at CCAFS West Africa.

**Laura Cramer** is the Science Officer at the CCAFS Flagship on Priorities and Policies for CSA.

**Samuel T. Partey** is the former Science Officer at CCAFS West Africa.

**Robert B. Zougmore** is the Regional Program Leader for CCAFS West Africa.

**Philip Thornton** is the Flagship Leader for the CCAFS Flagship on Priorities and Policies for CSA.

**Godfred S. Jasaw** is a Lecturer at the University for Development Studies, Tamale, Ghana.

**Saaka Buah** is an Agronomist at SARI Ghana.

**Alex Riba** is a Statistician at the Statistics for Sustainable Development (Stas4SD).

**Carlos Barahona** is the Managing Director at Statistics for Sustainable Development (Stas4SD).

## About CCAFS Info Notes

CCAFS Info Notes are brief reports on interim research results. They are not necessarily peer reviewed. Please contact the authors for additional information on their research. Info Notes are licensed under a Creative Commons Attribution – NonCommercial 4.0 International License.

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) brings together some of the world's best researchers in agricultural science, development research, climate science and Earth system science, to identify and address the most important interactions, synergies and tradeoffs between climate change, agriculture and food security. Visit us online at <https://ccafs.cgiar.org>.

CCAFS is led by the International Center for Tropical Agriculture (CIAT) and supported by:

