

Nutritional status among cocoa farming families and underlying causes in Ghana



Contents

| | |
|--|----|
| Executive summary | 2 |
| 1. Context..... | 3 |
| 2. Research methodology | 4 |
| Main research question | 4 |
| Source of information | 5 |
| 3. Country context | 6 |
| 4. Nutritional status | 7 |
| 4.1 Overview of the national nutrition situation | 7 |
| 4.2 Nutritional status in cocoa producing areas | 8 |
| 5. Causes of malnutrition..... | 10 |
| 5.1 Diseases influencing malnutrition..... | 10 |
| 5.2 Inadequate dietary intake..... | 11 |
| 5.2.1 Household Nutrition Security | 12 |
| 5.2.2 Household nutrition security for cash crops..... | 13 |
| 6. Institutional, policy and program context | 14 |
| 6.1 government policies and expenditures | 14 |
| 6.2 GAIN activities in Ghana..... | 16 |
| 6.3 Current programs (region) | 17 |
| References | 18 |

Executive summary

IDH has a program, the Cocoa Learning and Innovation Program (CLIP) to work towards a more sustainable livelihood for the cocoa farmers. One element of the program approaches the issue malnutrition. In this report a desk research is done to assess the nutritional status and underlying causes among cocoa farming families in Ghana. The main indicators which will be looked at are stunting and anemia. When assessing the underlying causes, dietary diversity is an important indicator.

Since limited information is available on the nutritional status among cocoa farming families, data on national and regional level are used. When levels of malnutrition are high in cocoa producing regions it will be assumed that the situation for the cocoa farming families will not be adequate. Indicators on malnutrition show that the stunting levels are low both in cocoa producing regions and the national average. Although the stunting levels are low, the level of anemia in both children under-5 and women is exceeding the 40% prevalence which indicates a severe public health problem. Anemia is known to be directly related to a decrease in productivity.

The underlying causes of malnutrition are analyzed based on the UNICEF conceptual framework: nutrition, care and (infectious) diseases related to water, sanitation and hygiene. Immediate causes of malnutrition are inadequate dietary intake and diseases. The major contributors to the high prevalence rate of anemia are inadequate iron intake and malaria. Another example of a disease influencing malnutrition is diarrhea. 12% of the children under-5 experienced diarrhea in the past 2 weeks and 17% of the children receiving no treatment. The impact of diarrhea with regards to nutrition is malabsorption which leads to loss of nutrients and appetite loss. The basic causes of diarrhea are lack of sanitation, drinking water and handwashing. The lack of the basic causes is higher in rural areas than in urban areas.

The other immediate cause of malnutrition is inadequate food intake. Inadequate food intake is not only the lack of quantity (not enough energy) but also to lack of quality (lack of essential macro – or micronutrients). Overall the diet in Ghana is monotonous and staple-based which indicate low level of household dietary diversity. A study showed that 67% of the Ghanaians do not have a diverse diet. A typical menu mainly consists of a stew containing flesh foods (dried fish), other vegetables (tomato, onion, eggplant) with staple crops (plantain cassava, yam, rice, banku).

A study performed in a cocoa region found a dietary diversity score of 4.3 in women during the cocoa season²⁰. A minimum dietary diversity score of 5 is considered to be an adequate diet. The dietary diversity score among cocoa farming families is in line with the known monotonous and insufficient diet of the Ghanaians.

Household nutrition security is dependent on three factors: availability, access and usage. Market vendors in a cocoa region indicated that staple crops and most vegetables are available throughout the whole year. Nevertheless, seasonality does have an impact on availability of food, especially for fruits. Access refers to affordability. Cocoa producing farmers tend to have increased purchasing power due to the higher household incomes. Lastly usage is a factor regarding knowledge, attitude and practice. Ghana tends to have a poor dietary diversity due to tradition, culture and insufficient knowledge regarding the importance of a good diet. Regardless of location or wealth, people eat a similar diet.

1. Context

IDH has a program, the Cocoa Learning and Innovation Program (CLIP) to work towards a more sustainable livelihood for the cocoa farmers. There are different innovation areas such as financing, nutrition & gender and sustainable land use. For the innovation area nutrition and gender, CLIP will support a scientific, fact-base prototyping approach to issue malnutrition. Before a nutrition intervention is implemented, it should be assessed whether there is a nutrition problem among the farmers in the supply chain. IDH asked GAIN to perform a situational analysis for Ivory Coast and Ghana to see what the major malnutrition issues are and what are the underlying causes of this malnutrition. The goal of the desk research is to identify primary nutritional deficiencies, causes of malnutrition and barriers to improved nutrition through desk research of existing information, reports from partners, research institutions, local governments and the health and agricultural sector. This desk research provides a foundation for further research in order to design a scientific, fact-based prototype.

GAIN has been working on Nutrition programs in the tea sector for a few years. GAIN started a pilot to improve the nutrition situation for small holder farmers in the tea sector in Indonesia, which resulted in a significant increase in dietary diversity. Building on this experience, Unilever and GAIN started a project in 2014 in Southern India to further develop this approach amongst small holder farmers and workers in tea factories. These programs started with desk research to understand the nutritional and dietary situation of the population in the tea farming regions (specific data for tea farming families were not available).

We follow a similar approach as is applied in the tea sector. We will make use of 3 manuals that were developed to get a better understanding of the nutrition situation among farmers in the tea supply chain. The first manual was developed to guide desk research as an initial appraisal of the health and nutrition situation in country and at regional level using existing data. The findings of the desk research are shown in this report. The next manual is developed to gain better insight in the nutrition situation of farmers in the supply chain. This step will be done in the field and can be performed by a local stakeholder. The last step is also performed in the field and is necessary to provide a deeper insight into the underlying causes of the nutrition problem. This step should be performed by a nutritionist in order to get the most accurate results.

2. Research methodology

The first manual developed for tea is the foundation for this desk research and will be addressing the following questions¹.

Main research question

- What is the nutritional status among cocoa farmer households in Ghana and Ivory Coast?
- What are the underlying causes of this nutritional status?

Sub questions

To answer the main research question, different regions will be looked at. The target group is the cocoa producing families but because of limited information on this specific group there will also be looked at the regional levels where cocoa production is highest and the national level. When levels of malnutrition are high in the cocoa producing regions it will be assumed that the situation for the cocoa farmers will not be adequate.

When it has been noted that the malnutrition status is a problem, the UNICEF conceptual framework for maternal and child nutrition is used to support and determine the underlying causes of malnutrition². The UNICEF framework identifies three levels of causes of undernutrition: the immediate causes, underlying causes and the basic causes. The immediate causes consist of disease and inadequate dietary intake. Several diseases have an impact on the nutrition status. The diseases which will be given extra attention are diarrhea and malaria.

Malnutrition

- What is the nutrition status of children, women and men on country level?
- What is the nutrition status of children, women and men in the cocoa producing regions?
- What is the nutrition status of children, women and men in cocoa producing families?

Underlying causes

- What are the statistics in cocoa producing regions on the different diseases influencing malnutrition? (malaria, diarrhea).
- What are the causes of inadequate dietary intake?
- What are the barriers to improved nutrition?

Indicators

The main indicators which will be looked at are stunting, anemia and dietary diversity score. An explanation of the indicators is given in this section.

Stunting (short for age) levels are used as an overall indicator of chronic malnutrition. Stunting is an indicator for lack of macro- or micronutrients as a consequence of poor diet, lack of care or diseases (UNICEF framework). A poor diet does not only refer to lack of quantity (not enough energy) but also to lack of quality (lack of essential macro – or micronutrients). It is an easy measurable indicator and is continuously collected making it easy for regional and cross-country comparisons.

Another indicator of the nutritional status in Ivory Coast is anemia. Anemia is used as an indicator because it is seen as a severe problem and it is directly related to productivity in adults. Anemia is a condition of low levels of hemoglobin in the blood. This results in a reduced amount of oxygen being transported in the body. Iron deficiency causes at least 50% of all anemias in Africa³. When the person is iron deficient, an insufficient amount of blood cell production takes place. Another important cause of anemia in developing countries is malaria; in this case excessive red blood cells are being destroyed due to the malaria.

Dietary diversity score is used as a key indicator of the nutrient adequacy of the diet⁴. Good nutrition is best provided by a balanced diet, consisting of many different types of foods. The difference is the mix: the more varied one's diet, the healthier it is. A dietary diversity score measures the amount of food groups eaten the previous day but says nothing about the quantity. A daily consumption of at least 5 food groups out of ten is seen as adequate to obtain all the necessary micronutrients. It is a simple count of food groups and therefore easy to perform.

Source of information

The methodology for the research will be following the GAIN CCVN methodology¹. Resources that were used were the Global Nutrition Report, World Bank (Nutrition at a Glance), the Demographic and Health Surveys (DHS) for both national as regional level. In addition articles were used which were already available within GAIN, such as GAIN Landscape Analysis for different developing countries^{5,6,7}. A search was performed in databases such as PubMed, Scopus and Web of Science for relevant published literature or websites. And finally a request is made for additional information via partners, who had access to studies or other relevant information that was not published in the scientific literature or on the internet.

In the databases PubMed, Scopus and Google Scholar a search was undertaken to identify relevant studies. The keywords such as cocoa, cocoa producing regions, cocoa producing households, cash crops, Ghana, malnutrition, stunting, anemia, dietary intake, dietary diversity and food security were used in different combinations. In addition, a bibliographic search of all the included studies was performed to identify any additional literature. The search was undertaken in March-April 2016. In the appendix a detailed description of the key words are shown.

All studies were screened on relevance related to the research questions based on the title and apparently irrelevant articles were removed. The remaining papers were reviewed by abstract to identify in more detail those that could be useful for the desk research.

Inclusion criteria were:

- Language: articles have to be in English
- Study was conducted in Ghana
- Types of outcomes such as malnutrition indicators and dietary indicators

3. Country context

Ghana, officially the Republic of Ghana is a country situated in West Africa. Formerly it was a British colony and Ghana gained its independence in 1957. The land area consists of 239,460 sq km with the capital city Accra. The country borders Ivory Coast, Burkina Faso and the republic of Togo. The climate of Ghana is tropical and there are two main seasons: the wet and the dry seasons⁸. A multicultural nation, Ghana has a population of approximately 27 million, spanning a variety of ethnic, linguistic and religious groups. Agriculture contributes to 54% of Ghana's GDP and accounts for over 40% of export earnings while at the same time providing over 90% of the food needs of the country. Ghana's agriculture is predominately smallholder, traditional and rain-fed^{9,10}.



Figure 1 Ghana

4. Nutritional status

4.1 Overview of the national nutrition situation

Table.1 presents indicators of health, food security, nutrition status and vitamin and mineral status. Health indicators indicate the general health of the population such as life expectancy and under-five mortality. The life expectancy at birth is 61.4 and the under-five mortality is 78 per 1,000 live births. To consume food it is important that it is accessible and affordable. Therefore food security indicators are related to income. 29% of the people in Ivory Coast have an income below 1.25 US dollar (extreme poverty) and 52% of the population below 2.00 US dollar a day which indicates poverty. The prevalence underweight in Ghana can be indicated as medium. The prevalence of both wasting and stunting can be seen as low. Anemia is present in 66% of the children under-5 years and 42% among women. At last indicators are shown for vitamins and breastfeeding. 52% of the children are exclusively breastfed during the first six months of life.

Table 1 Indicators of health, food security, nutrition status and vitamin and mineral status of Ghana

| Indicator | Value | Year |
|--|---|-----------|
| Health indicators | | |
| Human Development Index | 140 th out of 188 countries | 2015 (11) |
| Life expectancy at birth | 61.4 | 2015 (11) |
| Under-five mortality rate | 78 per 1,000 live births | 2014 (12) |
| Food security indicators | | |
| Population below \$1,25 a day | 29% | 2005 (13) |
| Population below US 2 a day | 52% | 2005 (13) |
| Prevalence of undernourishment (below minimum dietary energy consumption) | 5% | 2013 (14) |
| <5% = Not significant, 5 – 9% = Low, 10 – 19% Moderate, 20 – 34% High, >= 35% Very high | | |
| Hunger and Nutrition Commitment Index | 17 th out of 45 developing countries | 2016 (15) |
| 1 – 8 = High commitment, 9 – 20 = Moderate commitment, 21 – 29 = Low commitment, 30 – 45 = Very low commitment | | |
| Nutrition indicators | | |
| Percentage of children under five affected | | |
| Stunting | 19% | 2014 (10) |
| <20% = Low, 20 – 29% = Medium, 30 – 39% = High, >=40% = Very high | | |
| Wasting | 5% (1% severely wasted) | 2014 (10) |
| <5% = Low, 5 - 9% = Medium, 10 - 14% = High, >=15% = Very high | | |
| Underweight | 11% | 2014 (10) |
| <10% = Low, 10 - 19% = Medium, 20 - 29% = High, >=30% = Very high | | |
| Low birth weight (<2500 g) | 11% | 2011 (16) |
| Vitamins and minerals | | |
| Vitamin A deficiency in children aged 6 – 59 months | 50% | 2013 (17) |
| Anemia among children under 5 | 66% | 2014 (10) |

| | | |
|--|-----|-----------|
| <5% = normal, 5-19% = mild, 20-39% = moderate >40% = severe | | |
| Anemia among women 15-49 | 42% | 2014 (10) |
| <5% = normal, 5-19% = mild, 20-39% = moderate >40% = severe | | |
| Presence of iodized salt in the household | 66% | 2014 (10) |
| Intervention Coverage | | |
| Severe acute malnutrition, geographic coverage | 58% | 2012 (17) |
| Antenatal care (4+ visits) | 87% | 2011 (16) |
| Vaccination coverage DTP3 | 90% | 2013 (17) |
| Proportion of children age 12-23 months who received all basic immunizations | 77% | 2014 (10) |
| Children under 5 with diarrhea receiving ORS | 35% | 2011 (16) |
| Vitamin A supplementation | 96% | 2013 (16) |
| Breastfeeding | | |
| Percentage ever breastfed | 98% | 2014 (10) |
| Early initiation (started breastfeeding within 1 hour of birth) | 46% | 2011 (16) |
| Exclusive breastfeeding for the first six months | 52% | 2014 (16) |
| Mean duration of exclusive breastfeeding (in months) | 2.5 | 2014 (10) |
| Continued breastfeeding at 1 year | 91% | 2011 (16) |

4.2 Nutritional status in cocoa producing areas

Ghana is the world's second largest producer of cocoa. It is Ghana's dominant cash crop and single most important export product. Around 6.3 million Ghanaians depend on cocoa for their living, representing around 30% of the total population. Cocoa employs approximately 800,000 farm families spread over six of ten regions of Ghana. The regions are Ashanti, Brong Ahafo, Eastern, Central, Western and Volta¹⁸. Ghana's cocoa production is characterized by small-scale farming with an average productive cocoa area per household of approximately 2 hectares¹⁹.

The percentage stunting and under-5-mortality divided per region are shown in Figure 2 the stunting levels are higher in the Volta and Central region of Ghana in comparison to the national Average. When combining the data of the cocoa producing regions the prevalence in cocoa producing regions is similar to the national average. The northern Regions have the highest prevalence of stunting and the capital city Accra the lowest. The WHO classifies the rates of stunting in cocoa regions and the country as a whole as low, but bordering medium.

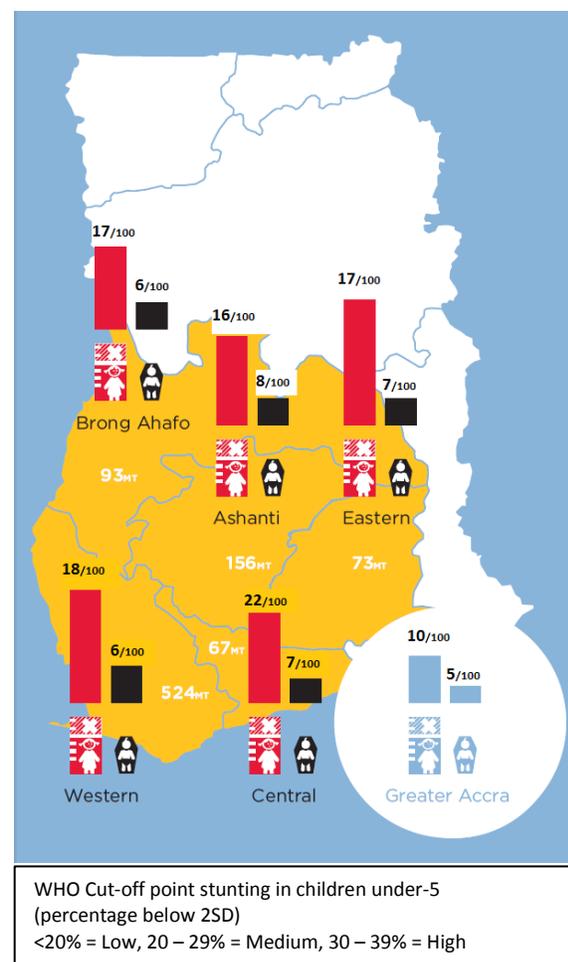


Figure 2 Prevalence of stunting and under-mortality in cocoa producing regions in Ghana

The anemia percentages are shown for both children under-5 and women aged 15-49 divided per region in figure 3. Anemia levels above 40% are seen as a severe problem which is the case in all regions as well as the national average for children and women. Anemia impairs adult productivity immediately, and intervening to reduce anemia may increase adult productivity by 5-17%. The most common causes of anemia in Ghana are inadequate dietary intake of iron, malaria and intestinal worm infestation³.

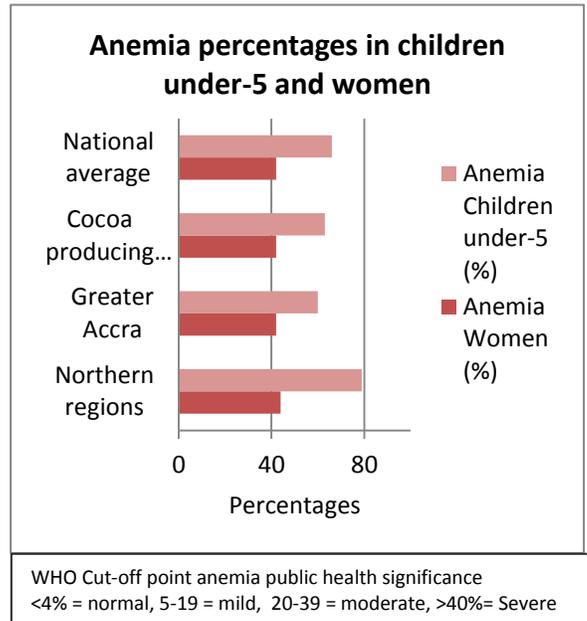


Figure 3 Anemia percentages in children under-5 and women in different regions in Ghana

5. Causes of malnutrition

Malnutrition has many causes divided into immediate, underlying and basic causes. In the UNICEF conceptual framework on maternal and child malnutrition all causes are addressed². Immediate causes of malnutrition are inadequate dietary intake and diseases. Diseases can be caused by inadequate care or unhealthy household environment (hygiene).

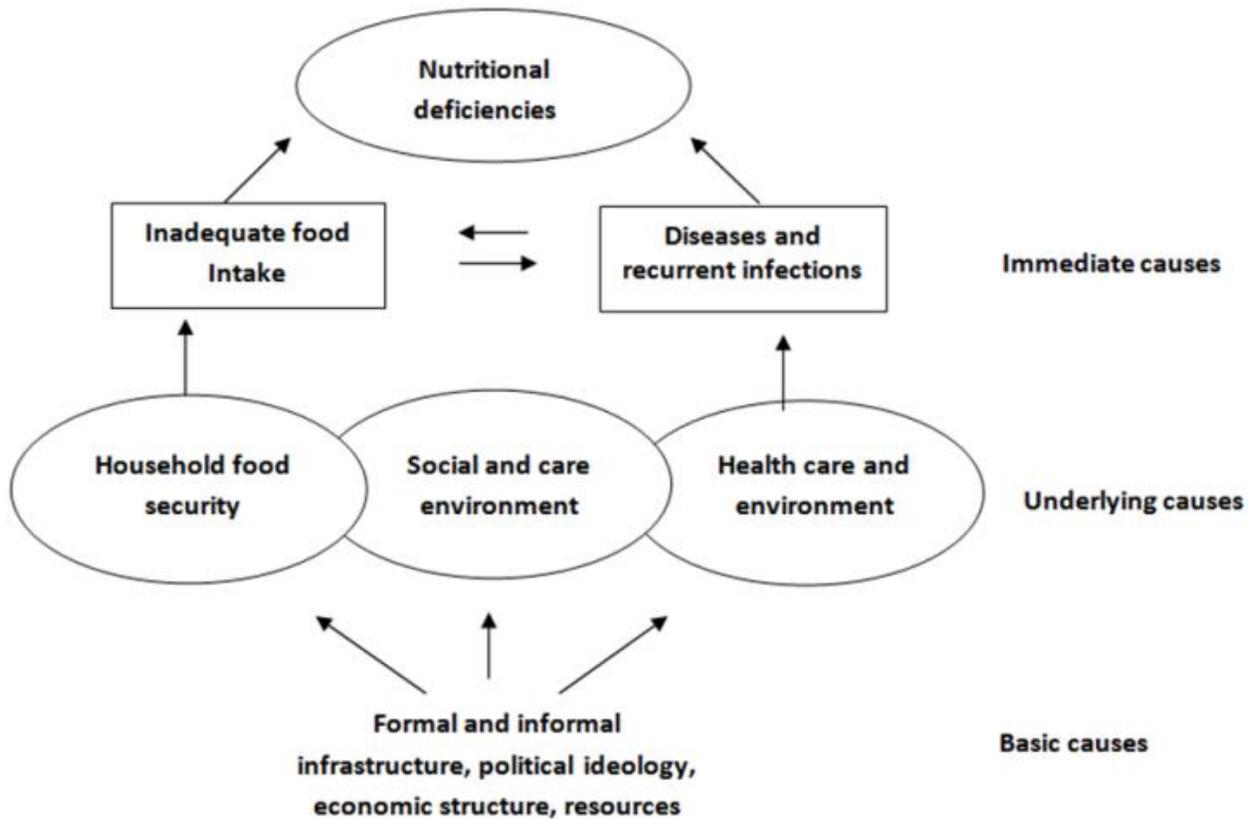


Figure 4 UNICEF conceptual framework

5.1 Diseases influencing malnutrition

The major contributors to the high prevalence rate of anemia are inadequate iron intake and malaria. Malaria fits under the heading diseases and can be decreased by interventions such as mosquito nets. Another example of a disease influencing malnutrition is diarrhea. The prevalence of diarrhea in Ghana is 12% whilst 17% of the children don't receive treatment¹⁰. The impact of diarrhea with regards to nutrition is malabsorption which leads to loss of nutrients and appetite loss. The basic causes of diarrhea are lack of sanitation, drinking water and handwashing.

Hand washing is one of the most efficient ways to stop germs from spreading and protect people from contracting communicable diseases. Among the observed households, 39% had soap and water at the place where household members washed their hands, 19% had water only, 4% had soap but no water and less than 1 percent had water and other cleansing agents (such as ash, mud, or sand). 37% of households did not have water, soap or other cleansing agents¹⁰. One out of 4 does not have improved sanitation facilities in Ghana. With a big difference found between urban and rural, 14% and 41% respectively. The same accounts for clean drinking water. 3% of the urban and 19% of the rural households don't have access to clean drinking water and the national average is 10%¹⁰. The comparison between urban and rural are shown for all three basic causes in figures 5,6,7.

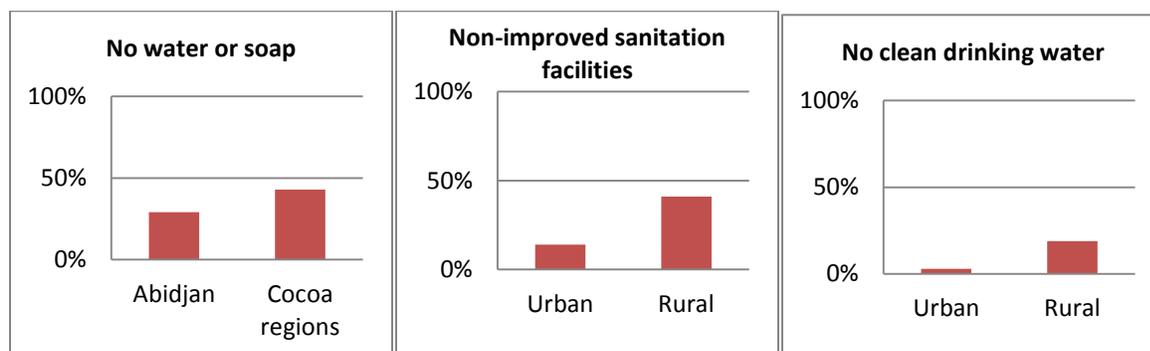


Figure 5 Percentage of households not using water or soap for handwashing

Figure 6 Percentage of households having non-improved sanitation facilities

Figure 7 Percentage of households having no access to clean drinking water

5.2 Inadequate dietary intake

The other immediate cause was inadequate dietary intake. Inadequate dietary intake is not only the lack of quantity (not enough energy) but also to lack of quality (lack of essential macro – or micronutrients).

Overall the diet in Ghana is monotonous and staple-based which indicates low level of household dietary diversity. A study said that 67% of the Ghanaians do not have a diverse diet. The diet is rich in staple foods, few vegetables and oil and very little-too little animal protein. For example in Ghana daily a stew is consumed with roots, vegetables and dried fish inside. The quantity and quality of the fish is not impressive but because most people eat some fish every day it is an important ingredient. It was suggested by the women that family food situation is ok during the cocoa season but deficient during the lean season when there is no cocoa money and fewer plantain and vegetables to harvest from the farm. When there is money in the household they say they eat meat once a week, when there is no money the families may eat meat once a month only. Households growing more cocoa reported consuming significantly less vegetables but more white tubers and fruits, indicating a decrease in dietary quality²⁰.

A study performed in a cocoa region found a dietary diversity score of 4.3 in women during the cocoa season²⁰. A minimum of 5 food groups are necessary for an adequate diet, therefore this score is insufficient. In addition when looking at the frequency of consumption of the different food groups it is seen that food groups that are nearly always consumed do not include the food groups that provide the highest level of micronutrients. The food groups that are hardly consumed provide key micronutrients to counter under-nutrition. They are 'dairy products', 'nuts and seeds', 'other fruits', 'orange vegetables' and 'eggs'. Consumption of nutrient-rich food groups is especially important for tackling the anemia problem²¹.

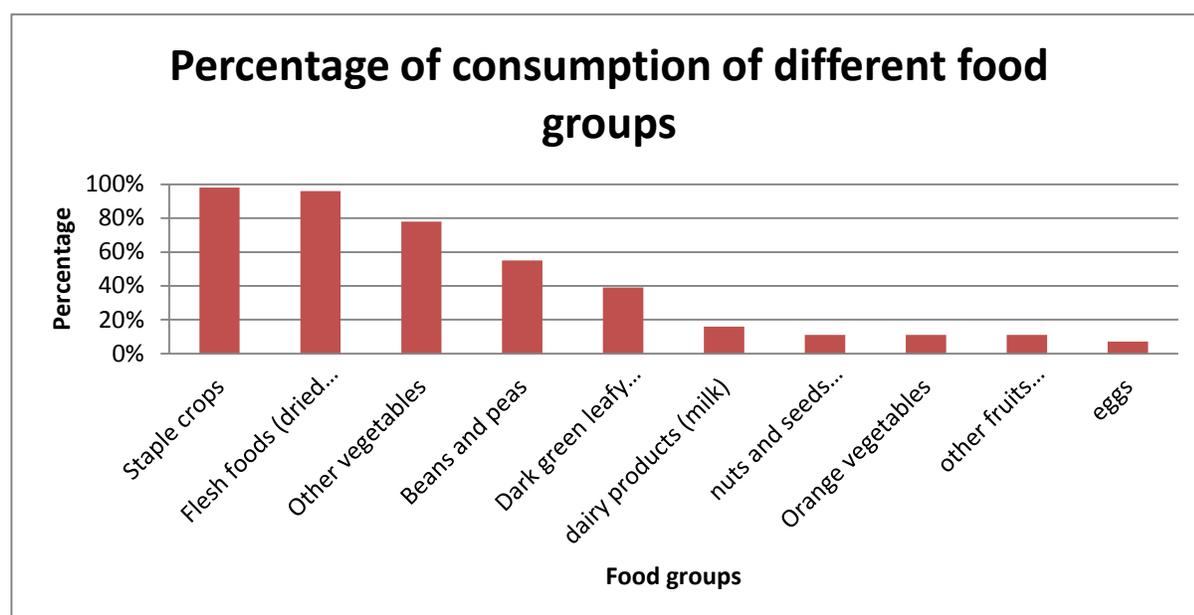


Figure 8 Percentages of consumption of different food groups in a cocoa producing village

5.2.1 Household Nutrition Security

Household nutrition security is dependent on three factors, availability, access and utility.

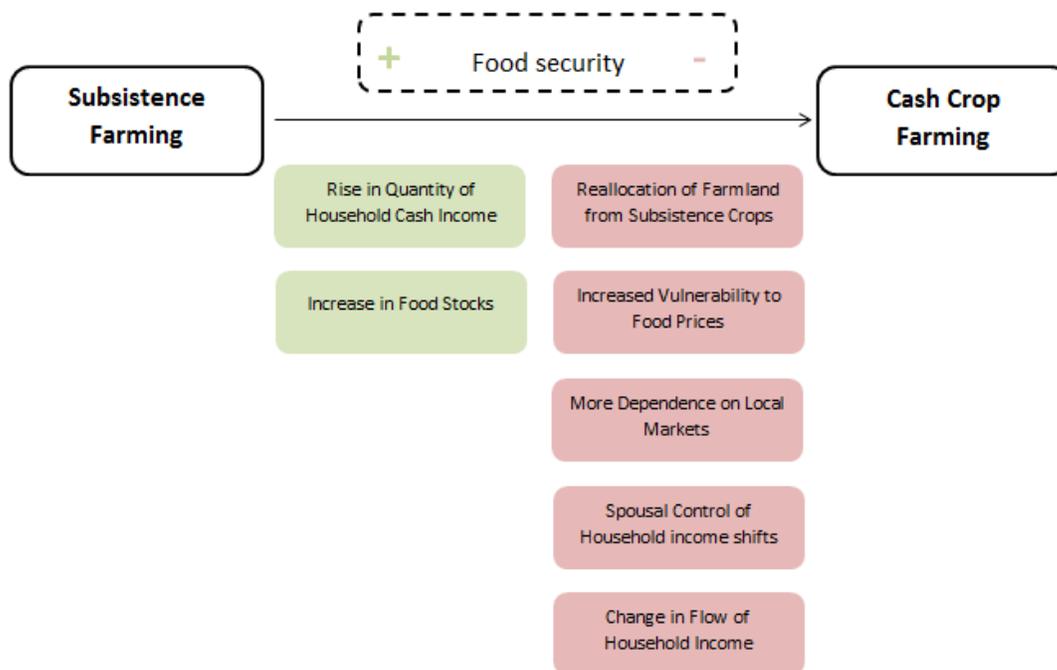
- Food availability relates to the supply of food through production, distribution, and exchange
- Food access refers to the affordability and allocation of food
- Utilization reflects differences in the allocation of food within households, the nutritional quality of that food, and variation in the extent to which the nutrients in food are able to be absorbed and metabolized by individuals within households

Starting with the availability, market vendors in the Nyinahin sub-district indicated that staple crops and most vegetables are available throughout the whole year. Nevertheless, seasonality does have an impact on availability of food especially for fruits. In addition people state that they eat 2/3 meals a day, assuming that availability is not the major problem. Secondly access of the cocoa farmers is increased since they have increased purchasing power due to higher household incomes. Lastly utility is probably

the most important factor contributing to malnutrition. Knowledge, attitude and practice are factors regarding utility. Ghana tends to have a poor dietary diversity due to tradition, culture and insufficient knowledge regarding the importance of a good diet. Regardless of location or wealth, people eat a similar diet²⁰.

5.2.2 Household nutrition security for cash crops

In the previous paragraph general factors on food security are explained. Cash crop production has more factors that influence good security and this is explained in this paragraph. People in the cocoa sector produce a cash crop and generally have an increased household income and therefore an increase in purchasing power. This increase in purchasing power does not one on one relate to decrease in malnutrition. Several things play a role concerning the food security when switching to cash crop farming. Farmers tend to have increased vulnerability to food prices, are more dependent on the local markets and generally household income shifts from the female to the male contributing to a decline in food security. Mostly men spend income on personal things such as alcohol, cigarettes or status



consumer goods. Women on the other hand are more likely to purchase goods for the household, and

Figure 9 A schema illustrating multiple pathways through which transitioning from subsistence to semi-subsistence farming and cash cropping can affect

particularly for children²².

6. Institutional, policy and program context

6.1 government policies and expenditures

Policies

Ghana has several policies and legislative provisions regarding nutrition, explained below and summarized in table 2.

Comprehensive Africa Agricultural Development Program²³

Ghana participates in the African-led Comprehensive Africa Agriculture Development Program (CAADP) which brings together governments and diverse stakeholders to reduce hunger and poverty and promote economic growth through agricultural development.

New Alliance for Food Security and Nutrition²⁴

Ghana is part of the New Alliance for Food Security and Nutrition, a partnership between African heads of state, corporate leaders, and G8 members to accelerate implementation of CAADP strategies. In Ghana the New Alliance goals are to: to generate greater private investment in agricultural development, scale innovation, achieve sustainable food security outcomes, reduce poverty, and end hunger.

National nutrition Policy 2014²⁵

The goal of the NNP is to ensure optimal nutrition of all people living in Ghana throughout their lifecycle.

Objectives

- To increase coverage of high/impact nutrition specific interventions to ensure optimal nutrition of Ghanaians throughout their lifecycle with special reference to maternal health and child survival
- To ensure high coverage of nutrition sensitive interventions to address the underlying causes of malnutrition
- To reposition nutrition as a priority multi/sectoral development in Ghana

Table 2 Policies and legislative provisions

| Policy and legislative provisions | | |
|---|-----------|------|
| Wheat fortification legislation | 2015 | (17) |
| National Nutrition Policy 2014-2017 | 2014-2017 | (25) |
| National implementation of the international code of marketing of breast-milk substitutes | 2014 | (17) |
| National Universal Salt | 2013-2017 | (17) |

| Iodization Strategy | | |
|--|------|------|
| Maternity protection | 2011 | (17) |
| Joined SUN movement | 2011 | (26) |
| National Food fortification Program | 2007 | (17) |
| The Ghana Home Grown School Feeding Programme | 2005 | (27) |

Figure 10 Policies and legislative provisions

SUN Movement²⁶

On 25 March 2011, the Republic of Ghana joined the SUN Movement. SUN is a global movement uniting national leaders, civil society, bilateral and multilateral organizations, donors, businesses, and researchers in a collective effort to improve nutrition. USAID is the donor convener for SUN in Ghana. Ghana’s priorities under SUN include increasing government nutrition funding, prioritizing nutrition among key stakeholders, and improving the measurement of nutrition indicators.

Figure 10 shows the progress that has been made until 2014, according to the SUN framework of monitoring and evaluation.

SCALING UP NUTRITION (SUN) COUNTRY INSTITUTIONAL TRANSFORMATIONS, 2014 (%)

| | |
|--|-----------|
| Bringing people into a shared space for action | 42 |
| Ensuring a coherent policy and legal framework | 36 |
| Aligning actions around a common results framework | 12 |
| Financial tracking and resource mobilization | 0 |
| Total weighted | 23 |

Source: SUN 2014.

Figure 4 Progress made until 2014 according to SUN framework

6.2 GAIN activities in Ghana²⁸

Focused ethnographic study and optifood analysis of infant and young child feeding in Ghana

GAIN was commissioned by USAID-Ghana to conduct a Focused Ethnographic Study (FES) and dietary analysis using the Optifood system to understand the eating habits of Ghanaian families and how mothers feed their children.

Ghana-led Alimentarius Working group

GAIN supported the Ghana-led Codex Alimentarius Working Group to ensure inclusion of recent scientific evidence on formulations for fortified complementary foods and supplements at the global level. This resulted in the 2013 revision of the Codex Guidelines on Formulated Supplementary Foods for Older Infants and Young Children (FAO, 1991)

Assessment team of the reduction of maternal and child undernutrition in the country

GAIN was part of assessment team who supported the Ghanaian National Task Force in undertaking a Landscape Analysis of Readiness to Accelerate the Reduction of Maternal and Child Undernutrition in the country. The process was led by the WHO and the Ghana Health Service. The purpose of analysis was to assess existing gaps and constraints in the area of child and maternal nutrition and to identify opportunities to integrate and scale up nutrition-related actions.

Food fortification program

From 2006 to 2009 GAIN and partners implemented food fortification program designed to strengthen the National Food Fortification Program, by implementing the fortification of wheat flour (iron, vitamin A, B-complex vitamins, folic acid, zinc) and vegetable oil (vitamin A).

Universal Salt Iodation

The UNICEF/GAIN Universal Salt Iodization partnership started in 2009 with the intent to tackle iodine deficiency in the country. Low household coverage of adequate iodized salt can be attributed to the sheer numbers of artisanal producers for whom iodization is neither practical nor cost-effective. The partnership promoted the consolidation with the salt processing industry by piloting a cooperative model. However due to a lack of motivation for industry to iodize salt, success has been modest.

6.3 Current programs (region)

WCF²⁹

Organizes farmers in cooperatives, provides training, education and invests in community health and welfare. All cocoa farmers are organized in co-operatives with a chief farmer at the local, district, regional, and national levels. These arrangements assist farmers, to get access to some commodities, and to present grievances as a collective body.

WCF has different programs such as the Cocoa livelihoods program and cocoa action. **Cocoa Livelihoods** is working to increase farm level productivity and improved farmer resiliency with a focus on food crop productivity. The food crop diversification helps to reduce farmer food insecurity by improving diets and promoting greater gender equity as women produce the most crops. **Cocoa action** facilitates partnerships between governments, cocoa farmers, and the cocoa industry to boost productivity and strengthen community development in Côte d'Ivoire. Cocoa Action works on improved planting material and fertilizer, empowerment of communities through education, child labor monitoring and women's empowerment.

Cocoa Life Sustainability program

Since 2008, the Cocoa Life program has supported sustainable cocoa growing aiming to secure the livelihoods of a million farmers in cocoa-growing communities. VSO is Mondelez's partner in Ghana providing training and support for cocoa farming communities.

USAID – The Ghana Water, Sanitation and Hygiene Project (GWASH)

The GWASH is designed to increase access to improved water and sanitation facilities, empower individuals and communities to adopt positive water, sanitation and hygiene practices.

USAID/Ghana and Peace Corps – Participating Agency Program Agreement (PAPA)

PAPA is a new cross-sector program to address food security. Through interventions at the grass-roots level, this program aims to increase the capacity of partner communities to ensure their own food security.

IFDC – CORIP Ghana

CORIP-Ghana, funded by the Embassy of the Kingdom of the Netherlands (2013-2017), is providing support services to cocoa farmers in Ghana through improvements in the cocoa production system and training.

References

1. GAIN 2016. Introduction and STEP 1 of the Manual for the Initial Nutrition Screening in Unilever Supply Chains: Towards Improving Nutrient Adequacy of the Diet of Farmers through the Promotion of Dietary Diversity
2. UNICEF Conceptual Framework
3. Righetti, A. A., Adiossan, L. G., Ouattara, M., Glinz, D., Hurrell, R. F., N'Goran, E. K., ... & Utzinger, J. (2013). Dynamics of anemia in relation to parasitic infections, micronutrient status, and increasing age in south-central Côte d'Ivoire. *Journal of infectious diseases*, 207(10), 1604-1615.
4. Biesalski, H.K. (2013): *Hidden Hunger*. Stuttgart
5. M-nutrition initiative. (2015) Nutrition Landscape Analysis: Part 1 Cote D'ivoire (draft)
6. M-nutrition initiative. (2015) Nutrition Landscape Analysis: Part 2 Cote D'Ivoire (draft)
7. M-nutrition initiative. Nutrition Landscape Analysis Ghana
8. C. McSweeney; M. New and G. Lizcano. United Nations Development Programme (UNDP) Climate Change Country Profiles: Ghana retrieved on 07-03-2016 from <http://ncsp.undp.org/sites/default/files/Ghana.oxford.report.pdf>
9. Statistics, Research and Information Directorate (SRID). 2001. Agriculture in Ghana. Facts and figures. Ministry of Food and Agriculture. Accra. Ghana
10. Ghana Statitistical Service (2015) Demographic and Health Survey (DHS). Ghana. 2014
11. United Nations Development Programme (UNDP) Human Development Reports: Ghana retrieved on 07-03-2016 from <http://hdr.undp.org/en/countries/profiles/GHA>
12. UN inter-agency group for child mortality estimation 2014 retrieved on 07-03-2016 from http://www.unicef.org/media/files/Levels_and_Trends_in_Child_Mortality_2014.pdf
13. World Bank 2015
14. The World Bank. Data. Prevalence of undernourishment (% of population). Retrieved on 07-03-2016 from <http://data.worldbank.org/indicator/SN.ITK.DEFC.ZS>
15. Hunger and Nutrition Commitment Index (HANCI). HANCI rankings. Retrieved on 07-03-2016 from <http://www.hancindex.org/>
16. UNICEF 2015
17. Global nutrition report. 2015 Nutrition Country Profile Ghana. Retrieved on 07-03-2016 from <http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/129939/filename/130150.pdf>
18. Ghana Cocoa Board. Regional cocoa purchases. 2016. Retrieved on 07-03-2016 from https://cocobod.gh/weekly_purchase.php
19. Sustainable food lab et al., 2009
20. De Vries, K., 2015. *Could nutrition sensitive cocoa value chains be introduced in Ghana?; Report of a brief study that identifies opportunities and bottlenecks*. Centre for Development Innovation, Wageningen UR (University & Research centre). Report CDI-15-105. Wageningen
21. Anemia: New Insights for the Healthcare Professional: 2013 Edition
22. Anderman, T. L., Remans, R., Wood, S. A., DeRosa, K., & DeFries, R. S. (2014). Synergies and tradeoffs between cash crop production and food security: a case study in rural Ghana. *Food Security*, 6(4), 541-554.
23. NEPAD 1016 African-led Comprehensive Africa Agriculture Development Program (CAADP) retrieved on 07-03-2016 from <http://www.nepad-caadp.net/>
24. New Alliance for food security and nutrition. Partner countries: Ghana. Retrieved on 07-03-2016 from <https://new-alliance.org/country/ghana>
25. National Nutrition Policy 2014-2017. Accra, Ghana September 2013. Retrieved on 07-03-2016 from <https://extranet.who.int/nutrition/gina/sites/default/files/GHA%202013%20National%20Nutrition%20Policy.pdf>
26. Scaling up Nutrition, 2015. Ghana. Retrieved on 07-03-2016 from <http://scalingupnutrition.org/sun-countries/ghana>

27. Emmanuel Ohene Afoakwa () Home grown school feeding programme – the Ghanaian model as icon for Africa. Retrieved on 22-05-2016 from <http://www.gcnf.org/library/Ghana-School-Feeding-Programme-Overview-and-Progress.pdf>
28. GAIN. GAIN and Ghana – other ongoing activities. Retrieved on 07-03-2016 from <http://www.gainhealth.org/knowledge-centre/project/gain-and-ghana-other-ongoing-activities/>
29. World cocoa Foundation. WCF Cocoa Livelihoods Program. Retrieved on 07-03-2016 from <http://www.worldcocoafoundation.org/wcf-cocoa-livelihoods-program/>

*Cover photo: Floris Leeuwenberg