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Building the Evidence Base on the Agricultural Nutrition Nexus: Cameroon

Fonteh Florence Anyangwe
Angaba

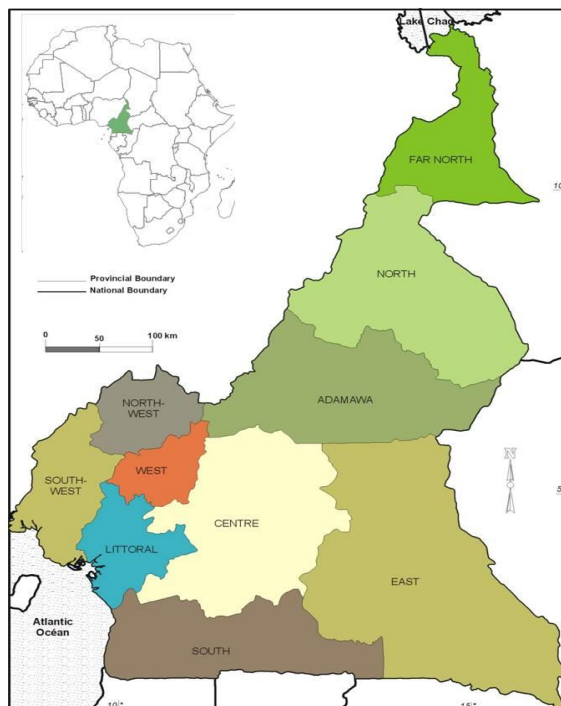
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Fonteh Florence Anyangwe Angaba

University of Dschang





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Table of Contents

List of Figures	v
List of Tables	v
List of Acronyms	vii
Acknowledgements	ix
Executive summary	xi
Background	1
Country overview	2
Nutritional status in Cameroon vis a vis sub-Saharan Africa (SSA)	3
Goal and objectives of the study	4
Methodology	5
Desk-top review	5
Interviews with key stakeholders	5
Stakeholder analysis	5
National stakeholder consultation workshops	6
The State of FNS in Cameroon	7
Variations in food availability and accessibility	7
Malnutrition hotspots	9
Variations in Nutritional Status	10
Adult nutrition	14
Nutrition in women	15
Dietary patterns and trends	16
Socio-cultural beliefs and feeding practices	18
Socio-cultural beliefs	18
Feeding practices	18
Nutrition data and capacity	22
Underlying Determinants of Nutrition Status in Cameroon	23
Economics and demographics	23
Population and level of development	23
Under-5 mortality	24
Poverty	25
Health care	25
Access to water and sanitation	26
Education	28
Gender equality and women's empowerment	31
Nutrition governance	32
Enabling Environment	33
Effective institutional framework	37

Management instruments	37
Stakeholder Analysis of the Agriculture–Nutrition Nexus in Cameroon	39
Identification and clustering of stakeholders	39
Stakeholder interests, relations and power	40
Stakeholder interests/activities and competences	41
Stakeholder relations/linkages	46
Influence and importance of stakeholders	48
Stakeholder Involvement (participation) in the agriculture–nutrition nexus	50
Good/Best practices for strengthening stakeholder / building cooperation	50
Nutrition-specific and nutrition-sensitive Initiatives	53
Combating iodine deficiency	53
Combating vitamin A deficiency	53
Emergency aid to refugees and displaced persons	54
FAO	54
UNICEF	54
WFP	55
HKI	55
Nutrition knowledge	57
Nutrition education and training	57
Nutrition education in secondary and primary schools	57
Nutrition education in higher education institutions	57
Knowledge management	58
Conclusions and way forward	60
Good/Best practices for building partnerships to improve FNS and for strengthening the agriculture–nutrition nexus in Cameroon	61
Entry points for strengthening FNS and the agriculture–nutrition nexus in Cameroon (priority interventions)	61
Opportunities for strengthening women’s participation in the agriculture–nutrition nexus	62
Strategies for improving the government’s commitment/investment in the agriculture–nutrition nexus	63
References	64
Annexes	69
Annex A. Terms of reference for the study	69
Building the Evidence Base on the Agricultural-Nutrition Nexus: Rapid Country Scans for informing Policy and Practice	69
Annex B. List and contact addresses of stakeholders interviewed	73
Annex C. List and contact addresses of participants at the Bamenda workshop	75
Annex D. List and contact addresses of participants at the Yaoundé workshop	77

List of Figures

Figure 1: The administrative regions of Cameroon	2
Figure 2: Prevalence of stunting in children under 5 years old in Cameroon	13
Figure 3: Evolution of malnutrition in Cameroon (UNICEF, 2014)	11
Figure 4: Trends in the gross agriculture and food production indices in Cameroon	8
Figure 5: Trends in the 3-year average food supply adequacy and the 3-year average prevalence of under nourishment in Cameroon	9
Figure 6: Females in secondary schools as % of total enrolment in 2013	29
Figure 7: Trends in the density of the health workforce in Cameroon	36
Figure 8: Stakeholders' interactions within the agriculture–nutrition nexus	47

List of Tables

Table 1: Some indicators of nutritional status in selected SSA countries	3
Table 2: Child anthropometry in Cameroon	12
Table 3: Body Mass Index (BMI), energy and macronutrient intake in southern Cameroon	14
Table 4: Frequency of consumption of eight food groups by adolescents in southern Cameroon	17
Table 5: Regional variations in the overall status of malnutrition in Cameroon	11
Table 6: Prevalence of malnutrition among children 1–5 years of age, by zone	12
Table 7: Prevalence (%) of malnutrition in children below 5 years in Cameroon, by region	11
Table 8: Factors influencing the nutritional status of children aged between 6–59 months in Cameroon	14
Table 9: Prevalence of micronutrient deficiencies in children 1–5 years of age, by zone	13
Table 10: Iron, vitamin A and iodine supply in children 6–59 months by region	20
Table 11: BMI and nutritional status of women, by zone	15
Table 12: Prevalence of micronutrient deficiencies in women 15–49 years of age, by zone	16
Table 13: Nutritional status of women 15–49 years, by region	16
Table 14: Iron and vitamin A supplementation in women between 15–49 years old, by region	21
Table 15: Population trends in Cameroon	23
Table 16: Trends in the per person GDP of Cameroon	24
Table 17: Under-5 mortality rates in Cameroon from 1990–2014	24
Table 18: Trends in the proportion of the population in Cameroon living below the national poverty line	25
Table 19: Indicators of the health status of Cameroonians compared to that of some African countries with similar or lower GNI per person	25
Table 20: Percentage of the population in Cameroon with access to improved drinking water sources	26
Table 21: Trend in the percentage of the population of Cameroonians using improved sanitation facilities by region	28
Table 22: Indicators of the level of education of Cameroonians compared to that of some African countries with similar or lower GNI per person	30
Table 23: Trend in the percentage of females in the total enrolment of secondary schools in Cameroon	30

Table 24: GII for Cameroon and some low-HDI African countries with a GNI about the same or lower than that of Cameroon.....	32
Table 25: Financial and human resources allocated to the health and education sectors in Cameroon compared to that of some African countries with similar or lower GNI per person	34
Table 26: Density of the health workforce by region in Cameroon in 2010.....	36
Table 27: Identification and clustering of stakeholders.....	40
Table 28: Stakeholder interests/activities and competences	41
Table 29: Influence and importance of stakeholders	49
Table 30: Stakeholder Influence–Importance Quadrant.....	50
Table 31: Stakeholder participation matrix.....	50

List of Acronyms

ACP	African, Caribbean and Pacific
ACDIC	Association of Citizens for the Defence of Common Interests
AFD	French Development Agency
BMI	Body Mass Index
CAMNAFAW	Cameroon National Association for Family Welfare
CAMORIF	Cameroon Movement on the Right to Food
CERF	Central Response Emergency Fund
CIG	Common Initiative Group
COMINSUD	Community Initiative for Sustainable Development
COSADER	National Alliance Against Hunger Food Policy and Strategy
CRTV	Cameroon Radio Television
CTA	Technical Centre for Agricultural and Rural Cooperation
DFAIT	Department of Foreign Affairs and International Trade
EU	European Union
FAO	Food and Agriculture Organization
FCFA	Central African Franc
FNS	Food and Nutrition Security
GDP	Gross Domestic Product
GEF	Global Environmental Fund
GII	Gender Inequality Index
GNI	Gross National Income
HDI	Human Development Index
HKI	Helen Keller International
HEDECS	Health and Development Consultancy Services
IFAD	International Fund for Agricultural Development
INADES	The African Institute for Economic and Social Development
Kcal	kilocalories
MBOSCUDA	Mbororo Social, Cultural and Development Association
MDGs	Millennium Development Goals
MINADER	Ministry of Agriculture and Rural Development
MINADT	Ministry of Territorial Administration
MINAS	Ministry of Social Affairs
MINCOM	Ministry of Commerce
MINCUL	Ministry of Culture
MINEDUB	Ministry of Basic Education

MINEE	Ministry of Energy and Water Resources
MINEPIA	Ministry of Livestock, Fishery and Animal Industries
MINESUP	Ministry of Higher Education
MINFI	Ministry of Finance
MINPMEESA	Ministry of Small and Medium Industries and Handicraft
MINPROFF	Ministry for the Protection of the Woman and the Family
MINRESI	Ministry of Research and Scientific Innovations
MINSANTE	Ministry of Health
MINT	Ministry of Transport
MINTEL	Ministry of Telecommunication
NEPAD	New Partnership for African Development
NGO	Non-governmental Organisation
NPFN	National Policy on Food and Nutrition
OFSAD	Women's organisation for food security and development
OWG	Open Working Group for Sustainable Development Goals
PPP	Purchasing Power Parity
PROPAC	Sub-Regional Platform of Farmer's Organisations in Central Africa
SCTC	Cameroon Company for transforming cereals
SDGs	Sustainable Development Goals
SIRDEP	Society for Initiatives in Rural Development and Environmental Protection
SNEC	National water supply Company
SNV	Netherlands Development Organisation
SSA	Sub-Saharan Africa
SUN	Scaling Up Nutrition
UNDP	United Nations Development Program
UNHCR	United Nations High Commission for Refugees
USDA	United States Department of Agriculture
USAID	United States Agency for International Development
WASH	Water Sanitation and Hygiene
WB	World Bank
WFP	World Food Program
WHINCONET	Western Highlands Nature Conservation Network

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Executive summary

People are at the centre of development and more so if development is to be sustainable. According to the *Open Working Group for Sustainable Development Goals*, individual wellbeing is essential to sustaining the inter-generational gains in health, productivity and social engagement that underpin the sustainable development agenda. It is now generally accepted that malnutrition is a major challenge to development. A lot of emphasis has been placed on its eradication; it was one of the Millennium Development Goals (MDGs) and has been given priority among the Sustainable Development Goals (SDGs). Food and nutrition security (FNS) is currently high on the policy agenda of most African countries including Cameroon.

To achieve desired FNS outcomes a number of pathways have been identified including policy harmonisation, political will, multidisciplinary research, technological and social innovation, multi-sectorial cooperation and collaboration, capacity building and development, gender equality, women's empowerment and local/national ownership. However, within a given context, a combination of various pathways including national, regional, and international options will yield tangible results. Multiple disciplines and stakeholders drawn from the public and private sectors, civil society organisations and the wider society must be engaged. It is against this backdrop that CTA has prioritised strengthening of the linkages between nutrition and agriculture as one of the key areas for improving FNS in the ACP region.

The goal of this study was to generate context-specific knowledge for informing policy processes and the development of strategies to support the attainment of FNS goals in Cameroon.

The objectives of the study were:

- To describe the current status of agriculture and the food and nutrition situation in Cameroon.
- To investigate the roles and interactions of the various stakeholders in ensuring FNS in Cameroon.
- To analyse the impact of related policies and programs/interventions linked to addressing the food and nutrition situation in Cameroon.
- To propose strategies for strengthening the agriculture and nutrition nexus in Cameroon, using the lessons learned.

The methodology consisted of: a desktop study and interviews with key stakeholders, followed by a stakeholder analysis. In addition, two national stakeholder consultation workshops were organised for enriching the data collected from the desktop study and interviews.

Results from the study reveal that:

- Only 20% of the country's arable land is currently cultivated. Agricultural productivity between the different production zones is highly variable. Food availability and accessibility has increased between 2005 and 2013, however, food security is still a

major challenge. At least 30% of Cameroonian households (both urban and rural) remain vulnerable and nearly 10% of rural households are food insecure.

- There are very wide variations in nutritional status between regions; the most affected are the Far North, North, Adamaoua and East regions. Children under 5 years old and women of childbearing age are the most impacted. Stunting in children under 5 years old remains alarmingly high (above 30%); having increased from 24.4% in 1991 to 32.5% in 2011 and 69% of them are deficient in zinc, 28% in vitamin B₁₂ and 35% in vitamin A. 76% women of reproductive age are deficient in zinc, 28% in vitamin B₁₂ and 21% are deficient in vitamin A.
- The level of poverty has remained constant at about 40% from 2001 to 2007. Life expectancy is low (55.1 years), under-five mortality is very high (144/1,000 live births); less than half of the national population (49.7%) has access to improved drinking water or sanitation facilities (44.7%); only 27.9% of the population aged above 25 years have at least some secondary education; and girls make up less than 50% of the secondary school enrolment.
- An institutional framework exists namely an inter-ministerial commission on food security and a national multi-stakeholder Scaling up Nutrition platform exists and policy instruments have been established. However, implementation has not been satisfactory mainly due to inadequacy of human and financial resources. Up-to-date data on nutrition is very scarce; there are very few trained nutrition specialists in the country.
- Several stakeholders (about 80 or more) representing government ministries, research and training, UN organisations, non-governmental organisations (international and national), food processors, mass media, donors, consumer syndicates, farmers and women's organisations are involved in implementing programmes that address the Agriculture–Nutrition nexus, but many operate in isolation. Government ministries work collaboratively and also with international organisations and donors but their relationship with civic society organisations is not well defined. NGOs also work collaboratively but there are no specific guidelines to foster collaboration to avoid duplication or conflicts. Active participation and collaboration among stakeholders is crucial for addressing the FNS challenge. Several high-influence-high-important stakeholders exist in Cameroon.
- Some nutrition-specific interventions; including combating iodine and vitamin A deficiencies have been implemented with positive impact in various regions of the country.

These findings suggest that, there is need to strengthen the agriculture and nutrition nexus; foster greater collaboration among the key actors; increase commitment especially from the government — to improving support services (health, water, education, etc.) and to creating a more enabling environment.

Some actions/initiatives identified (during the stakeholder workshops) that may contribute to improving the food and nutrition situation in Cameroon are as follows:

- Build on good practices of existing multi-stakeholder cooperation (e.g. inter-ministerial commission for the fight against malnutrition and SUN- Cameroon): carry out stakeholder analyses and clearly define roles for each (place farmers at the centre and include leaders of local communities); allocate resources and facilitate regular engagement. Build on 2014 national nutrition business forum.

- Promote research, education and sensitisation as entry points for strengthening FNS and the Agriculture–Nutrition nexus.
 - Research: increase production in the agricultural sector (both crops and animals); assess changes in food value along the processing chain; create data-bases.
 - Education (formal and informal): develop and introduce relevant nutrition programs at all levels of learning institutions; provide refresher courses for health/nutrition workers; assign adequately trained nutritionists (health-centres, hospitals, councils, districts, etc.).
 - Sensitisation: publish nutrition information on a regular basis in newspapers and make use of other mass media communication tools; schedule public mass gatherings (markets, churches, motor parks, social meetings, etc.).
- Strengthen women’s participation in the nexus: institutionalise a quota system to increase women’s participation in decision-making bodies and processes; change statutory laws to strengthen women's entitlements and access to land, capacity building, and loans and educate girls at secondary level and above.
- Improve the government’s commitment to the Agriculture–Nutrition nexus: identify agriculture and nutrition champions or goodwill ambassadors for lobbying, encourage the creation of, and support, food and nutrition advocacy groups.

Background

People are at the centre of development and more so if development is to be sustainable. According to the OWG (OWG, 2014), individual wellbeing is essential to sustaining the inter-generational gains in health, productivity and social engagement that underpin the sustainable development agenda. There are many pathways by which nutrition can play a key role in promoting and achieving sustainable development. Without adequate nutrition, the UNSCN (2014) argues that it will be difficult to attain the SDGs, which are currently under discussion. This is because, malnutrition is not simply the lack of sufficient, adequately nutritious and safe food, but the result of a host of interacting processes including health-care, education, sanitation and hygiene, access to resources, and empowerment of women. A good nutritional status leads to higher individual earnings and mental acuity, which in turn support macroeconomic and societal growth. Malnutrition impairs individual productivity, which results in reduced national economic growth.

It is now generally accepted that malnutrition is a major challenge to development. A lot of effort has therefore been directed to eradicating it, as evidenced by the fact that it was one of the MDGs and is a priority for the SDGs. Considerable progress has been made, but the picture remains bleak (EU *et al.*, 2014), which significantly hinders the economic advancement of many countries in the world:

- Approximately one in four children under 5 years of age is stunted and under-nutrition kills more than three million children every year.
- Over two billion people are deficient in key vitamins and minerals because of low dietary diversity.
- One in 15 children under 5 years of age (in total some 43 million) is overweight.
- Although the prevalence of wasting (acute under-nutrition) has declined, 19 million babies are born each year with a low birth-weight.

Agriculture is one of the sectors best placed to address the crucial underlying determinants of malnutrition and can positively affect food production, income and consumption of nutritious foods needed for healthy and active lives (Headey, 2011). Agricultural development has traditionally focused on food production with the assumption that increased production will result in lower food prices and hence improve the access to food. However, this is not so because access to food is influenced by many other factors such as education, socio-cultural practices, etc. Poor access to food ultimately results to malnutrition and eventually poor health. In the past, insufficient attention was paid to improving the linkages or the nexus between agriculture and nutrition (EU *et al.*, 2014).

A mutual relationship exists between agriculture and nutrition and the casualties are bi-directional. Changes in nutrition or health status are expected to affect agricultural production (hence food security); conversely changes in the agricultural sector can have significant effects on individual health and nutritional status, suggesting how vulnerable households can be locked in a vicious cycle of poverty and chronic under-nutrition (Chung, 2012). In order to eradicate malnutrition, the Agriculture–Nutrition nexus must be considered. Agriculture is the main occupation of about 80% of people living in rural areas of developing countries; women account for more than 40% of agricultural labour and dominate the small-scale food processing sector (50% in Africa). In addition, agricultural growth is at least twice as effective in reducing poverty as Gross Domestic Product (GDP) growth originating outside

the sector. On the other hand, nutrition impacts agriculture in the following ways: reducing under-nutrition improves the well-being of farmers and people living in rural areas; increasing knowledge on nutrition encourages diversification of agricultural production and reduces risk exposure; adopting a nutrition lens incentivises policy-makers to improve women's participation and empowerment; reducing under-nutrition can enhance a country's productive capacity (especially in the agricultural sector) and advance economic growth (Chung, 2012).

Country overview

Cameroon is hinged between West and Central Africa at the extreme north-eastern end of the Gulf of Guinea and is considered to be in the central Africa sub-region. It lies between latitudes 2° and 13° north of the equator, extending from the Gulf of Guinea to Lake Chad over a distance of about 1,200 km; and between longitude 8° and 16° east of the Greenwich Meridian and extends over a distance of 800 km at the widest portion. It has a total surface area of about 475,650 km² with a mainland surface area of 466,050 km² and a maritime surface area of 9,600 km² (INS, 2001). Cameroon is bounded by Lake Chad in the north, the Republic of Chad in the north-east, and the Central African Republic in the east. In the south are the Republic of Congo, Republic of Gabon and Equatorial Guinea, and in the west are the Federal Republic of Nigeria and about 400 km of Atlantic Ocean coastline. The country is divided into ten administrative regions each of which is further sub-divided into divisions, sub-divisions and districts. Figure 1 shows the administrative map of Cameroon.

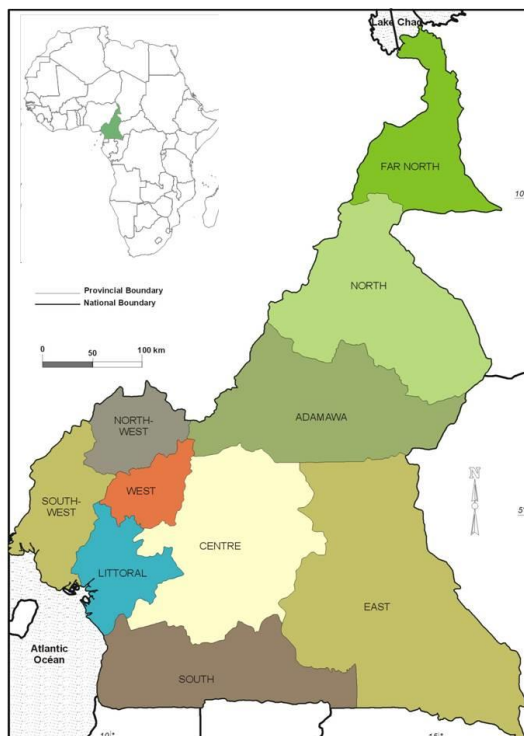


Figure 1: The administrative regions of Cameroon

The population is estimated at 22.3 million with a growth rate of 2.5% (UNDP, 2014). Life expectancy is 55 years. Countrywide, the population density is estimated at 33 inhabitants/km², with the highest value of 127 inhabitants/km² recorded in the West

Province. The agricultural sector is of vital importance for the country's economy. It represents more than 42% of GDP, 51% of exports and provides livelihoods to nearly 70% of the working population (INS, 2011). Agriculture is rich with heavily under-exploited potentials whereas productivity gains are potentially high. Agricultural products are consumed in rural areas and supplied to the urban population. Over the last three decades, exports from the rural sector in Cameroon have made up approximately 55% of the country's export earnings, followed by 30% from hydrocarbons and 15% from the service sector (INS, 2011). The GDP per person is 1,426 USD (WB, 2015). The national poverty line is defined to be 637 FCFA/day and about 40% of the population lives below this line (INS *et al.*, 2012). Cameroon has a Human Development Index (HDI) value of 0.505 and is ranked 152 out of 187 countries (UNDP, 2014).

Cameroon presents a lot of diversities in its physical, human and economic aspects and provides a panoramic view of Africa within a small geographic area. It is for this reason that Cameroon is often referred to as "Africa in miniature". Physically, it has distinct regions, which include mangrove swamps, coastal lowlands, plateaux, highlands, plains and many mountains, the highest of which is Mount Cameroon. Because of the length of the country (about 1,200 km from south to north), the proximity to the sea and the influence of altitude, Cameroon has a variety of climate types representative of those found in different regions of Africa and with great variations in rainfall, fauna and flora. Four climatic zones have been identified: the coastal zone (South West and Littoral regions) is generally sultry and humid; the Sudano-Sahelian zone (Far North, North and Adamaoua regions) is significantly warm and dry; the western highlands (West and North West regions) is typically guinea savannah; and the forest zone (Centre, South and East regions) which is humid and wet (INS, 2001).

Nutritional status in Cameroon vis a vis sub-Saharan Africa (SSA)

Despite numerous initiatives that have been carried out to combat malnutrition, it is still a major problem in the country. Table 1 presents the nutritional status of Cameroon in comparison to other SSA countries. Undernourishment is moderately high (15%) and is the major cause of child mortality. Chronic undernutrition (stunting) which is characterised by a deficit of height for age among children under 5 years is very high nationwide (33%).

The Under-One infant mortality rate in the country is estimated at 74 deaths per 1,000 live births while the Under-Five infant mortality rate is much higher at 144 deaths per 1,000 live births (FAO, 2015). Severe micronutrient deficiencies especially vitamin A, B₁₂, zinc, folate, iron and iodine have been observed both in children and in women of reproductive age. For example, zinc deficiency is estimated at 69% in children and 77% in women (UNICEF, 2011).

These statistics illustrate the pathetic picture of the nutritional situation of the Cameroonian population and it is a reflection of the fact that nutrition has never been adequately integrated into the health, agriculture, education and socio-economic policies of the state.

Table 1: Some indicators of nutritional status in selected SSA countries

Indicator	Prevalence			
	<i>Very high (>35%)</i>	<i>High (30–35%)</i>	<i>Moderately high (15–29%)</i>	<i>Low (<10%)</i>
Undernourishment	Sudan, Central African Republic, Democratic Republic of Congo, Somalia	Chad, Mali, Cote d'Ivoire, Ethiopia, Zambia	Cameroon, Kenya, Nigeria	Ghana
Stunting	Sudan, Central African Republic, Democratic Republic of Congo, Somalia, Congo	Cameroon, Nigeria, Chad, Mali, Cote d'Ivoire, Malawi, Zambia	Gabon, Tanzania, Uganda, Namibia, Ghana, Zimbabwe	
Infant mortality				
Country	Infant mortality (Under-One) per 1,000 live births		Infant mortality (Under-Five) per 1,000 live births	
Gabon	57		89	
Ghana	64		111	
Cameroon	74		144	
Kenya	77		115	
Uganda	88		152	
Ethiopia	97		168	
Nigeria	100		201	

Source: FAO, 2015; Doctors Without Borders, 2015

Goal and objectives of the study

In accordance with the terms of reference (Annex A), the goal of the study was to generate context-specific knowledge for informing policy processes and the development of strategies in support of the attainment of FNS goals in Cameroon.

The objectives of the study were:

- To describe the current status of agriculture and FNS in Cameroon.
- To investigate the roles and interactions of the various stakeholders in ensuring FNS in Cameroon.
- To analyse the impact of related policies and programs/interventions linked to addressing the food and nutrition situation in Cameroon.
- To propose strategies for strengthening the agriculture and nutrition nexus in Cameroon from the lessons learned.

Methodology

The methodology consisted of the following: a desktop study, interviews with some key stakeholders, stakeholder analysis and the organisation of participatory stakeholder consultation workshops.

Desk-top review

This involved the review of existing documents (hard and electronic) published by stakeholders in the public, private and civil society domains of relevance to FNS. The documents were from both national and international institutions in the country, as well as from the internet. Key issues that guided the review included: the state of agriculture and food security in Cameroon, the policy environment, stakeholders in the agriculture–nutrition nexus; the role of women in the nexus; nutrition-sensitive initiatives/programs to improve FNS; and nutrition education and knowledge.

Interviews with key stakeholders

The study worked closely with some members of an Inter-ministerial Committee for the fight against malnutrition created by the government in 2014. The committee comprises nine ministries, some UN organs, donors and non-governmental organisations (NGOs). It is chaired by the Secretary General of the Prime Minister's Office. The following stakeholders were consulted and interviewed:

- The focal point of the government in the Scaling Up Nutrition (SUN) movement who is the sub-Director of Food & Nutrition in the Ministry of Public Health.
- The national coordinator for food security in the Ministry in charge of Agriculture and Rural Development
- Helen Keller International (HKI), an international NGO
- United Nations Children's Emergency Fund (UNICEF)
- The Food and Agriculture Organisation of the United Nations (FAO)
- The World Food Program (WFP)
- The Food and Nutrition Research Centre at the Ministry in charge of Scientific Research
- French Development Agency (AFD)
- The executive secretary of Women's organisation for Food Security and Development (OFSAD), a national NGO.

The interviews were all face-to-face. The names and contact addresses of persons interviewed is found in Annex B.

Stakeholder analysis

Following the desktop study and interviews with key stakeholders, a stakeholder analysis was carried out. This involved the identification and categorisation (clusters) of the stakeholders in the Agriculture–Nutrition Nexus, an assessment of their interests and the ways in which those interests affect FNS in Cameroon. The analysis also assessed the power of stakeholders and the linkages between them. The stakeholder analysis contributes to the success of interventions by identifying the goals and roles of the different groups (including women and other disadvantaged groups), and is the basis for the development of an effective stakeholder participation strategy.

National stakeholder consultation workshops

The objectives of the workshops were to: a) share findings on the status of FNS in Cameroon; b) enrich and endorse the findings from the draft report; c) identify good/best practices for building multi-stakeholder, multidisciplinary, inter-sectoral and inter-ministerial cooperation and partnerships for improving FNS in Cameroon; d) identify entry points that provide the greatest opportunity for strengthening the Agriculture–Nutrition nexus; e) identify opportunities for strengthening women’s participation in the Agriculture–Nutrition nexus; and f) propose strategies for increasing the government’s commitment in the Agriculture–Nutrition nexus. Two one-day workshops were organised in Yaoundé and Bamenda. The third planned workshop in Maroua was shelved due to security reasons. However, a resource person was commissioned to collect data via interviews with various stakeholders in that region.

The State of FNS in Cameroon

Over 48% of the working population in Cameroon depends on agriculture and on pastoral activities, yet it is estimated that only 20% of the country's arable land is currently cultivated (FAO, 2012). Agricultural productivity remains low and highly variable between the different zones. Of over 21 million Cameroonians, at least eight million live in rural areas. The majority of these rural people—over 55%—fall below the national poverty line (IMF, 2010). An analysis (WFP/FAO, 2011) showed that approximately 10% of rural households are in a persistent state of relative food insecurity. These people generally do not produce enough food to feed themselves, and they are typically too poor to be able to purchase (access) adequate food. Another report (Germaine *et al.*, 2011) shows that Cameroonians living under such conditions are forced to skip meals (33%), reduce the size of their meals (45%), or buy the cheapest available foods (72%). Food security experts have concluded that without renewed efforts to scale up the domestic availability of food beyond present levels, Cameroonians will continue to have deficient access to adequate food (Snyed, 2014).

Cameroon remains the breadbasket in the Central African Region (CEMAC) and supplies huge amounts of food to almost all CEMAC countries. This has resulted in a significant increase in food prices in the local markets. Increase in food prices and transportation costs have contributed to an increase in the rate of inflation, which consequently reduces food accessibility for the local population. To make things worse, there have been additional increases in food prices due to the influx of refugees from Nigeria, Chad and the Central African Republic into the northern part of the country over the past few years. This also is a major cause of food insecurity in the country. WFP and FAO reported that, at any given time, at least 30% of Cameroonian households in both rural and urban areas remain vulnerable to food insecurity (WFP & FAO, 2011). It is, therefore, not surprising that there are high incidences of malnutrition throughout the national territory.

Variations in food availability and accessibility

There are many indicators to assess food availability and accessibility (FAO, 2013). For this study two have been used for determining availability; the food production index, which gives the trend of total food production and the average dietary energy supply adequacy, which is used to compare food supply (produced or imported) with food requirements. Access of the population to food is three dimensional; physical, social and economic, if there is to be access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. For this study, the prevalence of undernourishment was used as the indicator for access since it expresses the dietary energy deprivation compared to minimum requirements.

Variations in climate across the agro-ecological zones influence agricultural activities and hence food availability. The Sahel zone is made up of dry savannah plains and the steppe, favouring pasturage and breeding of animals like sheep, cows, goats for both food and sale while pigs are reared mainly for sale. Fishing is also common and used both for food and as a source of income. This climate also favours the growth of cereals such as maize, millet and sorghum. Cotton and groundnut are the most important sources of lipids, while palm-oil is scarce resulting in a high rate of vitamin A deficiency in the zone. Because of limited rainfall, fruits and fresh vegetables are also rare and expensive, resulting in high rates of vitamin C deficiency (Gouado *et al.*, 2005). Meanwhile, the forest zone is dominated by a

tropical climate, with long rainy seasons. Tubers, plantains/bananas, fresh green vegetables and fruits etc. are available year round. Bush-meat is consumed in high quantities although the government has officially clamped down on the hunting and trading of bush-meat. Fish varieties are available and consumed in these regions all year round. The western highlands and part of the coastal zone (south-west region) with its volcanic highlands, is the most fertile zone in Cameroon. Tubers, maize, plantains and a wide variety of vegetables are abundant throughout the year. Bean species are the main sources of plant protein and are available all year round while cows, goats and pigs are reared as a source of food and for income generation. However, fish is scarce and expensive. The coastal zone is the richest part of the country in seafood and fruits (Germaine *et al.*, 2011).

Despite this rich diversity in food production, malnutrition remains a challenge in most parts of the country. It has been almost universally agreed that Cameroon needs to take better advantage of its diverse agro-ecologic zones (Snyed, 2014). Although food availability is sufficient at most times of the year in many regions of the country, food security remains a challenge. Poverty and low education make people consume mostly what is locally produced. Consequently, monotony of the diet significantly contributes to poor nutritional status.

Figure 2 shows the variation of the gross food production indices in Cameroon from 1990–2013. These indices show the relative level of the aggregate volume of food production for each year in comparison with the base period 2004–2006. The gross production index is calculated without any deductions for feed and seed.

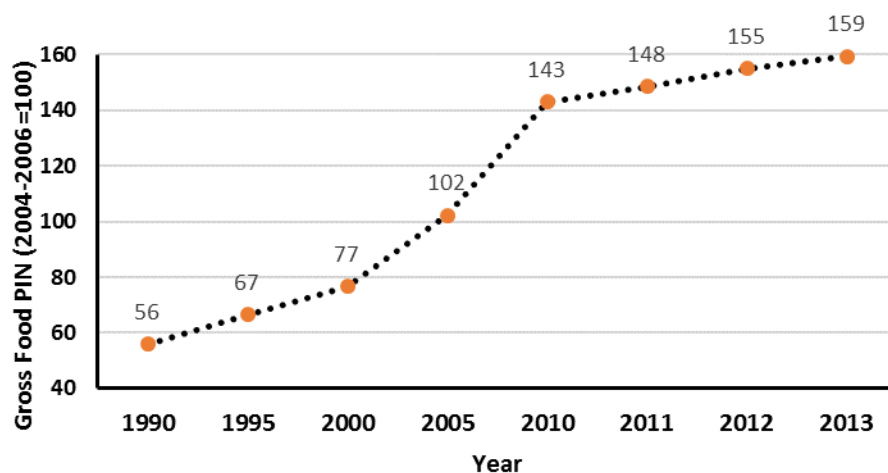


Figure 2: Trends in the gross agriculture and food production indices in Cameroon

Source: FAO, 2015

Compared to the base period of year 2004–2006, food production has been increasing. Up till the year 2010, the rate of increase was very high but after 2010, the rate of increase has reduced.

Figure 3 shows the trends in the 3-year average food supply adequacy and the 3-year average prevalence of under nourishment in Cameroon. The food supply adequacy has been greater than 100% since the year 2001. This suggests that the supply of food is greater than the requirements. The prevalence of under-nourishment has been reducing, which is logical since food supply has been increasing. However, the fact that more than 10% of the population is still under-nourished suggests problems of access to the available food. This may indicate that there are discrepancies across the country as concerns under-nutrition. Food security analysts generally agree that significant improvements to the Cameroon's governance context will be required for the availability of food to be sustainably enhanced (Snyed, 2014).

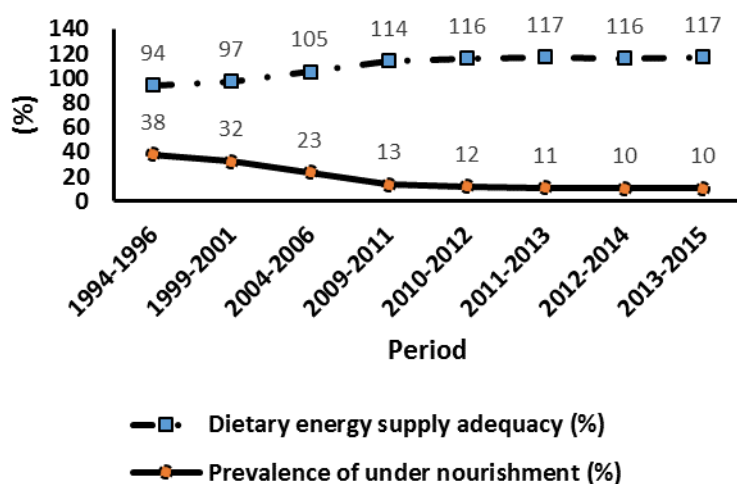


Figure 3: Trends in the 3-year average food supply adequacy and the 3-year average prevalence of under nourishment in Cameroon

Source: FAO, 2015

Malnutrition hotspots

Food security has always been a challenge in the North and Far North regions because of the prevailing climatic and edaphic constraints in the zone. It is typically a Sahel region characterised by very low rainfall and high temperatures, which do not favour food production. In addition, poverty-related factors (lack of education, natural disasters, absence of potable water, an unprecedented influx of refugees, inaccessibility and inequity in the distribution of health-care services, etc.) are prevalent in these regions resulting to a high prevalence of malnutrition. During the past five years (2010-2015), the zone has witnessed a succession of climatic variations (droughts, floods, etc.), which have had a negative impact on food production and security. In 2012, the food and nutrition situation in Sahel countries was quite worrisome because of the poor agricultural activities that resulted in low production, increased food prices, reduced food accessibility, which led to an increase in the vulnerability of many homes in the northern regions. Studies in the Far North and North regions in 2011 reported food insecurity in more than 20% of the homes and that 60% of homes are at risk of food insecurity (UNICEF, 2013).

At the start of the year 2014, the Far North region and the neighbouring countries (Nigeria and Chad) were attacked severally by the Boko Haram terrorist group. This led to the influx of Nigerian refugees into the region as well as the internal displacement of local people. Currently, there are over 44,000 Nigerian refugees and over 100,000 internally displaced persons in these regions (WFP, 2015). By the end of 2014, the displaced people were suffering from moderate (22.3%) or severe (2.7%) food insecurity. Consequently, there has been an increase in the prevalence of acute malnutrition especially in the Far North (from 8.6% in 2013, to 9% in 2014) and North regions (UNICEF, 2015).

The East and Adamaoua regions are also suffering from a massive influx of refugees fleeing inter-ethnic conflicts in the Central African Republic. An estimated 184,536 refugees have fled to Cameroon within the past year “to escape rebel groups and bandits in the north of their country” (WFP, 2015). This aggravates the state of food insecurity because the victims are unable to effectively carry out any agricultural activities. An assessment released in 2014 indicated that in Cameroon, up to one-in-three refugee children from Central African Republic suffer from malnutrition and the mortality rate has already exceeded 24% (WFP, 2015).

The data collected so far using various indicators show that among the ten administrative regions in the country, the Far North, North, East and Adamaoua regions (in order of severity) are currently the malnutrition hotspots in Cameroon.

Variations in Nutritional Status

Although malnutrition exists nationwide, the prevalence varies between zones and between administrative regions (Tables 2 and 3). The most vulnerable groups are children under 5 years old (UNICEF, 2013) and women within the reproductive age range (15–49 years) and pregnant and lactating mothers (INS, 2011). Most studies on the nutritional status have focused on these groups of people. The level of malnutrition has not changed much between 1991 and 2011 (Figure 4) although growth retardation is slowly on the rise, having increased by about 8% during this period (UNICEF, 2014). Underweight, growth retardation and emaciation are greatest in the Far North region, followed by the North region (INS, 2011). Apart from these two regions emaciation is less than 10% in all the other regions of the country. The Littoral region seems to be the least affected by malnutrition (UNICEF, 2014). Wasting and underweight are not a cause for concern in the large cities of Yaoundé and Douala.

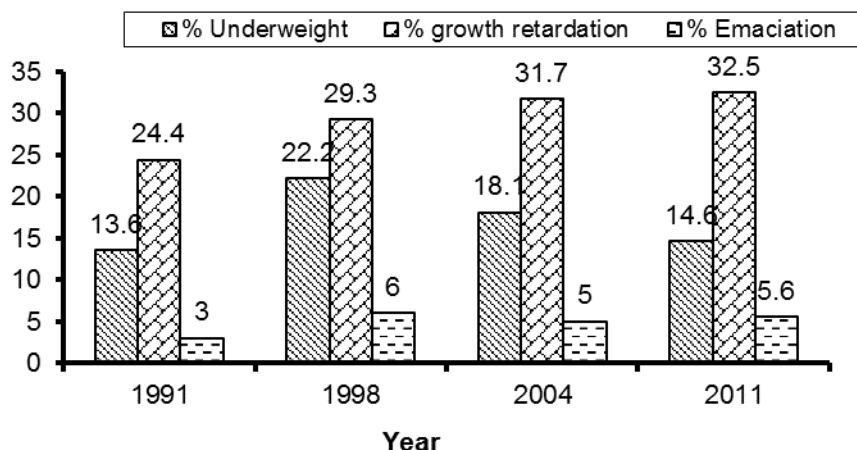


Figure 4: Evolution of malnutrition in Cameroon (UNICEF, 2014)

Table 2: Regional variations in the overall status of malnutrition in Cameroon

Indicator	Region									
	Adamawa	Centre	East	Far North	Littoral	North	North West	South	South West	West
% Underweight	20.8	8.3	15.4	31.6	4.7	23.6	7.1	10.1	8.0	4.9
% Growth retardation	39.8	23.4	37.3	44.9	24.4	40.2	35.6	33.1	27.0	32.0
% Emaciation	6.4	4.3	5.9	11.8	1.2	10.2	2.1	4.5	2.8	0.7

Source: INS, 2011

Table 3: Prevalence (%) of malnutrition in children below 5 years in Cameroon, by region

Region	Overall acute malnutrition (6–59 months)		Severe acute malnutrition (6–59 months)		Overall chronic malnutrition (0–59 months)		Overall wasting (0–59 months)	
	2012	2013	2012	2013	2012	2013	2012	2013
	Far North	6.3	8.6	1.1	1.8	44.8	39.1	26.8
North	5.5	5.8	0.7	1.2	43.3	40.4	23.8	22.6
Adamaoua	2.9	4.3	0.2	0	34.6	31.1	14.5	14.7
East	3.5	3	0	0.6	39.3	36	15.5	16.2
Refugees (in Ad/East)	NA	17.1	NA	3.2	NA	48.4	NA	39.2
North West	1.5	NA	0	NA	30.9	NA	5.3	NA
South	2.4	NA	0	NA	18.8	NA	8.6	NA

Source: UNICEF, 2013 (NA = Not Available)

Children who are undernourished between conception and 2 years of age are at high risk for impaired cognitive development, which adversely affects the country's productivity and growth (WB, 2014). Furthermore, undernourished children who fall sick are much more likely to die from illness than well-nourished children. 11% of infants in Cameroon are born with low birth-weight and acute malnutrition is most frequently seen in children under 18-months, varying between 9–18% (INS, 2011). Currently, the national acute malnutrition rate among children below 5 years is 5.6%, of which 1.9% suffer from severe acute malnutrition (UNICEF, 2013). The prevalence of stunting has not changed much in 20 years (33–38%; equivalent to about a million children) as presented in Figure 4.

Overweight is an emerging problem among children under 5 years old; and is reported to be 7% nationwide (Table 5). Low-birth-weight infants and stunted children may be at greater risk of chronic diseases such as diabetes and heart disease than children who start out well-nourished (Victora *et al.* 2008).

Table 4: Prevalence of malnutrition among children 1–5 years of age, by zone

Malnutrition category	Prevalence (%) by region			
	South	North	Large cities	National
Total stunting (moderate and severe)	33.1	46.1	13.0	33.0
Total wasting (moderate and severe)	0.4	7.2	1.0	6.5
Total underweight (moderate and severe)	9.2	28.6	1.4	19

* South covers Centre, East, South, Littoral, South West, West and North West Regions; North covers Adamawa, North and Far North Regions; Large cities include Yaoundé and Douala
Source: UNICEF, 2014

Table 5: Child anthropometry in Cameroon

	% children under 5 years old affected
Growth retardation (moderate)	31.7
Growth retardation (severe)	12.9
Stunting	33.0
Wasting	6.0
Wasting (severe)	2.0
Underweight (moderate)	14.8
Underweight (severe)	4.2
Overweight	7.0
Low birth weight	11.0

Source: IFPRI, 2014; INS, 2015

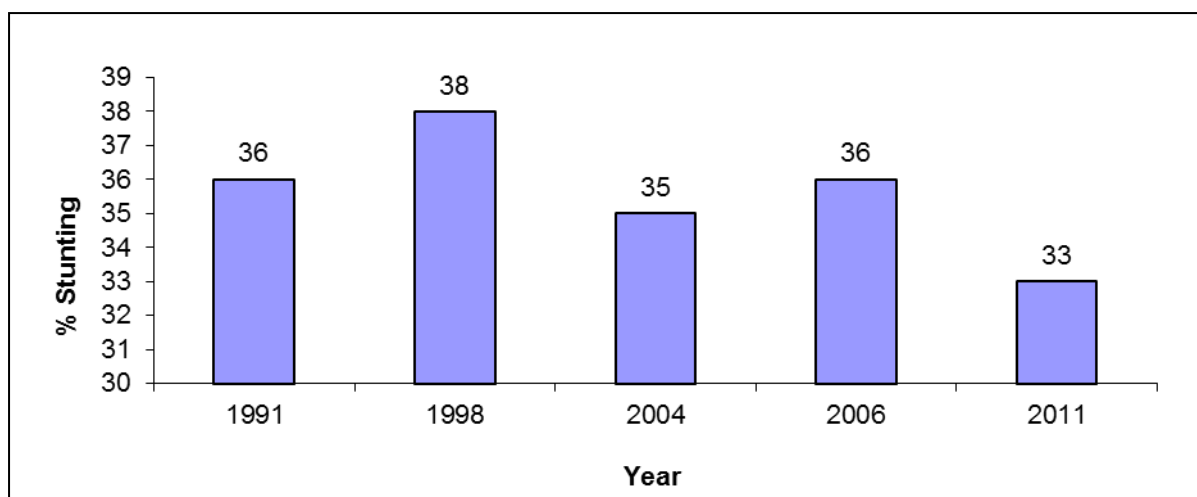


Figure 5: Prevalence of stunting in children under 5 years old in Cameroon

Source: UNDP, 2013

Zinc deficiency is the most prevalent (69%) among children under 5 years old; vitamin A deficiency is 35%, vitamin B₁₂ is 28%, while folate deficiency is 8.4% nationwide (Table 6). All the data indicate that sufficient attention has not been given to combat child malnutrition in the country.

Table 6: Prevalence of micronutrient deficiencies in children 1–5 years of age, by zone

Micronutrient	% National	% Urban	% Rural	% South	% North	Large cities
Zinc	69.1	63.9	76.7	67.6	80.5	54.8
Folate	8.4	6.8	11.0	5.4	19.8	12.9
Vitamin B₁₂	28.1	24.2	34.1	24.3	43.6	11.3
Vitamin A	35	36.1	33.5	28.6	43.0	37.0
Iron	-	25.8	35.4	16.6	49.0	29.1

* South covers Centre, East, South, Littoral, South West, West and North West Regions; North covers Adamawa, North and Far North Regions; Large cities include Yaoundé and Douala

Source: UNICEF, 2011

Some of the factors that influence the nutritional status of Cameroon children and how they relate to different indicators of malnutrition are presented in Table 7. The main factors include the region of residence, gender, level of urbanisation, financial status of the home, and level of education of the mother.

Table 7: Factors influencing the nutritional status of children aged between 6–59 months in Cameroon

Indicator	Region					Sex		Urbanisation level		Fin. status of home		Mother's Edu. level	
	Far North	North	Adamawa	East	Other regions	Boys	Girls	Rural	Urban	Poorest	Richest	High school	None
% Severe chronic malnutrition	27	18	18	17	NA	16	12	NA	NA	26	NA	NA	25
% Emaciation	12	10	7	6	1-6	7	5	8	3	11	2	2	12
% Anaemia	64	68	62	67	C=66 LT=57 NW=52 W=46 S=74 SW=70	62	59	63	57	66	51	50	67
% Breastfeeding, 1 day post-partum	62	46	77	83	C=73 LT=80 NW=86 W=85 S=79 SW=80	NA	NA	67	76	54	79	74	57

Source: INS, 2011 (NA = Not Available)

Generally, the nutritional status is better when the home is wealthier, when the educational level of the mother is higher, in urban settings and in the southern regions of the country. Male children seem to be more prone to malnutrition than in girls.

Adult nutrition

Investigations (Mennen *et al.*, 2001) on the nutrient intake of Cameroonian adults (25–74 years old) report variations in dietary intake as a result of the level of urbanisation and gender (Table 3).

Adults living in urban areas have a higher BMI than those in rural areas, irrespective of gender. The highest energy and macronutrient consumption were found in urban men (except for alcohol, which was highest in rural men). In contrast, rural women consume more of the macronutrients indicated than their urban counterparts. High amounts of alcohol are consumed by both men and women in rural areas.

Table 8: Body Mass Index (BMI), energy and macronutrient intake in southern Cameroon

Nutrients	Women		Men	
	Rural	Urban	Rural	Urban
BMI	22.3±3.3	27.0±5.0	21.9±2.7	25.0±3.7
Energy (MJ)	15.8	13.7	17.13	17.67
Carbohydrates (g)	425.33	397.67	432.33	485.33
Protein (g)	86	82.67	90	109.67
Total fat (g)	189.67	154.67	205	204.67
Saturated fat (g)	61.33	52.33	64.33	71
Polyunsaturated fat (g)	26.67	21.67	27.33	29
Alcohol (g)	13.67	4.67	34.33	15

Source: Mennen *et al.*, 2001

Nutrition in women

The nutritional status of Cameroon women in general is presented in Table 9. Overall, only about half (58%) of the women of reproductive age (24% of the national population) are of normal weight; 7.4% are underweight (including 1.5% who are severely underweight). More than 17% of the women in the north are underweight whereas less than 3% prevalence was observed in south zone and in the big cities respectively. 23.8% of women are overweight while 10.8% are obese (UNICEF, 2011). Women in the south, especially in the big cities have a higher BMI than those in the north zone. The same trend is observed with respect to overweight and obesity.

Table 9: BMI and nutritional status of women, by zone

	South	North	Large cities	% National
BMI	24.8 ± 0.3	21.2 ± 0.3	26.2 ± 0.3	24.0 ± 0.2
Nutritional status among women				
Severe underweight (%)	0.3	4.3	0	1.5
Moderate underweight (%)	0	1.3	0.3	0.5
Mild underweight (%)	2.3	12.3	2.1	5.4
Total underweight (%)	2.6	17.8	2.4	7.3
Normal weight (%)	55.3	70.2	46.0	58.0
Overweight (%)	30.4	9.2	30.2	23.8
Obese (%)	11.7	2.6	21.4	10.8

* South covers Centre, East, South, Littoral, South West, West and North West Regions; North covers Adamawa, North and Far North Regions; Large cities include Yaoundé and Douala
Source: UNICEF, 2011

Cameroon women are also deficient in micronutrients. About 40% are anaemic: 30% are slightly anaemic, 9% are moderately anaemic and less than 1% are severely anaemic. Iron deficiency is highest among pregnant women (50%) and lowest in breastfeeding mothers (35%) (INS, 2011). About 28.8% of women are deficient in vitamin B₁₂; 21.4% are deficient in

vitamin A; and 16.6% are deficient in folate (UNICEF, 2011). Deficiencies in zinc, vitamin B₁₂, vitamin A and iron are higher in rural than in urban women while the reverse is true for folate (Table 10). Micronutrients deficiencies are much more serious in women living in the north zone of the country.

Table 10: Prevalence of micronutrient deficiencies in women 15–49 years of age, by zone

Micronutrient	% National	% Urban	% Rural	% South	% North	Large cities
Zinc	76.9	72.3	83.3	72.6	86.5	70.5
Folate	16.6	17.4	15.4	10.5	17.8	27.4
Vitamin B ₁₂	28.6	25.1	33.8	28.1	41.2	9.5
Vitamin A	21.4	20.3	24.0	14.8	32.2	21.0
Iron	-	11.7	15.5	7.1	20.1	16.0

Source: UNICEF, 2011

More than half of all the women in the South West (53.6%) and South (52.6%) regions are anaemic while the lowest occurrence are in the West region (23.1%) (Table 11). Interestingly, anaemia is reportedly higher among women living in rich homes (42%) than in those in poor homes (36%). Similar to children, iron deficiency is greatest among women in the South region (54%) and least in the West region (23%). The highest frequency of thinness (underweight) was recorded among women in the Far North region (17.4%) and the lowest in the West region (2%) (INS, 2011). Women in rural areas are more affected (10%) than women in urban areas (5%). Thinness is greatest among uneducated women (16%) and is very low in women who have had at least secondary school education (2%). Overweight was greatest among women in the West region (31.2%) and obesity was highest in women of the Littoral region (14%).

Dietary patterns and trends

Lifestyle, and dietary patterns in particular, has major influences on nutritional and subsequently health status. The rapid change in nutritional habits in developing countries is due to increased urbanisation and changes in lifestyle (Germaine *et al.*, 2011). Others (Dapi *et al.*, 2007) have observed differences in dietary patterns between rural and urban populations: the rural population eats dishes based on traditional staple foods whereas the urban population incorporates more modern foods (including junk foods) into their diets. Because the percentage of school children, students and office workers in urban Cameroon is high, eating of junk food (doughnuts, fried groundnuts, sweet beverages, pastries, candies, etc.) outdoors is very common. The same authors report that junk food constitutes about 23% of the total food intake among adolescents in urban areas. Rapid urbanisation and the adoption of diets high in refined carbohydrates, saturated fats and sugars, combined with a more sedentary lifestyle are commonly cited as the major contributors to the increase in overweight and chronic diseases in urban areas (Pasquet *et al.*, 2003). Eight main food groups consumed in highly variable proportions by adolescents in the southern part of Cameroon (urban and rural) were identified as indicated in Table 12.

Table 11: Nutritional status of women 15–49 years, by region

Region		% Anaemia	% Thinness	% Overweight	% obese
Far North		36.5	17.4	6.6	0.8
North		40.7	11.4	12.3	4.9
Adamaoua		35.8	16.8	14.5	7.7
East		43.5	10.5	19.4	8.2
Centre		48.1	3.6	19.6	7.6
Littoral		37.6	2.2	28.8	14.4
North West		30.0	2.5	25.5	9.3
West		23.1	1.6	31.2	14.0
South		52.6	7.0	20.3	8.0
South West		53.6	3.1	30.5	12.8
Influencing factors					
Level of education	None	39.4	15.8	11.1	3.8
	At least high school	38.7	3.0	28	13.7
Level of urbanisation	Urban	41.1	4.8	25	15.5
	Rural	37.3	9.5	17.1	4.8
Financial status of home	Richest	42.3	3.2	28.8	18.6
	Poorest	36.0	15.9	8.0	0.8

Source: INS, 2011

Table 12: Frequency of consumption of eight food groups by adolescents in southern Cameroon

Food group	Urban	Rural
	% total food intake	% total food intake
Fruit	10.6	13.1
Milk products	5.5	1.4
Beans/pulses/nuts	7.3	15.3
Vegetables/green leaves	9.1	6.7
Meat/fish/eggs	11.3	8.0
Cereals	15.9	20.1
Roots/plantain	17.2	21.4
Junk food	23.2	14.2

Source: Dapi *et al.*, 2007

For the urban youths, junk food constitutes the highest food group (23.2%) of the total food consumed whereas roots and plantain is the major food group consumed in the rural setting (21.4%). In both settings, the consumption of milk products (an excellent source of calcium

and proteins of high biological value) is very insignificant. Vegetables (the main source of many vitamins) make up less than 10% of the foods consumed.

In a 24-hour recall study among young adults (21–31yrs) in the southern part of Cameroon, Sop *et al.* (2010) reported a similar dietary pattern: most of the foodstuffs consumed were tubers (yams, cocoyams, cassava, Irish potatoes, sweet potatoes and many others), cereals (rice and maize), plantains, legumes (peanuts, soybeans and beans); very little fruits, vegetables and animal products were included in the diet. They observed that choices of foods were not based on any particular knowledge, but on feeding habits according to the availability and affordability of meals. The average energy intake was estimated to be 2681 ± 859 Kcal for men and 2266 ± 960 Kcal for women, while the average BMI was reported to be 22.4 ± 1.9 Kg/m² for men and 23.0 ± 2.3 Kg/m² for women. About 20% of the women were found to be overweight. The general conclusion was that the meals consumed were very imbalanced (very low protein and high carbohydrate intakes) and that such diets could expose young adults to chronic nutrition-related diseases.

Socio-cultural beliefs and feeding practices

Socio-cultural beliefs

Many socio-cultural beliefs related to child-feeding and maternal health are widespread throughout Cameroon. In studies carried out in the Northern regions (Forka, 2009) and in the North West region (Reinsma *et al.*, 2012), many similar beliefs that negatively influence breastfeeding practices were identified. Examples include: no sex during pregnancy or while breastfeeding because the man's sperm will spoil the milk; colostrum is dirty and will give the baby diarrhoea; HIV mothers must not breastfeed else the baby will become infected; breast-milk spoils if a woman spends time away from the infant; and that an infant will refuse complementary foods if introduced after the baby is 6 months of age. Colostrum is very rich in antibodies, vitamins, minerals and immunoglobulins and is important in the development of the digestive tract. Such beliefs limit access of breast-milk to infants, and increase the risk of malnutrition, infections and mortality.

In some remote villages of the West and North West regions, women and children must not eat chicken or eggs for fear that it will cause their children to become thieves. Warthogs are also a taboo in the Northern regions because Muslims consider it to be dirty and if a pregnant woman violates this, it is believed her child will resemble the warthog (Forka, 2009). Such beliefs that prohibit women and children from consuming these highly nutritive foods have a negative impact on their nutritional status.

Feeding practices

Feeding practices are also determinant factors of the nutritional state of children, which in turn influences their morbidity and mortality. Feeding practices relate to the quality and quantity of foods offered to young children as well as the timing of their introduction.

Infant feeding practices

Exclusive breastfeeding among infants less than or equal to 6 months of age and continued breastfeeding up till 20–23 months of age are high-priority indicators of infant health (UNICEF, 2009). Almost all (97%) babies in Cameroon are breastfed. The practice of breastfeeding is more common in rural (99%) than urban areas (91%). However, only 40%

of all new-borns receive breast-milk within one hour of birth (39% and 42% in rural and urban areas, respectively), while 71% of new-born babies are breastfed within 24 hours after birth (67% and 76% in urban and rural areas, respectively). The quality and quantity of colostrum decreases with time post-partum. Therefore any delay in breast-feeding the baby has negative effects on its immune system. Late initiation into breastfeeding is at variance with the recommendations of the World Health Organization, which demand that infants be initiated into breastfeeding within one hour of birth as this can contribute to reducing neonatal mortality by 22% (WHO, 2004). Only 20% of babies under 6 months are exclusively breastfed (UNICEF, 2011). Due to delay in the onset of breastfeeding, 56% of babies have been given other foods before breast-milk. Between ages 0–1 month, 43% of babies receive water in addition to breast-milk, 18% receive other types of liquid (including other types of milk, juice, etc.), while 5% receive other food supplements (cereal/tuber broths) in addition to breast-milk. By 4–5 months of age, 36% already receive cereal broth as a food supplement. This means, exclusive breastfeeding for the first 6 months of life (as recommended by WHO) is not adhered to by most mothers. During the important transition period to a mix of breast-milk and solid foods (between 6–9 months of age), 31% of infants are not fed appropriately with both breast-milk and other foods (UNICEF, 2011). These practices increase the risk of infections and/or diarrhoea especially when hygiene is poor. About 91% of babies are continuously breastfed up to 9–11 months of age. However, the proportion decreases drastically to 30% when the child is between 18–23 months. Rural women breastfeed for longer periods (19.1 months) than urban women (16.5 months). The duration of breastfeeding decreases with the level of education: less educated women breastfeed for longer periods (21.1 months) than those with levels greater than or equal to secondary school (14.6 months) (INS, 2004; Tanya *et al.*, 2010). The variation in feeding practices between rural and urban women, and between the educated and non-educated, can be explained by the increasing level of westernisation of life in the urban areas. The rapid social and economic transformations in urban areas increase the difficulties faced by women in breastfeeding their children. Some work far from home. Consequently, they wean their children too early and sometimes give them poorly adapted foods or milk substitutes.

Adult feeding practices

As a result of its diversity, Cameroon has several ecosystems in which the foods consumed are a function of what is available locally. As earlier mentioned the diet is generally monotonous and based largely on starchy foods, which must meet the essential nutritional needs. Data on food consumption and habits indicate that diets, in general, are not balanced. High carbohydrate-foods such as cassava, maize and rice are the lowest cost options for consumers with low household incomes (Dury *et al.*, 2002, Drewnowski and Specter, 2004). Consequently, diseases linked to nutrition (diabetes, hypertension, obesity, etc.) are on the rise in the country. (Tanya *et al.*, 2010). Dapi *et al.* (2007) reported that adult food intake in Cameroon comes from three main meals consumed daily (breakfast, lunch and dinner); dinner being the most important meal in the urban setting while breakfast is equally as important as dinner in the rural setting. Cameroonian meals are predominantly composed of cereals or roots with sauce from green leaves and oil. Meat/fish and dairy products are related to high-income households while the consumption of vegetables and legumes are related to poor households (Tambi *et al.*, 1999). As a consequence, protein deficiency (malnutrition) is expected to be higher in poor households. In wealthy homes, breakfast would include bread and a hot beverage. Whereas Cameroonians in most regions

consume foods rich in Vitamin A, particularly red palm-oil and green vegetables, the very common practice of bleaching palm-oil greatly reduces the serum retinol levels because of the destruction of B-carotene in palm-oil (Ponka *et al.*, 2005).

Micronutrients such as minerals and vitamins are essential for good health. These nutrients must come from the foods consumed. In Cameroon, palm-oil is the most important source of α and β carotene (vitamin A precursor). Vitamin A intake with foods (especially palm-oil) in the north zone is very low. Vitamin A deficiency is higher in urban (36.1%) than in rural (33.5%) children. This may be as a result of poor cooking techniques used in urban areas (bleaching of palm-oil) as suggested by Ponka *et al.* (2005). In Cameroon, iron deficiency is largely responsible for anaemia, which is caused by low intake of foods rich in bioavailable iron and high intake of foods rich in iron inhibitors and dietary fibre (Stolzfus, 2003, Kana *et al.*, 2004). Another important cause of iron deficiency in Cameroon is the malaria parasite, which causes a massive destruction of red blood cells.

Iodine deficiency was found to be endemic in the inland regions of Cameroon. The highest prevalence (29%) was found in the East region (Lantum, 1990), while Taga *et al.* (2008) reported a prevalence of 21% in the West region. Iodine deficiency is mostly caused by insufficient intake of iodine in the diet. A study by Tahboub *et al.*, (2005) shows that thiocyanate (SCN) could competitively inhibit the action of human thyroid sodium/iodide symporter (goitrogenic compound). Cassava, is a rich source of SCN and is widely consumed in the southern regions of Cameroon. This could explain the prevalence of iodine deficiency in these regions. Also, the iodine content of food is proportional to the quantity of iodine in the soil. Taga *et al.* (2004) reported low levels of iodine in the soil and food harvested in the East and North regions compared to that in West and South. Iodine deficiency during foetal development can cause iodine deficiency disorders such as mental retardation, brain damage, impaired physical development, spontaneous abortions, low birth-weight, infant mortality, cretinism and goitre in adults (Delange *et al.*, 2001).

Vitamin and mineral deficiencies can be mitigated by providing foods rich in these micronutrients or through mineral supplements. Table 13 captures the different ways by which micronutrients are provided to children in the different regions of Cameroon.

The greatest proportion of children who consumed foods rich in vitamin A were from the South West region (84%) where palm-oil is abundant while those in the Adamaoua region received the most vitamin A supplements (77%) in the six months preceding the study period. Children in the South West region had the highest consumption of iron-rich foods (76%) while iron supplementation was greatest in the South region (14%). Iodine deficiency disorders have reduced significantly following the iodisation of salt in Cameroon. In children, it reduced from 29.1% in 1991 to 5.4% in 2002 Tanya *et al.* (2011). More than 75% of all homes in Cameroon use iodised salt. A better education of the mother, better financial status of the home and the urban setting positively influence the provision of these micronutrients to children.

Table 13: Iron, vitamin A and iodine supply in children 6–59 months by region

Region		% consumed vit. A-rich foods during past 24 hours	% received vit. A supplement during the past 6 months	% consumed iron-rich foods during past 24 hours	% received iron supplement during past 7 days	% living in homes having iodised salt
Far North		59	72	45	4	94
North		67	45	54	8	76
Adamaoua		80	77	67	8	88
East		77	52	62	6	92
Centre		82	40	66	12	86
Littoral		72	61	60	11	90
North West		78	54	54	13	96
West		76	60	75	8	91
South		79	33	68	14	92
South West		84	49	76	10	94
Influencing factors						
Level of education	None	62	61	47	5	89
	At least high school	83	53	75	15	94
Level of urbanisation	Urban	77	51	68	12	93
	Rural	70	58	56	7	88
Financial status of home	Richest	78	51	72	16	95
	Poorest	63	61	46	4	94

Source: INS, 2011

Another study determined the rate of supplementation of iron and vitamin A among women in the different regions; the results are presented in Table 14.

The highest proportion of women who received iron supplementation for more than 90 days during pregnancy was from the Littoral region (74%) while the North and Far North regions recorded the lowest percentages (29% and 28%, respectively). Women who received a dose of vitamin A post-partum were greatest in the West (63.3%) and North West (63.4%) regions, and the lowest was in the Far North region (24.8%). Again, better education, a higher financial status and an urban environment positively influence the rate of supplementation of these micronutrients in women.

Table 14: Iron and vitamin A supplementation in women between 15–49 years old, by region

Region		% Received iron supplement for more than 90 days during pregnancy	% Received Vit. A dose post-partum
Far North		28	24.8
North		29	28.0
Adamaoua		56	59.6
East		36	38.5
Centre		59	43.7
Littoral		74	56.2
North West		72	63.4
West		72	63.3
South		55	59.8
South West		61	56.3
Influencing factors			
Level of education	None	27	24.3
	At least high school	83	52.8
Level of urbanisation	Urban	69	51.9
	Rural	42	38.2
Financial status of home	Richest	80	51.8
	Poorest	25	21.7

Source: INS, 2011

Nutrition data and capacity

Up-to-date data on the nutritional situation for the different regions of the country is indeed scarce as most of the limited available resources are concentrated on the malnutrition hotspots in the country. Information on nutrition capacity (number of nutritionists/1,000 people, competences, etc.) is non-existent. Most of the personnel involved at various levels in this sector are employees of the Ministry of Public Health who were originally trained for other services and are not competent to handle nutrition-related issues. This reportedly has had negative effects on the implementation of nutrition intervention programmes in some areas of the Far North and South regions, and it is imperative that they are regularly retrained to build up their capacity (CAS, 2014). A continuous supervision of junior or less qualified personnel coupled with orientated in-service capacity-building training programmes will improve the execution of nutrition programmes.

One factor hindering Cameroon's progress in nutrition is the limited institutional capacity and lack of a highly skilled nutrition workforce to design, plan and deliver evidence-based nutrition-specific and nutrition-sensitive interventions. Although there is a strong consensus among stakeholders on the urgent need to develop capacity for nutrition, investments in capacity development initiatives in the country have so far been scanty (Tanya *et al.*, 2011).

Underlying Determinants of Nutrition Status in Cameroon

Significant and sustained improvements in nutrition come from combinations of nutrition-specific and nutrition-sensitive actions that operate at the level of underlying determinants (IFPRI, 2014). There are many pathways by which nutrition can play a key role in promoting the achievement of the 17 SDGs being discussed, and achieving the SDGs can also benefit nutrition (UNSCN, 2014). However there is a sub-set of SDGs for which the linkages between nutrition and SDGs are direct and where the evidence is most robust. This chapter focuses on the underlying drivers or determinants of the nutrition status. According to IFPRI (2014), the key determinants of the status of nutrition are:

- Economics and demographics
- Food security
- Health care
- Access to water and sanitation
- Education
- Gender equality and women empowerment
- Enabling environment or nutrition governance

Economics and demographics

Population and level of development

There is a very strong link between economic growth, poverty and malnutrition. The UNSCN (2014) reports that doubling the per person income cuts child stunting by about 15%. This results as households escape poverty and governments have more resources to tackle malnutrition. Table 15 shows population trends in Cameroon. The population growth rate has been very high and this puts a strain on socio-economic development and the reduction of poverty. In addition, the low proportion of the population of age greater than 65 is an indicator of a low level of development and low life expectancy.

Table 15: Population trends in Cameroon

Population attribute	Value
Total population in 2013 (millions)	22.3
Under-Five population in 2013 (%)	16.1
Urban Population (%)	53.2
Population > 65 years old (%)	0.7
Population growth rate 2000–2005 (%)	2.6
Population growth rate 2010–2015 (%)	2.5

Source: UNDP, 2014

Cameroon has an HDI value of 0.505 and is ranked 152 out of 187 countries (UNDP, 2014). This places Cameroon in the last tier of development. The HDI of Cameroon is above the average of the low-HDI nations (0.493) and about the same as the average for SSA countries of 0.505. Table 16 shows the trends in the growth of the GDP in Cameroon from 1990 to 2014. Based on the data, from the year 1990 till 2000, the GDP was falling. This corresponds to the period of the economic crises in Cameroon when the currency was

devalued and salaries reduced by about 50%. From the year 2005 the GDP has been increasing at an average rate of 10% compared to the value of the year 2000. This indicates that there has been sustained economic growth except in the year 2000.

Table 16: Trends in the per person GDP of Cameroon

Year	GDP/person (current US\$)
1990	924
1995	627
2000	583
2005	915
2010	1,145
2012	1,220
2014	1,426

Under-5 mortality

The Under-5 child mortality rate is an indicator of the quality of life, including income and education of parents, efficacy of health services, access to safe drinking water and sanitation, etc. Table 17 shows the variation in Under-5 mortality in Cameroon from 1990 to 2014. The rate has been very high for the past 20 years but has been falling slowly. In the year 2012, the average Under-5 mortality rate for SSA was 95 while for the low-HDI countries it was 94. In 2015, Cameroon recorded a rise in mortality rate of 144 per 1,000 live births aggravated mainly by the influx of refugees from neighbouring countries.

Table 17: Under-5 mortality rates in Cameroon from 1990–2014

Year	Number of deaths/1,000 live births
1991	144
1998	146
2004	144
2011	122
2012	95
2015	144

Source: INS *et al.*, 2012; FAO, 2015

A study by Montgomery (2002) revealed that in cities with a good piped water distribution network, adequate sanitation, drainage, waste removal and a good healthcare system, child mortality rates are usually about 10 per 1,000 live births and few deaths result from water-related diseases. The study also indicated that the rate is between 10–20 times higher in

urban areas with inadequate provision of these facilities. For cities in middle-income countries, the rate ranges from 50 to 100 per 1,000 live births.

Poverty

Under-nutrition usually has a very strong correlation with the level of poverty. Table 18 presents the latest data on the changes in the level of poverty in Cameroon. The national poverty line is defined to be 637 FCFA/day in 2007 (INS *et al.*, 2012). In general, the level of poverty remained essentially constant at about 40% from 2001–2007. Poverty is more severe in rural areas and while the rate has reduced by 5.7% in urban areas, it has instead increased from 52.1% to 55% from 2001–2007 in rural areas.

Table 18: Trends in the proportion of the population in Cameroon living below the national poverty line

Year	Proportion (%)		
	<i>National</i>	<i>Urban</i>	<i>Rural</i>
1996	53.3		
2001	40.2	17.9	52.1
2007	39.9	12.2	55

Source: INS *et al.*, 2012

However, reducing under-nutrition is easier in the context of economic growth and rising tax revenues—although these conditions do present challenges for keeping overweight and obesity in check (Ruel and Alderman 2013). As such, economic growth is an important determinant to improving the nutrition status of people.

Health care

There is a very strong link between health and nutrition and good health is not possible without good nutrition (The World Bank, 2013). It has been estimated that about 45% of child mortality can be attributed to under-nutrition (Black *et al.*, 2013). Improved health, starting with focus on the first 1,000 days of the life of a child, supports child nutrition and yields benefits not only for that child’s lifetime but across generations (Black *et al.*, 2013). The status of the health of the population can be determined by life expectancy and the mortality rate (adult and infant). The better the health of the population, the higher the life expectancy and the lower the mortality rates. The Gross National Income (GNI) per person is the aggregate income of an economy generated by its production and its ownership of factors of production, less the incomes paid for the use of factors of production owned by the rest of the world, converted to international dollars using PPP rates, divided by mid-year population.

The life expectancy in Cameroon is low when compared to countries with much lower GNI. Amongst the countries listed, Cameroon has the lowest life expectancy, and the value is lower than the average of the low-HDI countries and that of SSA. The mortality rates are also very high implying poor health facilities (Table 19).

Table 19: Indicators of the health status of Cameroonians compared to that of some African countries with similar or lower GNI per person

Country/region	GNI in 2013 (2011 PPPs)	Life Expectancy (Years)	Mortality rate (/1,000)		
			Adult in 2011		Under-5 in 2012
			Females	Males	
Madagascar	1,333	64.7	167	213	58
Rwanda	1,403	64.1	291	344	55
Ethiopia	1,303	63.6	265	306	68
Senegal	2,169	63.5	239	293	60
Kenya	2,158	61.7	294	346	73
Tanzania	1,702	61.5	322	363	54
Liberia	752	60.6	292	331	75
Zimbabwe	1,307	59.9	473	501	90
Uganda	1,335	59.2	363	410	69
Cameroon	2,557	55.1	372	415	95
Low-HDI countries	2,904	59.4	270	313	94
Sub Saharan Africa	3,152	56.8	327	372	97
Latin America and the Caribbean	13,767	74.9	98	181	19

Source: UNDP, 2014

Access to water and sanitation

Human health is closely linked to a range of water-related conditions like safe drinking water, adequate sanitation, minimised burden of water-related disease and healthy fresh water ecosystems (UN-Water, 2006). Statistics show that 90% of all diseases worldwide are related to water, resulting in the deaths of millions of people every year (UN-Water, 2006). Since children have weaker immune systems, the effect of poor quality water has a disproportionate effect on them. In developing countries, diarrhoea accounts for about 21% of all deaths in children under 5 years old. Access to adequate and safe water for basic needs therefore reduces the incidence of diarrhoea diseases and other gastro-intestinal infections. A survey by INS *et al.*, (2015) in the year 2014 reported that in Cameroon 20% of children below the age of 5 years had had diarrhoea within the past two weeks.

Table 20 shows the trend in the percentage of the population of Cameroonians with access to an improved drinking water source by region. Despite the abundant water resources in Cameroon (Fonteh, 2008), only about 60% of the population had access to improved water supply by the year 2010. There has been an improvement of about 10% since the year 2001.

Table 20: Percentage of the population in Cameroon with access to improved drinking water sources

Region	Year		
	2001	2005	2010
Douala	83.5	90.0	96.4
Yaoundé	93.0	91.4	89.1
Littoral excluding Douala	56.2	67.6	78.6
South West	78.2	66.3	75.4
Adamawa	41.8	40.4	60.7
National	49.7	50.5	59.8
West	29.6	38.2	59.7
Centre excluding Yaoundé	23.5	47.6	58.8
North West	47.9	52.0	51.5
South	33.0	39.7	44.3
Far North	40.7	32.9	37.8
North	42.8	28.0	35.4
East	12.8	26.7	25.3
Urban Areas	84.4	84.6	88.5
Rural Areas	31.2	32.8	42.0

Source: INS *et al.*, 2012

There is great disparity in access between urban and rural areas and between the regions. The two main cities in Cameroon, (Yaoundé and Douala) have the highest proportion of their population with access to water. Access to potable water is lowest in the East region (25.3%), North (35.4%), and Far north (37.8%).

There is a lot of discrepancy between the data on Table 20 and that provided by other sources. For example, WHO and UNICEF (2015) estimated that in the year 2010, 72% of Cameroonians had access to improved drinking water sources: with 93% in urban areas and 50% in rural areas. The Ministry of Energy and Water Resources (MINEE) (2014), citing the statistical yearbook of the African Development Bank indicates the access to potable water in Cameroon was 89% in 2011. The same author indicated the access rate was about 50% in 2007. It is very unlikely that from 2007 to 2011, the rate of access could have increased by 39% considering that most urban areas in Cameroon have been experiencing water shortages over the last couple of years. It is also ironic that MINEE, which should be the authoritative as far as water supply is concerned does not have data of its own but is quoting data from an external source. For this study, the data in Table 20 is considered more credible because it was obtained from a survey of thousands of Cameroonians.

Table 21 shows the trend in the percentage of Cameroonians using improved sanitation facilities by region. In the year 2010, only about one in two Cameroonians had access to adequate sanitation. There has been progress since the year 2001 but it has been very slow. There is also great disparity between urban areas (81.3%) and rural areas (34.3%). The regional disparities are, again, significant. The region with the worst access is the Far North

region with only 16.9%. This is followed by the North region (32.6%) and the East region (35.8%). Other regions have at least 50% of their population with access to decent sanitation.

Table 21: Trend in the percentage of the population of Cameroonians using improved sanitation facilities by region

Region	Year		
	2001	2005	2010
Yaoundé	79.8	78.8	85.8
Douala	70.6	75.5	85.4
Littoral excluding Douala	58.4	54.2	66.8
South West	55.3	49.2	61.4
Adamawa	47.2	42.7	60.6
West	43.5	47.6	56.4
North West	27.1	35.8	56.2
South	57.5	52.2	55.6
National	44.7	41.5	52.4
Centre excluding Yaoundé	31.4	40.4	37.9
East	33.1	44.3	35.8
North	27.4	12.4	32.6
Far North	27.2	15.2	16.9
Urban Areas	77.3	75.0	81.3
Rural Areas	27.4	24.2	34.3

Source: INS *et al.*, 2012

There is also a discrepancy between the data provided by WHO and UNICEF (2015) on the percentage of Cameroonians using an improved sanitation facility. For example in 2010, they estimate that 45% of Cameroonians were using an improved sanitation facility; with 62% in urban areas and 27% in rural areas. This is significantly lower than the results by the INS in Table 21. This shows that the availability of reliable and consistent data on this indicator is problematic in Cameroon.

Education

The ability to learn and the nutrition of a child are inextricably linked. It has been shown that access to information, education, going to school and informal knowledge enhances health and food choices, income growth and nutrition (UNSCN, 2015). A study by Smith and Haddad (2014) concluded that the education of girls in particular had a very direct link to improved nutrition of their children. Education also indirectly results in girls getting married later when their bodies are more mature and reduces infant mortality rates. According to

Ruel and Alderman (2013), quality education and learning especially of girls leads to improvements in caring practices and dietary choices.

For education, the most nutrition-sensitive indicator is the proportion of females with secondary education. Figure 6 shows that nationally, girls make up less than half (45.8%) of the total enrolment in secondary schools in Cameroon. Increased female education is crucial for strengthening the Agriculture–Nutrition nexus.

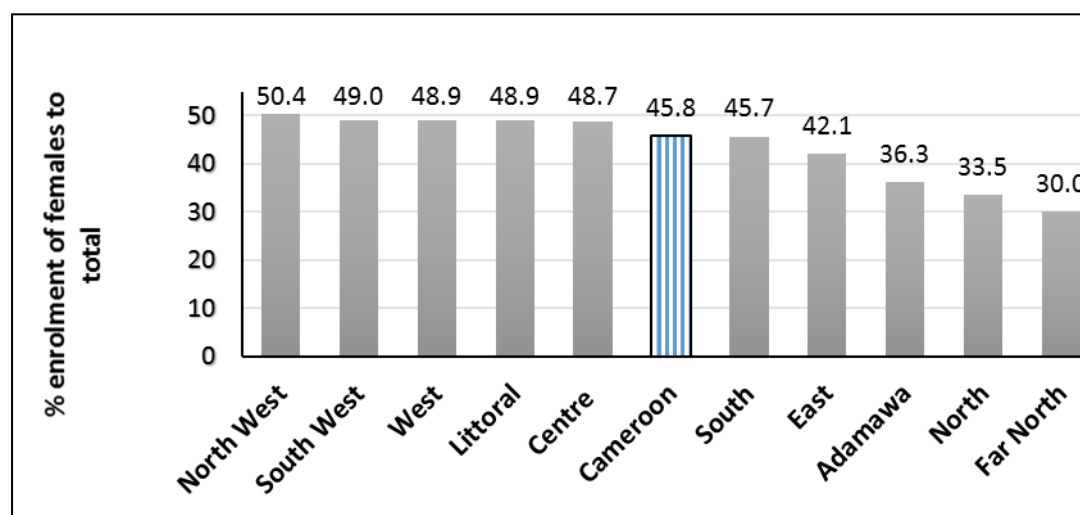


Figure 6: Females in secondary schools as % of total enrolment in 2013

Source: INS, 2014

There are enormous regional differences as can be seen: there are five regions with percentages above the national average and five also below the average. The regions with the lowest female enrolment are the three northern regions of Adamawa, North and Far North with% in the 30s. The low level of education of females is a contributing factor to the high prevalence of malnutrition and poverty that prevail in these regions. Only the North West region records more females in secondary schools than males. It can also be expected that there will be significant differences as well between urban and rural zones.

Table 22 presents the level of education of Cameroonians compared to that of some African countries with similar or lower GNI per person. The adult and the youth literacy rate in Cameroon is much significantly higher than the average in SSA and also that of the low-HDI countries. About one in five women in Cameroon have at least secondary education. This proportion is much higher than the average in the low-HDI countries and it is about the same as the average in SSA. However, there is still much to be done to improve considering that in Zimbabwe and in Latin America and the Caribbean about one in two women have at least a secondary school education.

Table 22: Indicators of the level of education of Cameroonians compared to that of some African countries with similar or lower GNI per person

Country/region	Literacy Rate, 2005–2012		Population with at least some secondary education, 2005–2012 (% aged 25 and above)	Female population with at least some secondary education in 2005–2012 (% aged 25 and above)
	Adult (% aged 25 and above)	Youth (% aged 15–24)		
Zimbabwe	83.6	90.9	55.4	48.8
Kenya	72.2	82.4	28.6	25.3
Uganda	73.2	87.4	28.8	22.9
Cameroon	71.3	80.6	27.9	21.1
Liberia	42.9	49.2	27.3	15.7
Ethiopia	39.0	55.0	12.5	7.8
Rwanda	65.9	77.3	7.7	7.4
Senegal	49.7	65.0	10.8	7.2
Tanzania	67.8	74.6	7.4	5.6
Madagascar	64.5	64.9	ND	ND
Low-HDI countries	58.2	70.2	21.1	14.3
Sub Saharan Africa	58.9	69.2	25.9	21.9
Latin America and the Caribbean	91.5	97.1	54.7	53.3

Source: UNDP, 2014 (ND=Not Determined)

From Table 23, the percentage of females in relation to the total enrolment in secondary schools is about 46%. Ideally this should be about 50% since the female-male ratio of the national population is about 1:1. INS *et al.*, (2015) indicates that the secondary school enrolment rate is 55% for males and 50% for females. This indicates that about 55% of males of school-going age actually attend secondary schools compared to about 50% for females.

Table 23: Trend in the percentage of females in the total enrolment of secondary schools in Cameroon

Year	% of females
2011	45.51
2012	45.82
2013	45.82

Source: INS, 2014

Gender equality and women's empowerment

Gender equality and empowerment especially of girls and women is an important determinant of the nutrition status of the population. This is partly because of the important role women play in food production, food preparation and childcare; and partly because of their vulnerabilities related to reproductive health (Pinstrup-Andersen, 2011). EU *et al.*, (2014) recommend that equity could be improved through participation, access to resources and employment of the vulnerable. Women should be empowered by ensuring access to productive resources, income opportunities, extension services and information, credit, labour and time-saving technologies (including access to food preservation and preparation techniques, energy and water services), and inclusion in household and farming decisions. Equitable opportunities to earn and learn should be compatible with safe pregnancy and young-child feeding.

The Gender Inequality Index (GII), proposed by the UNDP, assesses levels of empowerment of women and gender inequalities (UNDP (2014)). It is a composite index reflecting inequality in achievement between women and men in three dimensions:

- reproductive health measured by maternal mortality ratio and adolescent birth rate;
- empowerment estimated using the proportion of parliamentary seats occupied by females, and the proportion of adult females and males aged 25 years and older with at least some secondary education;
- economic status expressed as labour market participation and measured by labour force participation rate of female and male populations aged 15 years and older

The greater the equality or level of empowerment of women, the smaller the value of the GII. Table 24 shows GII values for Cameroon and some African countries considered to have a low-HDI and with a GNI about the same or lower than that of Cameroon.

Table 24: GII for Cameroon and some low-HDI African countries with a GNI about the same or lower than that of Cameroon

Country/region	GII in 2013	Maternal mortality ratio in 2010 (deaths per 100,000 live births)	Adolescent birth rate in 2010–2015 (births per 1,000 women aged 15–19)	Share of seats in parliament in 2013 (% held by women)	Female population with at least some secondary education in 2005–2012 (% aged 25 and above)	Female labour force participation rate in 2012 (% aged 15 and above)
Rwanda	0.41	340	33.6	51.9	7.4	86.5
Zimbabwe	0.516	570	60.3	35.1	48.8	83.2
Uganda	0.529	310	126.6	35	22.9	75.9
Senegal	0.537	370	94.4	42.7	7.2	65.9
Ethiopia	0.547	350	78.4	25.5	7.8	78.2
Kenya	0.548	360	93.6	19.9	25.3	62
Tanzania	0.553	460	122.7	36	5.6	88.1
Cameroon	0.622	690	115.8	16.1	21.1	63.6
Liberia	0.655	770	117.4	11.7	15.7	58.2
Madagascar	nd	240	122.8	15.8	nd	86.8
Low-HDI countries	0.587	427	92.3	20	14.3	55.7
Sub Saharan Africa	0.578	474	109.7	21.7	21.9	63.6
Latin America and the Caribbean	0.416	74	68.3	25.3	53.3	53.7

Source: UNDP, 2014

Based on this, Cameroon has GII of 0.622 and ranked 138 out of 152 countries in 2013. Factors contributing to this poor score are the high maternal mortality rate (690 per 100,000 births) and high adolescent birth-rate (115.8 births per 1,000 in women aged 15–19). In addition, only about 16% parliamentary seats are occupied by women, compared to the SSA average of about 22. The results indicate that Cameroon has a lot of work to do as far as gender equality and women empowerment is concerned. A country like Rwanda has done quite well in this regard in spite of its low literacy rate (especially of women).

Nutrition governance

Nutrition governance can be defined as: a set of systems put in place for stakeholders to take and implement decisions relating to nutrition security. The systems could be political,

social, economic and administrative. Each society has to determine its own course and the most appropriate governance structure. This will depend on the stage of development, available financial and human resources, its traditions, norms and other specificities. However, the following principles should be used as the basis for developing a good and effective governance system:

- Open and transparent
- Inclusive and communicative (encourage all to participate)
- Holistic (consider all stakeholders, sectors etc. and their inter-connections).

There are three ingredients that should be implemented concurrently for any effective governance. These are:

- 1) An enabling environment. This is determined by:
 - a) An adequate nutrition_policy for the interpretation, application and enforcement of legislation.
 - b) Legislation on nutrition that defines the rules of the game and authorises various stakeholders to play their roles.
 - c) Financial resources for institutions to function to ensure nutrition security.
- 2) An effective institutional framework for enhancing nutrition security in Cameroon. This should:
 - a) Clearly define the roles and functions of various stakeholders.
 - b) Provide an adequate co-ordination mechanism.
 - c) Provide a forum for stakeholders to dialogue, share information and experiences, and strengthen capacity.
 - d) Provide an effective institutional capacity-building programme at all levels to develop human resources and enhance performance.
- 3) Management Instruments
 - a) Management instruments are required to provide a sound basis for policy formulation, planning, coordination and investment decisions as well as for operational management and monitoring of nutrition security.

Each of these three ingredients will now be analysed for the case of Cameroon to assess the effectiveness of nutrition governance in Cameroon.

Enabling Environment

The enabling environment for Cameroon can be determined from the following indicators: existence of policies and legislation on nutrition; and the financial and human resources available to ensure nutrition security (investment budget in agriculture, health, education, social protection, personnel in health sector, water and sanitation etc.).

Policies and legislation on nutrition

There are currently no nutrition-related laws in Cameroon but there are many policy instruments that have been adopted and implemented over the years. These include:

- the adoption of a *National Policy on Food and Nutrition* (NPFN) in 2006 (currently being revised);

- the creation of an inter-ministerial commission on food security in 2010;
- the admission of Cameroon into the SUN movement in 2013;
- the creation of an inter-ministerial commission to combat malnutrition in the three northern regions and the East region in 2014;
- the adoption in 2014 of a national policy on gender for 2011–2020;
- the elaboration of a revised NPFN for 2015–2034 (in 2015). The vision of the latest NPFN is to significantly reduce the incidence of malnutrition through concerted actions on the important determinants of the status of malnutrition (Republique du Cameroun, 2015). These include: improved food security, water and sanitation, and nutrition education to effect behaviour changes. The government considers the improvement of the nutrition status of the population to be a social development issue and an economic development issue. To attain the objectives of the NFNP, sectoral strategies in health, agriculture, social protection, and water and sanitation were to be developed and implemented. The previous NPFN did not attain its objectives because of insufficient human, financial and material resources for the implementation of the policy from 2006–2011.

Human and financial resources

As mentioned earlier mentioned, there is no available data on the number of nutrition specialists in the country. Since the nutrition sub-sector is embedded in the Ministry of Health (MINSANTE), most of the personnel involved at various levels in this sector are employees of this ministry, who were originally trained for other services and are not competent to handle nutrition-related issues. Reportedly, there is no special budget allocated to the sub-sector. However, MINSANTE finances activities carried out by the nutrition sub-sector.

The higher the proportion of GDP spent on health, agriculture, education and social protection, the better the enabling environment can be expected to be. Similarly the greater the human resources devoted to nutrition-sensitive sectors like health, education etc. the, better the enabling environment for improving the status of nutrition. Table 25 shows some of the above mentioned indicators for Cameroon and a number of countries in Africa with lower or similar GNI. Data on expenditures on agriculture and on social protection are not available.

Table 25: Financial and human resources allocated to the health and education sectors in Cameroon compared to that of some African countries with similar or lower GNI per person

Country/region	# of Physicians in 2003–2012 (1,000)	Expenditures on Health		Pupil–Teacher Ratio, 2003–2012	Expenditure on Education 2005–2012 (% of GDP)
		(% of GDP)	(% by Households)		
Cameroon	0.08	5.2	65.1	46	3.2
Ethiopia	0.03	4.7	33.8	54	4.7
Kenya	0.18	4.5	46.4	47	6.7
Liberia	0.01	19.5	17.7	27	1.9
Madagascar	0.16	4.1	25.2	43	2.8
Rwanda	0.06	10.8	21.4	59	4.8
Senegal	0.06	6.0	32.7	32	5.6
Tanzania	0.01	7.3	31.7	46	6.2
Uganda	0.12	9.5	47.8	48	3.3
Zimbabwe	0.06	Not available	Not available	39	2.5
Low-HDI countries	0.28	5.2	52.7	Not available	3.7
Sub Saharan Africa	0.18	6.3	27.6	Not available	5.2
Latin America and the Caribbean	ND	7.6	34.4	Not available	5.2

Source: UNDP, 2014

The density of physicians in Cameroon in 2012 was very low compared to the average in SSA and in the other low-HDI countries. The density is less than half of the average density in SSA and less than a third of average density of the low-HDI countries (Figure 7). From 2004–2005 there was a very sharp drop in the density of both physicians and nurses/midwives. Since then the situation has improved slightly but has not returned to the densities of the year 2004. WHO (2015) estimated that countries or regions with fewer than 0.23 health workers (physicians + nurses + midwives) per 1,000 persons generally fail to achieve adequate coverage rates for selected primary health-care interventions as prioritised by the MDG framework. Based on this guideline, the national average density of 0.258 in Cameroon is adequate to ensure the provision of basic health-care to the population. There are, however, great regional variations, which indicate that some regions are greatly understaffed while others have more than the required basic density. Table 26 shows the density of health-workers by region in Cameroon in 2010. The national average of 0.24 is acceptable by WHO standards, but there is great disparity from region to region—with six regions having densities lower than the minimum suggested density. The Far North region has the

lowest density of 0.1 followed by the North, South West, Adamawa, the North West and then the Littoral region, with a density just below the minimum of 0.22. In terms of the density of the health workforce, the Centre region has the best medical coverage in Cameroon followed by the West, the East and the South regions.

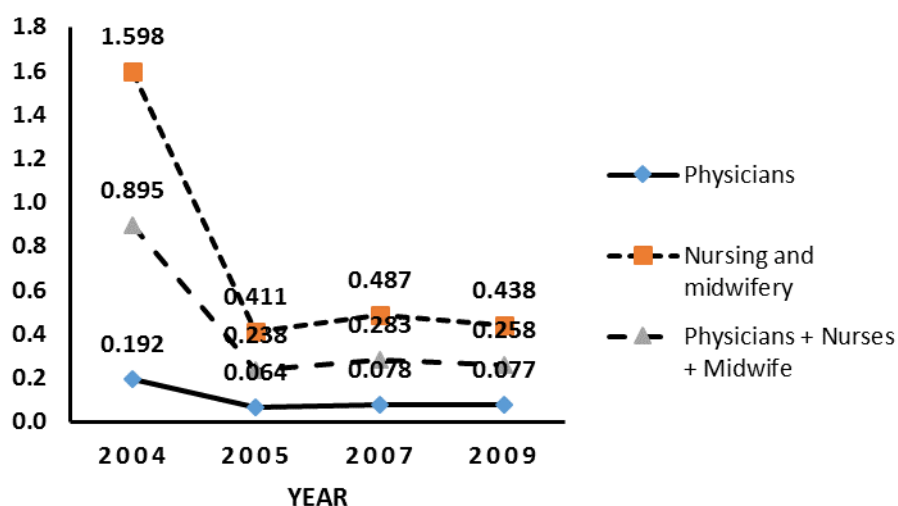


Figure 7: Trends in the density of the health workforce in Cameroon

Source: WHO, 2015

Table 26: Density of the health workforce by region in Cameroon in 2010

Health work force	Adamawa	Centre	East	Far North	Littoral	North	North West	West	South	South West	National
Nurses/1,000 persons	0.32	0.64	0.60	0.17	0.38	0.25	0.33	0.64	0.54	0.31	0.40
Medical doctors/1,000 persons	0.04	2.2	0.07	0.02	0.06	0.02	0.02	0.05	0.09	0.03	0.07
Doctors + Nurses	0.18	0.43	0.34	0.10	0.22	0.14	0.18	0.35	0.32	0.17	0.24

Source: INS, 2014

The percentage of GDP that Cameroon spends on health is lower than the average of other SSA countries, but about the same as that spent on average by low-HDI nations. Cameroon has one of the highest percentages (65%) of health expenditures covered by household income amongst the countries on the table. The percentage is higher than that of the average of the low-HDI countries and that of SSA, suggesting that the financial resources devoted to the health sector in Cameroon are not efficiently spent.

As concerns the enabling environment in Cameroon, there is a good policy environment on paper but implementation is poor mainly due to insufficient financial and human resources—

suggesting that the political will and commitment is inadequate. Secondly, the use or allocation of the available financial and human resources is not optimal, leading to great disparities between regions. For example, the national average ratio of doctors + nurses in Cameroon is 0.24 per 1,000 persons. According to the WHO (2015), this is adequate to provide basic health-care to the population. However, there are regions with ratios much greater than the required norm, while others have much lower ratios. The Centre region for example has a ratio four times higher than that in the Far North region.

Effective institutional framework

- 1) Existence and effectiveness of a coordination mechanism on ensuring nutrition security.
The inter-ministerial commissions on food security created in 2010 and 2014 to combat malnutrition in four regions are the coordinating mechanisms created to ensure nutrition security in Cameroon. The membership of these commissions includes the key ministries that deal with the main determinants of the status of nutrition in Cameroon. Being an inter-ministerial commission, ministries are well represented but the civil society has little or no place.
- 2) Existence and effectiveness of stakeholder platforms
Cameroon's admission into the SUN movement provided another opportunity for the coordination of activities and the creation of a stakeholder platform. This is because at the national level of each SUN member state and under the coordination of a national focal point, stakeholders are supposed to be brought together to:
 - a) work together, effectively, through functioning multi-sector, multi-stakeholder platform(s);
 - b) establish (and seek legislative endorsement for) a coherent policy and legal framework;
 - c) identify common objectives and agree a framework of results around which to align and intensify actions; and
 - d) mobilise sufficient domestic resources, supplemented with external assistance, to realise the agreed results as quickly as possible.The national SUN platform is broad-based and includes representatives of the different key stakeholders concerned with ensuring FNS in Cameroon. It comprises representatives from government ministries and departments, as well as from the donor agencies and development banks, the UN system, civil society, business and researchers. Unfortunately, due to limited financial resources, the national SUN platform in Cameroon has not been very active
- 3) Existence and effectiveness of a capacity-building program
There is no existing capacity building programme for the nutrition sub-sector although training programs on nutrition exist in some universities and colleges.

As concerns the institutional frame work, it is adequate in terms of the existence of coordination mechanisms and stakeholder platforms. However, the effectiveness of these mechanisms is doubtful due to insufficient human and financial resources.

Management instruments

The key management instrument required to provide a sound basis for policy formulation, planning, coordination and investment decisions, along with operational management and

monitoring of nutrition security is accurate, up-to-date data. Data is required on available human resources; determination of indicators to evaluate the determinants of nutrition; and the financial resources allocated for food and nutrition especially social protection. Such data is not available in Cameroon.

Stakeholder Analysis of the Agriculture–Nutrition Nexus in Cameroon

The success in combating food insecurity and malnutrition in Cameroon depends a lot on the active participation and collaboration of the major stakeholders involved in the agriculture–nutrition nexus. The active involvement of stakeholders means that they have to commit time and resources to the process, ranging from the time the stakeholders spend in taking part in the process to the provision of technical know-how and financial resources (Dick, 1997). This section deals with the various stakeholders operating within the nexus in Cameroon, their interests, relations and power.

Identification and clustering of stakeholders

Many of the stakeholders identified in the agriculture–nutrition nexus intervene directly within the nexus while a lesser number intervene indirectly.

The institutional framework of the different stakeholders has been identified as follows:

- Policy-makers (government institutions)
- Research and training (educational institutions)
- UN system (UN organs)
- NGOs (national and international)
- The business world (food processors)
- Farmer’s associations/women’s groups
- Consumer syndicates
- Donors
- Mass media

Based on this framework, the various stakeholders were clustered as follows:

Table 27: Identification and clustering of stakeholders

Cluster	Stakeholders
Policy-makers	MINSANTE, Ministry of Agriculture and Rural Development (MINADER), Ministry of Livestock, Fishery and Animal Industries (MINEPIA), Ministry of Finance (MINFI), Ministry of Research and Scientific Innovations (MINRESI), Ministry for the Protection of the Woman and the Family (MINPROFF), MINATD, MINEE, Ministry of Transport (MINT), Ministry of Commerce (MINCOM), Ministry of Higher Education (MINESUP), MINSEC, MINEDUB, Ministry of Small and Medium Industries and Handicraft (MINPMEESA), Ministry of Culture (MINCUL), Ministry of Telecommunication (MINTEL), Ministry of Social Affairs (MINAS)
Research and training	MINRESI, MINESUP, Ministry of Basic Education (MINEDUB), MINSEC
UN system	UNICEF, FAO, WFP, WHO, UNDP, United Nations High Commission for Refugees (UNHCR), UN Women
NGOs	International: HKI, Plan Int., Counterpart Intl, French Red Cross, CARE, Netherlands Development Company (SNV), New Partnership for African Development (NEPAD), The African Institute for Economic and Social Development (INADES) National: Western Highlands Nature Conservation Network (WHINCONET), Health and Development Consultancy Services (HEDECS), Society for Initiatives in Rural Development and Environmental Protection (SIRDEP), Community Initiative for Sustainable Development (COMINSUD)
Business world (Food processors)	Oil processors (Diamor, Mayor, Palm'or, Mula palm); salt processors (Sasel, Ngwang); flour processors such as Cameroon Company for transforming cereals (SCTC), Grand moulins and La Pasta; National Water Supply Company (SNEC); water bottling companies (Tangui, Supermont, Semme, Madiba, Sano)
Farmer's associations/Women's group	Cameroon National Association for Family Welfare (CAMNAFAW), OFSAD, Mbororo Social, Cultural and Development Association (MBOSCUDA), Sub-Regional Platform of Farmer's Organisations in Central Africa (PROPAC)
Consumer syndicates	National Alliance Against Hunger Food Policy and Strategy (COSADER), Association of Citizens for the Defence of Common Interests (ACDIC), Cameroon Movement on the Right to Food (CAMORIF)
Donors	AFD, M/S Dell Foundation, The Bill & Melinda Gates Foundation, the World Bank (WB), United States Agency for International development (USAID), International Fund for Agricultural Development (IFAD), Department of Food And International Trade (DFAIT), Sight for life, Global Environment Fund (GEF), (Central Response Emergency Fund) CERF, Japanese Embassy Fund, Government of Belgium, African Development Bank (ADB), European Union (EU)
Mass media	Cameroon Radio Television (CRTV), Cameroon Tribune, The Post, The Messenger, The Horizon, The Herald, Canal 2 International, Equinox, Radio Hot cocoa, NDEFCAM radio, Abakwa FM

Stakeholder interests, relations and power

It is essential that all the stakeholders in the agriculture–nutrition nexus be involved in the fight against food insecurity and malnutrition. Therefore it is necessary to assess the type and level of involvement of each stakeholder with respect to FNS.

Stakeholder interests/activities and competences

The type of involvement depends on the characteristics of each stakeholder: activities, interests, relations and power (influence and importance). The level of competence is based on the available resources (human, financial and infrastructure) to address food and/or nutrition issues. Table 28 gives a summary of the characteristics of each stakeholder.

Table 28: Stakeholder interests/activities and competences

Stakeholder	Interests and activities	Level of Competence
MINSANTE	<ul style="list-style-type: none"> • Elaboration and execution of national policy on public health • Promotion of food hygiene, nutrition education • Development of strategies for preventing and treating nutrition problems • Quality control of food products • Coordinates and supervises all national programs/interventions on feeding and nutrition • Focal point of the government in the SUN movement 	High: Has a sub-directorate in charge of feeding and nutrition; which also co-ordinates SUN-Cameroon
MINADER	<ul style="list-style-type: none"> • Elaboration and execution of national policy on agriculture and rural development • Develop and execute strategies that guarantee food self-sufficiency/security • Coordinates management of agriculture and food security crises • Liaison between government and FAO/WFP • Coordinates and supervises all national programs/interventions on food security 	High: Has a large number of qualified personnel (in food production) and offices distributed all over the country; Has a sub directorate in charge of food security
MINEPIA	<ul style="list-style-type: none"> • Elaboration and execution of national policy on animal husbandry and fisheries and related industries 	High: Has a large number of qualified personnel (in animal production) and offices distributed all over the country
MINFI	<ul style="list-style-type: none"> • Elaboration and execution of national policy on financial, budgetary, fiscal and monetary issues; allocation, disbursement and follow- up and control of budget execution. 	High: decides the extent of the government's financial support in food/nutrition security
MINATD	<ul style="list-style-type: none"> • Elaboration and follow-up of rules and standards for preventing and managing natural disasters • Coordinating national and international interventions in times of natural disasters 	High
MINEE	<ul style="list-style-type: none"> • Elaboration and execution of national policy on production, transportation and distribution of water and energy 	High
MINT	<ul style="list-style-type: none"> • Elaboration and execution of national policy on transport and road safety 	Moderate

Stakeholder	Interests and activities	Level of Competence
	<ul style="list-style-type: none"> Development and functioning of all means of transport (air, land, sea, rail, rivers, etc.) 	
MINPROFF	<ul style="list-style-type: none"> Elaboration and follow-up of government policy for promotion and respect of women's rights and protection of the family Studies and proposes strategies that facilitate employment of women and that reinforces promotion/protection of children's rights 	Moderate
MINCOM	<ul style="list-style-type: none"> Elaboration and execution of national policy/strategies to promote Cameroonian products, regulation of food prices, negotiation of trade agreements, homologation of standards 	Low
MINRESI	<ul style="list-style-type: none"> Elaboration and execution of national of policy on scientific research and innovations Responsible for the valorisation, dissemination and exploitation of research results 	High: A large number of qualified researchers. Has two institutes directly related to food security: the Research Centre for Food and Nutrition, and the Agricultural Research Institute for Development
MINPMEESA	<ul style="list-style-type: none"> Elaboration and execution of national policy to promote creation of small and medium enterprises/handicraft and sales of their products Promote creation of private initiatives especially women groups 	Low
MINAS	<ul style="list-style-type: none"> Elaboration and execution of national policy to protect and assist socially vulnerable people Fight against social exclusion Follow-up of procedures that protect abandoned children 	Low
MINESUP, MINSEC, MINEDUB	<ul style="list-style-type: none"> Elaboration and monitoring of national policy on education (primary, secondary and tertiary levels) 	Low
MINCUL	<ul style="list-style-type: none"> promotes cultural heritage intermediary between traditional and modern world 	Low
MINTEL	<ul style="list-style-type: none"> Elaboration and execution of national policy on telecommunication 	Low
UNICEF	<ul style="list-style-type: none"> Providing life-saving assistance to children affected by disasters Protecting children's rights in any circumstances Promoting health and nutrition, water and sanitation Represents the UN system in SUN-Cameroon 	High
FAO	<ul style="list-style-type: none"> Promotion of sustainable agriculture and food security/biosecurity 	High

Stakeholder	Interests and activities	Level of Competence
	<ul style="list-style-type: none"> • Nutrition and consumer protection • Forestry and sustainable development • Fishery development 	
WHO	<ul style="list-style-type: none"> • Providing leadership on matters critical to health and engaging in partnerships where joint action is needed • Providing technical support, catalysing change, and building sustainable institutional capacity • monitoring the health situation and assessing health trends 	High
WFP	<ul style="list-style-type: none"> • Provide emergency assistance to displaced persons (food, money) • Develop and execute nutrition programs with refugees • monitoring and assessing of nutrition status and trends 	High
UNDP	<ul style="list-style-type: none"> • Promotion of sustainable development in the areas of natural resource management and agriculture • Health, education, micro credits, infrastructural development 	Low
UNHCR	<ul style="list-style-type: none"> • Protect the rights of refugees • Ensure the well-being of refugees • Emergency interventions to refugees (food, medication, money, etc.) • Execute development programs for refugees (education, food production, health-care, etc.) 	High
UN Women	<ul style="list-style-type: none"> • Defend the rights of women • Promote gender equality and equity • Promote women's empowerment 	High
HKI	<ul style="list-style-type: none"> • Reducing malnutrition in children and women • Preventing blindness through vitamin A supplementation • Empowering women through homestead food production • Represents the civil society in SUN-Cameroon 	High
Plan International	<ul style="list-style-type: none"> • Hygiene and sanitation • Community capacity building • Livelihood promotion • Promotion of health related activities and education 	Moderate
CARE	<ul style="list-style-type: none"> • Rural water supply, sanitation and environmental protection • Agriculture and natural resources management • Civil society strengthening 	Moderate

Stakeholder	Interests and activities	Level of Competence
	<ul style="list-style-type: none"> • Primary healthcare and food security • Capacity building 	
SNV	<ul style="list-style-type: none"> • Natural Resource Management • Capacity building • Local governance and private sector development 	Low
SNEC	<ul style="list-style-type: none"> • Supply of piped water throughout the national territory 	High
Diamoor, Palm'or, Mayor	<ul style="list-style-type: none"> • Processing and sale of cooking oil • Enrichment of oil with vitamin A 	High
Sasel, Ngwang	<ul style="list-style-type: none"> • Processing and sale of table salt • Enrichment of salt with Iodine 	High
Water bottling companies	<ul style="list-style-type: none"> • Production and sale of bottled water 	Low
SCTC, LA Pasta, Grand Moulins	<ul style="list-style-type: none"> • Processing and sale of flour • Enrichment of flour with micronutrients 	High
WHINCONET, SIRDEP, INADES	<ul style="list-style-type: none"> • Sustainable management of natural resources on the western highlands (forests, water), • Promotion of agriculture/animal husbandry • Biodiversity conservation, wetland management • Capacity building and networking 	High: WHINCONET is made of 10 NGOs and four CBOs
HEDECS	<ul style="list-style-type: none"> • Promotion of health, nutrition, microfinance, water and sanitation • Training, field studies, and supervision of networks of community facilitators 	Moderate
CAMNAFAW	<ul style="list-style-type: none"> • Defending interests and rights of women and the family • Promoting women's empowerment by facilitating access to loans • Education on health and family planning 	High
OFSAD	<ul style="list-style-type: none"> • Promotion of family health, nutrition • Evaluation of nutritional status of communities • Capacity building 	High
MBOSCUDA	<ul style="list-style-type: none"> • Organisation of cattle breeders into networks for sustainable grazing of cattle • Pasture improvement and natural resource management • Prevention of farmer-grazier conflicts • Capacity building 	Moderate
COMINSUD, COSADER,	<ul style="list-style-type: none"> • Sustainable development • Capacity building 	Moderate

Stakeholder	Interests and activities	Level of Competence
PROPAC	<ul style="list-style-type: none"> • Networking • Sourcing of funds 	
ACDIC, CAMORIF	<ul style="list-style-type: none"> • Protection of the rights of the population and increasing engagement in the management of public affairs. • Studies and research on topical issues. • Fight against poverty • Dissemination of information 	High
AFD	<ul style="list-style-type: none"> • Represents donors in SUN-Cameroon 	Moderate
WB	<ul style="list-style-type: none"> • Provision of loans and credits for development • Analytical and advisory services to meet development needs • Poverty eradication and debt relief 	High
EU	<ul style="list-style-type: none"> • Development cooperation with countries in the south • Poverty reduction for equitable development • Infrastructural development • Research and technological development • Humanitarian aid 	High
NEPAD	<ul style="list-style-type: none"> • Promote agriculture and rural development • Poverty reduction for equitable development 	High
ADB	<ul style="list-style-type: none"> • Mobilisation of resources for the economic, social and political development of its member countries Promotion of initiatives on good governance, economic development and cooperation between the government, civil society and the private sector • Collection and dissemination of information on development issues in Africa 	Moderate
M/S Dell Foundation, The Bill & Melinda Gates Foundation, USAID, IFAD, DFAIT, Sight for life, GEF, CERF, Japanese Embassy Fund, Government of Belgium, Counterpart international, French Red Cross	<ul style="list-style-type: none"> • Promotion of fight against poverty • Financing of development initiatives • Promotion of initiatives on good governance, economic development and cooperation between the government, the civil society and the private sector • Capacity building 	High
CRTV, Cameroon Tribune, The Post, The Messenger, The Herald, Canal 2 International, Equinox	<ul style="list-style-type: none"> • Collection and analysis of information on issues of national and international interests • Dissemination of information to the public on food security and nutrition issues affecting Cameroonians. 	High

Stakeholder relations/linkages

Active participation and collaboration of the main stakeholders in the nexus is crucial for attaining FNS in Cameroon.

Policy-makers (government ministries) work collaboratively since there are specific guidelines for their roles and responsibilities. The relationship between policy-makers and the civil society (NGOs, associations, activists, etc.) is not yet well defined. The major relationship is in the form of the regulation of the activities of the civil society by the government. In general, interactions between policy-makers and many stakeholder groups is limited and often unidirectional as illustrated in Figure 8. This negatively affects collaboration, which ultimately weakens the nexus.

There is some degree of cooperation among some of the NGOs. For example, HKI operates as a technical advisor to other NGOs by helping them incorporate nutrition aspects in their respective programs. Generally, there are no specific guidelines with respect to the specification of their activities. This may lead to conflicts and duplication of activities. Hence, efforts should be made to reinforce networking and coordination between the NGOs.

Food processing companies (particularly salt and oil processors, for now) are required by the government to enrich their products with specified micronutrients before sale. Because profit-making is the main interest of such companies, it is difficult for them to work effectively in collaboration with the other stakeholder clusters. There should be close monitoring of their activities and products for quality control, especially to ensure that government requirements are respected.

There is a good working relationship between international organisations (UN system and Donors) and policy-makers because of specific bilateral agreements that exists. Also, there is close collaboration between international organisations and NGOs (international and national) in particular because of the various types of support provided by international organisations to NGOs. Associations also get support from donors and sometimes from the government while pressure groups (activists) are mostly supported by the private sector and some international NGOs. CRTV and Cameroon Tribune are financed by, and work in close collaboration with, the government while the other mass media organisations are sponsored by the private sector.

All the above-mentioned stakeholders have varied interests and needs with respect to ensuring FNS in the country. Therefore linkages between them need to be created and/or strengthened so as to consolidate their activities towards the same goal.

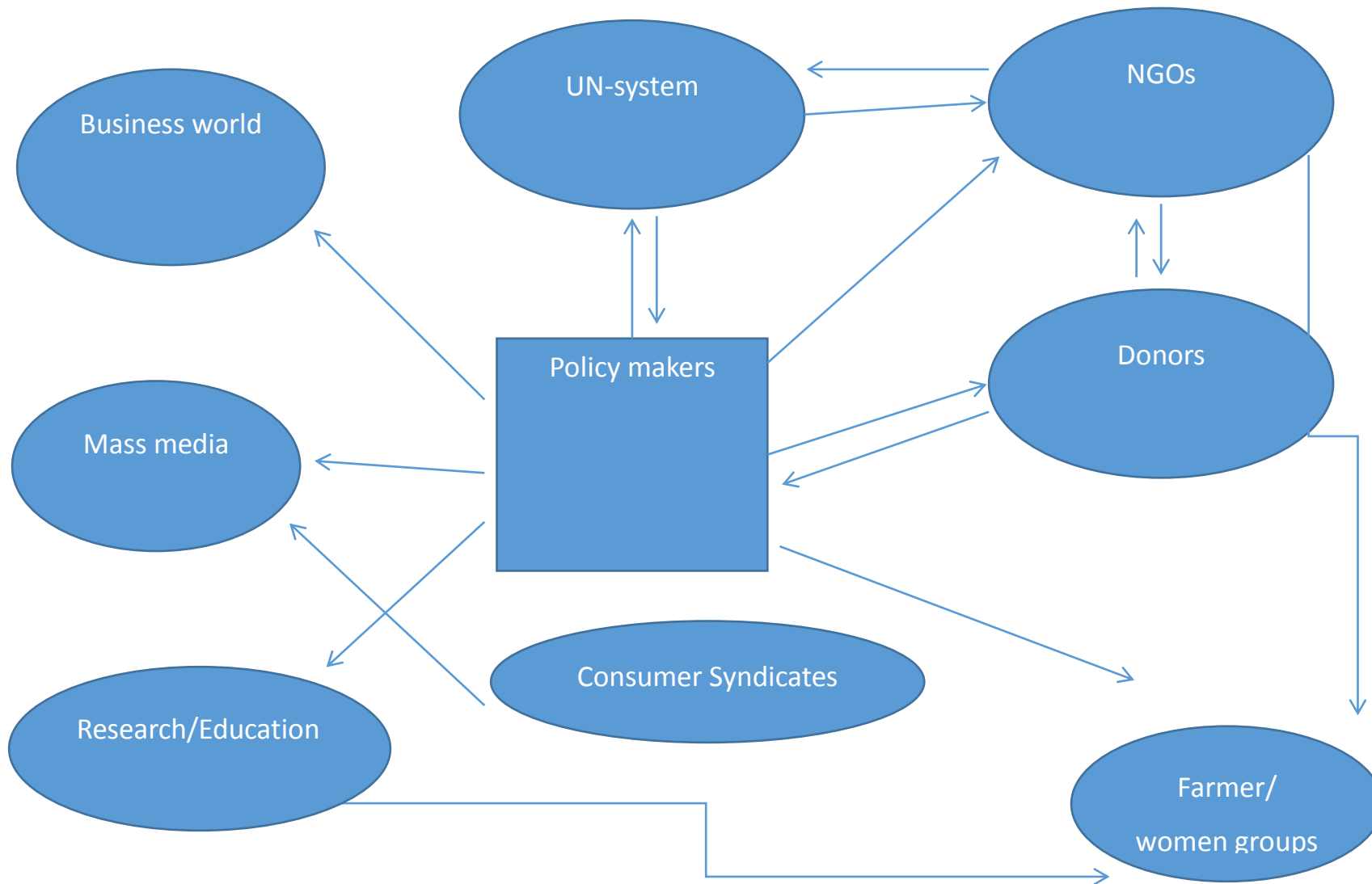


Figure 8: Stakeholders' interactions within the agriculture–nutrition nexus

Influence and importance of stakeholders

Determining the level of power (influence and importance) of stakeholders is critical for the promotion of FNS.

Influence indicates the stakeholder's relative power over and within the nexus.

Stakeholders with high influence have power of veto, formally or informally as to the success of any initiative or project related to them. They are able to control decisions, play a key role in facilitation and the implementation of tasks, and influence the actions of others. Such influence is derived from the stakeholder's hierarchical, economic, social or political position. When a stakeholder has medium influence it implies that the goals of the project could be achieved despite the opposition of the stakeholder, but not easily. Stakeholders with a low influence have no influence on the outcome of the intended actions (Dalau-Clayton and Bass, 2002).

Importance which can be categorised as High, Medium or Low, is based on the degree to which the project cannot be considered a success if needs and expectations of the stakeholder are not met. The interests of the stakeholder therefore coincide with those of the process (Dalau-Clayton and Bass, 2002).

These two measures, influence and importance, are distinct from each other in that the project may have a very crucial financial partner that can stop the project at any time, for any reason, but does not participate at all in its implementation (Dick, 1997).

In order to ease the classification of stakeholders using the influence/importance quadrant, only the "high" and "low" categories have been considered.

The influence and importance of each stakeholder has been captured in Table 29.

Classification of stakeholders' influence/importance is important so as to understand potential risks and highlight groups of stakeholders whose needs can be addressed in a common manner (Dick, 1997). The four classes include:

- *High-influence/High-importance Stakeholders:* These stakeholders should be closely involved throughout the preparation and implementation of any project related to FNS. Their participation in the process is critical for the success of the initiative.
- *High-influence/Low-importance Stakeholders:* These stakeholders can influence (positively or negatively) the outcomes (success or failure) of the process but their priorities are not those of the process.
- *Low-influence/High-importance Stakeholders:* Their participation is also critical to ensure that the needs are met. Special efforts should be made to ensure that their needs are met and that their participation is meaningful.
- *Low-influence/Low-importance Stakeholders:* Are unlikely to be closely involved in the project and require no special participation strategies (beyond information-sharing to the general public).

The stakeholders have been classified into these four groups as shown in Table 30.

Table 29: Influence and importance of stakeholders

Stakeholder	Influence	Importance
Action for Development, CAMORIF	Low	High
ADB	High	High
AFD	High	High
CAMNAFAW, OFSAD, MBOSCUDA	Low	High
CARE	High	High
COMINSUD, WHINCONET, SIRDEP, HEDECS, INADES, COSADER, PROPAC, INADES	Low	High
EU	High	Low
FAO	High	High
Food processors (oil, flour, salt, water-bottling)	High	Low
HKI	High	High
Mass media: CRTV, Cameroon Tribune, The Post, The Messenger, The Horizon, The Herald, Canal 2 International, Equinox, Radio Hot Cocoa, NDEFCAM Radio, Abakwa FM	High	Low
MINADER	High	High
MINATD	High	Low
MINAS	High	High
MINCOM	Low	Low
MINCUL	Low	Low
MINEE	High	Low
MINEPIA	High	High
MINESUP, MINSEC, MINEDUB	High	High
MINFI	High	Low
MINPMEESA	Low	High
MINPROFF	Low	High
MINRESI	High	High
MINSANTE	High	High
MINT	High	Low
NEPAD	High	High
Plan International	Low	Low
SNV	Low	Low
UNDP	High	High
UNHCR	High	High
UNICEF	High	High
UN Women	Low	High
USAID, IFAD, DFAIT, Japanese Embassy Fund, Government of Belgium, M/S Dell Foundation, The Bill & Melinda Gates Foundation, Sight for life, GEF, CERF, Counterpart International, French Red cross	High	High
WB	High	High
WFP	High	High
WHO	High	High

Table 30: Stakeholder Influence–Importance Quadrant

<p><u>Low-influence/High-importance</u> MINPROFF, CAMNAFAW, OFSAD, COSADER, ACDIC, COMINSUD, Action pour le Developpement, WHINCONET, MBOSCUDA, PROPAC, INADES, HEDECS, CAMORIF, SIRDEP, UN Women, UNDP</p>	<p><u>High-influence/High-importance</u> MINSANTE, MINADER, MINEPIA, MINESUP, MINSEC, MINEDUB, MINAS, UNICEF, FAO, WHO, WFP, UNHCR, WB, AFD, ADB, M/S Dell Foundation, The Bill & Melinda Gates Foundation, USAID, IFAD, DFAIT, Sight for Life, GEF, CERF, Japanese Embassy Fund, The Government of Belgium, Counterpart international, French Red Cross, HKI, CARE, EU, NEPAD</p>
<p><u>Low-influence/Low-importance</u> SNV, Plan international, MINCUL, MINCOM</p>	<p><u>High-influence/Low-importance</u> MINFI, MINATD, MINEE, MINT, food processors, CRTV, Cameroon Tribune, The Post, The Messenger, The Horizon, The Herald, Canal 2 International, Equinox, Radio Hot Cocoa, NDEFCAM Radio, Abakwa FM</p>

Stakeholder Involvement (participation) in the agriculture–nutrition nexus

The involvement of all the stakeholders in relevant initiatives/project is very crucial for attaining and maintaining FNS in the country. Stakeholder involvement can be in form of information sharing (inform stakeholder about the project through mass media: internet, TV, radio, newspapers, posters, flyers, etc.); consultation (include stakeholder in discussions on goals and objectives of the project); collaboration (stakeholder participates in decision-making); or control (transfer of decision-making powers and resources to the stakeholder). The matrix in Table 31 provides an overview of the way each stakeholder could be involved and at what stage of the process.

Good/Best practices for strengthening stakeholder / building cooperation

All the stakeholders of the nexus must be encouraged to participate actively in the different stages of project implementation. Participation could be in various forms as discussed in section 4.3 and would result in better collaboration between policy-makers (government), the private sector (the business world), civil society, and farmer organisations in the implementation of food security and nutrition programs. NGOs work best when they are treated as partners by governments. These organisations can provide essential assistance to governments by mobilising local participation in both the planning and construction phases. Local participation is crucial to ensuring affordable maintenance and successful management of public goods through a greater sense of local ownership.

The creation of a platform where all these stakeholders can meet to coordinate efforts and define roles is essential for the success of projects. Cameroon’s increased awareness of the interconnectedness of the agriculture, nutrition and other development sectors has enabled the state to adopt a multi-sectoral approach to addressing FNS. A few activities in Cameroon can be identified as best practices for building linkages and cooperation between stakeholders as follows:

Table 31: Stakeholder participation matrix

Stage in the process	Type of stakeholder involvement			
	<i>Information sharing</i>	<i>Consultation</i>	<i>Collaboration</i>	<i>Control</i>
Initiation	Media organisations, food processors,	All government ministries; all donors; farmer associations, consumer activists	MINSANTE, MINADER, MINEPIA, MINESUP, MINRESI, the UN system, NGOs	MINSANTE, MINADER, MINEPIA
Development of vision and policy	All the government ministries; all donors, NEPAD	All government ministries; all donors	MINSANTE, MINADER	MINSANTE, MINADER, MINEPIA
Situation analysis (problem identification, prioritisation of problems)	All the government ministries; all donors, food processors, the UN system, NEPAD	MINSANTE, MINADER, MINEPIA, MINRESI, NGOs	MINSANTE, MINADER, MINEPIA, MINRESI, NGOs	MINSANTE, MINADER, MINEPIA,
Development and approval of plan	All government ministries	MINSANTE, MINADER, MINEPIA, MINRESI, the UN-system, donors, farmers' associations, women's groups,	MINSANTE, MINADER, MINEPIA, MINRESI, MINSESUP, MINSEC, MINEDUB, the UN-system, donors	MINFI, donors
Implementation of plan	All government ministries; all donors, food processors, UN system, media organisations, NEPAD	MINSANTE, MINADER, MINEPIA, MINRESI, the UN-system, donors	MINSANTE, MINADER, MINEPIA, MINRESI, MINSESUP, MINSEC, MINEDUB, NGOs, food processors, farmers' associations, women's groups	MINSANTE, MINADER, MINEPIA
Monitoring and evaluation (assessing progress and revising plan)	Media organisations, consumers activists	Food processors, farmers' associations, women's groups	MINSANTE, MINADER, MINEPIA, MINRESI, MINSESUP, MINSEC, MINEDUB, NGOs	MINFI, UN-system, donors

- In 2013, Cameroon joined the international movement called SUN. The movement helps each member country develop strategies that aim at meeting the global nutrition targets as established in 2012 by the World Health Assembly (SUN, 2012). SUN stakeholders also work together at the global level to support the successful achievement of their objectives within SUN countries. A SUN branch was created in Cameroon the same year and the focal point in the government is the Sub-director of Food and Nutrition in the Ministry of Public Health. Members include the Ministry of Public Health, MINADER (specifically the National Programme for Food Security), the UN organs (UNICEF, FAO WFP), HKI and funding agencies (particularly AFD). The focal point organises and co-ordinates meetings quarterly for discussions and updating of activities among its members. However, attendance of its members is dwindling and meetings are now less frequent due to lack of funds.
- Also in 2013, a national nutrition business forum was organised (by UNICEF and the Ministry of Public Health) comprising the private sector in the areas of telecommunication, transportation, processing, distribution, building construction and public works. During the forum, SUN-Cameroon put forward the role that the private sector can play in significantly reducing malnutrition: through increased financing for development and the scaling up of multi-sectoral nutrition interventions. Initiatives such as large-scale food fortification and financial support for drugs for people living with HIV were identified as entry points of intervention for private sector (Cameroon Nutrition Business Forum, 2014). A network for the business sector still needs to be created and made functional.
- In August 2014, the government of Cameroon created an inter-ministerial commission for the fight against malnutrition in the northern zone (Far North, North and Adamaoua regions) and East region of the country. It comprises nine government ministries, UNICEF, WHO, WFP, FAO, HKI, Plan Cameroon and Origine Unite. It is more comprehensive than the previous commissions because it includes representatives of other stakeholder clusters. It is chaired by the Secretary General of the Prime Minister's Office. The overall mission of the committee is to mobilise resources, develop intervention strategies and ensure their execution for the reduction of malnutrition.

Nutrition-specific and nutrition-sensitive Initiatives

A number of nutrition-sensitive initiatives have been carried out within the national territory over the past several years. All of the initiatives were conducted under the leadership of the government in partnership with both national and international institutions. This section summarises some of the initiatives.

Combating iodine deficiency

Iodine deficiency was a serious public health problem in Cameroon during 1950–1995. It was reported to be as high as 58% in certain rural populations of the East Region (Lantum, 2009). This discovery provoked the government to embark on the distribution of iodine supplements (lugol iodine to all those who visited hospitals) and later intramuscular injections of lipidol to adult patients who presented with goitre in health-centres and hospitals. In 1991, the government changed its strategy and enacted an Order to organise the utilisation of iodised salt for the prevention and control of iodine deficiency in the entire country. The Order was immediately implemented by the lone salt distributing company in the country at the time. To track down the effectiveness of this Universal Salt Iodisation (USI) program, it was necessary that national surveys be conducted every five years, as well as more frequent monitoring especially in formerly recognised endemic sites. As resources were extremely limited to support the surveys, monitoring through sentinel sites was adopted to follow up the impact. A good partnership was developed amongst the Ministry of Public Health, UNICEF, the Faculty of Medicine and Biomedical Sciences (University of Yaounde) and the National Nutrition Centre in implementing these activities. It was found that the consumption of iodised salt increased in households to 95.6% and was sustained from 1991 to 2010, and that the prevalence of goitre decreased, from 29.5% to less than 5% (INS, 2004).

Combating vitamin A deficiency

The high prevalence rates of vitamin A deficiency in Cameroon, resulted in the Vitamin A supplementation programme within the framework of the *Expanded Programme on Immunisation* (EPI). Results have been encouraging as 57.7% of children (6–59 months) surveyed had received a vitamin A capsule (INS, 2006). The strategies for the fight against vitamin A deficiency as adopted by MINSANTE and its partners include:

- exclusive maternal breastfeeding of children during the first 6 months of life;
- consumption of foods rich in Vitamin A for example red palm-oil (not bleached), tomatoes, carrots, green vegetables, fruits, eggs, margarine and butter;
- vitamin A supplementation for all women (where possible) within eight weeks post-partum to enrich maternal milk;
- vitamin A supplementation to children from 6 months to 5 years of age, twice per year;
- food fortification with vitamin A through industries producing flour, oils, salt and other products.

Other strategies initiated by the government and its partners include the:

- institutionalisation of bi-annual National Child Health Days since 2008 with the introduction of deworming (1–5 years) at national level;
- accelerating the process of food fortification (industrial assessment and creation of the National Alliance for Food Fortification);
- implementation of community-based management of acute undernutrition in East, Adamawa, North and Far North Regions;
- implementation of undernutrition prevention programmes (such as the Essential Nutrition Actions Programme) in North-west, Centre, East, North and Far North Regions.

Emergency aid to refugees and displaced persons

In 2014, over 200,000 refugees from the Central African Republic were reportedly living in Cameroon, mainly in the East, Adamaoua and North Regions. This has created a lot of strain on the local population and an increase in food insecurity. Despite the joint efforts of the government and relevant UN organs, the situation is still critical. Some specific initiatives that have been carried out to handle the crisis include:

FAO

FAO, the MINADER and the Ministry of Animal Husbandry have collaborated in projects that help the victims to produce food for themselves. In 2014, FAO provided 493,000 dollars for the purchase of improved seeds, fertilisers, pesticides and farm tools, which were distributed to victims in the Far North Region. Storage barns were constructed and small processing equipment was purchased to reduce post-harvest losses. 3,500 households received agricultural inputs while capacity building in food preservation was reinforced in eight refugee camps in the East Region. An evaluation at the end of the initiative (December 2014) showed that food security improved in the target zones, with beneficiaries generate some revenue from the sale of surplus farm products (FAO, 2015). The FAO has also initiated the creation of school gardens in the North, Far North, Adamawa Regions and East Regions; distributed cotton-seed cake to small ruminant farmers in the East and Adamawa Regions; and constructed poultry and small ruminant pens and provided animals in the Far North Region. The main financial donors to FAO include Global Environment Fund (GEF), (Central Response Emergency Fund) CERF, Japanese Embassy Fund, the Government of Belgium.

UNICEF

Some of the emergency interventions carried out by UNICEF in Cameroon include the following:

About 3,000 children under 5 years old, affected by severe acute malnutrition were admitted for treatment in health-centres in the northern zone in 2014. In the same year, displaced persons/refugees, especially vulnerable girls and boys, were rescued and placed in interim care, foster families, or reunified with their families. In 2013, over 61,000 children from the Central African Republic, Nigeria and children who were internally displaced benefited from teaching and learning supplies and potable water. New classrooms and toilets were provided to 60 primary schools in the Far North Region. Approximately 259,000 children under 12 months of age were targeted for routine immunisations against measles in North and Far

North (Sahel) Regions in 2013. In 2014, 120,000 Central African Republic and Nigerian refugee children aged 6 months to 15 years were targeted for immunisations against measles and 50,000 refugees were provided access to safe, reliable water in sufficient quantity. Funding agencies include the World Bank (WB), United States Department of Agriculture (USDA), European Union (EU), the Bill & Melinda Gates Foundation and other foundations.

WFP

Current food/nutrition programs include:

- School canteens in the northern regions. The main objective is to maintain and encourage children (especially girls) to go to school. Food is distributed to all children in school and girls are given take-home rations, in addition.
- Village bread baskets: these are cereal warehouses in the northern regions. Through Common Initiative groups (CIG), WFP helps families acquire food during periods of drought (July–September). Personnel of the CIG are trained to manage the warehouses. During the harvest season, members of the CIG can store or sell their cereals to the CIG (at a reduced price) and then recover their stocks or buy cereals from the CIG during droughts (at a reduced price).
- Food aid: WFP supplements food to some vulnerable groups: pregnant and lactating women, children under 5 years of age, people suffering from moderate acute malnutrition, and HIV infected persons.

Current nutrition education programs include:

- Evaluation and treatment of moderate acute malnutrition
- Prevention of acute malnutrition (especially during times of natural or man-made disasters) by providing enriched food-packs to children 2 years of age
- Prevention of chronic malnutrition by providing food supplements to children 2 years of age; and education to breastfeeding and lactating women and care-takers of young children
- 1,000-day initiative (from conception to 2 years of age), which focuses on adequate nutrition education to mothers and caretakers.

Monitoring and evaluation: in the case of emergency interventions, a post-distribution monitoring survey and nutrition screening are carried out on the beneficiaries a few weeks following assistance.

For nutrition education programs, monitoring is done every 3 months.

Donors: United States Agency for International development (USAID), Food for peace, United States Department of Agriculture (USDA), US government, individuals, private sector

HKI

Nutrition intervention programs include:

- Vitamin A supplementation to children aged between 6–59 months old and to post-partum mothers.
- De-worming children aged between 12–59 months

- Food fortification: monitoring of agro-food industries to ensure that foods such as oil, flour and more recently, maggi cubes are enriched with vitamin A, iron, vitamin B₁₂, folate and zinc. This food fortification programme was executed by HKI in 2009 (financed M/S Dell Foundation) but was suspended one year later because the state failed to provide the necessary finances for continued monitoring as earlier agreed. Monitoring, by HKI and MINSANTE with funds provided by Sight and Life, is expected to commence any time from the time of publication of this study.

Food security intervention programmes include:

- Food for education: activities include distribution of food to children in schools (especially to girls); promoting the Water Sanitation and Hygiene (WASH) concept; and homestead food production. The programme is operational in the North Region where 150 schools (with 90,000 children) have been targeted.
- Modelling: for the development of policies and strategies to help orient policy-makers in FNS (in collaboration with economists from the University of California, Davis).

The main donors include United States Department of Agriculture (USDA), United States Agency for International development (USAID), Department of Food And International Trade (DFAIT), M/S Dell Foundation and The Bill & Melinda Gates Foundation.

Nutrition knowledge

Nutrition education and training

Nutrition education plays an important role in our understanding of how the human body works and how to prevent deviations from normal function. According to Tanya *et al.* (2011) the role of nutrition education as a development tool is underestimated in Cameroon and as such a number of issues plaguing its efficiency have been left unattended for a very long time. Some of these are: inadequate personnel in the field of nutrition education nationwide; insufficient training tools and manuals for proper teaching of nutrition education; existing messages are not well adapted for target groups; inadequate dietitians/nutritionists in health structures.

Nutrition education in secondary and primary schools

Nutrition education currently places a lot of emphasis on the nutritive values and chemical composition of foods, but it has not been viewed as a tool that can contribute to the broadening of knowledge on proper feeding of children in schools and homes. Teachers and school staff have a vital role to play in sharing such knowledge. Nutrition education at the primary and secondary school level should communicate more, so as to enable positive behavioural changes in students with regards to types, varieties and quantities of foods consumed (Tanya *et al.*, 2011).

Nutrition education in higher education institutions

Tertiary-level nutrition training is not common in Cameroon. In most cases, basic nutrition courses are embedded in related training programs such as agriculture, food science, applied biochemistry, health sciences, etc. Four undergraduate programs (less than five years old) specialised in nutrition are currently operating in Cameroon in Buea, Yaoundé and Maroua as follows:

- In Buea (South West Region): St Francis Higher Institute of nursing and midwifery, a private institute, offers both a Higher National Diploma (HND) and a bachelor's degree in nutrition and dietetics.
- In Yaoundé (Centre Region): the Higher Institute of Biological and Applied Sciences, a private institute offers an HND in dietetics.
- In Maroua (Far north Region): the University of Maroua, a public institute, offers a bachelor's degree in health and nutrition.
- The University of Bamenda - College of Technology (North West Region): offers a combined bachelor's degree in Food Science and Nutrition.
- Only one post graduate programme (Masters of Science in Applied Nutrition) is offered in the University of Ngaoundere (Adamaoua region). The Universities of Maroua and Bamenda will be launching master's programs (in Food and Nutritional Biochemistry, and Food Science and Nutrition, respectively) in September 2016.

Currently, no doctorate degree programme in nutrition is offered in Cameroon.

There are a vast number of health professional schools (public and private) that train medical doctors, nurses and midwives in Cameroon. Most of these schools use a standard nutrition curriculum that was designed by MINSANTE. There is a specific nutrition curriculum

for nursing and midwifery schools. Nutrition instruction occurs mainly during the first year for the nursing and midwifery programs, while it is taught throughout the duration of the medical program, especially during clinical years. The total amount of time devoted to nutrition is 37 hours in the nursing program, 20 hours in the midwifery program, and 28 hours for each of the first 2 years in the medical program.

In a recent study, Sodjinou *et al.* (2015) reported that nutrition programs in Cameroon's higher education sector lack sufficient clarity on the knowledge, attitudes and skills that students were expected to gain during the programme to prepare them for their professional careers. The prevailing teaching methods are very didactic, with little hands-on practical training. They also observed a general absence of external and internal institutional collaboration for tertiary-level nutrition training. The study recommends that an expanded set of knowledge, skills and competencies needs to be integrated into existing nutrition training curricula to ensure that the country has a critical mass of skilled nutrition professionals.

Since nutrition education plays an important role in our understanding of the concepts that explain how the body works and ways to prevent deviations from normal function, it is necessary for the various actors in this sector to:

- Elaborate and adopt a document that defines the nutrition and health policy for schools.
- Increase the number of teachings hours for nutrition courses in medical, food science and nursing schools.
- Develop continuing education programs on nutrition for health-care providers as they have to keep up with new developments and recommendations in health sciences.
- Organise refresher courses for teachers of nutrition and home economics in secondary and primary schools.
- Encourage the organisation of public campaigns to inform the public on how and what to eat to assure a good nutrition status.
- Develop strategies to educate women on the importance of breast-feeding.

For nutrition education to effectively play its role as a development tool in the country Tanya *et al.* (2011) suggested that public authorities in Cameroon need to:

- increase personnel in the field of nutrition education nationwide;
- provide sufficient training tools and manuals for proper teaching of nutrition education;
- adapt existing messages to the target groups;
- recruit more nutritionists for health structures in the country.

Knowledge management

There are no specific structures or procedures assigned to the management of knowledge as far as nutrition is concerned. Current strategies for knowledge dissemination include advocacy, interpersonal communication, social mobilisation, the use of media (radio and television) and education institutions. The level of efficacy of each strategy varies depending on the region of the country. For example, Inter-Person Communication (IPC) was found to be most effective in the North West and South regions, while social mobilisation and radio was the most effective strategy in the Far North region (CAS, 2014). This implies that there is no single best strategy for knowledge dissemination recommendable for the entire country.

In 2013, UNICEF trained 40 journalists on the nutrition situation in Cameroon and its consequences. This resulted in wide dissemination of nutrition information via various radio and TV stations (UNICEF, 2014). In times of crisis, NGOs play a very active role in rallying communities for education and dissemination of knowledge.

A number of studies showing that many Cameroonians are lacking in nutritional knowledge (Sharma *et al.*, 1996, Dapi *et al.*, 2005) have concluded that there is a dire need to improve nutrition education in schools, and to increase dissemination of nutritional information through media (newspapers, television and radio). Results presented in the section on variations in nutritional status of this report indicate malnutrition is more severe among people living in rural areas and among the less educated. Therefore nutrition education and dissemination programs should be emphasised more in rural areas.

Conclusions and way forward

This study was meant to provide evidence to show that the agricultural-nutrition nexus needs to be strengthened in order to eventually attain FNS in Cameroon. Data collected from the desk-top review, interviews and stakeholders' workshops indicate that malnutrition levels are still very high and at best stagnating (indicated by a 33% growth retardation rate among children under 5 years old despite the fact that there has been adequate food supply adequacy since 2001). This is because significant and sustained improvements in nutrition come from combinations of nutrition-specific and nutrition-sensitive actions, complemented by other actions that respond to underlying determinants; such as education, poverty, water and sanitation (IFPRI, 2014). Although progress has been made in combatting malnutrition, important disparities persist because of resource allocation and governance problems (The World Bank 2014). The analysis of the underlying determinants of the nutritional status reveals that Cameroon is lagging behind in key development indicators.

The study reveals that there are tremendous regional variations in the nutritional status of Cameroonians with the northern regions being the most affected. For example, underweight is reportedly over 30% in the Far North Region whereas it is less than 5% in the Littoral Region. The trend is similar for micronutrient deficiencies. In addition, the rural population (compared to urban dwellers) has very limited access to the key requirements for good nutrition despite the fact that most of the food is produced in these areas. This negatively impacts on their nutritional status and consequently on their individual productivity.

For illustrative purposes, regional disparities in accessibility to some underlying drivers of malnutrition are as follows: despite the abundant water resources in Cameroon, only about 60% of the population had access to improved water supply by 2010. Greatest access is in the Littoral region (79%) while the lowest is in the East region (25%). Girls make up less than half (46%) of secondary school enrolment with the highest enrolment (51%) recorded in the North West Region and the lowest (30%) in the Far North Region. Nationally, only 42% of the population in rural areas has access to potable water as opposed to 89% in urban areas. Government expenditure on health is low: 5.2% of GDP compared to an average of 6.3% in SSA. Consequently, the health sector is performing poorly as evidenced by low life-expectancy (55 years), very high maternal mortality rate (690 per 100,000 births), high under-five mortality rate (144 per 1,000 live births) and high adolescent birth rate (115.8 births per 1,000 in women aged 15–19). Government expenditure on education is even lower (3.2% of GDP) compared to 5.2% in SSA. Furthermore, only about 16% of the seats in parliament are occupied by women compared to the average of about 22% in SSA. These figures indicate that Cameroon has a lot of work to do to improve the current state of affairs.

The institutional framework is weak, hence ineffective. Since 2006, a total of six impressive policy instruments on food and nutrition have been elaborated and adopted but none attained its objectives because of insufficient human, financial and material resources for implementation. The national SUN platform has not been very active for the same reasons. In addition, some major stakeholders are not represented on the government's inter-ministerial commissions responsible for implementing the policies. The stakeholder analysis of the agriculture–nutrition nexus revealed that generally, interactions between the policy-makers and many stakeholder clusters is limited and often unidirectional. This negatively affects partnerships/collaboration and further weakens the nexus.

There is no existing capacity building programme to address the human resource constraints that impact on the delivery of nutrition services and it is characterised by highly insufficient and inadequately trained personnel. Availability of up-to-date data is a major challenge in the country.

Some nutrition-sensitive interventions have been implemented with positive impact in various regions of the country; including combating iodine and vitamin A deficiencies. Results from these initiatives suggest that a lot still has to be done if Cameroon intends to achieve/attain the SDGs. Some actions/initiatives (identified during the stakeholders' workshops) that may contribute towards improving the food and nutrition situation in Cameroon have been grouped as follows:

Good/Best practices for building partnerships to improve FNS and for strengthening the agriculture–nutrition nexus in Cameroon

- Putting farmers at the centre of interventions. The BAFOD approach (Back up Farmers Organisational Dynamism) used by some NGOs is reportedly very effective.
- Carry out stakeholder analysis during project conception and clearly define roles of stakeholders (include local communities as stakeholders).
- Set up and Listen to all stakeholder views, ensuring that flow of information and ideas are there is bi-directional.
- Strengthen the inter-ministerial commission and the SUN and regularly facilitate the platforms and allocate resources for its functioning.

Entry points for strengthening FNS and the agriculture–nutrition nexus in Cameroon (priority interventions)

The entry points identified can be classified in three main groups: research, education and sensitisation (communication)

- Research:
 - Valorise indigenous foods: evaluate their nutritive values. This will serve as basis for recommendations on eating the right foods (combinations and quantities).
 - Evaluate post-harvest losses of major food commodities for both crop and animal foods.
 - Analyse the value chain of major foods from farm to fork (how do food values change in quantity and quality along the food chain?)
 - Innovate and develop production and post-harvest technologies that improve on nutritive value of foods (value-addition through bio-fortification and fortification of processed foods).
 - Establish standards and evaluate safety of locally produced and imported foods.
 - Creation and updating of data-bases on food and nutrition at regional and national levels.
 - Make use of existing grey research data from universities and research institutes (transform research into practice). Translate research data into user-friendly formats for use by farmers, planners and policy-makers.
 - For crop production: encourage development of indigenous high-yielding seed varieties of maize, potato, rice, beans, coco-yams, cotton, oil palms, cocoa and coffee, which have greatly enhanced food security in Cameroon; avoid the use of

foreign seeds to avoid genotype-environment interaction and avoid middlemen in seed production and marketing as currently practiced.

- For animal production: promote the development of improved indigenous animal breeds such as the Gudali cattle; improvement of milk production through artificial insemination of indigenous cattle with high-yielding exotic bulls; promote pig, chicken, and fishing sectors, which greatly contribute to food security and develop adaptable/sustainable technology packages such as integrated pest/disease management in crop/animal production.
- Nutrition education (formal and informal):
 - Formal nutrition education: introduce relevant nutritional components in all educational programs and at all levels, beginning from primary to post-secondary institutions; introduce nutrition training programs in all higher education institutes; update and harmonise nutrition education programs in schools; provide refresher courses to health workers (most of them are not abreast with current trends in nutrition);
 - Informal education: education of the population on cultural practices that negatively impact on nutritional status; educate people on how different culinary techniques affect nutritive value of foods and then encourage them to change cooking practices; recruit and assign adequately trained nutritionists to health centres, hospitals, councils, districts, etc.
- Sensitisation:
 - Publish nutrition information on a regular basis in newspapers and make use of other mass media communication tools e.g. TV/radio (during prime time), billboards, mobile network, posters, etc.
 - Programme mass sensitisation in public places such as markets, churches, motor parks, social meetings, etc.

Opportunities for strengthening women's participation in the agriculture–nutrition nexus

- Institutionalise a quota system to increase women's participation in decision-making bodies and processes at the national, regional and local levels (e.g. parliamentarians, ministers, councillors etc.).
- Change statutory laws to strengthen women's entitlements and access to land.
- Reform land tenure policies to protect small-scale producers (especially women) against land grabbing.
- Capacity building of women: women to be given adequate training to actively participate at all stages in the agricultural value chains (food production/preservation techniques, eating/cooking habits) and leadership roles.
- Increase education of girls. Well-educated girls grow up to be empowered women who can be actively involved in decision-making processes.
- Sensitise local leaders (e.g. chiefs) on the role of women in decision making and advocate that they drop practices that exclude women from participating in decision-making.
- Increase access to loans that will result in increased income generation. Establish loan schemes for women only as is currently practiced by some NGOs in the country.
- Implement school-feeding programs. Counterpart International has created school canteens where food is provided to children in parts of the North West Region. The

programme has reportedly increased enrolment of children (especially girls) in schools. If the food for such programs is supplied by small-scale farmers (most of whom are women), this will increase their revenue, livelihood and also promote empowerment.

Strategies for improving the government's commitment/investment in the agriculture–nutrition nexus

The government is conscious of the role played by the agricultural sector in its contribution to the GDP, hence it makes considerable efforts to support growth and development of this sector. However, the link between agriculture, nutrition and the underlying determinants of malnutrition is not so obvious. Consequently, little is done to effectively promote nutrition and the strengthen agriculture–nutrition nexus. The following strategies will help in translating government commitment into action:

- Creation of an autonomous national office on food and nutrition in Cameroon directly under the auspices of the Prime Minister (independent of any Ministry). Nutrition currently has a very low profile (it is only a sub-directorate in MINSANTE). In addition, it is dependent on the goodwill of the minister for any budget allocations. Therefore, it needs more visibility and autonomy. In addition to other activities, this office will have a central data-base unit that will collect, synthesise and disseminate research results from various institutions. This office will also mobilise resources and coordinate the numerous stakeholders in the nexus.
- Evaluate the cost of malnutrition in monetary terms to demonstrate the cost of inaction. This will help to mobilise political will to invest in the nutrition sector.
- Identify nutrition champions or goodwill ambassadors (such as sports or music stars) who will lobby for the government's investment in food and nutrition sector.
- Encourage the creation of, and support, food and nutrition advocacy groups.

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Annexes

Annex A. Terms of reference for the study

Building the Evidence Base on the Agricultural-Nutrition Nexus: Rapid Country Scans for informing Policy and Practice

Background

FNS is high on the global policy agenda and is of special significance for the African, Caribbean and the Pacific (ACP) region. Several pathways have been identified for achieving the desired FNS outcomes which include; policy harmonisation, political will, multidisciplinary research, technological and social innovation, multi-sectoral cooperation and collaboration, capacity building and development, gender equality, women's empowerment and local/national ownership. However, it is a combination of the various options within a given context; national, regional, international, which will yield tangible results. Multiple disciplines and stakeholders drawn from the public and private sectors, civil society organisations and the wider society must be engaged.

The Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA) works with a wide range of stakeholders; academic and research institutes, policy related bodies, farmers' organisations, extension and advisory services and youth and women's groups in the generation of context-specific knowledge for informing policy processes as well as in the development and implementation of strategies and programmes in support of the attainment of FNS goals. Since 2013, CTA has identified some key areas of focus for its FNS related work programme.

These include:

- Identifying, documenting and promoting successful interventions such as the uptake and scaling-out of research outputs, social and technological innovations and supportive policies.
- Advocating for greater investments in science and innovation including higher education and extension for increasing productivity, marketing opportunities, and greater consumption and value-addition of locally available diverse, nutrient-dense foods and for building resilience of agri-food systems.

More recently, CTA has prioritised strengthening the linkages between nutrition and agriculture as one of the three key areas for 2015 and beyond in Africa, the Caribbean and the Pacific. It has also committed to a joint EC/FAO/CTA/WBG (2014) framework of action on "*Agriculture and nutrition: a common future*" which includes improving "*the knowledge and evidence base to maximise the impact of food and agricultural systems on nutrition*" as one of the three strategic priorities. This commitment is also reflected in the newly elaborated CTA regional business plans (2015).

Justification

Governments require evidence decision-making e.g. for increasing public investment as well as for attracting private sector investment in agriculture and ensuring that investments in research, education, health and extension and advisory services benefit society including

small-holder farmers. In addition to under-performance being witnessed in the agricultural sector, coping with malnutrition (both under- and over-nutrition) is also a burden for resource-constrained governments. Stunting and micro-nutrient deficiency in children under 5 years old, and rising health-care costs related to dealing with malnutrition need to be comprehensively addressed.

Small-scale farming will continue to dominate the agricultural landscape in the majority of ACP countries. Hence, efforts aimed at improving the FNS situation require strengthening multi-stakeholder, inter-disciplinary and multi-sectoral involvement not only in analysing the situation but also to examine the various options and ensure that the answers are reflected in national, regional and international FNS policy processes, programme design and implementation.

CTA has identified some key guiding questions to inform its work:

- What are the priority interventions for improving FNS outcomes in the ACP region?
- What is the link between agri-food systems, food/dietary intake and nutrition outcomes? Where are the gaps and how can/should they be improved? What are the existing models/best practices that benefit smallholder farmers especially women and how can they contribute to improving incomes, food/dietary intake and nutrition outcomes?
- What are the good/best practices for building multi-stakeholder, multi-disciplinary, inter-sectoral and inter-ministerial cooperation and partnerships for improving FNS outcomes at national and regional level, and for informing global processes?

CTA is specifically interested in collecting more detailed information on the agriculture and food and nutrition situation in selected countries where malnutrition is prevalent to determine the entry points that provide the greatest opportunity for strengthening the Agriculture–Nutrition nexus. Good governance, national ownership and women's empowerment are seen as key.

Approach

CTA has a long history of working with national, regional and international partners and especially those engaged in research, higher education, innovation, policy and knowledge management. As such, CTA will partner with key experts/knowledge institutes (universities and research organisations) and specialised agencies among others, and leverage this partnership to provide answers on how to strengthen the Agriculture–Nutrition nexus at national level. A rapid scan and analysis of policies, programmes/interventions and existing capacities will guide future investments.

Objectives

- To undertake a rapid scan of related policies and programmes/interventions including the identification of major actors and target groups, in-country competencies in nutrition linked to addressing the FNS situation as well as the Agriculture–Nutrition nexus, to learn lessons for formulating guidelines for improving FNS outcomes and strengthening the agriculture-nutrition nexus;
- To document and share the lessons learned with policy-makers, researchers, farmers and other key stakeholders.

Tasks

- Develop a methodological framework for undertaking the rapid scan of related policies and programmes linked to FNS and improving agriculture, food and nutrition outcomes in the target country to provide an overview of the state of FNS, the most at risk communities and major pockets of malnutrition and related underlying causes, various agricultural/nutrition initiatives, the main actors and target beneficiaries (especially women and young children under 5 years old) and their impact (potential or realised) on agricultural productivity, incomes, food, nutrition and health outcomes
- Undertake a rapid scan using the approved methodology
- Produce a report which details the results of the rapid scan and an assessment of their potential for improving food and nutrition outcomes and strengthening the agriculture–nutrition nexus. The report must meet the approval of CTA.

Some key questions that may be used in developing the methodological framework for undertaking the study.

Targeting: Are there existing policies and agriculture–nutrition programmes and what are their major goals/objectives as well as incentives for implementation? Are specific groups targeted e.g. women, children? And if yes, are they targeted separately or as part of a group? (household, mother & child...) and how?

Institutional Framework: What is the existing governance structure (e.g. organisations and institutions — national, regional and international working on FNS and agriculture–nutrition and the linkages that exist between/among them)?

Nutrition education/knowledge: Is there a special nutrition unit and where is it located – in MINSANTE/agriculture university? Do women have access to these services? Is consideration given to the cultural context of food/dietary intake and nutrition? (E.g. what is known about food preferences, prejudices etc.)? Have dietary patterns changed over the years and are the changes monitored/documentated? What is known about women's decision-making power regarding agricultural production, food purchasing and distribution within the home, and income generation?

Information and Knowledge Management: How are key messages on agriculture and nutrition communicated and by whom?

n.b. The study should also seek to identify the opportunities for strengthening women's participation in improving food and nutrition outcomes. This will include identifying:

The major women's organisations involved in the development and implementation of agriculture and food and nutrition programmes and providing a brief overview of their involvement and; identifying opportunities for increasing their engagement in future programmes/projects aimed at strengthening the Agriculture–Nutrition nexus.

Expected outputs

- **A methodological framework** for undertaking the rapid scan;
- **A report/evidence paper** on the major policies and programmes on FNS, agriculture and nutrition, including the major actors and the impact (potential or actual); status of the food and nutrition (FNS) situation including key facts on the nutritional status of

the population and major pockets of malnutrition in the target country (including data on women and children impacted) in key agricultural zones; possible platforms for building consensus on priority intervention areas for linking agriculture and nutrition and possible entry points for integrating nutrition into agricultural projects to achieve better nutrition outcomes in particular involving women's groups.

Expected outcomes

The methodological framework and report/evidence paper will be endorsed by the wider national community involving scientists, farmers, policy-makers and other key stakeholders and used for influencing future related policies and programmes for strengthening the Agriculture–Nutrition nexus and the engagement of women

Annex B. List and contact addresses of stakeholders interviewed

	Name of interviewee	Institution	Position at institution	Telephone number and e-mail address	Date(s) of interview
1	Dr Ejigui Jeanne	UNICEF	Nutrition officer	(+237) 679710018	15 th July 2015
2	Mr Njebayi Ongla Alex Marco	HKI	Operations manager (former food fortification coordinator)	(+237) 677804405 andjebayi@hki.org	15 th and 23 rd July 2015
3	Mr Nankap Michel	HKI	Nutrition programme manager	(+237) 675141681 mnankap@hki.org	15 th July 2015
4	Mr Okala Georges	MINSANTE	Sub director, Nutrition and Focal point, SUN-Cameroon	(+237) 677758365 okalageorges@yahoo.fr	16 th July and 8 th September 2015
5	Elhadj Ibraïma Hamadou Aminou	WFP	National programme officer	(+237) 699890017 ibraïma.hamadou@wfp.org	17 th July 2015
6	Mme Eveline Ngwenyi	WFP	Nutrition officer	(+237) 693764193 Evelin.ngwenyi@wfp.org	17 th July 2015
7	Dr Medoua Gabriel	Food and nutrition research centre (Ministry of Research & Scientific innovation)	Head of centre	(+237) 697392842 gmedoua@yahoo.fr	23 rd July 2015
8	Mme Felicitas Atanga	FAO	Assistant FAO representative (Programme officer)	(+237) 677486009 Felicitas.Atanga@fao.org	24 th July 2015
9	Mr Foudama	National programme for food security (MINADER)	National coordinator	(+237) 677195258 foudama@yahoo.fr	29 th July and 8 th September 2015
10	Mr Maina Hamadou	National programme for food security (MINADER)	In charge of sub section for supporting production and nutrition education	(+237) 674406046 ndammaina@yahoo.fr	29 th July and 9 th September 2015
11	Mr Abate Thomas	National programme	In charge of sub section	(+237) 697864865 thomasabatendoum@yahoo.fr	29 th July and 9 th September

	Name of interviewee	Institution	Position at institution	Telephone number and e-mail address	Date(s) of interview
		for food security (MINADER)	for monitoring food security		2015
12	Mme Caroline Comiti	AFD	Health officer	(+237) 656753395	9 th September 2015
13	Dr Sibetcheu Daniel	OFSAD	Executive Director (former sub director of nutrition, MINSANTE)	(+237) 677781321 dsibetcheu@yahoo.fr	10 th September 2015

Annex C. List and contact addresses of participants at the Bamenda workshop

CTA WORKSHOP - BAMEDA - 10TH DECEMBER 2015

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5	Dr. Ebamei	Ch. IRAD Boulbi	F. Chief of	677 43 72 89	
6		P.O. box 50 Bida	Centre	alekang@yahoo.fr	
7	Prof TANYA Agatha	College of Technology Univ. of Bamenda	Director	tanyaagatha@yahoo.fr 677 65 66 61	
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11	Bolima Nancy	Health development Consultancy Services HEDAS	Executive Director	677 67 38 78 nanciatolima@yahoo.com	
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22	FOM NSOH	COMINSUD (Community P.O. Box 356 M'kon-Bda)	Coordinator	677606488 mfonsoh@yahoo.com	
23	Dusman Haman	M BCSUDA - NW BP: 221 Bamenda	Paralegal officer	Dusman.rugaa@gmail.com 677447336	
24	CHE LENA NEH	University of Isichang	Student	675-263-609	
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26	STARENCE TANAH FRU	University of Isichang Faculty of Agronomy and Agricultural Sciences	Student	674-080-505 tstarence@yahoo.ca	
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Annex D. List and contact addresses of participants at the Yaoundé workshop

CTA WORKSHOP – Yaoundé - 17TH DECEMBER 2015

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The Technical Centre for Agricultural and Rural Cooperation (CTA) is a joint international institution of the African, Caribbean and Pacific (ACP) Group of States and the European Union (EU). Its mission is to advance food security, resilience and inclusive economic growth in Africa, the Caribbean and the Pacific through innovations in sustainable agriculture.

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