



Country Policy Analysis

Nutrition Impact of Agriculture and Food Systems

Senegal

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Executive summary

Despite substantial reductions worldwide, malnutrition has remained high in Africa. Various African countries are experiencing the early stages of nutrition transition and diet related non-communicable diseases are on the rise in specific population groups. While most of the African population relies on agriculture for subsistence, the African food system is developing rapidly in urban areas. At this stage, well-targeted investment in public services and sectors is crucial to address malnutrition effectively.

Unlocking the vast agricultural potential of the continent offers a genuine opportunity to address malnutrition and improve health and human development. Agriculture has traditionally focused on increasing food productivity. New thinking how to use agriculture for better nutrition and public health have received considerable attention during the past years. There is no dearth of theoretical frameworks and conceptual models around nutrition sensitive agriculture but experiences on how to do it on the ground remain poorly documented.

The context is favorable to build strong nutrition agricultural linkages in Senegal. Nutrition has enjoyed high-level leadership for over a decade in the country. In 2001, a formal structure called the Cell Against Malnutrition was established under the Prime Minister's office and was tasked with the coordination of nutrition at national level. In 2013, the country has made significant commitments to mobilize the agricultural sector for improved nutrition in the country and is currently embarking in the development of a new national nutrition policy.

This document presents the result of a country assessment of nutrition sensitive agriculture in Senegal. It contains suggestions to develop nutrition sensitive agriculture in Senegal and provides a state-of-the-art and reviews how national food and agricultural policies currently incorporate nutrition concerns. In addition, it identifies promising approaches to increase nutrition sensitivity of the agricultural policies and strategies in Senegal at various levels. This country assessment aspires to pave the way for a discussion between the agricultural and health sector in Senegal, as well as other stakeholders involved in the elaboration of the nutrition policy in Senegal.

Interviews with agricultural experts showed large consensus that agriculture can and needs to tackle both under and over nutrition. To date, the Senegalese agricultural policies and programs have a strong emphasis on food security. Nutrition objectives are largely absent in agricultural policies. There are however, important pathways to promote nutrition that merit further attention

by the agricultural sector i.e. post harvest processing, delivery of nutrition education and nutrition sensitive selection of plant seeds or animal species to promote in the extension program.

Promising approaches such as targeting and identification of nutrition vulnerable population, identification of nutrition goals and use of nutrition indicators and use of agricultural programs as vehicle to deliver nutrition interventions are currently poorly developed in the agricultural sector. In contrast to this, gender is a concern shared by both the agricultural and nutrition sector. The experiences to mainstream gender in agriculture might generate useful experiences to integrate nutrition in the agricultural sector, in particular with regard to targeting programs on the basis of nutritional criteria.

There are a number of experiences with value chain approaches (i.e. fruit and vegetable value chain or innovation platform for the incorporation of local cereals in bread) within the food system in Senegal. They offer a promising avenue for economic development for the Ministry of Agriculture. Current initiatives have brought together various actors of the food system but will require additional support and involvement of nutritionists to incorporate nutritional concerns.

The experiences with the value chain point towards a larger issue in Senegal. Despite the large recognition and willingness to leverage agriculture for nutrition, there is a vast misunderstanding amongst the agricultural experts on the scope and concept of nutrition. Most actors in the agricultural sectors did not perceive the public health dimension of nutrition and looked at nutrition from a productionist point of view “ensuring enough and diverse food” or from a technological perspective “i.e. food technology”. Currently, nutrition expertise in Senegal is principally situated at the Ministry of Health or at the Cell Against Malnutrition and there are hardly experts at the Ministry of Agriculture that hold an advanced degree in human nutrition.

To enable mutual dialogue, a common understanding of concepts is needed. The development of a shared understanding of nutrition and public health nutrition among the health and agricultural experts at national level needs to be fostered. Various opportunities such as the development of specific in-service courses for agricultural professionals, review of the academic curriculum or recruitment of agricultural professionals with a specialization in nutrition deserve exploration. The existence of the MSc, PhD program in nutrition and research expertise in nutrition in Dakar provides a valuable asset in this regard.

There is a clear scope to integrate nutrition objectives in the agricultural sector in Senegal. To forge the nutrition-agricultural link however, nutrition commitments will need to be formally incorporated in the Agricultural Pastoral

Orientation Law. The upcoming evaluation round provides a window of opportunity to achieve this and to capitalize on the commitments made by the Government. In parallel to this, the Cell Against Malnutrition should continue to explore the opportunities for collaboration with the agricultural sector during the development of the national nutrition policy.

This analysis has identified a number of opportunistic interventions to increase nutrition sensitivity of ongoing agricultural policies and programs. Development of an integrated approach and concerted action however, will require a change of thinking and fundamental change in the policy environment. The administrative organization of the government of Senegal, as in most countries, is not conducive to joint nutrition and agriculture programming and policy implementation.

Although the creation of a fully-fledged nutrition coordination structure seems an attractive prospect, previous experience and failures with such initiatives around the world call for careful consideration. Informal structures where experiences and ideas can be shared might prove to be a first useful step to produce recommendations for nutrition sensitive agriculture in Senegal.

There is a clear capacity and willingness for a reflection on the development of nutrition sensitive strategies in the agricultural sector in Senegal. The Cell Against Malnutrition, appropriately situated at the highest policy level, can facilitate the dialogue between the agriculture and nutrition sector. To act as a catalyst for nutrition sensitive agriculture in Senegal however, the Cell will need additional support and involvement from other disciplines. But to develop effective nutrition sensitive approaches more will be needed. A sustained dialogue between Agriculture and Nutrition or Health, -and equally economy and social affairs- is required and needs to be visionary, practical and results-oriented. Such dialogue should result in a shared vision on nutrition sensitive development in Senegal on various fronts of the policy process, from inception, implementation to evaluation under the auspices of the highest political levels.

Nutrition sensitive agriculture in Africa

Despite substantial economic progress, malnutrition rates in African have not been declining compared to other regions in the world (1). In addition to this, various African countries are confronted with a substantial increase in diet related noncommunicable diseases such as obesity and hypertension (2). This is unfortunate, as malnutrition is associated with a reduction in economic development (3) and poor diets are an important cause of premature death (4).

The potential of Africa to feed its populations and improve nutrition is vast (5). As the food system is developing, unlocking the agricultural potential of the continent offers a genuine opportunity to address malnutrition and drive development.

The continent has important agricultural resources that have remained unexploited. Agriculture in Africa has not received proper attention for decades. As a result, agricultural productivity is still far from international standards to ensure food security (6). Recently however, there seems to be a renewed attention for agriculture in Africa. In 2003, African leaders recognized the importance of agriculture for the provision of food and economic well being of Africans in the Maputo Declaration (7).

Despite this recognition, much needs to be done to use the potential of agricultural interventions for better nutrition. Various research activities are being conducted to elucidate the potential of agriculture for improved nutrition (8). The scientific evidence on how agriculture can contribute to better nutrition remains scarce. Two comprehensive reviews (9;10) that looked at the effect of agricultural interventions on nutrition outcomes concluded that the evidence base is limited and often conflicting. What the reviews reveal, is an apparent lack of well-designed studies that are capable to infer causality between changes in agricultural context and nutrition outcomes. At a national and international level, a recent review on the effect of agricultural policies on nutrition outcomes similarly concluded that insufficient evidence is available to date to draw firm conclusions (11).

The conceptual linkages between agriculture and nutrition are well understood and there is no lack of models in this regard (12). Ruel *et al.* (13) have recently summarized the knowledge on how agriculture can contribute to better nutrition and propose 4 key pathways for agricultural interventions to improve nutrition.

1. Targeting of beneficiary populations on the basis of nutrition vulnerability;

2. Identification of nutrition goals or include nutrition indicators in agricultural programs and interventions;
3. Engagement and targeting of women in terms of well being, empowerment and livelihoods, and
4. Use as deliver platform for nutrition interventions.

A key challenge to tackle malnutrition in Africa is to integrate nutrition and agriculture in national policies. Most low and middle income countries, including various African ones, have developed national nutrition policies during the last decades (14). Most of these policies however, lack comprehensive strategies that tackle various determinants of malnutrition (15). The fundamental determinants of nutrition such as agriculture are insufficiently considered and coordination with relevant ministries or agencies is rarely put in place.

A critical challenge for the development of nutrition-sensitive agricultural strategies is the establishment of multisectoral action. The need for multisectoral action to tackle nutrition was recognized early on and dates back to the seventies (16). Various approaches with multisectoral action have been poorly conceived and subsequently met with limited success to address malnutrition effectively.

There are however, important lessons to share (17), which justifies the need to document experiences on how to incorporate nutrition in agricultural policies. One of the issues that have received substantial attention is the need to place nutrition action at the highest level of political power to facilitate multisectoral coordination. During the 2012 FAO Regional Conference for Africa, African governments noted that *“in those countries with successful food security and nutrition actions, mapping had involved the highest level of government in its implementation”* (18).

Policy context of nutrition sensitive agriculture in Senegal

The Government in Senegal is structured under 30 Ministries under the Prime Minister’s office (19). Agriculture in the large sense falls under the Ministries of (i) Agriculture and Rural Equipment, (ii) Livestock and (iii) Fisheries and Maritime Affairs, while human Nutrition is a matter of the Ministry of Health and Social Action.

After the implementation and evaluation of a national policy on nutrition in 2001 (20), the country is currently initiating the development of a multisectoral strategic plan for nutrition, called *“Lettre de Politique de Nutrition”* for 2013-2018 (20).

To develop a nutrition policy, Senegal can build on its experiences with

multisectoral action for nutrition. Under the impetus of national government in collaboration with the World Bank, the country has successfully established a dialogue with various stakeholders in nutrition and institutionalized structures for concerted action. Factors that contribute to this success are a clear mandate and personal commitments from high-level policy makers. In addition, much experience was obtained with the implementation of the Nutrition Enhancement Program that recently completed its second phase that ran from 2007–2011.

Nutrition has received the highest political attention in Senegal for more than a decade (21). In 2001, the country established a formal central coordination structure for nutrition action, called the Cell Against Malnutrition or “*Cellule contre la Malnutrition*”. The latter is situated under the Prime Minister’s office and ensures concerted efforts to tackle malnutrition in the country (22) (Figure 1). The main function of the Cell Against Malnutrition is to advise the Prime Minister’s Office and relevant ministries and to coordinate the development of nutrition policies. The Cell Against Malnutrition coordinates its activities with 7 Ministries (Health, Education, Economy and Finance, Decentralization, Trade, Industry and Agriculture), National Association of Rural Advisors and the Civil Society.

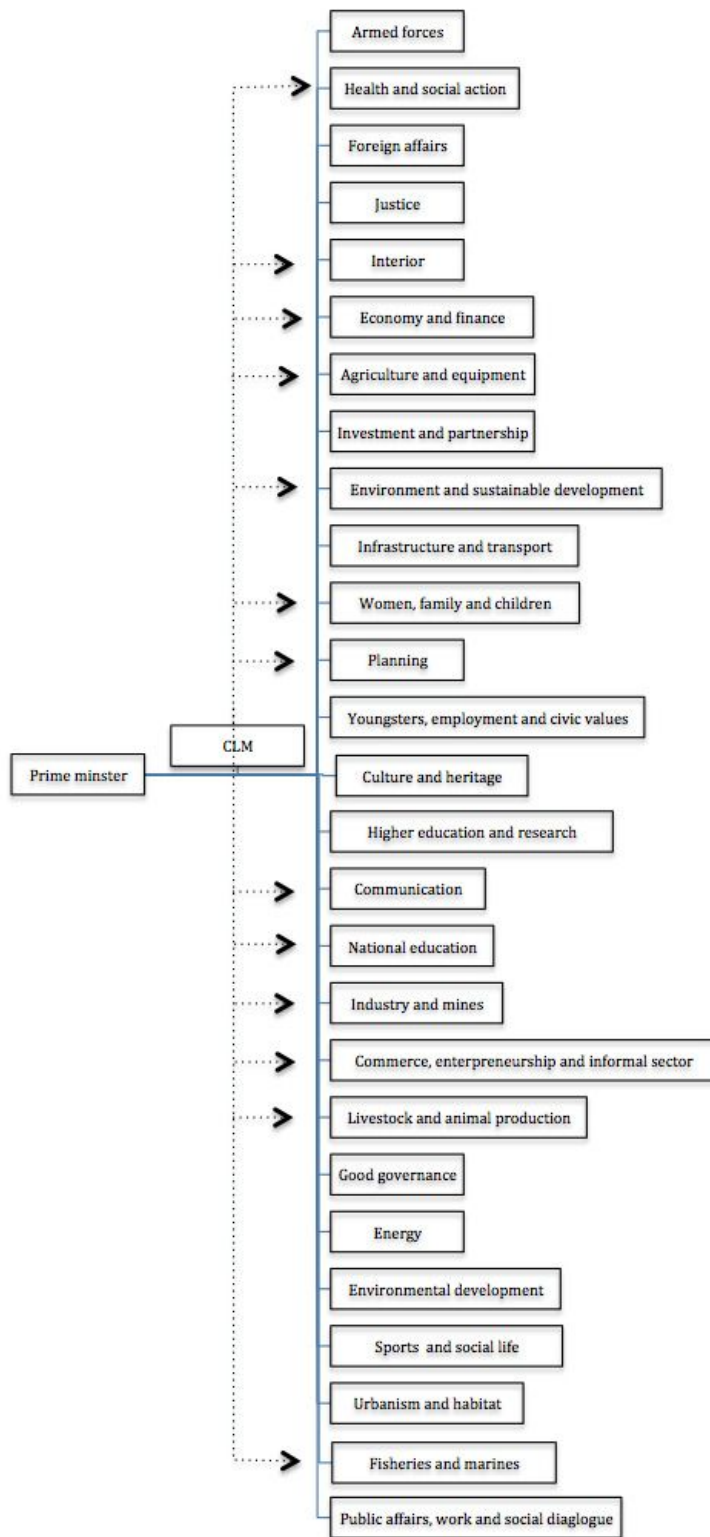


Figure 1 Organization of the Government of Senegal and place of the Cell Against Malnutrition in the organogram. Dotted lines represent coordination links between the Cell Against Malnutrition and the Ministries

Although the mandate of the Cell Against Malnutrition is to coordinate all nutrition activities in Senegal, most of its activities are currently devoted to tackling under nutrition and micronutrient deficiencies. Its structure is shown in Figure 2.

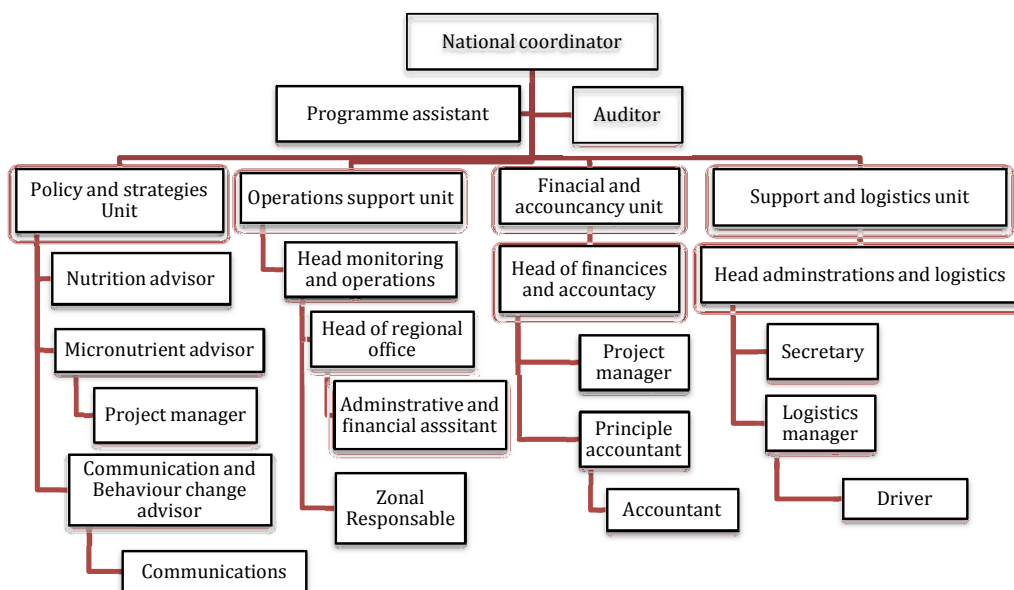


Figure 2 Organogram of the Cell Against Malnutrition

Senegal's recent commitment to address nutrition through multisectoral action is significant. The country has signed up to Scale Up Nutrition in 2011 (23) and aims to accelerate investment in nutrition, in particular through the involvement of the Agricultural sectors.

Recent commitments from the Government of Senegal highlight the importance to develop nutrition-sensitive agricultural strategies (24). Significant commitments to improve the nutrition situation in Senegal were made by the Minister of Agriculture on behalf of the Senegalese Government during a high level event entitled "Nutrition for Growth", hosted by the government of the United Kingdom in 2013 (24). Amongst others, nutrition will be included on the list of national priorities and adequate resources will be allocated to it. The strengthening of multisectoral interventions for nutrition was highlighted. It was specifically mentioned that the fight against the determinants of malnutrition will be intensified so that the relevant sectors i.e. health, agriculture, education,

water and social security incorporate nutrition objectives in their policy document and undertake to implement pro-nutrition interventions and to bring to scale the interventions with high impact on nutrition.

The high-level leadership of the government will be ensured together with transparency and accountability of different stakeholders and close monitoring of progress. In addition, funding for nutrition will be increased annually to 2.8 billion FCFA per year in 2015 to enable full coverage of children and women in effective nutrition interventions. The full list of commitment of the Senegalese government is included as Annex 1.

Scope and objectives

Objectives

This study was carried out to guide the development of nutrition-sensitive agriculture in Senegal and to contribute to the advancement of the discussion on nutrition-sensitive agriculture internationally. The objectives of this study were:

- To review how food and agricultural policies are having or are intended to have an impact on nutrition in the country, and
- To identify gaps and opportunities to strengthen agricultural policies with nutrition-sensitive approaches.

This work seeks to stimulate the discussion in the different sectors involved in the elaboration of the nutrition policy in Senegal. By visualizing the different pathways through which agriculture can contribute to a better nutrition in Senegal, gaps and opportunities for non-nutrition stakeholders will be identified.

Specifically, three elements are addressed in this report. First, a situation analysis describes

- The current nutrition and agriculture situation in the country using available country statistics and international databases (WHO NLiS, FAO, WFP, IFPRI etc);
- The current food system from food consumption to food supply, diets and stage of the nutrition transition in the country using available country statistics and international databases (WHO NLiS, FAO database, WFP survey reports, IFPRI etc), applying an equity lens, gender lens and climate justice/sustainability lens when describing the system;
- How existing problems are being prioritized according to the purposes and goals of the current National Nutrition Policy and Action Plan;

- Main policy frameworks of the current agriculture and food policies in the country and their main purpose(s); and
- How nutrition is referred to in the national food and agriculture policy documents.

Second, we present an analysis of the nutrition sensitivity (23) of the specific agriculture and food policies and frameworks that currently exist. The aim here was to

- Analyze to what extent the specific agriculture and food policies and frameworks that currently exist are nutrition-sensitive;
- Describe how far and how relevant actions of these nutrition-sensitive agriculture and food policies are being implemented effectively;
- Describe the major nutrition-sensitive agriculture/food programs and projects funded and carried out by donors and NGOs in the country; and
- Describe at what point (how and where) the food and agricultural system engages or links with relevant policies of other sectors.

Third and lastly, we describe the policy processes and alignments including cross-sectoral communication and coordination, monitoring and evaluation frameworks.

Scope

The nutritional entry point for this exercise is principally to develop a context that effectively prevents acute malnutrition in under-fives, and micronutrients deficiencies such as iron, vitamin A and iodine in vulnerable populations. Such context should also prevent diet related chronic diseases such as obesity, type II diabetes and hypertension.

The analysis in Senegal will therefore take a holistic approach from food production to consumption. It will analyze the food system comprehensively taking into account rural/urban, nutritional aspects, opportunities to improve food intake using local foods, without ignoring behavioral and lifestyle issues. Agriculture in this exercise comprises all food producing sectors including horticulture, fisheries and aquaculture. The entry point for this analysis was policy making at national level.

Nutrition situation in Senegal

Child mortality

In general, under 5 mortality in Senegal has been decreasing substantially since 2000 (25) with an annual rate of reduction of 6.4% in the last decade (26) (Figure 3). Despite this however, important socio-economic differences exist. Rates of under 5 deaths are 2.8 times higher when the education level and socio-economic status are lower (25). Senegalese children in rural areas face a 2.4-fold increased risk of dying compared to children who are living in an urban living environment (25). Globally more than one third of child deaths are attributable to under-nutrition. The following causes contributed the most to child mortality in 2010 in Senegal in order of impact: malaria (22.5%), acute lower respiratory infections (18.5%), other communicable diseases (other group 1, 16.3%), diarrheal diseases (12.9%), congenital anomalies (8.2%), injuries (6.6%), measles (3.8%), prematurity (3.8%), meningitis & encephalitis (2.6%), HIV/AIDS (2.4%), birth asphyxia and birth trauma (0.9%), pertussis (0.8%), other non-communicable diseases (0.6%) (27).

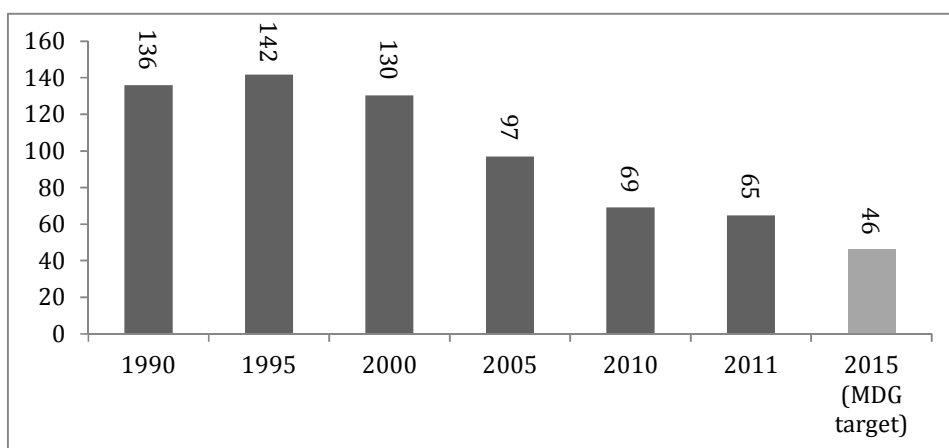


Figure 3 Under 5 mortality rate in Senegal (per 1,000 live births)

Malnutrition

The prevalence of children under the age of 5 who are stunted or wasted and overweight has been decreasing over the past decades (28) (Figure 4) .

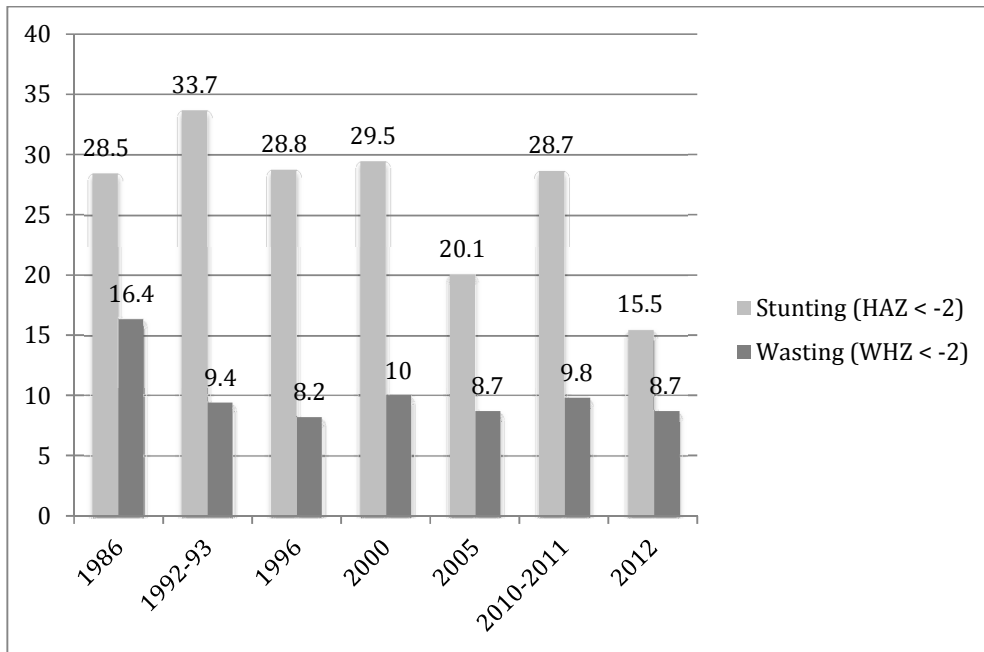


Figure 4 Prevalence of child malnutrition in Senegal per year

The most recent estimates of 2012 indicate a higher prevalence of malnutrition under the age of 5 year (Figure 5) (29).

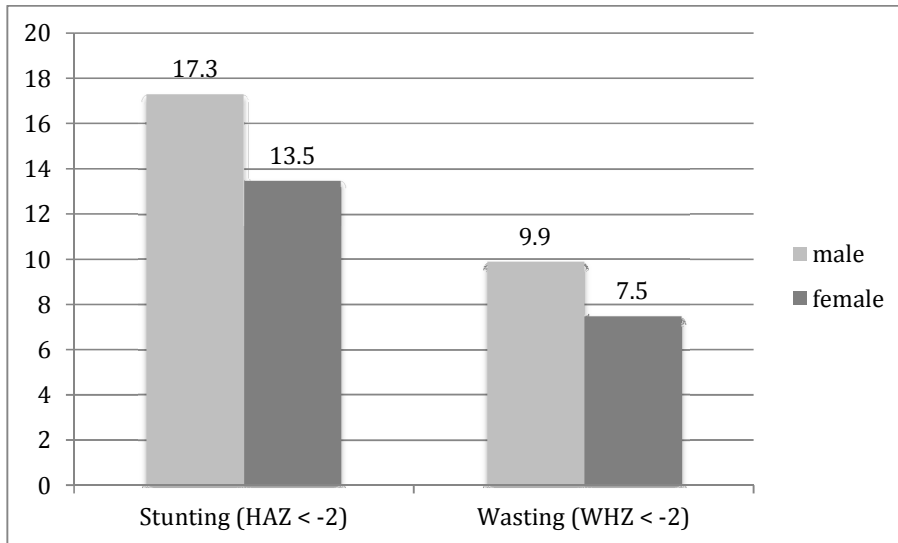


Figure 5 Prevalence of child malnutrition in Senegal by gender

The prevalence of childhood malnutrition is higher in rural areas of the country (28)(Figure 6). In Dakar for instance, the latest measurements of 2012 estimate underfive stunting at 4.9% while the national average was 15,5%. The estimates for wasting were 6.2% and 8.7% respectively. For women with a low BMI, the difference between places of residence was not that pronounced. It was previously argued that the prevalence of undernutrition was similar for same

level socio-economic groups in urban and rural areas (30). However this figure does not account for subgroups within urban and rural areas, which possibly masks wide wealth disparities.

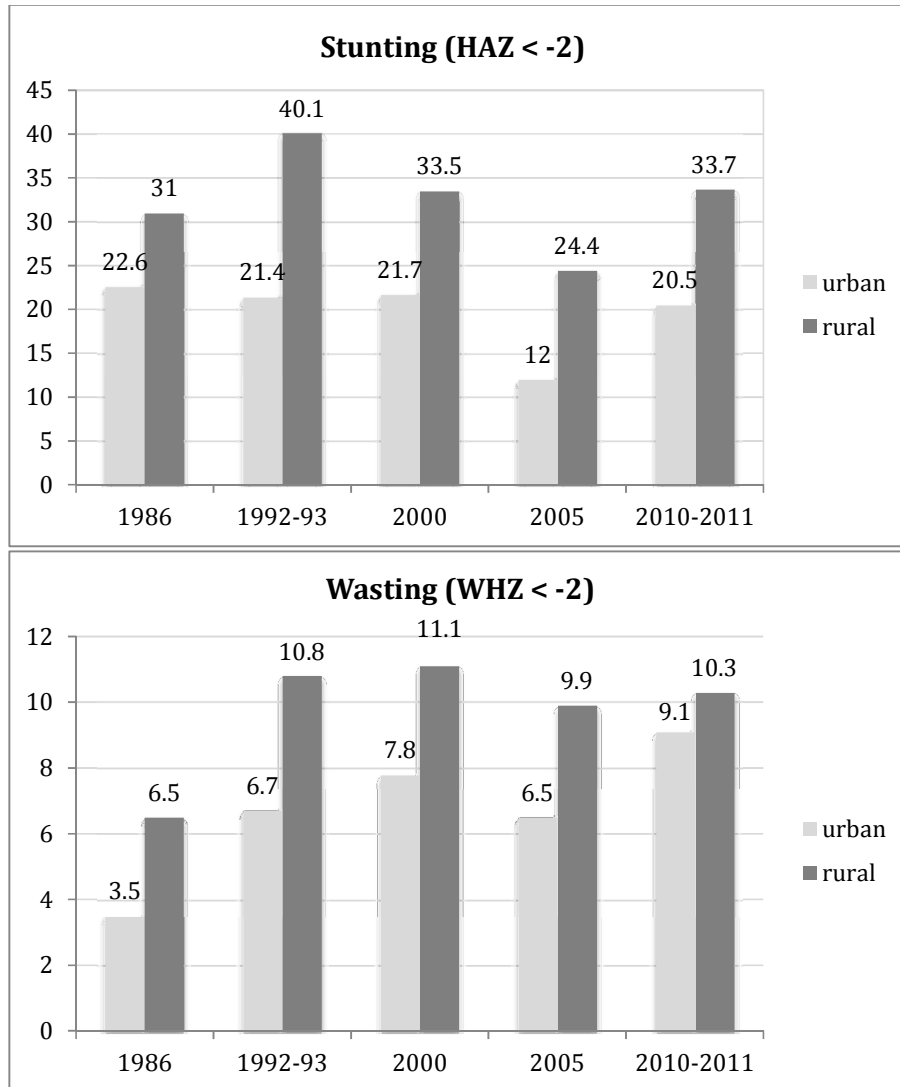


Figure 6 Prevalence of stunting (HAZ<-2) and wasting by rural and urban areas in Senegal

Figure 7 displays the prevalence of underweight, stunting, wasting in children under 5 and a low BMI in women, based on their socio-economic status (29). The prevalence of underweight and stunting is inversely associated with socio-economic status. The differences for wasting and low BMI however are quite smaller. Specific information regarding wealth disparities stratified by residence i.e. urban and rural disparities was not found.

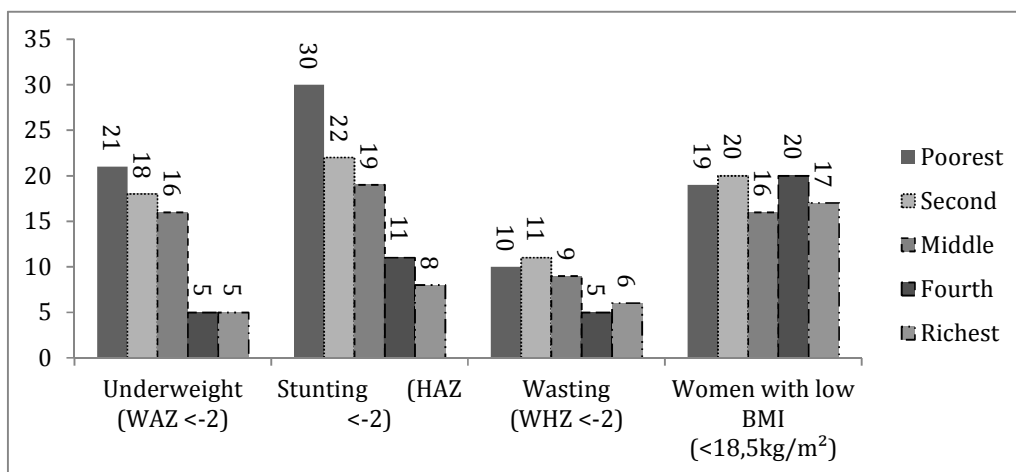


Figure 7 Prevalence of malnutrition in Senegal based on socio-economic status (2005)

The mean BMI in Senegal has been increasing every year in every age group and for both genders but particularly in women. In women over age 30, the mean BMI is projected to exceed 25 kg/m² by 2015 (Figure 8)(31). (Note: original age group of the surveys are used)

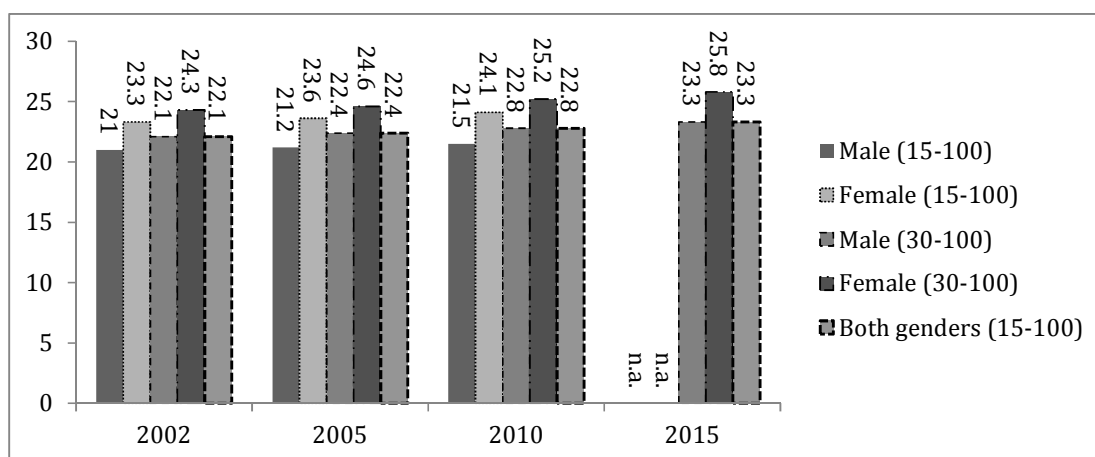


Figure 8 Mean BMI (%) in Senegal per year

A consistent increase in prevalence of overweight and obesity is in both genders but particularly in women (Figure 9 and 10) and with increasing age. (Note: original age group of the surveys are used). The prevalence of overweight and obesity in urban areas is estimated to be twice that of the rural area but is estimated to decrease with lower wealth status.

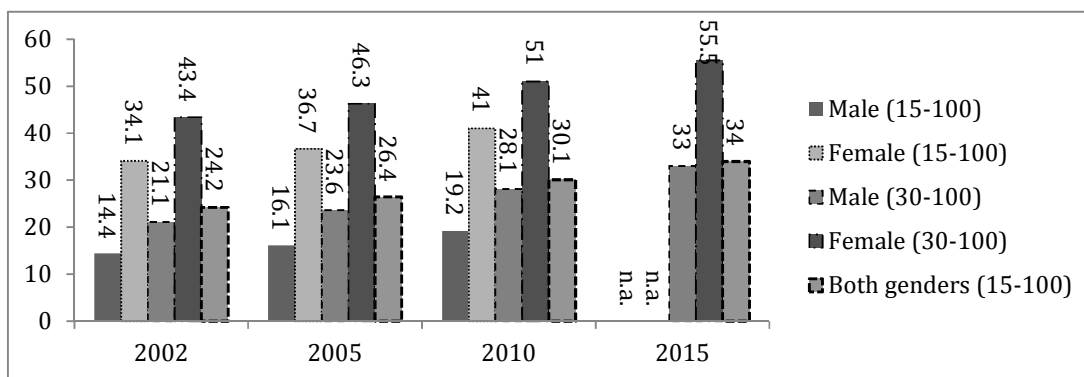


Figure 9 Trend in national prevalence of overweight in Senegal

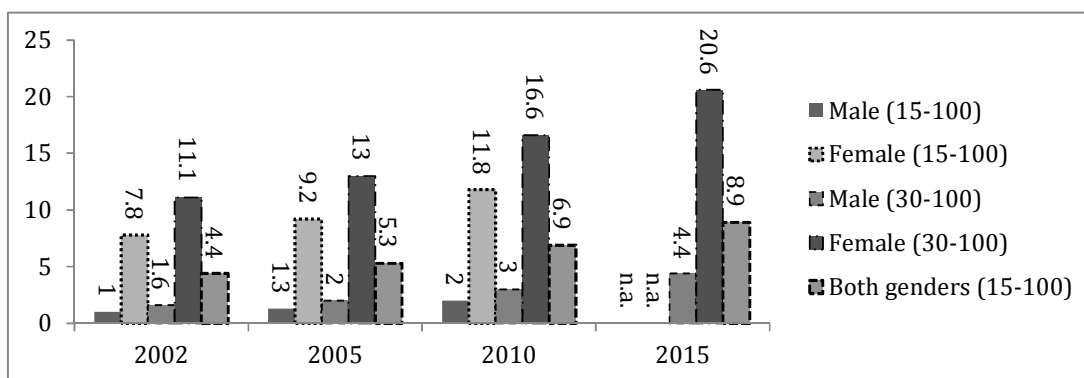


Figure 10 Trend in national prevalence of obesity in Senegal

Micronutrient deficiencies

There are no recent national estimates on the prevalence of iodine deficiency disorders. Data from urinary iodine in Senegalese children from the central regions estimate that 20% of the study subjects were not deficient in iodine and 15% had a severe deficiency (32). The consumption of adequately iodized salt is still low with an estimated 41% of households that consume an adequate amount of iodized salt in 2005 (33).

The coverage of vitamin A supplementation is quite widespread for children. On average 97% of children aged 6-59 months received two doses of vitamin A in 2009 (29;34) (Figure 11). Higher coverage is obtained in children in urban areas and/or a wealthy family (35). Nevertheless, the importance of vitamin A deficiency at the national level has not yet been estimated in this population group. For women, the 2005 national survey indicated that 13% of women were defined as clinically vitamin A deficient (36). A survey of 2012 showed some improvement and estimated that 8% of the women showed clinical signs of vitamin A deficiency and 11% reported difficulties with night vision. Less than half of the breastfeeding women reported to have received vitamin A supplementation postpartum (37).

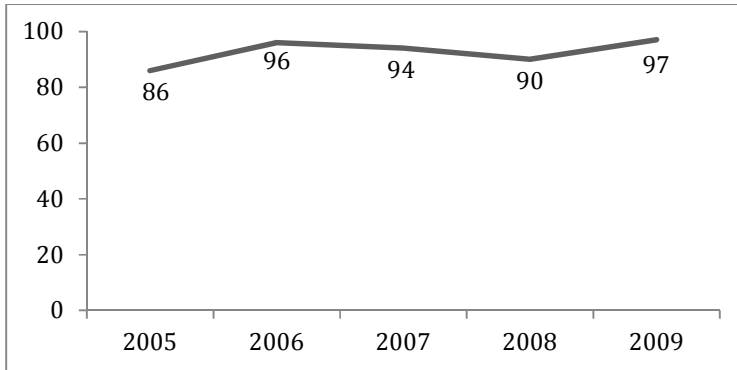


Figure 11 Percentage of children 6-59 months old receiving two doses of vitamin A during one calendar year in Senegal

Anemia was estimated to be higher than 40% in 2005 with more than 90% of children under 2, more than 80% of children under 5, almost 60% of women and more than 70% of pregnant women being affected (29) (Figure 12). In 2012, 34% of the women in reproductive age was clinically anemic and 8% reported to have used iron supplementation during the last pregnancy (37).

The coverage of iron supplementation in pregnant women is fairly good and estimated to be 77% (35). Coverage is again higher for urban, wealthier and more educated women (35). The prevalence of anemia did not differ substantially for different socio-economic groups or places of residence (35). Results of the latest Demographic and Health Survey in Senegal (35) showed that the prevalence of anemia is decreasing in children from 6 to 59 months of age. The amount of pre-school anemic children dropped from 83% to 76%, of which 23% had a mild form of anemia, 48% a moderate form and 5% a severe form (35).

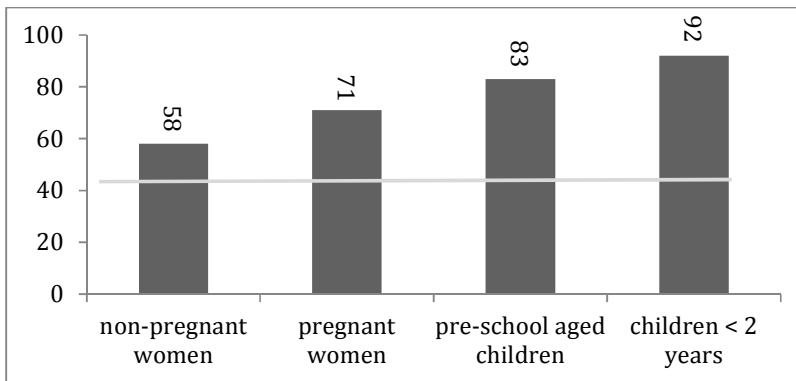


Figure 12 Prevalence of anemia among selected populations in Senegal (DHS 2005)

No data about the coverage of zinc status or supplementation were found.

Dietary transition

In 2003, a food intake study (38) was carried out in the Sine region in the Sereer ethnicity group to assess dietary intake data in Senegalese rural children aged 12-42 months (38). Over an average of 3.6 meals were consumed per day. Cereals, fish and other foods such as vegetables, fruits or peanuts were the most frequently consumed food groups. Millet and rice were the main staple cereals and the consumption of tubers like manioc and potatoes was rare. Fresh fish was almost eaten daily by the study population in contrast to other animal-derived food sources like meat, poultry and animal milk that were only rarely consumed. Fruits (mainly mangoes because of mango season) and vegetables were consumed by about one-third of the children. Meat consumption was significantly associated with increasing socioeconomic status i.e. housing quality and maternal education (38).

A second dietary assessment was carried out the same population in 2009 in children 6-36 months old and assessed seasonal differences in food intake. A first visit was conducted in May–June (pre-rain season), and November–December, (harvest season). The dietary diversity index was lower in the second visit because of lower amounts of fruit, rice, fresh fish, vitamin A rich and fat-containing foods consumed. However, the intake of milk, bread and biscuits, groundnuts, vegetables and leaves increased (39).

A 2009 study sheds light on the dietary intake of Senegalese adult men sampled from a rural area outside Dakar (40). The majority (65%) of this population consumed fruits and vegetables, meats and grains. Most frequently reported fruits and vegetables were carrot, potato, mango, and lettuce. Frequently consumed animal source foods were fish, beef, and ox. The frequently consumed grains were found in bread and rice and most frequent beverages were water, coffee and tea. Other foods commonly reported were sauce/peanut paste, sugar, cheese and butter (Figure 13 & 14).

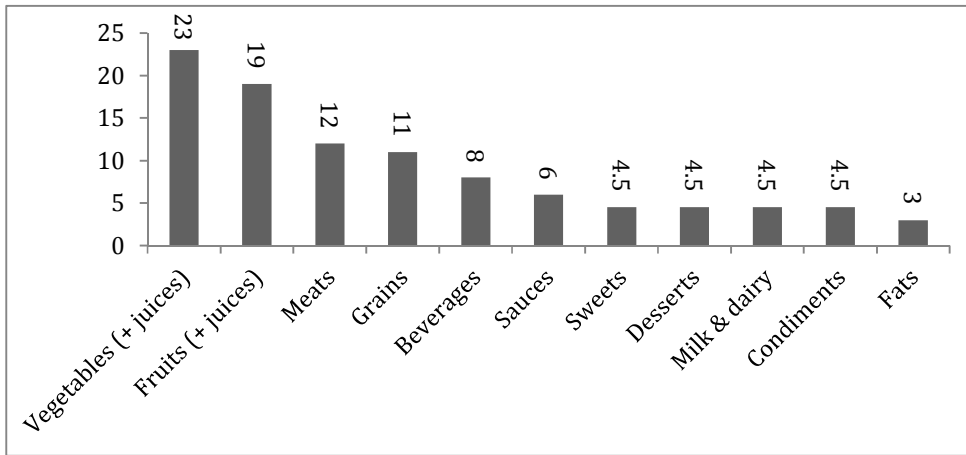


Figure 13 Most commonly consumed food groups by Senegalese men (n = 50)

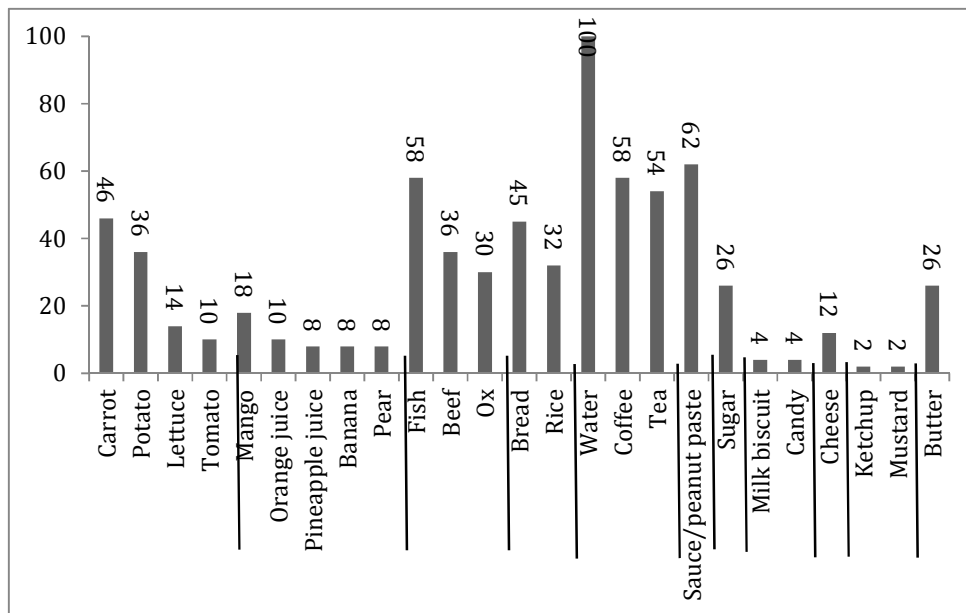


Figure 14 Most consumed foods by Senegalese men (n = 50)

Most of these foods reported were traditional to the Senegalese diet and there were no differences found in daily intake of each food by age, education or area of residence (40).

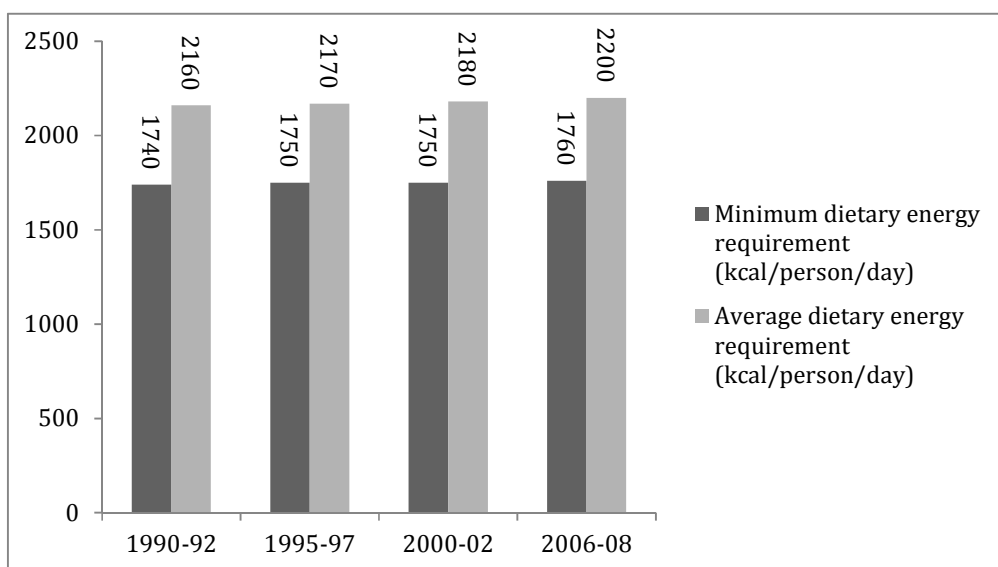


Figure 15 Food needs in Senegal per year

The country has also seen a rise in dietary energy supply over the years as well as in fat consumption, but a decrease in total and animal protein consumption (Table 1) (41).

Table 1 Trends in good supply for human consumption in Senegal

Food Supply for Human Consumption	90-92	95-97	00-02	06-08
Dietary energy supply (kcal/person/day)	2190	2140	2140	2280
Total protein consumption (g/person/day)	63,7	58,5	55,4	58,8
Animal protein consumption (g/person/day)	18,8	17,3	16,6	16,6
Fat consumption (g/person/day)	57,6	62	63,4	65,3

Diet intake of the Senegalese population shows a general trend to decrease total and animal protein consumption (41).

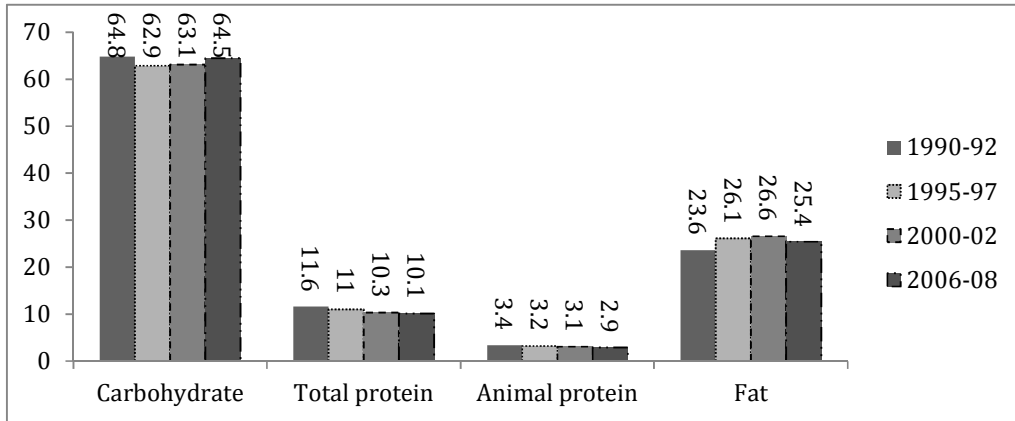


Figure 16 Dietary composition in Senegal per year

FAO food balance sheets also estimate the food group shares in total food supply (42). Cereals comprise more than half of the share while vegetable oils and animal fats account for 17% of the food supply in Senegal, followed by respectively sugars and honey (6.2%), milk and eggs (3.1%), meat (3%) and roots (2.8%) (42).

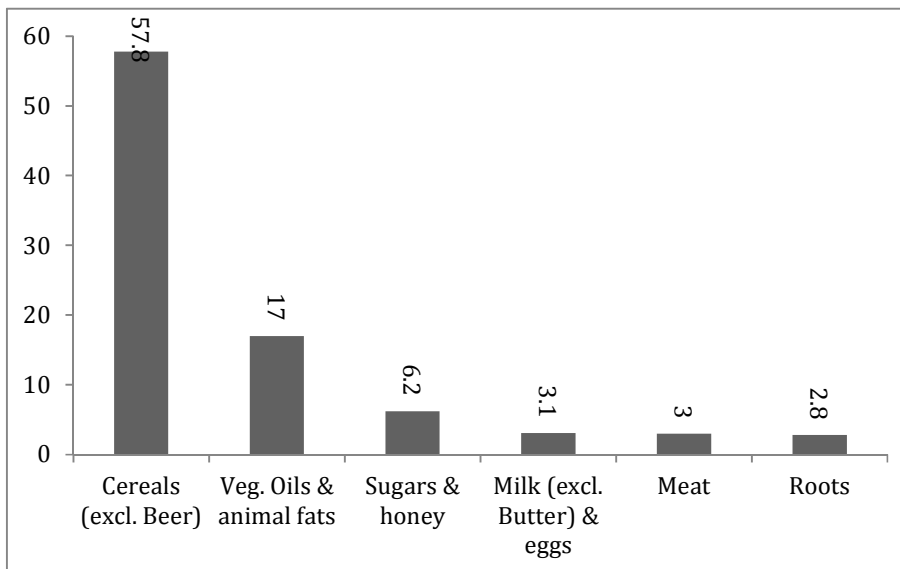


Figure 17 Food group shares in total food supply [%] in 2009 in Senegal

Methods

Literature and secondary data review

To retrieve relevant published literature on nutrition and agriculture in Senegal, a comprehensive search was conducted in PubMed on the 15th-18th of April 2013 (Table 2).

Table 2 Search syntax to retrieve published papers on Senegal

```
((("food supply"[MeSH Terms] OR ("food"[All Fields] AND "supply"[All Fields]) OR "food supply"[All Fields]) OR ("food supply"[MeSH Terms] OR ("food"[All Fields] AND "supply"[All Fields]) OR "food supply"[All Fields]) OR ("food"[All Fields] AND "security"[All Fields]) OR "food security"[All Fields]) OR ("agriculture"[MeSH Terms] OR "agriculture"[All Fields]) OR ("nutritional status"[MeSH Terms] OR ("nutritional"[All Fields] AND "status"[All Fields]) OR "nutritional status"[All Fields] OR "nutrition"[All Fields] OR "nutritional sciences"[MeSH Terms] OR ("nutritional"[All Fields] AND "sciences"[All Fields]) OR "nutritional sciences"[All Fields]) OR ("diet"[MeSH Terms] OR "diet"[All Fields])) AND (("senegal"[MeSH Terms] OR "senegal"[All Fields]) OR Dakar[All Fields])) NOT ("animals"[MeSH Terms] NOT "humans"[MeSH Terms])
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This search provided 378 scientific articles that were manually screened based on their title and according to their relevance to the topic of nutrition, agriculture and Senegal. Following this, the abstract of all remaining articles was read. Articles considered important were downloaded as a full-text and reviewed for their content.

To obtain data on the prevalence of malnutrition and micronutrient deficiencies, international databases of the World Health Organization (25;27;31) were consulted as well as the National Demographic and Health Surveys of Senegal of 2010-11 (35) and 2005 (36). The online available documents of other organizations like UNICEF (26;34) and FAO (33) supplied additional data – (15th to 22nd of April 2013).

The FAOSTAT country profile was consulted for information concerning food supply and dietary composition in Senegal. In addition, the food security profile of the FAO provided other information regarding the dietary requirements of the Senegalese population. Food balance sheets of the FAO from 2009 were consulted as well (41;42) (22nd to 26th of April 2013).

Policy analysis

We reviewed a set of policy documents of Senegal for their nutrition sensitivity. Nutrition policy documents are considered adequate and objective resources that reflect prevailing thinking around nutrition at national level in a country and have been used for benchmarking of policy issues (15;43).

English or French policy documents were acquired using several methods. First, most of the materials used were provided by the Senegalese counterparts of the study. Secondly, using the global database on the implementation of nutrition action (44), additional references were retrieved and full text documents were obtained from an Internet search. Lastly, additional references were found in a presentation on the state-of-the-art of food and nutrition in Senegal (37). To assess complements and relevance of the set of policy documents, the titles of the document were presented during a workshop in Senegal with various technical experts from different agencies under the Ministry of Agriculture and other relevant Ministries. In addition, participants of the workshop were requested by email to review the titles of the documents and if needed, to suggest additional documents for review.

All policy documents and programs were given a score to assess the level of nutrition-sensitivity and action taken concerning nutrition (Table 3). The scoring grid was developed in collaboration with the other teams carrying out the UNSCN assessment of nutrition sensitive agricultural systems to ensure harmonization and comparability. The different criteria represent characteristics of policies that were considered to enhance the nutrition sensitivity of agricultural programs and policies.

The aim of the scoring was principally to provide an overview of the policy environment in agriculture with regard to nutrition sensitivity and not to rank policies as such.

Table 3 Screening criteria of the policy documents

1 Incorporate explicit nutrition objectives

2 Have explicit goals and indicators into their design, and track and mitigate potential harms, while seeking synergies with economic, social and environmental objectives. + **Link with nutrition M&E system.**

3 Assess the context¹ at the local level, to design appropriate activities to address the types and causes of malnutrition².

¹ Context assessment can include potential food resources, agro-ecology, seasonality of production and income, access to productive resources such as land, market opportunities and infrastructure, gender dynamics and roles, opportunities for collaboration with other sectors or programmes, and local priorities.

² Malnutrition includes chronic or acute undernutrition, vitamin and mineral deficiencies, and obesity and chronic disease.

4 Target the vulnerable³ and improve equity through participation, access to resources, and decent employment.

5 Empower women by improving access to productive resources, income opportunities, extension services and information, credit, labor and time-saving technologies (including energy and water services), and supporting their voice in household and farming decisions. Equitable opportunities to earn and learn should be compatible with safe pregnancy and young child feeding.

6 Increase the production of foods (particularly horticultural products, legumes, small-scale livestock and fish, biofortified crops, and underutilized foods). Diversified production systems are important to vulnerable producers to enable resilience to climate and price shocks, more diverse food consumption, reduction of seasonal food and income fluctuations, and greater and more gender-equitable income generation.

6.1 Increase production of nutritious foods

7 Reduce post-harvest losses

8 Facilitate diversification of agricultural production (particularly horticultural products, legumes, small-scale livestock and fish, biofortified crops, and underutilized foods). Diversified production systems are important to vulnerable producers to enable resilience to climate and price shocks, more diverse food consumption, reduction of seasonal food and income fluctuations, and greater and more gender-equitable income generation

9 Incorporate nutrition promotion and education around food and sustainable food systems that builds on existing local knowledge, attitudes and practices. Nutrition knowledge can enhance the impact of production and income in rural households, especially important for women and young children, and can increase demand for nutritious foods in the general population.

10 Improve processing, and to make healthy foods convenient to prepare.

10.1 Improve processing of foods to retain nutritional value

11 Improve storage and preservation to retain nutritional value, shelf life, and food safety, to reduce seasonality of food insecurity and

12 Expand markets and market access for vulnerable groups, particularly for marketing of foods or products vulnerable groups have a comparative advantage in producing. This can include innovative promotion (such as marketing based on nutrient content), value addition, access to price information, and farmer associations.

12.1 Expand market access of nutrient-rich foods

13 Collaborate and coordinate with other sectors (health, environment, social protection, labor, water and sanitation, education, energy) and programs, through joint strategies with common goals, to address concurrently the multiple underlying causes of malnutrition.

14 Maintain or improve the natural resource base (water, soil, air, climate, biodiversity), critical to the livelihoods and resilience of vulnerable farmers and to sustainable food and nutrition security for all. Manage water resources in particular to reduce vector-borne illness. and to ensure sustainable, safe household water sources.

³ Vulnerable groups include smallholders, women, youth, the landless, urban dwellers, the unemployed.

The policy documents were reviewed and scores were allocated based on the presence of the specific criteria in the text. If a criterion was mentioned specifically in the document, a score of one was allocated. Criteria were considered present if the word, a derivative or a synonym of the item was found in any relevant section of the whole document. For example, for the first aspect 'Have explicit nutrition objectives' the document was searched for '*objectif(s)*', '*but*', '*cible*', '*mission*', '*nutrition*', '*alimentaire*', ... and afterwards the document was searched manually for specific relevant information related to nutrition objectives. Documents were also manually reviewed in the appropriate sections for each separate aspect. In total, 13 policy documents were scored for a total of 17 items (14 items and 3 sub-items) that refer to characteristics related to nutrition-sensitive agriculture. The highest score that a document could achieve was 17 points, indicating that all items were present. A numerical score was assigned to each category (i) "Very low" = 0 to 3 points, (ii) "Low" = 4 to 6 points, (iii) "Medium" = 7 to 10 points, (iv) "High" = 11 to 14 points, and (v) "Very high" for policies with a score from 15 to 17 points.

Country assessment

The organization of the fieldwork in Senegal was conducted in 2 stages. First, as inception of the fieldwork, nutrition agricultural linkages in Senegal were conceptualized during a national workshop that convened stakeholders from different agricultural sectors. Next, the different pathways were explored in detail with in-depth interviews of stakeholders who participated in the workshop. The schedule of the field visit and names of persons met is included as Annex 2 and Annex 3 respectively.

The fieldwork was completed with a mapping of the governance of nutrition in Senegal and a brief assessment of the capacity of nutrition in Senegal and at the relevant agricultural governmental agencies.

Causal model

Although various conceptual models linking agriculture and nutrition exist, they are generic and fail to shed light on contextual factors that prevail in a specific setting or country. In addition, the development of a specific conceptual model that linked agriculture with nutrition at national level in Senegal triggered participation, discussion and involvement of stakeholders from different technical agencies and backgrounds.

To build the causal model, a one-day workshop was organized with 32 Senegalese stakeholders, principally from governmental agencies at national level (Annex 4) and aimed to:

1. Assess current perceptions and views on pathways through which agriculture affects nutrition status in Senegal;
2. Develop a common understanding of agriculture to nutrition linkages in Senegal at the start of the country assessment; and
3. Provide conceptual basis for the in-depth assessment and interpretation of nutrition linkages of agricultural interventions.

The pathways were identified using an analysis of the determinants of nutrition status in Senegal. A causal model was constructed for this purpose. The causal model is used to facilitate and enable a participatory approach to unravel determinants of complex issues such as nutrition status. The causal model is an instrument of the Comprehensive Participatory Planning and Evaluation (45) approach and is widely used to plan and evaluate complex interventions (46). The agenda of the workshop is included as Annex 4.

Before the causal model analysis was conducted, a presentation of the main nutritional issues in Senegal was given by the Cell Against Malnutrition. The presentation dealt with both overnutrition (diet related chronic diseases such as obesity, diabetes and hypertension) and undernutrition (childhood malnutrition and micronutrient deficiencies) topics and highlighted differences within the country.

In depth interviews

The conceptual analysis was completed with an analysis of individual pathways. In total, eleven interviews were conducted with agricultural professionals at relevant governmental agencies. The objective of the interviews was to obtain a state-of-the-art on how current agricultural programs are nutrition-sensitive, in order to build on current experiences and identify new opportunities. To do so, four major ways through which agricultural programs can improve nutrition, as suggested previously by Ruel *et al.* (13) were addressed in the interviews:

1. To what extent the existing agricultural interventions target beneficiary populations on the basis of nutrition vulnerability;
2. How current agricultural programs identify nutrition goals or include nutrition indicators;
3. How current agricultural programs engage and target women in terms of well being, empowerment and livelihoods, and

4. How agricultural programs are used as vehicle to deliver nutrition interventions.

The questioning route used during the interviews is included as Annex 5. Except from two phone-interviews, interviews were conducted face-to-face. The panel of interviewees was selected to include a wide representation of different sectors involved in agriculture e.g. agriculture, horticulture, fisheries, seed selection, agricultural extension, valorization of technology and capacity building. Verbal consent was provided and the interviews were recorded to allow revision and transcription of answers.

Assessment of nutrition capacities at governmental agencies involved in Agriculture

To assess how nutrition was institutionally embedded in the government in Senegal, we conducted a search on official governmental websites and reviewed the organogram of the Cell Against Malnutrition. We also asked our respondents during the interviews which technical capacity existed in their organization in terms of nutrition. In addition, a scoping exercise was performed to identify the training programs in nutrition in Senegal. In addition, during the in-depth interviews, probing questions on the existing nutrition capacity at the Ministry of Agriculture were included.

Case study of value chains

To date, the use of value-chain concepts for nutrition has been minimal. This is unfortunate as the approach is potentially useful to the retention or creation of the nutritional value of agricultural produce in the food system. To add to the current knowledge of the potential of value chains for nutrition sensitive agriculture in Senegal, two specific case studies of value chains were assessed. The first case study dealt with fruit and vegetables and the second with the use of local cereals (mainly millet) in bread. Value chains were assessed for their (i) objectives and overall approach, (ii) actors, activities and interrelationships/ operational linkages through the value chain and (iii) advantages, achievements and challenges with regard to nutrition.

Findings

Policy analysis

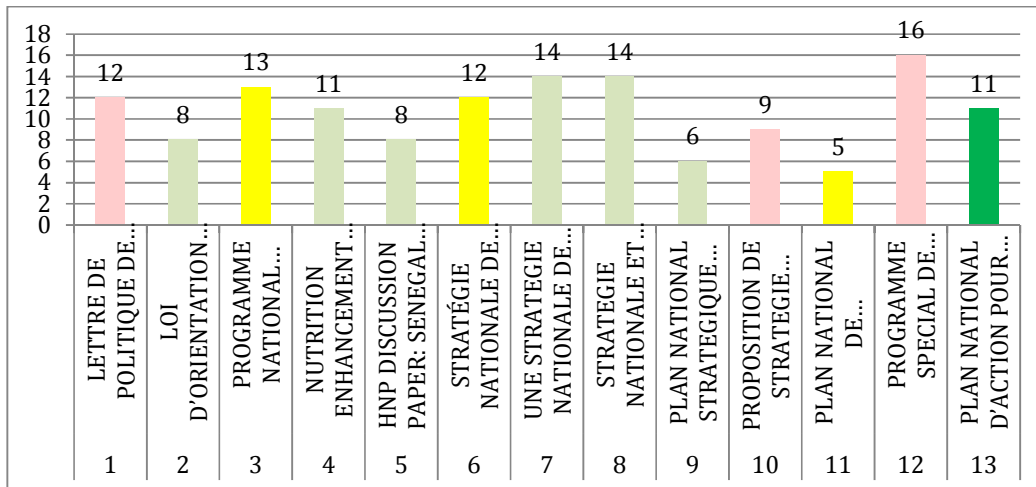
Thirteen policy documents were retrieved and reviewed (Table 4).

Table 4 List of policy document reviewed

Nr	Title	Time frame
1	<i>Lettre de politique de développement de la nutrition</i>	2001-NR
2	<i>Loi d'orientation agro-sylvo-pastorale</i>	2004-2016
3	<i>Programme national d'investissement agricole (PNIA): plan d'investissement 2011-2015</i>	2011-2015
4	Nutrition enhancement program: phase II strategic plan	2007-2011
5	<i>HNP discussion paper: comprendre les facteurs politiques et institutionnels conduisant au changement des politiques de nutrition: Senegal case study</i>	2010
6	<i>Stratégie nationale de développement économique et social (SNDES)</i>	2013-2017
7	<i>Une stratégie nationale de sécurité alimentaire au Sénégal: résumé du diagnostic, les stratégies, les chantiers et les défis</i>	1999-NR
8	<i>Stratégie nationale et programmes prioritaires de sécurité alimentaire: Sénégal</i>	2002-2015
9	<i>Plan national stratégique pour la survie de l'enfant: Sénégal</i>	2007-2015
10	<i>Proposition de stratégie opérationnelle du secteur agricole</i>	2001-2005
11	<i>Plan national de développement sanitaire</i>	2009-2018
12	<i>Programme spécial de sécurité alimentaire</i>	NR
13	<i>Plan national d'action pour la nutrition</i>	1997-2002

NR: Not reported

Annex 6 summarizes the key policy documents and their main components in Senegal. With an average of 11.3/17 (66%), the policy documents score moderately well on the score for nutrition-sensitivity (Figure 18).



Degree of nutrition-sensitivity



Figure 18 Results of scoring grid of policy documents

Most of the high scoring policies are geared towards food security, i.e. *'Programme Spécial de Sécurité Alimentaire du FAO (2002)'*, *'Une Stratégie Nationale de Sécurité Alimentaire Au Sénégal (1999)'*, and *'Stratégie Nationale et Programmes Prioritaires de Sécurité Alimentaire: Sénégal (2002)'*. These two last documents contain every aspect of the scoring grid, except for the bullets 6.1 "Increase production of nutrient-rich foods", 10.1 "Improve processing to retain nutritional value" and 12.1 "Expand markets +access of nutrient rich foods". The *Programme Spécial de Sécurité Alimentaire* of FAO almost has a perfect score since it only lacks item 12.1 "Expand market access of nutrient-rich foods".

The item that was best covered across policies was sustainability approach. This approach refers to the sustainable use of natural resources, livelihoods and resilience of farmers. As such this term covers a wide range of issues that relevant to policies that aim to improve agriculture and livelihoods. Most policies included references to such items. References to sustainable diets as defined by FAO (47) "those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources" was not encountered in the documents.

The policies that had the lowest score were the, ‘*Plan National Stratégique Pour La Survie De L’enfant : Sénégal (2007)*’ and ‘*Plan National De Développement Sanitaire (2009)*’. This low score was not surprising as these documents were only remotely related to agriculture and nutrition.

The three best scoring policies all contain items 7 (Reduce post-harvest losses), 9 (Nutrition education), 11 (Improve storage) and 12 (Expand markets and access) while none of the three worst scoring policies mention these aspects at all.

Almost all policy documents do contain objectives, strategies/activities and a link with a monitoring & evaluation system related to nutrition to some extent (Figure 19).

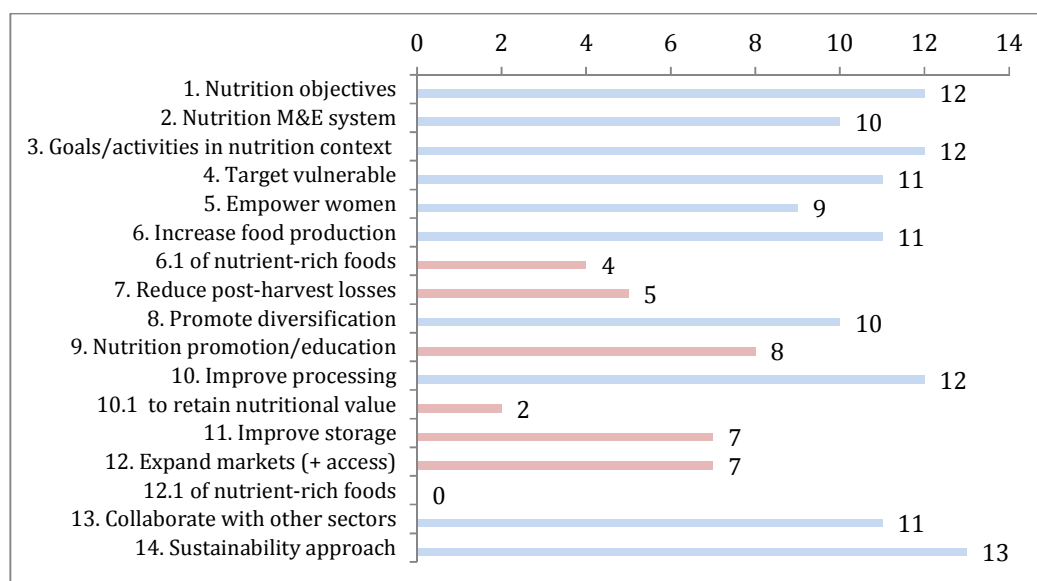


Figure 19 Aspects discussed by the national policy documents (n=13) in Senegal

Items 4 (Targeting vulnerable), 5 (Empower women), 6 (Increase production), 8 (Diversification), 10 (Improve processing), 13 (Collaboration) and 14 (Sustainability) are present in most of the policies but again in a highly variable way. Items 7 (Reduce post-harvest losses), 9 (Nutrition education), 11 (Improve storage) and 12 (Expand markets + access) are the least frequently encountered considering all policy documents. Expansion of market access of nutrient-rich foods is not present in any of the documents.

More recent documents do not necessarily perform better on the scoring grid: the highest score of 16/17 was the ‘*Programme Spécial de Sécurité Alimentaire*’ of the FAO, released in 2002. Also, the three least scoring policies were quite recently published (resp. in 2012, 2007 and 2009).

The '*Loi d'Orientation Agro-Sylvo-Pastorale (2004)*', is a law text that hierarchically comes higher than the other documents. The document describes the overall context in which sectoral policies can be developed. Since its key focus is agriculture, it is remarkable that some of the characteristics such the reduction of post-harvest losses and improving storage facilities are not present in this document. Noteworthy is also that the document does not contain aspects related to nutrition monitoring and evaluation system or targeting the vulnerable or empowerment of women. Both items are characteristics that are found in most of the other documents. The nature of this document however, implies that the text stipulates what has to be done without detailing specific actions or detailed information on how to follow up on these activities. The detailed development of strategies and actions is situated at the level of sectoral programs and policies.

The last policy document, '*Plan National d' Action Pour La Nutrition (1996)*' is the national action plan of Senegal for nutrition. This document is a concise outline of nutrition action in Senegal and dates back to 1996. The documents consists of two main parts, the first describes the nutritional status of the country while the second part focuses on nutrition objectives, strategies and specific actions. The document scores 11/17 and Empowerment of women, collaborating with other sectors and expanding markets and market access are the three most important items in the scoring list that are missing in this document.

Country assessment

Causal analysis

After explaining the purpose of the study, the workshop participants decided to use nutrition status in general as the main issue to explore. It was felt that an analysis of determinants of nutrition in Senegal should both incorporate undernutrition as well as overnutrition issues. The model was constructed in plenary up to the first 3 lines and the analysis continued to explore determinants of food intake, as health status and genotype were considered too secondary in this assessment.

Next, the participants split into groups and identified the determinants of following aspects related to nutrition status:

- related to food quantity: (i) food availability, (ii) food accessibility, (iii) food habits, and
- related to food quality: (iv) nutritional characteristics, (v) food safety and (vi) food habits.

As food habits appeared as a determinant of food quantity and food quality, it was only analyzed once and 5 separate groups were formed. The Causal Model is Annex 7.

The following conclusions are drawn from the causal analysis:

- There was a general consensus that agriculture should contribute to tackling both under nutrition and over nutrition;
- Various pathways that are of immediate relevance for professionals in agriculture were identified, ranging from variety selection, food production, distribution, marketing to post harvest processing during production and primary transformation;
- The determinants were principally technical aspects related to food supply and focused less on social or cultural aspects of food habits such as practices, perception and community participation;
- The determinants on food availability at individual level was replaced by an analysis of food availability at national level.

Overall, the exercise was perceived very positively and enabled a dialogue between various sectors of agriculture and nutrition. This is significant, as both sectors had not formally explored collaboration. For example, most of the participants had not met with the staff of the Cell Against Malnutrition before. The workshop triggered an interest and a constructive attitude towards the initiative to explore nutrition-agricultural linkages in Senegal. Participants from various technical backgrounds in agriculture recognized how they could contribute with their expertise to tackle nutrition in Senegal. During the analysis, various participants identified new pathways in this regard.

The exercises itself has shown that the dissemination of research and knowledge is important. The transfer of knowledge is really important and will take place in the rural councils.

Agricultural Expert at national level, Senegal

In depth interviews

General observations

The interviewees showed a great willingness to contribute to the analysis of nutrition agricultural linkages and recognized the importance of agriculture in the prevention of malnutrition.

For the agricultural sector, the **National Agricultural Investment Program** and

Agricultural Pastoral Orientation Law are the key documents. The law is the overarching context in which the sectoral policies and programs are developed and implemented. If nutrition-agricultural linkages are to be forged at national level in Senegal, they need to be incorporated in the Agricultural Pastoral Orientation Law.

Targeting on the basis of nutritional vulnerability

The current agricultural programs generally do not target on the basis of nutritional vulnerability or nutritional profile of the community. Only in a few cases such as Cell Against Malnutrition, which work in the nutrition sector, interventions are tailored to nutritional needs of the beneficiary population.

Identification of nutrition goals

The respondents noted that the current agricultural programs in which they were involved had no explicit nutritional goals. The main objective of the current agricultural programs is to ensure availability of food, with a first level of post harvest transformation. In addition to this, the programs aim to diversify food production in the country. The respondents generally perceived food security or dietary diversity as the finality of their work, but essentially looked at this from an angle of food production and food availability.

For instance the project Nutrition, children and food security was organized with the directorate of horticulture in partnership with Cell Against Malnutrition, FAO, WHO, UNICEF, WFP or UNESCO.

The interviews showed a general significant misunderstanding of what nutrition is within the agricultural sector. Most of the respondents stated that they incorporated nutrition in their programs, as they (i) worked with food scientists for primary transformation of agriculture produce, (ii) simply produced the food that people eat, or (iii) looked at food safety e.g. postharvest reduction of aflatoxins in peanuts. Most of the programs poorly considered how agricultural production was used in dietary intake. Although interviewees reported that data were collected on this, these were information on national food consumption levels not individual food consumption data. In terms of dietary quality, the concerns of the respondents were mainly focused on (i) ensuring enough protein in the diet, (ii) dietary diversification or (iii) increasing food availability.

When we work with women groups in gardening projects we tell that vegetables are good and that they contain important vitamins.

Agricultural Expert at national level, Senegal

The *Agricultural Pastoral Orientation Law, 2011-2015* provides the legal basis for agricultural action in Senegal. It is the overarching document that serves as a legal framework for the development and implementation of sectoral policies e.g. program of fisheries. As such, it can incorporate nutritional recommendations under a sectoral policy for nutrition. In its current form, the *Agricultural Pastoral Orientation Law* contains no specific nutritional goals and considers nutrition under food security and food sovereignty. The main objectives of the law are stipulated as 52 commitments “*Engagements*”. After an initial evaluation after 3 years of implementation, the law is evaluated on a 5-year basis.

Empowerment and engagement of women

In general, agricultural programs have specific components to target female beneficiaries. The legal framework for this is stipulated in the *Agricultural Pastoral Orientation Law*. The law is quite explicit and recognizes all those involved in agriculture as professionals. These professionals consequently benefit from some form of social protection and are free to unite themselves and organize unions and can link with regional and international actors. The Law further includes specific articles for women, in particular in Chapter 12 on the promotion of equality in urban and rural areas. Article 54 deals specifically with gender issues and specifies the equality of men and women, when it comes to agricultural exploitation. There are 2 important paragraphs that further specify that access of women to land and credit needs to be facilitated.

Delivery platforms

The current agricultural programs do not deliver nutritional interventions. Although the respondents stated to provide nutritional recommendations when delivering agricultural interventions, such information was done at an *ad hoc* and informal way. The respondents acknowledged that the nutritional education component was not well developed and that they generally lacked basic knowledge on nutrition to develop such programs.

An interesting delivery platform for capacity building in nutrition is the ANCAR “*Agence Nationale de Conseil Agricole et Rural*” or National Agency for Rural Agricultural Counseling (48). ANCAR is a national structure with a mandate to diffuse technology that was developed through research to the communities. It also plays an intermediate role with financing institutions to facilitate access to credit for instance. ANCAR can also deliver health information to producers when needed through the rural councils.

We traditionally focus on production and efficiency but could incorporate nutritional messages also. We know the consumption of millet is good. It is disturbing to see how people sell millet to buy rice and we need to increase this. We should add nutritional messages to complement our work. We are increasing production but where are we going? Are we not going to an inequilibrium?

Agricultural Expert at national level, Senegal

Assessment of nutrition capacities at governmental agencies involved in Agriculture

Academic training

Since 2009, a Master in nutrition is organized at the Université Cheikh Anta Diop in Dakar (previously “*DEA de Nutrition et Alimentation Humaine*”) and enrolls about 40 students every 2 years. It is a 2-year program with an overall aim to train students for technical work in nutrition and food science with attention for public health nutrition in the form of nutrition interventions and nutrition epidemiology (49). The Master program is open to students with a variety of backgrounds, including agronomy and veterinary sciences. The university also organizes a PhD program in nutrition.

The academic training in Agriculture contains an elementary course of nutrition in the curriculum. The “*Ecole Nationale Supérieure d’Agriculture de Thiés*” (50) is the key institution where advanced training in agriculture is organized in Senegal. The curriculum currently does not contain a formal course in nutrition and nutrition is only covered marginally in other courses (Annex 8).

Capacity in nutrition at the Agricultural Ministries

The interviewees generally acknowledged that they lacked knowledge in nutrition. Although respondents noted to have received a basic course on nutrition during their formation in agriculture, this knowledge was perceived inadequate and outdated. The interviewees suggested that a specialization course in nutrition would be helpful and of interest. The current capacity in nutrition at the Ministry of Agriculture was perceived to be restricted to animal nutrition or food science and composition. For expertise with regard to human nutrition, the agricultural staff reported to turn to the Ministry of Health and Social Action.

Although specialization courses in nutrition exist, people with a medical background have mainly attended them. Although some experts in food science have been trained, the program has not yet reached out to agricultural staff. As the Ministry of Agriculture employs staff with a technical background in agriculture and is unable to recruit medical expertise at this point. Revising the curriculum of agricultural engineers with specific courses on nutrition sensitive agriculture seems a logical start to build capacity at the Ministry of Agriculture. Currently, Nutrition practitioners are not recognized institutionally as certified professionals by the Agricultural line Ministry.

Agricultural workers are mostly agricultural engineers, veterinarians, biologists, food scientists, and engineers in fisheries. These Ministries do not formally collaborate with structures depending from the Ministry of Health or any nutrition agency like Cell Against Malnutrition, nor does the Cell Against Malnutrition work with these institutions.

Case study of value chains

Case study 1: Fruit and vegetable value chain

Fruit processors are members of several formal networks such as the Federation of Agribusiness Professionals (fruit producers and processors), the union of women entrepreneurs, the central purchasing office of food packaging, the Cooperative of actors of horticulture in Senegal. The objective of these networks is to reinforce the activities of individual members. They are formalized structures with an office, a permanent secretariat and a board and hold monthly meetings.

Fruit processors collaborate with several other actors, through their networks:

- Funders,
- The project to support the agricultural sector "*Projet d'Appui à la filière agricole, PAFA*", which provides good quality seeds to fruit producers and gives technical support to producers; these producers have contracts with fruit processors to provide them with the kinds and qualities of fruits they need;
- The Senegalese Association for the promotion of export; and
- The Direction of women's entrepreneurship of the Ministry in charge of women.

Advantages of the networks are:

- Better and easier defense of common rights;
- Easier access to funding as funders prefer to support groups rather than individuals;
- Easier access to information related to the activity (market, trade fairs), and
- Knowledge of other actors in the sector and collaboration.

The main challenge they are facing is to secure funding adapted to small and medium enterprises to expand, buy equipment and access export markets. Guaranties required by banks are difficult for fruit processors to provide and interest rates are too high for them.

Although fruit processors are in networks, their collaboration is not optimal and well organized. According to the interviewee, there is a need for a consultation platform.

Case study 2: Innovation platform for the incorporation of local cereals in bread

The organization of bakers and their partners is more formal and is in the form of an innovation platform. The creation of this platform comes from the need to reduce the price of the exclusively wheat-based baking flour. With regard to that, the Institute of Food Technology (*Intitut de Technologie Alimentaire, ITA*) decided to incorporate local cereals (especially millet) in the baking flour (15% millet, 85% wheat). Pilot tests were conducted at the bakery of the Institute of Food Technology. A pilot project, financed by the World Bank's West Africa Agricultural Productivity Program (WAAPP) and the Government of Senegal, was implemented in Dakar. This project ended 6 months ago and is about to be scaled up in six regions of Senegal, including Dakar, with more funding.

The innovation platform was created in the framework of this project. It established constant relationships with farmers, millers, the national federation of bakers of Senegal, Institute of Food Technology and consumers. It is based on a contracting approach. The Institute of Food Technology technically support the parties involved to ensure that they all meet the specifications. As such, producers should provide good quality millet to millers who also have the obligation to supply good quality ready-to-use mixed baking flour to bakers. The latter guarantee the purchase of a predefined quantity. Bakers also benefited from new equipment through the national agriculture and food research fund (*Fonds National de Recherche Agricole et Agroalimentaire, FNRAA*) and trainings organized by the Institute of Food Technology. Millers were also trained.

Advantages of this platform are:

- Reduction of the price of the baking flour,

- Reduction of importation volumes (which is important for the Government),
- Reduction of the price of the bread which is appreciated by consumers,
- Longer shelf life of the bread,
- Less demanding storage conditions, and
- Higher fiber and phosphorus content of the bread.

Nutritional potential of the value chains

With regard to value chains, they add to the revenue of actors involved, from producers to transformers. Better revenue would make it easier for the actors to provide more diversified, nutritious and sufficient food to families, provided they receive appropriate nutrition education. Therefore the challenge would be to organize nutrition education sessions for actors of value chains, for instance through the project to support the agricultural sector (*Projet d'Appui à la filière agricole, PAFA*) in the case of the fruit and vegetable value chain. Another challenge would be to support actors of value chains in fundraising, so that their activities yield more revenue, and to create a better policy environment for the sectors involved (better taxation, incentives to produce more nutritious food).

In addition, actors of the value-chains need to get more technical support from their partners (public and private) to define clear nutrition goals from the beginning. One possible goal is to increase the supply of nutritious foods that are accessible to the poor all year round. Defining a clear nutrition goal from the beginning will facilitate identifying concretely the sectors where more actions are needed in the chain, to improve access to and acceptability of nutritious foods to consumers. For instance, in the fruit and vegetable value chain, micronutrient-rich varieties of fruits could be selected at production level, so that the end products have higher micronutrient content, at an affordable price.

In the process of adding more nutrition value to the chains in addition to higher financial value, all sectors should be involved and coordinated; the chain should be considered as a whole and all actors should be associated to the definition of the actions to be implemented. This should be done by a coordinator, a neutral actor to be hired to manage and integrate activities of the value chain.

Final appraisal of nutritional value of analyzed action

Policy analysis

Overall the nutrition status and sensitivity of these agricultural policy documents was moderate. Targeting the vulnerable population groups, empowerment of women, the increase of the production, the diversification and improvement of processing of agricultural products, collaboration between sectors and sustainability approaches were found to be present in the large majority of the policy documents. Recognizing the heterogeneity between the objectives and scope of the documents, the areas that offer a margin for improvement are the reduction of post-harvest losses, organization of nutrition education & promotion, improving storage and expanding markets and market access. The latter items are clearly relevant elements for policy documents that deal with agriculture or nutrition but were absent in more than half of the 13 policy documents reviewed.

The items where the most improvement can be made in the future, are the items concerning nutrient-rich foods, nutrient value preservation and preservation of nutritional quality of agricultural produce. Only a minority of the policies takes into account these important aspects.

Country case study

Pathways through which agricultural programs can improve nutrition

The causal analysis and interviews revealed several pathways through which agricultural programs and policies can be improved with nutritional outcomes.

Four promising pathways were assessed during the interviews: (i) targeting of nutritionally vulnerable populations; (ii) identification of nutrition goals and use of nutrition indicators, (iii) engagement of women and (iv) use of agricultural programs as vehicle to deliver nutrition interventions. All but the engagement of women in agricultural programs are pathways that are currently not exploited.

The exercise showed the difficulty of linking agriculture and nutrition at various levels. While most participants were comfortable to identify conceptual links between the various determinants of malnutrition, linking the national or regional food availability with individual or household food availability was challenging. The workshop participants decided to focus on the analysis on national or regional availability, ignoring links with nutrition. The difficulty to tackle this part of the conceptual framework illustrates the disconnect between

both sectors and the need to develop a shared understanding of human nutrition and its complex determinants.

From the interviews however, there was a clear recognition that agricultural interventions could be targeted and tailored to the nutritional profile of the target population. To achieve this however, current efforts will need strengthening. Various regions of the country suffer from persisting high rates of malnutrition despite a significant increase in agricultural productivity and income from agricultural products. Current agricultural programs insufficiently consider nutritional aspects and utilization of crops. Food availability at macro level (regional – national level) has received the bulk of the attention of the agricultural sector but food availability at the individual level has received much less.

Current programs do not have nutritional goals and are not monitored using nutritional indicators. Incorporating nutritional objectives and indicators in agricultural programs is clearly a challenge. It will require careful joint planning, monitoring and evaluation by Ministries involved in Agriculture and Health. Accountability of agricultural interventions on nutritional outcomes will need to be shared as well. Agricultural interventions need to develop feedback mechanisms that stimulate maximal nutrition or health benefit from increased production of crops or revenue generated from them. Nutritional surveillance sites are a promising idea but will require careful planning to avoid previous failures. Decades of experiences has shown how nutrition surveillance systems are often reduced to administrative data collection exercises and fail to generate timely information for action (51). Nutrition surveillance systems should be multi-sectoral and potentially integrate health, agriculture and water and sanitation indicators. The need for a careful conceptualization and rationalization of nutritional surveillance systems is apparent.

Current agricultural programs are reported to engage and target women in terms of wellbeing, empowerment and livelihoods. The legal basis for this is in place and the respondents generally confirmed to abide by this. Various agricultural programs are implemented that specifically target women, including facilitation of access to credit. A review is needed how to best integrate of nutritional elements such as promotion of optimal child caring practices and maternal and child health in these activities.

Currently, agricultural programs are not used as delivery platforms for nutrition education. It is clear however, that suitable structures and delivery platforms such as ANCAR are available to diffuse nutritional knowledge that complements agricultural activities. These structures enable a tailored approach to the context of the communities and enable enhancing nutrition sensitivity of agricultural extension work. To achieve this however, relevant training packages need to be

developed. Tentative findings from the interviews and causal analysis indicate how such activities need to focus on the utilization of crops for nutritional benefits, food preservation activities, improving storage and reduction of post harvest losses, (in particular for high value crops) and market access.

An additional pathway emerged from the interviews. The selection of choice of seeds and varieties is done on the basis of commercial (e.g. yield, pest resistance and appearance) indicators only. It is well known however, that the variation in micronutrient content of different varieties is high. Promoting varieties on the basis of micronutrient composition of the crops is therefore considered a promising strategy to address micronutrient deficiencies and promote local foods.

An incorporation of nutritional considerations in the selection of varieties seems a reasonable approach to incorporate nutrition in agriculture. This consideration should take into account the nutritional characteristics of the agricultural produce (nutritional composition) as well as cultural and traditional values (indigenous varieties and species). Such approach however, will entail prioritizing different varieties taking into account various criteria. Additionally, such approach requires the availability of adequate food composition data and collaboration with research groups such as Institute of Food Technology and the nutrition department of the Université Cheikh Anta Diop.

Fundamental changes

To develop nutrition sensitive agricultural strategies however, a number of fundamental changes are needed.

First, the role of agriculture for the prevention of malnutrition needs to be recognized in the *Agricultural Pastoral Orientation Law*. Integration of nutritional objectives and commitments will require a clear recognition of the role of agriculture in nutrition in the *Loi d'Orientation Agro-Sylvo-Pastorale*. The initiative to develop a policy letter of nutrition and the upcoming revision round of the orientation law of the agricultural sector is the opportunity not to be missed to institutionalize nutrition-agricultural linkages in Senegal.

Secondly, capacity building is needed to upgrade knowledge and understanding of agricultural professionals regarding nutrition. Nutrition is too poorly understood by the various professionals at the agricultural ministries to enable dialogue and effective collaboration with the nutrition sector. Action at various levels is needed in this regard:

- The nutrition component of the curriculum of agricultural sciences follows a traditional format of a basic course in nutrition. Now that the knowledge on nutrition-sensitive approaches in agriculture is being developed, it is opportune to update this course with these elements. Rather than a basic theoretical course in human nutrition, it seems more reasonable to outline what nutrition and malnutrition is and how it can be used in agriculture to tackle malnutrition in the country. The online course of the London School of Hygiene and Tropical Medicine on programming for nutrition outcomes^{4,5} could provide guidance for this.
- The options for in-service training for staff working in agriculture needs to be explored. A short-term course on nutrition and nutrition sensitive approaches in agriculture responds to a latent need. Currently, such specialization courses for agricultural experts in nutrition are not organized in Senegal. In the short term, an interesting option in this regard is the refresher course FINSA “*Formation Internationale en Nutrition et Sciences Alimentaires*” organized at the University of Abomey-Calavi in Benin (52). The course is a one-month course for practitioners and has been organized on a yearly basis since 2005. It trains various professionals in francophone Africa and has received international recognition in this regard (53).
- Build capacity in behavioral nutrition and nutrition education. The current master program in nutrition in Senegal does not contain courses on behavior change or nutrition promotion. The renewed interest in nutrition sensitive approaches will fuel a demand for expertise in behavior sciences and lifestyle interventions to improve dietary intake. Although behavioral sciences are well recognized in the prevention of dietary related chronic diseases, they seem to be less common in the prevention and treatment of childhood malnutrition.
- Ensure adequate capacity at the appropriate governance levels. To ensure nutrition sensitive approaches in agriculture in Senegal, it will not suffice to upgrade capacity and skills in nutrition at the ministry level or other levels of implementation. Developing nutrition sensitive programs at national level in Senegal will require conceptual thinking on nutrition

⁴ http://ble.lshtm.ac.uk/pluginfile.php/20037/mod_resource/content/42/OER/PNO101/index.html

⁵ http://ble.lshtm.ac.uk/pluginfile.php/20037/mod_resource/content/42/OER/PNO101/sessions/S1S12/PNO101_S1S12_010_010.html

during conceptualization phase. Nutrition expertise needs to be situated at the policy-making levels (i.e. Cabinets). Similar to the Cell Against Malnutrition, nutrition expertise needs to be at overarching levels such as the Prime Minister's office to ensure mainstreaming of nutrition in the development and evaluation of all relevant national programs.

Developing a visionary approach for nutrition in development in Senegal

Multi-stakeholder collaboration for nutrition action in Senegal has a long-standing tradition. Despite this however, agriculture has been poorly involved in nutrition programs and policies. Our assessment showed a great willingness for collaboration between both sectors and a clear recognition of the role that agriculture can play to improve nutrition in the country. Suitable structures are in place to enable concerted action between both sectors.

Developing nutrition-sensitive approaches in agricultural programs at national level is not a panacea. Although the focus of the present analysis has been restricted to agriculture, lessons learned should inform future challenges to integrate nutrition sensitive approaches in other areas such as education, social affairs, environment, demography etc.

Nutritional challenges however are not restricted to agriculture and feed into a larger context. Emerging challenges such as lifestyle changes, demographic pressure, scarcity of natural resources, social dynamics etc. will require innovative strategies to mitigate impact on nutrition. Effective strategies will need to be comprehensive and multisectoral. To achieve this, a visionary approach towards nutrition for development in Senegal is needed.

Currently, most technical agencies work in isolation and only collaborate on a "needs-basis". The different technical agencies collaborate typically at the implementation level and there is little joint thinking to share experiences and inform policy development upstream. The mandate of the Cell Against Malnutrition is explicit in this regard and considers the Cell as a framework for concerted action in nutrition. This is unfortunate as novel ideas for the development of nutrition-sensitive policies could emerge from the practical experiences in multi-sectoral actions from implementing agencies. There should be a space or forum for implementing agencies to share lessons learned, generate ideas and contribute to policy making.

Braun *et al.* previously suggested an incentive approach for intersectoral collaboration between the agriculture and health sector and propose these originate from the highest policy making level (54). The position of the Cell Against Malnutrition clearly presents opportunities to do so in this regard. There

are currently no mechanisms through which implementing agencies can inform policy development. The Cell Against Malnutrition could initiate a process to establish a “think tank” to advise policies makers. Such “think tank” should mobilize a wide array of stakeholders from various technical backgrounds and foster an open debate that generates ideas for strategies to mainstream nutrition in the country. Leadership for this initiative could be provided by the Cell Against Malnutrition. Ideally, the think tank should foster a holistic vision on nutrition for development and care must be taken not to use a narrow nutritional lens for this. A potential way to achieve this is to have the meetings chaired by high-level scholar in social sciences or anthropology.

Conclusions and recommendations

Senegal is currently experiencing early stages of nutrition transition. Despite promising achievements, the country faces persisting high rates of malnutrition and is confronted with increasing incidence of diet related chronic diseases in pockets of the society.

The stage of nutrition transition of the country presents a number of useful conditions to develop nutrition-sensitive agricultural system. At this stage, the build-up of services and public infrastructure is needed and the time is opportune to capture synergies across sectors (55).

Senegal has made a number of significant commitments to do so. In particular the establishment of the Cell Against Malnutrition under the Prime Minister's office creates valuable experiences for scale-up concerted efforts against malnutrition and build bridges with the agricultural sector. Recently, the government of Senegal has committed to foster nutrition-sensitive agricultural strategies and to develop a national policy for nutrition.

This assessment aims to guide the development of nutrition-sensitive agriculture and nutrition policy by reviewing how food and agricultural policies are having or are intended to affect nutrition and identifying gaps and opportunities to strengthen agricultural policies with nutrition-sensitive approaches.

The analysis of the policy environment in the agricultural sector indicates substantial attention for food security but much less to nutrition. Nutrition objectives are largely absent in agricultural policy documents at national level. In addition, there are important opportunities that the agricultural sector can seize to promote nutrition, in particular in the area of processing and post harvest handling and provision of nutrition education during agricultural extension services.

Discussion with the agricultural experts at national level show a important willingness and interest to reflect on the incorporation of nutritional objectives in national strategies. A first workshop with representatives from different sectors was a valuable and eye opening experience. There was a large consensus amongst the participants that agriculture can and needs to tackle both under and over nutrition. The initiative for nutrition sensitive agriculture is expected to result in an inclusive process to enable discussion, consensus and shared understanding of the nutrition and agricultural sectors in the country.

Further reflection on linking nutrition and agriculture is needed, in particular in the identification of pathways that link national or regional availability of food with household food availability and food security. In contrast to other pathways

for nutrition sensitive agriculture, agricultural experts has substantially greater difficulties linking the former.

Further in-depth assessment of current agricultural strategies, indicate important opportunities for action in the targeting and identification of nutrition vulnerable population, identification of nutrition goals and use of nutrition indicators and use of agricultural programs as vehicle to deliver nutrition interventions. Mainstreaming of gender issues is a concern shared by both the agricultural and nutrition sector and might generate useful experiences in this regard.

There are a number of experiences with value chain approaches in the food system (i.e. fruit and vegetable value chain or Innovation platform for the incorporation of local cereals in bread) that offer a promising avenue for the Ministry of Agriculture for economic development. Current initiatives have brought together various actors of the food system but will require additional support to incorporate nutritional concerns. Current attention in the value chain for food related expertise is geared at food safety or food technological aspects. Nutritional or health concerns are not systematically assessed in the value chains and will require mobilizing additional expertise from dietitians, nutrition or the public health sector. Hawkes & Ruel provide useful concepts to develop nutrition sensitive value chains (56).

Fostering a common understanding of nutrition

The experiences with the value chain points towards a larger issue in Senegal. Despite the large recognition and willingness to leverage agriculture for nutrition, there is a vast misunderstanding of what nutrition is within the agricultural sector. Most actors in the agricultural sectors did not perceive the public health dimension of nutrition and looked at nutrition from a productionist point of view (ensuring sufficient and a diverse supply of food) or from a technological perspective (i.e. food technology).

The development of a shared understanding of nutrition and public health nutrition needs to be fostered. Currently, advanced nutrition expertise in Senegal is principally situated at the Ministry of health or at the Cell Against Malnutrition. Various opportunities such as the development of specific in-service courses for agricultural professionals, review of the academic curriculum or recruitment of agricultural professionals with a specialization in nutrition exist and need to be explored. The existence of the MSc, PhD programme in nutrition and research expertise in nutrition in Dakar provides a valuable asset in this regard.

Development of nutrition sensitive agricultural approaches

If nutrition-sensitive agriculture in Senegal is to be developed, it needs to be integrated in the Agricultural Pastoral Orientation Law. The upcoming evaluation round provides window of opportunity to incorporate nutritional commitments in the Law. In parallel to this, the Cell Against Malnutrition should continue to explore the opportunities for collaboration with the Agricultural sector during the development of the national nutrition policy.

The administrative organization of the government of Senegal, as in most countries (57), requires specific efforts to facilitate coordinated efforts between nutrition and agriculture. Although the creation of a fully-fledged nutrition coordination structure seems an attractive prospect, previous experience and failures with such initiatives around the world call for careful consideration (58). Informal structures where experiences and ideas can be shared might prove to be a first useful step to produce recommendations for nutrition sensitive agriculture in Senegal.

The Cell Against Malnutrition, appropriately situated at the highest policy level, can facilitate the dialogue between the agriculture and nutrition sector. To develop effective nutrition sensitive approaches however, more will be needed. A sustained dialogue between both sectors is needed and needs to be visionary, practical and results-oriented. Such dialogue should result in a shared vision on various fronts of the policy process, from inception, implementation as evaluation under the auspices from the highest political levels.

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Annexes

Annex 1 Commitments on nutrition by the Senegalese Government for nutrition

Commitments made by the Minister of Agriculture on behalf of the Government of Senegal

Nutrition for Development - United Kingdom

The Government of Senegal recognizes that improving the nutritional situation of a country requires -visibility of nutrition; the inclusion of nutrition on the list of National Priorities; allocating adequate resources to nutrition; the scaling up of interventions; and the adoption of a multisectoral approach in the fight against malnutrition. Senegal fully endorses the "Global Nutrition for Growth" compact. By 2020, the Government of Senegal is committed to⁶:

- Reducing stunting and wasting so that the national prevalence is at satisfactory levels (less than 10% for stunting and less than 5% for wasting);
- Addressing micronutrient deficiencies so that the national prevalence is at satisfactory levels.

These objectives will be achieved through:

- Scaling-up community-based nutrition services: the level of coverage is expected by 2020 to reach at least 90% for effective nutrition interventions for pregnant women and children under 2 years.
- The strengthening of multisectoral interventions for nutrition: a multisectoral approach based on the fight against the determinants of malnutrition will be intensified so that the relevant sectors (health, agriculture, education, water, social security) incorporate nutrition objectives in their policy document and undertake to implement pro-nutrition interventions and to bring to scale the high impact interventions on nutrition.
- For effective coordination of the multisectoral approach: the need for coordination and harmonization of actions is important and special

⁶ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/205880/Nutrition-for-growth-commitments.pdf.

Note: this is a first version, and was subjected to corrections at the time of write-up

emphasis will be placed on the political dialogue, business intelligence and monitoring and evaluation. The high-level leadership of the Government will ensure transparency and accountability of different stakeholders and close monitoring of progress.

- The government's commitment to invest in the fight against malnutrition: the Government of Senegal is firmly invested in the financing of nutrition interventions found effective. The government has pledged in 2011 to increase funding for nutrition annually to 2.8 billion FCFA per year in 2015. This direct investment will be strengthened to ensure full coverage of children and women in effective nutrition interventions.

Annex 2 Schedule of the field visit of the country case study

Mon 10/6	Tue 11/6	Wed 12/6	Thu 13/6	Fri 14/6	Sat 15/6	Sun 16/6
<p>Inception and testing</p> <ul style="list-style-type: none"> Briefing by country team and consultants Meeting at WHO country representative Meeting with WHO focal point for nutrition Meeting with CLM Fine tuning if schedule and planning Revision of questionnaires and test with Senegalese counterparts 	<ul style="list-style-type: none"> Workshop & causal analysis “agricultural pathways to improve nutrition status in Senegal” 	<ul style="list-style-type: none"> Planning of Key informant interviews 	<ul style="list-style-type: none"> Key informant interviews 3 & 4 	<ul style="list-style-type: none"> Key informant interviews 6 &7 	<ul style="list-style-type: none"> Notes and reporting 	<ul style="list-style-type: none"> Notes and reporting
<ul style="list-style-type: none"> Fine-tuning of planning, workshop preparations and communication 		<ul style="list-style-type: none"> Key informant interviews 1 & 2 	<ul style="list-style-type: none"> Key informant interview 5 	<ul style="list-style-type: none"> Mid term Debriefing and planning of week 2 		

Mon 17/6	Tue 18/6	Wed 19/6	Thu 20/6	Fri 21/6	Sat 22/6	Sun 23/6
Key informant interviews	<ul style="list-style-type: none"> • Transcription of interviews • Phoning to appoint for remaining interviews 	Preparation of interview guide for value chain assessment	Key informant interviews	Final debriefing at FAO, WHO and CLM	Notes and reporting	Notes and reporting

Annex 3 List of persons met

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Annex 4 Agenda and list of participants of the causal model analysis workshop

ANALYSE DE L'IMPACT NUTRITIONNEL DES POLITIQUES ET SYSTÈMES ALIMENTAIRES AU SÉNÉGAL

ORGANISATION ET AGENDA D'UN ATELIER D'ANALYSE CAUSALE

Mardi 11 Juin 2013

Novotel Dakar

En dépit des progrès importants dans la productivité agricole, le nombre de personnes sous-alimentées reste encore très élevé. À l'heure actuelle, il y a très peu de connaissance, d'expérience et de données disponibles sur le potentiel de l'agriculture et du système alimentaire pour améliorer l'état nutritionnel des populations. Par conséquent, la nécessité de mieux comprendre le lien entre agriculture et nutrition s'impose. Pour éclairer ce sujet, un certain nombre de pays ont exprimé leur intérêt à collaborer avec le « United Nations System Standing Committee on Nutrition » (UNSCN) pour évaluer et analyser l'environnement politique du système alimentaire ayant des répercussions sur les résultats en nutrition. Ces pays sont: le Népal, la Sierra Leone, le Brésil, le Mozambique, le Malawi, la Thaïlande, l'Afrique du Sud et le Sénégal. Ces études de cas par pays sont effectuées d'avril à juin 2013. En général, les objectifs de cette étude sont les suivants :

- Examiner comment les politiques alimentaires et agricoles ont ou pourraient avoir un impact sur la nutrition dans le pays et
- Contribuer à l'avancement du débat sur l'agriculture pro nutrition

Du 10 au 14 Juin, un consultant va collecter, en collaboration avec une équipe du pays, des données sur les liens agriculture-nutrition au Sénégal. Comme le Sénégal est en train d'élaborer une nouvelle politique en alimentation et nutrition, cette étude de cas tombe à propos puisqu'elle apportera une contribution spécifique à l'identification des opportunités pour (mieux) associer et mobiliser les différents secteurs dans ce processus. Plus précisément, le travail au Sénégal visera à stimuler la discussion entre les différents secteurs impliqués dans l'élaboration d'une politique en nutrition. En visualisant les différentes voies par lesquelles l'agriculture peut contribuer à un meilleur état nutritionnel au Sénégal, les lacunes et opportunités pour les acteurs impliqués seront identifiées.

Comme point de départ de l'analyse, il est essentiel d'identifier les déterminants spécifiques des liens agriculture-nutrition. Pour réaliser ceci, un atelier d'une journée est organisé avec les principaux intervenants en matière de nutrition et d'agriculture au Sénégal. En plus de fournir une analyse du chemin à suivre pour que l'agriculture puisse déterminer l'état nutritionnel au Sénégal, l'atelier va construire une vision commune et servira de base pour poursuivre en profondeur l'analyse des différentes voies qui sera effectuée pendant la visite de terrain. La méthodologie utilisée sera « Planification et Evaluation Participatives et Globales »⁷.

L'atelier s'adresse principalement aux experts au niveau national, mais la participation d'experts au niveau régional pourrait être bénéfique. Trente participants sont envisagés et devraient représenter une variété de domaines techniques pertinents pour la nutrition et l'agriculture dans le pays. A savoir :

- des experts techniques du ministère de l'Agriculture et / ou Ressources naturelles et Eau qui s'occupent de la production végétale, l'élevage, la pêche, les moyens de subsistance, la sécurité alimentaire, le commerce et les marchés des matières premières ;
- des experts techniques qui interviennent en nutrition au Ministère de la Santé et à la cellule nationale de nutrition et
- des experts techniques provenant d'autres secteurs ou ministères, par exemple des Affaires Sociales (gender), Planification et qui sont considérés comme essentiels pour cette analyse au Sénégal.

Agenda

9:00 -10:00 Session 1: Session d'ouverture

- Introduction
(Abdoulaye Ka; Coordonnateur National, Cellule de Lutte contre la Malnutrition et Ndiobo Diene : Conseiller technique Ministère de l'Agriculture)
- Présentation des objectifs de l'atelier
(Carl Lachat et Eunice Nago ; Consultants UNSCN)
- Profil nutritionnel du Sénégal
(Cellule de Lutte contre la Malnutrition)
- Présentation de l'approche du modèle causal pour appréhender les relations entre nutrition et agriculture au Sénégal
(Carl Lachat et Eunice Nago ; Consultants UNSCN)

⁷ <http://www.ifad.org/pub/bsf/cppe/cppe.pdf>

- Feedback et clarification des points relevés par les participants

10:00 -13:00 Session 2: Construction d'un modèle causal

Cette session sera facilitée par les consultants. Les participants identifieront en plénière les déterminants de l'état nutritionnel au Sénégal. Ils seront ensuite répartis en groupes de travail suivant leurs domaines d'intervention (secteurs). Les travaux de groupe consisteront en une analyse du modèle causal par champ thématique, suivant les domaines d'intervention des participants (en particulier l'agriculture, l'élevage, la pêche, l'horticulture,...).

11:00-11:15 Pause-café

13:30 -14:30 Déjeuner

14:30 -16:30 Session 2: Suite

16:30-16:45 Pause-café

16:45 -17:30 Session 3: Feedback et discussion

Les groupes de travail présenteront leur modèle causal et expliqueront aux autres participants les relations identifiées.

17:30 -18:00 Session 4: Clôture

- Feedback des consultants
- Clôture de l'atelier par Mr. Abdoulaye Ka

List of participants

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Annex 5 Questioning route for the in-depth interview

Introduction

Presentation of the team, interviewees and purpose of the interview. Permission for recording the interviews and oral consent.

Questions

1. What are the current policies and community based programs
 - Which agencies or structures implement them
 - Who are the beneficiaries and how are they targeted
 - Do these programs integrate nutritional objectives? If so, what are these? If not, how can they be integrated?
 - How are women integrated in these programs? When are they involved?
 - Can these programs be used to deliver nutritional interventions or messages? If not, what would be needed?
2. What is the level of human resources trained in nutrition or what capacity in nutrition is there in your institution?
3. How do you work with current structures or agencies in the field of nutrition or health? How could we make this more operational at the local or regional level?
4. Do these policies or programs collect nutritional information or data? How is the monitoring and evaluation done?
5. If nutrition is to be integrated in these programs or policies how can this be done.

Annex 6 Summary of policy elements in key policy documents relevant to nutrition in Senegal

	Author	Year of publ.	Time frame	Main objectives	Main strategies	Stake-holders involved	Scope (national, regional..)	Monitoring & Evaluation
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1) LETTRE DE POLITIQUE DE DEVELOPPEMENT DE LA NUTRITION	Government of Senegal	2001	2001-?	<p>To combat the direct and indirect multi-factor causes of malnutrition, food insecurity and food safety by involvement of all sectors related to development. In this way it is possible to represent a framework for measures and strategies for intervention that will improve the nutritional status of vulnerable groups and socio-economic development. One specific goal was to achieve a decrease in underweight of 45% in children in the next ten years (2001-2011).</p>	<p>Working at the level of several principles: equity, decentralization, associations, 'le faire-faire', community ownership, transparency in management, sustainability, medical ethics.</p> <ul style="list-style-type: none"> - Strengthening community approaches - Strengthening food security by improving agricultural production, research in nutrition-sensitive agriculture and distribution of food - Improving the supply of drinkable water and sanitation and household living environment - Restructuring and reinforcing the frames of institutional management and nutrition programmes management - Strengthening the partnerships with local NGO's, associations, implementing agencies and the private sector in programs that have the aim to control malnutrition - Improving collection systems, analysis, data dissemination on nutrition and promotion of studies and research - Reinforcing the capacity of human resources at the national and community level - Reinforcing programmes of information-education-communication (IEC), behavioral changes and social engagement - Developing resource-generating activities 	<p>Funding: Not mentioned in detail</p> <p>Partners: Nutrition is taken into account through programs and projects in implemented by several ministries, including the Ministry of Health, Education National, Agriculture and Livestock, Fisheries, Family and National Solidarity, Early Childhood, Trade, hydraulic. The coordination of all stakeholders involved (public & private sector, NGOs, development partners and local comm.-unities) is a requirement of all times.</p>	<p>The intersectoral strategies to be implemented to ensure harmonization of interventions and to develop synergy between actors in the field of nutrition requires the site management frameworks and consultation at all levels, central, regional, local..</p>	<p>Described quite shallow</p> <p>From the perspective of effective implementation of nutrition policy and the guarantee of a multisectoral approach to problems, it is a need for effective policy frameworks for consultation, programming, implementation and monitoring/evaluation.</p>
2) LOI D'ORIENTATION AGRO-SYLVO-PASTORALE	Republique du Senegal	2004	2004-2016	<p>Les objectifs spécifiques de la politique de développement agro-sylvo-pastoral sont :</p> <p>1) La réduction de l'impact des risques climatiques, économiques, environnementaux et sanitaires, par la maîtrise de l'eau, la diversification des productions, la formation des ruraux, afin</p>	<p>Les axes stratégiques de la politique de développement agro-sylvo-pastoral sont :</p> <ul style="list-style-type: none"> - La reconnaissance formelle des métiers de l'agriculture et des organisations professionnelles agricoles; - La protection sociale des personnes exerçant les métiers de l'agriculture; - La définition d'un statut juridique des 	<p>These guidelines take into account the sub-regional integration policy within the UEMOA and ECOWAS, the commitments in the OMVS and OMVG and</p>	<p>Un Conseil Supérieur d'Orientation Agro-Sylvo-Pastorale est institué</p>	<p>Not very detailed, no separate chapter</p> <p>Le Ministre chargé de l'agriculture établit un rapport annuel sur les mesures prises pour l'exécution de la</p>

				<p>d'améliorer la sécurité alimentaire de la population, et de réaliser à terme la souveraineté alimentaire du pays;</p> <p>2) L'amélioration des revenus et du niveau de vie des populations rurales, et la mise en place d'un régime de protection sociale en leur faveur;</p> <p>3) L'amélioration du cadre et des conditions de vie en milieu rural, notamment par l'accès aux infrastructures et aux services publics, grâce à un aménagement équilibré et cohérent du territoire;</p> <p>4) La protection de l'environnement et la gestion durable des ressources naturelles notamment par la connaissance et l'amélioration de la fertilité des sols ;</p> <p>5) La mise en place d'un système d'incitations à l'investissement privé dans l'agriculture et en milieu rural;</p> <p>6) L'amélioration de l'environnement et de la qualité de la production afin que l'agriculture soit un moteur du développement industriel et artisanal, et pour mieux satisfaire aux besoins des marchés intérieur et extérieur (sous régional et international);</p>	<p>exploitations agricoles;</p> <ul style="list-style-type: none"> - La réforme foncière; - La diversification des productions agricoles, l'intégration des filières agricoles et la régulation des marchés; - La sylviculture et les aménagements forestiers; - La politique de développement de l'élevage; - La maîtrise de l'eau; - Le développement des infrastructures et des services publics en milieu rural; - La promotion de l'équité sociale en milieu rural; - La protection contre les calamités naturelles et les risques liés aux activités agro-sylvo-pastorales; - Le développement de l'information agricole, de l'éducation et de la formation au profit des métiers de l'agriculture; - Le renforcement des capacités des organisations professionnelles agricoles, des organisations de la société civile, des collectivités locales et des services de l'Etat; - Le développement de la recherche et du conseil agro-sylvo-pastoral; - Le financement du développement agro-sylvo-pastoral. 	<p>commitments under international conventions and bilateral and multilateral trade agreements (AGOA, Canadian initiative/ACP, WTO. Agreements EU), as well as the agricultural NEPAD vision. These integration spaces and these international commitments provide the framework within which the protection and assistance to Senegalese agriculture are defined.</p>	<p>Un Comité Régional d'Orientation Agro-Sylvo-Pastorale est institué auprès du Gouverneur de region</p> <p>Une Conférence agricole annuelle est organisée par l'Etat, sous l'égide du Conseil Supérieur d'Orientation Agro-Sylvo-Pastorale.</p>	<p>présente loi et sur les modalités de sa mise en œuvre.</p> <p>Ce rapport est remis au Président de la République, au Président de l'Assemblée nationale, au Président du Conseil de la République, au Premier Ministre et aux représentants des organisations professionnelles agricoles le 31 mars de chaque année.</p>
<p>3) PROGRAMME NATIONAL D'INVESTISSEMENT AGRICOLE (PNIA): PLAN D'INVESTISSEMENT</p>	<p>Republic of Senegal</p>	<p>?</p>	<p>2011-2015</p>	<p>To complement the efforts of the Government of Senegal (for several years) to play a major role in agriculture in economic growth, food security, poverty reduction by 2015. To ensure a more balanced distribution of agricultural activities between agro-ecological zones</p>	<p>Il répartit les composantes et sous-composantes des six programmes prioritaires du PNIA</p> <p>retenus par la table ronde de février 2010 autour de huit objectifs stratégiques, à savoir :</p> <ul style="list-style-type: none"> - réduire les risques climatiques par la maîtrise de l'eau, - préserver et gérer durablement les autres 	<p>Funding:</p> <ul style="list-style-type: none"> - l'État, - les collectivités locales, - les organisations paysannes 	<p>National Regional Continental</p> <p>Distinction between rural &</p>	<p>Mécanisme de suivi-évaluation du programme:</p> <p>Pour mesurer les progrès réalisés par rapport aux objectifs de</p>

ENT 2011-2015				<p>regions and local authorities.</p> <p>The implementation of the investment plan has to drastically change the usage of instruments and objectives of the agricultural sector. Several policy levers (training, agri-cultural advisory, supportive access to inputs, etc..) that can have significant positive effects on future performance will be mobilized.</p>	<p>ressources naturelles</p> <ul style="list-style-type: none"> - augmenter la production et améliorer fortement la productivité globale des facteurs, - valoriser les produits agricoles par leur transformation, - améliorer l'accès aux marchés des produits agricoles, - renforcer la recherche pour générer et transférer de nouvelles technologies dans la production, la transformation et la commercialisation, - renforcer significativement les capacités des différents acteurs, et - assurer un pilotage et une coordination efficace de la mise en oeuvre 	<ul style="list-style-type: none"> - les partenaires financiers et techniques (PTF), - le secteur Privé - les organisations non-gouvernementales (ONG). <p>Partners:</p> <ul style="list-style-type: none"> - ECOWAPP (<i>Economic Community Of West African States</i>) - PDDAA (Programme Détaillé pour le Développement de l'Agriculture Africaine) 	urban areas	<p>l'ECOWAP et du PDDAA,</p> <p>un système de suivi-évaluation sera mis en place dans le cadre du programme SAKSS.</p>
4) NUTRITION ENHANCEMENT PROGRAM: PHASE II STRATEGIC PLAN	Republic of Senegal & National Committee against Malnutrition (CLM)	2006	2007-2011	<p>To assist Senegal to achieve the Millennium goals - eradication of extreme poverty and hunger - by supporting Senegal's nutrition policy, which objective is to improve the nutritional status of the target groups (children under five years of age, pregnant women and breast-feeding women) The following objectives are targeted during the program second phase</p> <ul style="list-style-type: none"> - to improve the populations nutritional status and particularly the growth of children under 2 years of age living in urban or poor rural zones - to build the country's institutional and organizational capacities in nutrition for the 	<p>PHASE I: to test community intervention strategies of nutrition/ICMI and to prepare the expansion of these programs to rural zones while consolidating results achieved in the previous community nutrition project</p> <p>PHASE II: see the expansion of nutrition and community IMCI programs, with an improvement of implementation capacities, in order to benefit 50% of the rural population in the country's 11 regions.</p> <p>PHASE III: It will consist of ensuring a national coverage of interventions. At the end of the program, Senegal will have effective and functional institutional mechanisms capable of providing cost effective nutrition</p>	<p>Funding:</p> <p>The government of Senegal + assistance of development partners</p> <p>Partners:</p> <ul style="list-style-type: none"> - Cellule de lutte contre la malnutrition (CLM) <p>Others:</p> <ul style="list-style-type: none"> - Community - Local collectivities - Technical Ministries 	National + regional	<p>During the first phase, the NEP had a monitoring and evaluation system, which has been a decision-making tool. Throughout the program implementation, this system provided information contributing to a good program management. In fact, the monitoring assessed the program implantation, activities conducted within committees, and costs associated with its</p>

				<p>policy implementation and evaluation</p>	<p>services adapted to the needs and with the participation of community and local authorities.</p> <p>From the second phase on, strategies will be strengthened by new ones:</p> <ul style="list-style-type: none"> - life cycle approach - multi-sectoriality - learning by doing - capacity & organizational building - gender approach 	<ul style="list-style-type: none"> - Civil society - Private sector - Ministries 		<p>imple-mentation. The monitoring identified and measured the program side-effects (impacts) on communities.</p> <p>A whole chapter is devoted to the monitoring and evaluation system. Separate bullets are discussed like:</p> <ul style="list-style-type: none"> - monitoring system - supervision system - community level - health post level - district and regional level - national level - reporting system - evaluation system
<p>5) HNP DISCUSSION PAPER: COMPRENDRE LES FACTEURS POLITIQUES ET INSTITUTIONNELS CONDUISANT AU CHANGEMENT DES POLITIQUES DE NUTRITION:</p>	<p>Alfred InisNidaye (Health, Nutrition and Population , World Bank)</p>	<p>2010</p>	<p>?</p>	<p>L'Objectif de l'étude est d'identifier, d'une part les facteurs politiques, institutionnels et administratifs qui sont associés au succès des programmes de nutrition et leurs interrelations et, d'autre part les stratégies des acteurs clés ayant contribué à l'intégration progressive des politiques de nutrition dans le pays.</p> <p>Le principal résultat attendu de l'étude est d'avoir une bonne connaissance de tous les éléments du changement ayant conduit à un renforcement de la nutrition dans les politiques de développement au Sénégal.</p>	<p>Les interventions visant à améliorer la nutrition ont une longue histoire au Sénégal. Avec le concours de partenaires, de donateurs ou de bailleurs de fonds, l'Etat et la société civile mettent en oeuvre depuis plus d'une trentaine d'années des projets et programmes de nutrition incluant des volets en nutrition. Plusieurs projets d'aide alimentaire et de lutte contre la malnutrition ont été ou sont encore exécutés par la société civile nationale et internationale, en particulier les Organisations Non Gouvernementales (ONG), sur toute l'étendue du territoire national depuis les années 1970.</p> <p>Les premières ONG internationales se sont</p>	<ul style="list-style-type: none"> - Italian Trust Fund for Children and Youth in Africa (CHYAO) - Health, Nutrition and Population (HNP World Bank) - Le Gouvernement - Les communautés - Les Organisations de la société civile nationale et internationale - Les bailleurs de 	<p>Ce document a été préparé comme une analyse de cas pour une étude régionale sur l'économie politique de la nutrition en Afrique sub-saharienne</p>	<p>AGETIP was chosen to do the monitoring and evaluation of the project:</p> <p>Pour d'autres informateurs, l'AGETIP a été choisie au vu de son efficacité dans la délivrance de services, dans le monitoring, et l'évaluation de projet. Elle disposait de toute l'expertise nécessaire à l'exécution du projet et</p>

SENEGAL CASE STUDY					<p>installées au Sénégal dès 1960, année de l'indépendance du pays⁹. Suite à la sécheresse de 1974, leur présence s'est renforcée. Des ONG nationales ont rejoint sur le terrain leurs partenaires internationales au moment des premières politiques d'ajustement structurel des années 1980. Le Conseil des Organisations Non Gouvernementales d'Appui au Développement (CONGAD) a établi que 81% de ses membres interviennent dans le domaine de la santé .</p> <p>Une partie de ces ONG membres du Réseau Santé du CONGAD interviennent dans le domaine de la nutrition à travers des projets de Survie de l'Enfant ou des Projets de Santé Nutrition.</p>	<p>fonds</p> <ul style="list-style-type: none"> - Les partenaires techniques (agencies du système des Nations Unies - Les nutritionnistes nationaux 		<p>avait des procédures plus souples et une action plus rapide.</p>
6) STRATEGIE NATIONALE DE DEVELOPPEMENT ECONOMIQUE ET SOCIAL (SNDES)	Republic of Senegal	2012	2013 - 2017	<p>L'objectif consiste à assurer les conditions d'une croissance soutenue et durable à même de réduire significativement la pauvreté et d'atteindre les Objectifs du Millénaire pour le Développement (OMD).</p> <p>L'élaboration de la Stratégie Nationale de Développement Economique et Social (SNDES) pour la période 2013-2017 obéit à la volonté politique d'inscrire le Sénégal sur la trajectoire de l'émergence et à la nécessaire prise en compte des préoccupations des populations. Elle s'effectue dans un contexte économique international difficile, marqué par la flambée des prix des produits alimentaires et énergétiques, doublée d'une incertitude sur la volatilité future. Par ailleurs, la persistance de la crise financière illustrée par les turbulences sur les marchés financiers ainsi que les difficultés</p>	<p>Dans son ensemble, la SNDES vise l'accélération de la croissance économique et l'amélioration de la productivité. Elle pose de manière stratégique les orientations dans les secteurs productifs et d'appui à la production dans le premier pilier. La composante principale de ce pilier est la Stratégie de Croissance Accélérée (SCA). Par cette stratégie, l'approche grappe invite les parties prenantes à bâtir des partenariats féconds autour des filières porteuses dont les produits peuvent avoir une visibilité nationale ou internationale. Cette approche est rendue opérationnelle à travers, d'une part, la structuration des principales filières productives en chaînes de valeur et, d'autres part, la mise en œuvre de projets de clusters locaux dans des secteurs à haut potentiel de création de valeur, articulés à des incubateurs et réseaux d'incubateurs d'entreprises sur tout le territoire national. A cet effet, faire de chaque région (ou territoire), en fonction des avantages comparatifs qu'elle présente, un exportateur de produits</p>	<p>Les organes de pilotage, aussi bien au niveau national que régional ou local, mobilisent l'ensemble des parties prenantes que sont les acteurs étatiques, les collectivités locales, la société civile, le secteur privé, le Parlement et les partenaires techniques et financiers. A cet égard, il est attendu de l'Etat l'appui du fonctionnement de ces entités (collectivités locales,</p>	<p>Les acteurs régionaux, avec la tenue de consultations locales et de procéder à la revue des contraintes sectorielles avec l'ensemble des ministères techniques et les forces armées nationales.</p>	<p>Chapitre III : Mise en œuvre et suivi-évaluation (p.51)</p> <p>Le dispositif de suivi et d'évaluation permet aux acteurs de suivre et d'analyser les résultats obtenus, tout au long de la mise en œuvre de la Stratégie. Il fournit l'opportunité d'explicitier, au fur et à mesure, les objectifs de la Stratégie, de s'assurer qu'ils demeurent réalistes et vérifiables et de les réajuster en cours d'exécution, si l'évolution des indicateurs n'est pas conforme aux prévisions. Après une évaluation de</p>

				rencontrées par les économies avancées, devront sans doute accentuer des risques de repli de la croissance économique mondiale, mais à l'inverse réorienter une partie des flux d'IDE, la mise en œuvre de la SCA devient un objectif principal de la SNDES sur la période 2013-2017	spécifiques vers le reste du pays, de la sous-région ou du monde, devient un impératif. En termes d'objectifs stratégiques, la SNDES s'articule d'une part, à l'étude prospective « Sénégal 2035 », pour laquelle elle constitue une déclinaison quinquennale, et d'autre part, aux orientations politiques gouvernementales, à la SCA, aux engagements internationaux (OMD et post-OMD), aux politiques multisectorielles (par exemple : Stratégie Nationale de Protection Sociale) et sectorielles.	société civile, secteur privé).		la mise en œuvre du système statistique national (SSN) et pour les besoins d'un meilleur suivi de la politique économique et sociale, le plan d'actions du Schéma Directeur de la Statistique (SDS) a été revu et réajusté sur la période 2013-2017 pour être plus performant et apte à produire et à diffuser des données statistiques de qualité.
7) UNE STRATEGIE NATIONALE DE SECURITE ALIMENTAIRE AU SENEGAL: RÉSUMÉ DU DIAGNOSTIC, LES STRATÉGIES, LES CHANTIERS ET LES DÉFIS	FAO & Republic of Senegal & Ministry of Agriculture	1999	?	Des objectifs doivent alors être poursuivis sous quatre thèmes spécifiques : 1) Réduire la pauvreté dans toutes les régions du pays en général et dans les zones les plus vulnérables en particulier. 2) Développer l'agriculture et la valeur ajoutée de ses produits, là où il est possible de le faire, de manière à accroître le disponible alimentaire comme les revenus qui en décou-lent. 3) Lutter efficacement contre la malnutrition par la mise en place de mesures qui vont améliorer la situation	Dans le cadre de ses orientations stratégiques pour le secteur agricole, l'État propose des stratégies qui couvrent l'ensemble des contraintes du secteur agricole. Ces stratégies portent sur: - La poursuite des réformes portant sur la politique de libéralisation, de privatisation et de restructuration institutionnelle (l'ajustement de la fiscalité relative aux intrants et matériels agricoles et la recherche des gains de productivité au niveau des filières). - La mise en oeuvre d'une politique de crédit agricole adaptée aux conditions d'exploitation de l'agriculture sénégalaise par	Funding: La plupart des systèmes tire ses ressources financières de l'État. La collecte et le stockage automatique de l'information lourde (enquêtes, recensement, SISIAAR, PNC etc.) par contre, sont encore soutenus par des ressources	National Regional Department levels	In this scheme (SCHÉMA CONCEPTUEL DES MESURES D'INTERVENTION EN MATIÈRE DE SÉCURITÉ ALIMENTAIRE, P9) a part is foreseen for M&E but no separate chapter is devoted to a detailed description of M&E One of the weaknesses described: the frequent absence of

			<p>nutritionnelle des groupes les plus vulnérables à court terme.</p> <p>4) Mettre en place des lignes de défense appropriées pour protéger les populations de calamités naturelles ou d'autres origines.</p> <p>A long terme, les objectifs de lutte contre la mal-nutrition seront obtenus par des mesures correctives qui s'attaquent aux causes fondamentales du fléau. Ces mesures sont connues et ont été discutées dans les sections qui précèdent. Il s'agit de :</p> <ul style="list-style-type: none"> - La lutte contre la pauvreté - La modernisation et l'accroissement de la productivité du secteur agricole - L'amélioration de la disponibilité et de l'accès aux aliments de base <p>Challenges of the state, national partners, the private sector and donors are listed from page 47 to 49.</p>	<p>l'émission de produits diversifiés pour couvrir les besoins des différents segments des filières en général, la mise en place de fonds de garantie, de calamité et de bonification, l'amélioration des conditions d'accès (durée des prêts pour l'investissement, taux d'intérêt) et le développement du crédit de proximité (mutualisation du crédit).</p> <ul style="list-style-type: none"> - Le développement de l'investissement privé dans la production agricole - Un cadre incitatif sur le plan législatif réglementaire et financier prenant en compte essentiellement le critère de rentabilité pour favoriser l'investissement privé et permettre aux acteurs privés de remplacer l'État dans le domaine des intrants, des services vétérinaires et à terme du conseil agricole. - Un programme d'appui à la recherche agricole pour la fourniture de semences aux privés et un programme d'appui à la commercialisation seront mis en oeuvre. - La réforme foncière en vue de sécuriser l'investissement privé agricole. - La mise en oeuvre d'une stratégie de gestion et de préservation de l'environnement en mettant l'accent notamment sur la restauration et la fertilisation des sols. - La mise en place d'infrastructures agricoles en milieu rural, de l'éducation et de la santé avec l'appui des collectivités locales qui en assureront la gestion et l'entretien. - Le renforcement des capacités des collectivités 	<p>extérieures.</p> <p>Partners & Others:</p> <ul style="list-style-type: none"> - Population, - Government - Donators - International organisms - NGO's 	<p>an M&E programme</p>
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					<p>locales et des organisations paysannes à travers un appui institutionnel (par des programmes de formation, d'appui conseil)</p> <ul style="list-style-type: none"> - Le renforcement du système de gestion de la qualité des produits agricoles par un appui institutionnel aux professionnels du secteur (formation à la gestion de la qualité au niveau de tous les segments des différentes filières agricoles) - L'identification de stratégies propres aux filières pour accompagner les politiques sectorielles. 			
<p>8) STRATEGIE NATIONALE ET PROGRAMMES PRIORITAIRES DE SECURITE ALIMENTAIRE: SENEGAL</p>	<p>Republic of Senegal & Comité permanent Inter-Etats de Lutte contre la Sécheresse dans le Sahel (CILSS)</p>	<p>2002</p>	<p>2002-2015</p>	<p>L'objectif général est d'assurer l'accès de tous les Sahéliens, à tout moment, aux aliments nécessaires pour mener une vie saine et active à l'horizon 2015. Il s'appuie sur la définition couramment admise de la sécurité alimentaire et recouvre ainsi les quatre dimensions correspondant aux principaux déterminants de la sécurité alimentaire en général et dans le Sahel en particulier :</p> <ul style="list-style-type: none"> - la disponibilité d'aliments de bonne qualité sanitaire et nutritionnelle, - leur accessibilité pour les populations, y compris pour les plus vulnérables, - la stabilité des approvisionnements dans l'espace et dans le temps, - l'utilisation optimale des aliments par les individus. <p>Objectif spécifique n°1:</p> <ul style="list-style-type: none"> - La promotion d'une agriculture productive, 	<p>Stratégie d'intervention:</p> <p>Elle a été adoptée dans le cadre de Sahel 21 et est bâtie autour du programme d'actions suivant:</p> <ul style="list-style-type: none"> - la mise en place d'un Plan Directeur National des Ressources en eau, synthèse des sept (7) plans régionaux des ressources en eau coïncidant avec les sept (7) bassins identifiés ; - la poursuite dans les centres urbains des opérations de privatisation des bornes fontaines ; - l'accroissement des forages en milieu rural à un rythme sécuritaire de 70 à 80 forages par an, ce faisant on multiplie le rythme d'implantation par 1,5 ; - la poursuite dans l'agglomération dakaroise et les capitales régionales de la réhabilitation des vieux réseaux et ouvrages défectueux, de l'extension des réseaux secondaires et tertiaires pour les branchements à l'égout, - la réalisation d'une étude pour la réutilisation des eaux usées traitées, 	<ul style="list-style-type: none"> - L'État - Collectivités locales - Secteur privé - Organisations paysannes - Femmes, jeunes, - ONG et autres organisations de la société civile. 	<p>À tous les niveaux :</p> <p>Local National Régional</p> <p>dans le cadre d'une gestion rationnelle des ressources naturelles</p>	<p>Mentioned a lot but no specific detailed chapter present</p> <p>La réalisation des objectifs et l'obtention des résultats qui concourent à l'amélioration de la sécurité alimentaire des populations reposant sur la mobilisation de nombreuses institutions et acteurs, le dispositif de pilotage, de suivi et d'évaluation des progrès enregistrés, des lacunes et des difficultés constitue un élément très important pour garantir l'efficacité des politiques mises en oeuvre. Le suivi-évaluation constitue de</p>

				<p>diversifiée, durable et régionalement intégrée;</p> <p>Objectif spécifique n°2:</p> <ul style="list-style-type: none"> - le développement, la fluidification et l'intégration sous-régionale des marchés nationaux; <p>Objectif spécifique n°3:</p> <ul style="list-style-type: none"> - l'amélioration durable des conditions d'accès des groupes et zones vulnérables à l'alimentation et aux services sociaux de base; <p>Objectif spécifique n° 4:</p> <ul style="list-style-type: none"> - l'amélioration des dispositifs de prévention et de gestion des crises conjoncturelles, en cohérence avec la construction de la sécurité alimentaire structurelle; <p>Objectif spécifique n° 5:</p> <ul style="list-style-type: none"> - le renforcement des capacités des acteurs et la promotion d'une bonne gouvernance de la sécurité alimentaire. 	<ul style="list-style-type: none"> - l'assainissement des eaux pluviales dans les villes, - l'extension des réseaux et développement d'interconnexions pour augmenter le taux de desserte des populations en milieu rural, - la finalisation du code de l'assainissement en harmonie avec les autres codes, création d'une commission consultative notamment, - l'amélioration de la protection des ressources en eau et promotion de l'hygiène, - la poursuite de la réalisation de nouveaux ouvrages de protection (digues barrages, barrages anti-sel); - la responsabilisation des usagers dans les actes de gestion, dans un cadre juridique et institutionnel amélioré, prévoyant la mise en place de contrats entre les différents intervenants. Les femmes doivent y prendre part, avec des responsabilités de plus en plus accrues. <p>+ 42- Axes stratégiques d'interventions prioritaires (p.58)</p>			<p>ce fait une de prérogatives</p> <p>les plus importantes à considérer dans la réforme ou la conception des dispositifs institutionnels de gestion de la sécurité alimentaire.</p>
<p>9)PLAN NATIONAL STRATEGIQUE POUR LA SURVIE DE L'ENFANT: SENEGAL</p>	<p>Ministry of Health & Prevention</p>	<p>2007</p>	<p>2007-2015</p>	<p>Objectifs généraux:</p> <ul style="list-style-type: none"> - Réduire la mortalité neonatal de 35% en 2005 à 16% d'ici 2015 en tenant compte de la feuille de route pour l'accélération de la réduction de la mortalité et de la morbidité maternelles et néonatales; - Réduire la mortalité infant juvénile de 121% en 2005 à 44% d'ici 2015 conformément aux MDG's. 	<p>Trois axes stratégiques ont été déterminés:</p> <ol style="list-style-type: none"> 1) Amélioration de la disponibilité et de l'accessibilité du paquet integer d'interventions de qualité pour la santé de la mère, du nouveau né et de l'enfant 2) Augmentation de la demande et de l'utilisation des services par les populations notamment les groupes vulnérable 3) Création d'environnements institutionnel, réglementaire et économique favorable au passage à l'échelle du paquet d'interventions. <p>A partir de ces axes, des domaines ont été identifiés</p>	<p>Funding & Partners:</p> <ul style="list-style-type: none"> - l'État - Global fund to fight aids, tuberculosis and malaria - Global alliance for vaccines and immunisation - AIR Taux - Autres partenaires 	<p>Niveau national</p> <p>Niveau régional</p> <p>Niveau du district</p>	<p>De nombreux indicateurs de couverture ont été définis dans le cadre logique joint en annexe du présent plan stratégique. Les responsables techniques impliqués dans la gestion du plan stratégique (DANSE, DSR, MCR et MCD) devront veiller à disposer</p>

					<p>et pour chaque domaine, des objectifs spécifiques ont été définies pour permettre l'atteinte des MDG's.</p> <p>Lignes d'action:</p> <ul style="list-style-type: none"> - Révision des curricula et renforcement des compétences des prestataires de services - Mise en oeuvre d'une politique cohérente de gestion des ressources humaines - Mise en place d'un système de développement de la qualité des services - Renforcement des capacités physiques, techniques et managériales du système de santé - Développement de la Communication pour le Changement de Comportement (CCC) - Renforcement des capacités de la communauté et des acteurs communautaires pour la mise en oeuvre adéquate du paquet SMNI - Renforcement des mécanismes de collaboration intra et multisectorielle en faveur de la mère, du nouveau-né et de l'enfant - Développement des ressources financières et matérielles 			trimestriellement d'une synthèse des données de routine, compilées par le SNIS, sur les indicateurs de couverture retenus dans le cadre logique.
10) PROPOSITION DE STRATEGIE OPERATIONNELLE DU SECTEUR AGRICOLE	Republic of Senegal & Ministry of Agriculture & Livestock	2001	2001 - 2015	<p>Le but visé par le DSRP et de saisir la réalité de la pauvreté sous toutes ces formes pour définir les objectifs et les domaines d'intervention en mettant l'accent sur les résultats qui guident l'intervention publique.</p> <p>Le DSRP qui sera le cadre de référence du</p>	<p>L'Etat s'est engagé dans une revue de ces politiques et stratégies pour mieux prendre en compte l'ensemble des contraintes qui bloquent encore le développement du secteur. Les principaux éléments de ces politiques devraient s'articuler autour d'axes tels que :</p> <ul style="list-style-type: none"> - Consolider et approfondir les résultats positifs 	<ul style="list-style-type: none"> - CERP (Centre d'Éxpansion Rural Polyvalent) - ANCAR (Agence nationale de conseil agricole et rural) 	National Regional	<p>Deux organes de suivi ont été institués afin d'assurer un pilotage efficace de la réforme: (i) le</p> <p>Conseil national de développement, présidé</p>

				<p>gouvernement en matière de lutte contre la pauvreté doit être :</p> <p>Un outil de coordination pour impulser de partenariat entre les différents acteurs ;</p> <p>Un instrument de mobilisation de ressources et de recentrage des actions de développement de l'état autour d'objectifs clairement définis, assortis d'indicateurs de performance et d'impact ;</p> <p>Un cadre pour un développement communautaire efficace.</p>	<p>des réformes portant sur la politique de libéralisation, de privatisation et de restructuration institutionnelle avec tout particulièrement la décentralisation, le renforcement des capacités des collectivités locales et des organisations paysannes pour en faire les principaux gestionnaires de l'économie rurale ;</p> <ul style="list-style-type: none"> - Appuyer le développement de l'investissement et des initiatives privés en amont et en aval de la production rurale ; - Adapter le financement aux conditions du développement rural; - Mettre en place des infrastructures en milieu rural y compris les infrastructures de base pour assurer la maîtrise de l'eau ; - Mettre en place des services agricoles adaptés au contexte de régionalisation et de partenariat avec les organismes socioprofessionnels, y compris avec le renforcement du système de gestion de la qualité, en particulier pour le développement des parts des produits sénégalais sur le marché mondial et avec la diversification des ressources alimentaires en dehors des productions traditionnelles. Une attention particulière devra être donnée aux productions animales et forestières, ce qui obligera à tenir compte dans l'allocation des terres de la nécessité de préserver les zones de pâturage, les parcours et les forêts ; - Définir une législation et une politique foncière nouvelle privilégiant l'équité, la sécurisation des investissements consentis et la valorisation des terres - Renforcer la recherche pour développer des technologies nouvelles et adaptées. 	<ul style="list-style-type: none"> - Sociétés régionales de <p>Développement</p> <ul style="list-style-type: none"> - Producteurs - Le secteur privé - l'État - Collectivités locales - Partenaires au développement 	<p>par le Chef de l'Etat et comprenant des représentants de l'Etat, des</p> <p>élus des régions, des communes et des communautés rurales, établit annuellement un état de la coopération</p> <p>décentralisée et formule toutes propositions utiles; et (ii) le Comité interministériel de l'administration territoriale</p> <p>est consulté chaque année sur la conduite de la politique de déconcentration de l'Etat.</p>	
11) PLAN NATIONAL DE	Republic of Senegal-	2009	2009-	Le Plan National de Développement Sanitaire 2009-2018 repose sur la vision	Les onze orientations stratégiques suivantes ont	Funding & partners: - Les professionnels	Niveau central	Activités d'évaluation:

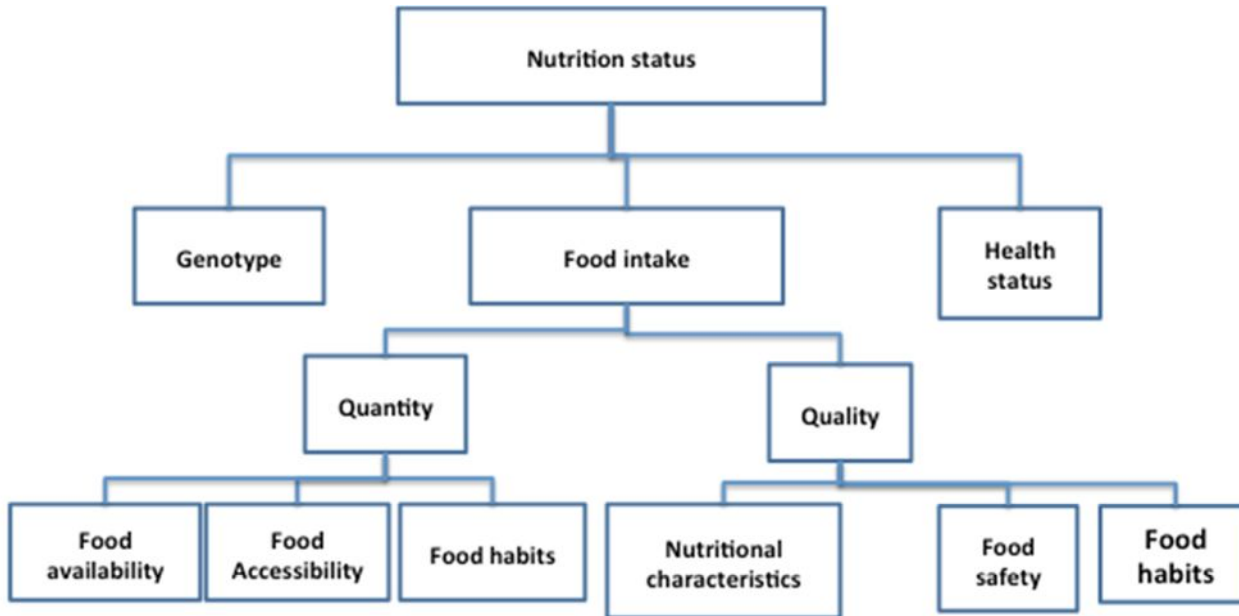
<p>DÉVELOPPEMENT SANITAIRE</p>	<p>Ministry of Health & Prevention</p>		<p>2018</p>	<p>d'un Sénégal où tous les individus, tous les ménages et toutes les collectivités bénéficient d'un accès universel à des services de santé promotionnels, préventifs, curatifs et ré-adaptatifs de qualité sans aucune forme d'exclusion et où il leur est garanti un niveau de santé économiquement et socialement productif.</p> <p>La mise en œuvre de ce plan s'inscrit dans l'atteinte des objectifs nationaux et internationaux en matière de santé notamment les objectifs du DSRP et des OMD. Il s'agit plus spécifiquement de :</p> <p>1) Réduire le fardeau de la morbidité et de la mortalité maternelles et Infantile juvéniles.</p> <p>2) Accroître les performances du secteur en matière de prévention et de lutte contre la maladie</p> <p>3) Renforcer durablement le système de santé</p> <p>4) Améliorer la gouvernance du secteur de la santé</p>	<p>été retenues dans ce cadre :</p> <p>- pour l'atteinte du premier objectif sectoriel :</p> <p>1) Accélération de la lutte contre la mortalité et morbidité maternelles néonatales et infantile juvéniles ;</p> <p>- pour l'atteinte du deuxième objectif sectoriel:</p> <p>2) Amélioration de la Promotion de la Santé</p> <p>3) Renforcement de la prise en charge de la maladie et</p> <p>4) Renforcement de la surveillance intégrée de la maladie et de la riposte</p> <p>- pour l'atteinte du troisième objectif sectoriel:</p> <p>5) Développement des ressources Humaines</p> <p>6) Renforcement des Infrastructures, des Equipements et de la Maintenance</p> <p>7) Amélioration de la disponibilité des médicaments et produits médicochirurgicaux, 8) Renforcement du système d'information et de la recherche en santé ;</p> <p>- pour l'atteinte du quatrième objectif sectoriel:</p> <p>9) Promotion de la gestion axée sur les resultants</p> <p>10) Amélioration des capacités du secteur en matière de planification et de gestion administrative et financière et</p> <p>11) Renforcement de la couverture du risque maladie en mettant l'accent sur les groupes vulnérables.</p>	<p>de la santé</p> <p>- Les secteurs partenaires de la Santé</p> <p>- La société civile</p> <p>- Le secteur privé</p> <p>- Les collectivités locales</p> <p>- Les partenaires au développement</p> <p>- L'État</p> <p>- Des populations</p> <p>- L'Université, les Instituts de recherche</p> <p>- L'Union des Associations d'Elus Locaux (UAEL)</p> <p>- ONG's</p>	<p>Niveau sous-régional</p> <p>Niveau régional</p> <p>Niveau au district</p> <p>Niveau Communautaire</p>	<p>Le PNDS sera évalué selon la procédure suivante : (i) une évaluation à mi-parcours avec un volet de satisfaction des bénéficiaires ; (ii) une évaluation finale à la fin du programme. L'évaluation sera quantitative et qualitative, interne et externe. Elle s'attellera à mesurer les progrès réalisés à partir des indicateurs retenus et de faire des recommandations pertinentes pour améliorer les performances. Trois groupes d'indicateurs seront retenus pour cette enquête : les indicateurs de résultats, les indicateurs de couverture et les indicateurs d'impact ainsi que les cibles (voir annexes). Cadre institutionnel du suivi et de l'évaluation P59</p>
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<p>12) PROGRAMME SPECIAL DE SECURITE ALIMENTAIRE</p>	<p>FAO</p>	<p>?</p>	<p>?</p>	<p>Le principal objectif du PSSA est d'aider les pays en développement, notamment les pays à faibles revenus et à déficit alimentaire (PFRDA) à améliorer leur sécurité alimentaire au niveau des ménages comme au plan national, à travers :</p> <ul style="list-style-type: none"> - une augmentation rapide de la production alimentaire et de la productivité, - la réduction, année après année, de la variabilité de la production alimentaire sur des bases durables au niveau environnemental comme économique - une amélioration de l'accès de la population à la nourriture <p>The SPFS is in line with the Government of Senegal's agricultural development policy, which gives priority to the improvement of food security. It stresses irrigation improvements, promotion of rainfed agriculture and increased meat and milk production in a participatory approach. The pilot phase of the SPFS started in January 1995 in the Casamance and Senegal River areas. Target crops are rice, millet, sorghum and maize. In 1995/96 rice yields on demonstration plots in the Senegal River Valley varied from 4.2 to 6.7 tonnes/ha. In the inland valleys of Kourouck, Sounaye and Banny of the Casamance sites, yields varied between 1.1 and 1.9 tonnes/ha. However, some farmers in Kourouck obtained yields of up to 4.5 tonnes/ha.</p>	<p>Le PSSA se concentre sur quatre domaines d'activité liées et complémentaires : la maîtrise de l'eau, l'intensification des cultures, la diversification et l'analyse des contraintes.</p> <p>Maîtrise de l'eau</p> <ul style="list-style-type: none"> - Introduction de petits dispositifs de récupération de l'eau, d'irrigation à faible coût (ex. pompes à pédale) et de systèmes de drainage; - Amélioration de la gestion de l'eau à travers la promotion d'associations d'usagers. <p>Intensification</p> <ul style="list-style-type: none"> - Intensification des systèmes de production végétale basée sur le transfert d'une technologie et de pratiques culturales appropriées et accessibles (ex. lutte intégrée contre les nuisibles et amélioration de la fertilité des sols); - Appui à des dispositifs fonctionnels de commercialisation, stockage et crédit. <p>Diversification</p> <ul style="list-style-type: none"> - La diversification des systèmes de production inclut l'aquaculture, la pêche artisanale, le petit élevage (volailles, moutons, chèvres, cochons) et l'agroforesterie; - Appui aux activités post-production productrices de revenus. <p>Analyse des contraintes</p> <ul style="list-style-type: none"> - Identification des contraintes qui limitent la rentabilité, l'accès à la terre, les intrants, la technologie, la commercialisation, la 	<p>Le PSSA est également un vecteur de la coopération entre la FAO et ses partenaires au développement.</p> <p>Lorsque des accords concrets sont trouvés, des missions conjointes sont organisées à l'étape de la formulation comme pendant le processus de mise en œuvre, pour conduire le suivi des progrès et assurer la réalisation des objectifs du PSSA.</p> <p>De nombreux bailleurs bi et multilatéraux, gouvernements et ONG appuient les activités du PSSA dans les pays où le programme est déjà en activité, ainsi que la formulation du programme dans les pays qui démarrent leurs participation. Un appui accru provient également</p>	<p>World-based, 66 pays opérationnels :</p> <ul style="list-style-type: none"> - 38 en Afrique - 14 en Asie - 9 en Amérique latine - 3 en Océanie - 23 Accords de coopération sud-sud signés <p>Aux niveaux mondial, régional, national et local</p>	<p>Pour mettre en place un système national de suivi de la sécurité alimentaire et d'alerte, les actions suivantes sont requises:</p> <ul style="list-style-type: none"> - Créer un Comité National de Sécurité Alimentaire (CNSA) regroupant les décideurs au plus haut niveau dans les quatre domaines de la sécurité alimentaire qui décideront des indicateurs de sécurité alimentaire à suivre pour chaque zone agro-écologique et groupe vulnérable. - Mettre en place des Groupes de Travail Interdisciplinaire (GTI) regroupant les responsables techniques de chaque domaine (public, privé ou associatif) qui seront chargés du suivi technique et statistique des indicateurs spécifiques à chaque domaine et des prévisions de risque alimentaire.
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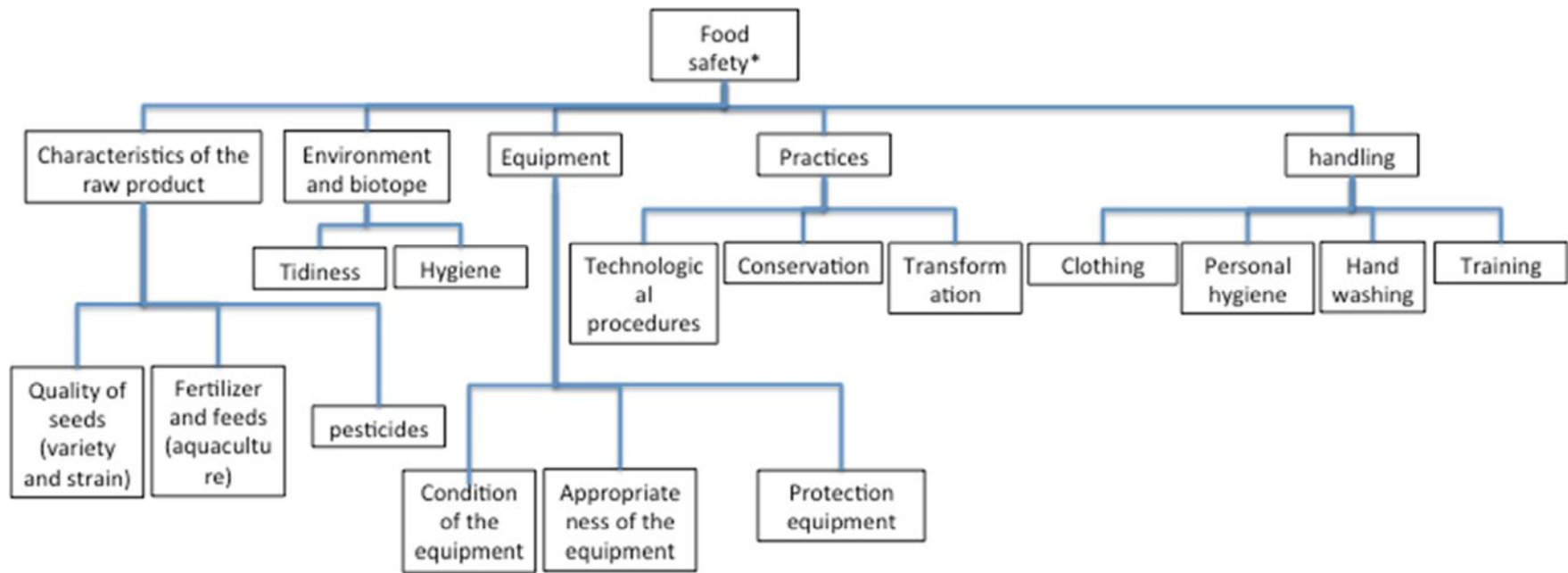
					<p>transformation et le crédit;</p> <p>- Recherche des solutions pratiques pour surmonter ces problèmes et obstacles et identification des actions pour les résoudre.</p>	<p>d'accords unilatéraux de fonds fiduciaires qui permettent aux gouvernements concernés d'assurer le financement du PSSA par le biais de la FAO. Le nombre de donateurs et d'activités dans lesquels ils se sont engagés est en augmentation régulière.</p>		<p>- Mettre en place des Comités Provinciaux de Sécurité Alimentaire (CPSA) regroupant des représentants locaux des quatre domaines (agents de santé, vulgarisateurs, statisticiens, éducateurs, responsables de projets sociaux, commerçants, etc..) qui analyseront les données et indications disponibles au niveau local sur la sécurité alimentaire au niveau des ménages.</p> <p>- Créer, au secrétariat du CNSA, une petite cellule pour synthétiser et analyser toutes les données sur la sécurité alimentaire fournies par les GTI et CPSA, et pour diffuser ces informations de synthèse et d'alerte.</p>
<p>13) PLAN NATIONAL D'ACTION POUR LA NUTRITION</p>	<p>Republic of Senegal & Ministry of Agriculture & Ministry of Public Health and</p>	<p>1996</p>	<p>1997-2002</p>	<p>Objectifs:</p> <p>1) Amélioration de la sécurité alimentaire des ménages:</p> <ul style="list-style-type: none"> - Assurer une production vivrière suffisante et disponible pour l'autoconsommation - Améliorer les pouvoirs d'achat des ménages ruraux et urbains - Accroître la consommation des produits locaux <p>2) Amélioration de la qualité et</p>	<p>Stratégies et actions spécifiques:</p> <p>1) - Accroissement de la production agricole</p> <ul style="list-style-type: none"> - Facilitation d'accès au crédit - Création et consolidation d'emplois rémunérateurs - Amélioration du système d'approvisionnement - Transformation des produits locaux <p>2) - Renforcement du cadre juridique</p> <ul style="list-style-type: none"> - Normalisation et certification des produits par les entreprises 	<ul style="list-style-type: none"> - Gouvernement - Coopération internationale et bilatéral - Institut Sénégalais de Recherches Agricoles, Institut de Technologie Alimentaire - Ministères de 	<p>National mais aussi des stratégies au niveau régional et local</p>	<p>Chapitre consacré à le Suivi et l'Évaluation du Plan National D'action pour la Nutrition:</p> <p>Au delà de la phase d'élaboration d'une politique sous l'aspect stratégique, la maîtrise de l'information est</p>

	Social Action			<p>l'innocuité des produits alimentaires</p> <p>3) Elimination de la malnutrition protein-énergétique des groupes vulnérable</p> <p>4) Promotion de régimes alimentaires appropriés et des modes de vie sains</p> <p>5) Promotion de l'allaitement maternel et des bonnes pratiques de sevrage</p> <p>6) Elimination des troubles dues à la carence en iode et à l'avitaminose A et réduction de la prevalence de l'anémie</p> <p>7) Prévention et traitement des maladies infectieuses</p> <p>8) Intégration dans les politiques et programmes, des objectifs, des considerations et des elements d'ordre alimentaire et nutritionnel</p>	<ul style="list-style-type: none"> - Coordination des structures nationales - Promotion de la qualité - Elaboration de normes de qualité 3) - Surveillance de la croissance - Amélioration du poids de naissance des enfants - Création des centres de recuperation et d'éducation nutritionnel - Renforcement des capacities nationaux et décentralisées - Amélioration de la couverture sanitaire, hygiène - Mobilisation sociale/ Information Education & Communication (IEC) 4) - Appui institutionnel - Mobilisation sociale/IEC 5) - Renforcement des capacities dans les services de santé publics, privés et communautaires - Réglementation de la commercialization des substituts du lait maternel - Révision de legislation du travail en faveur des femmes allaitantes - Mobilisation sociale/IEC 6) - Iodation du sel - Supplémentation en vit. A - Supplémentation en fer/folate - Participation communautaire - Mobilisation sociale/IEC 7) - Programme en cours 8) - Renforcement des cadres de concertation entre les Ministères - Assurer une coordination régulière entre le Comité technique du PNC et du CNPAN - Mise en place de commissions Nutrition/Alimentation au niveau parlementaire et au niveau du Conseil Economique et Social 	<p>l'Agriculture, du Développement Rural, de l'Économie des Finances et du Plan, de la Santé et de l'Action Sociale, du Commerce de l'Artisanat et de l'Industrialisation, ...</p> <ul style="list-style-type: none"> - Présidence, Primature Ministères Assemblée Nationale et Conseil Économique 	<p>indispensable pour évaluer le niveau d'atteinte des objectifs préalablement fixes, afin de pouvoir prendre à temps les mesures correctives.</p> <p>Les structures qui s'occupent de l'information pour la sécurité alimentaire et nutritionnelle sont nombreuses et diverses. Le constat actuel est que, malgré le nombre important d'intervenants, aucune structure ne dispose d'un système d'information orienté vers le volet alimentaire et nutritionnel. Seule la CASPAR (cellule agro-sylvo-pastorale pour la securite alimentaire) s'oriente vers un système d'information integer.</p>
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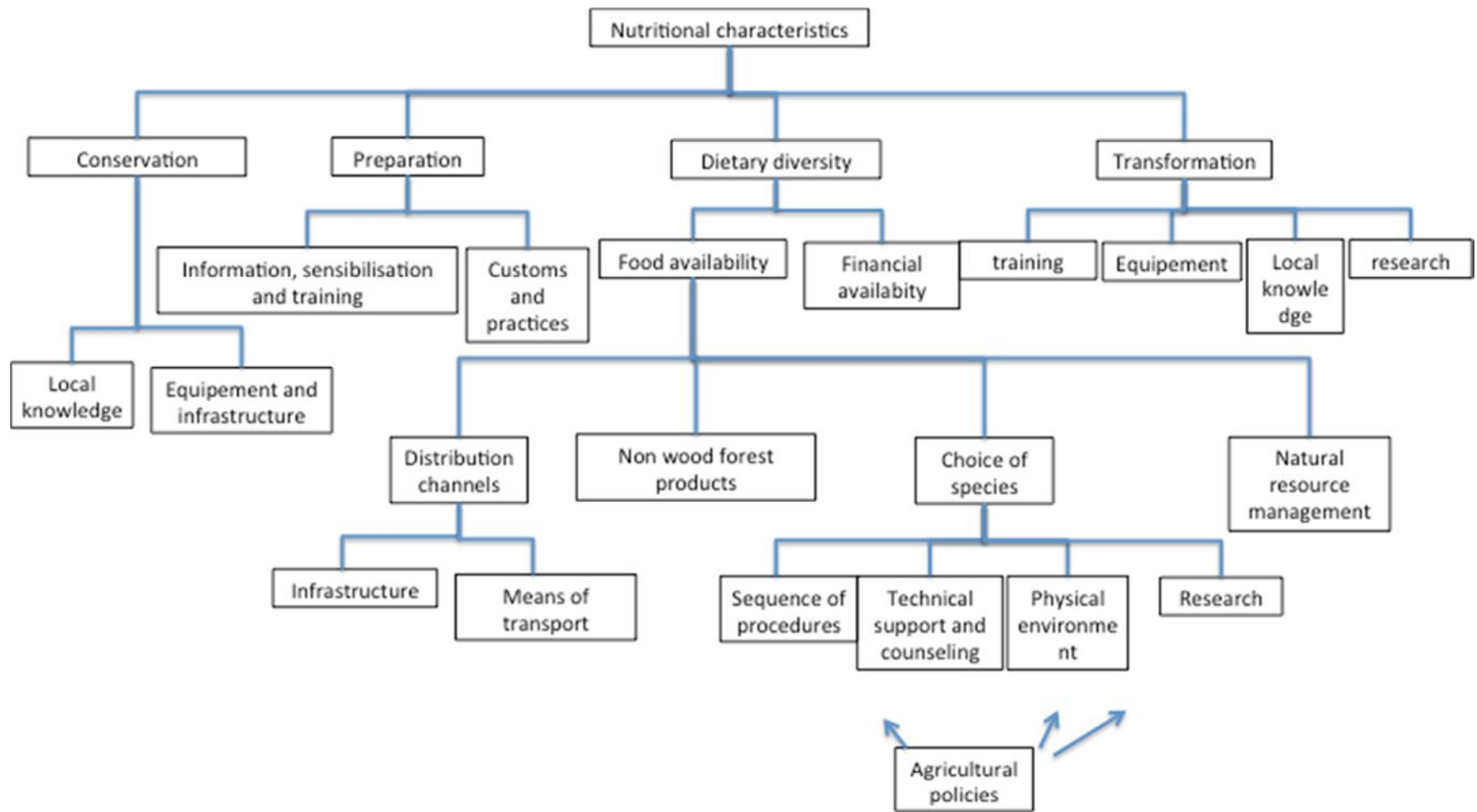
Annex 7 Causal model

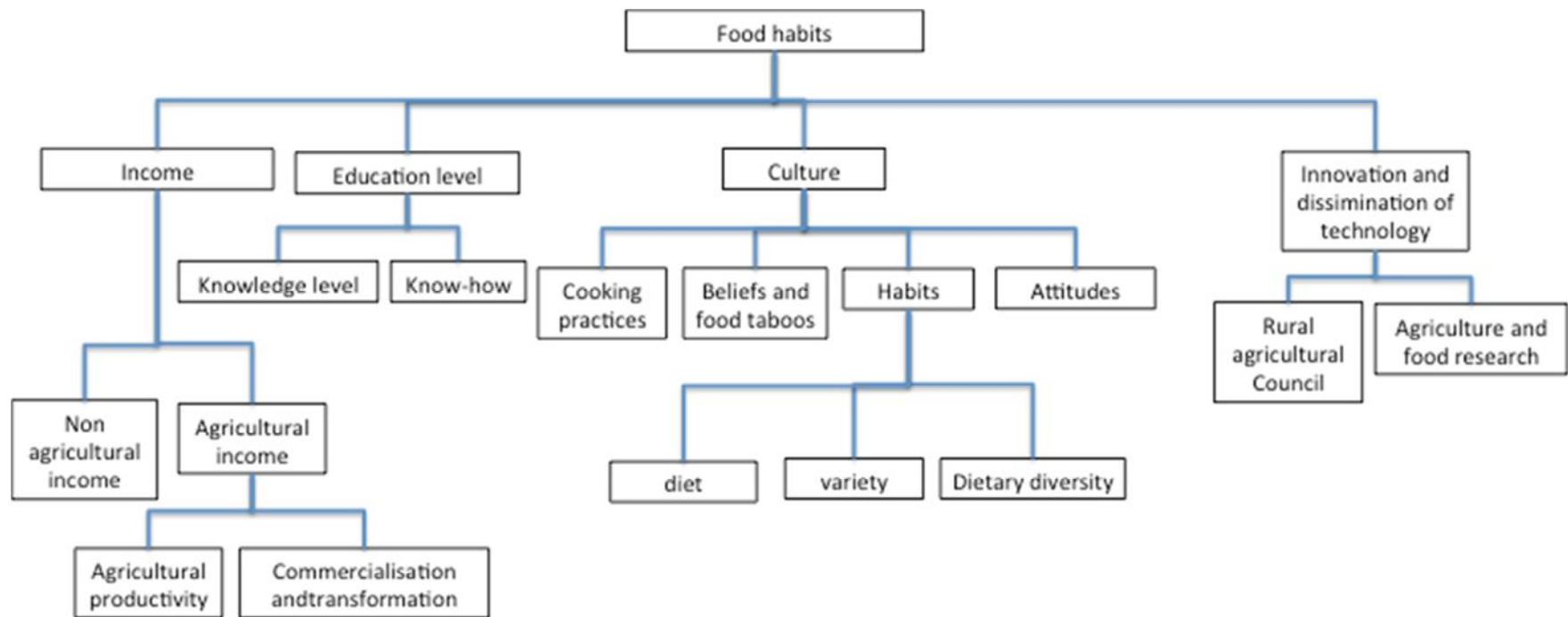


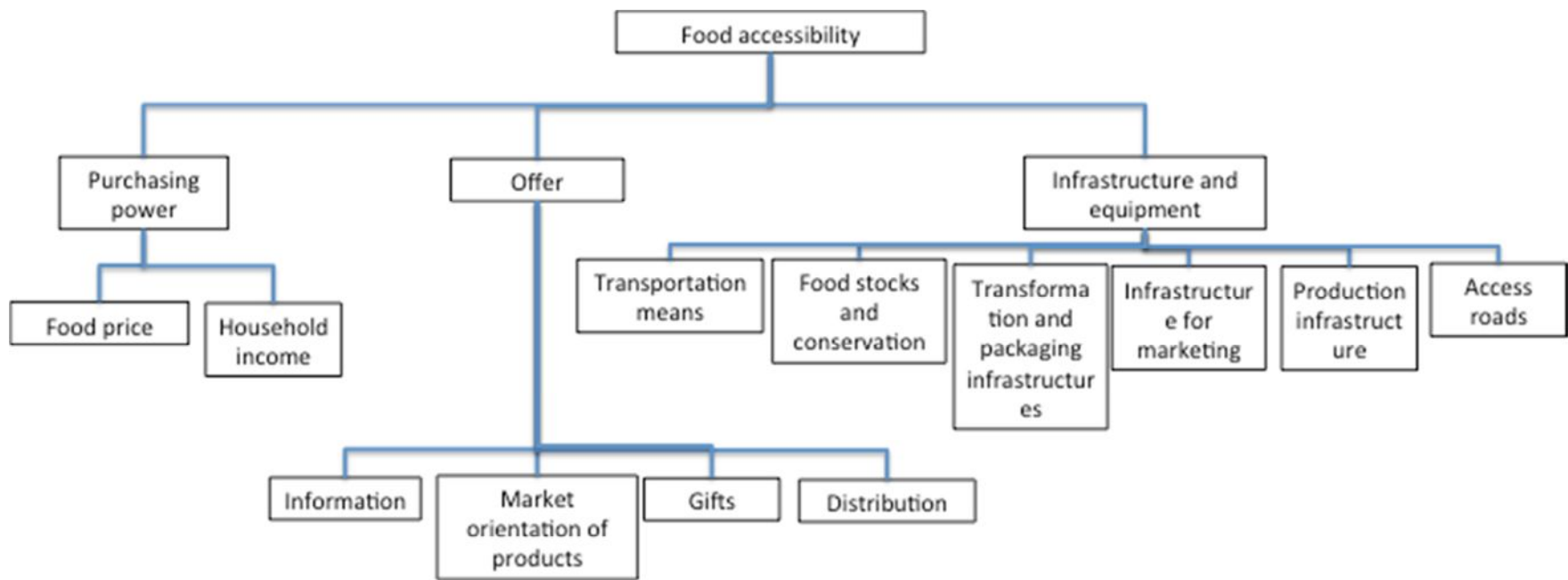
Nutrition status here includes under nutrition, micronutrients deficiencies and overnutrition (obesity, overweight..)

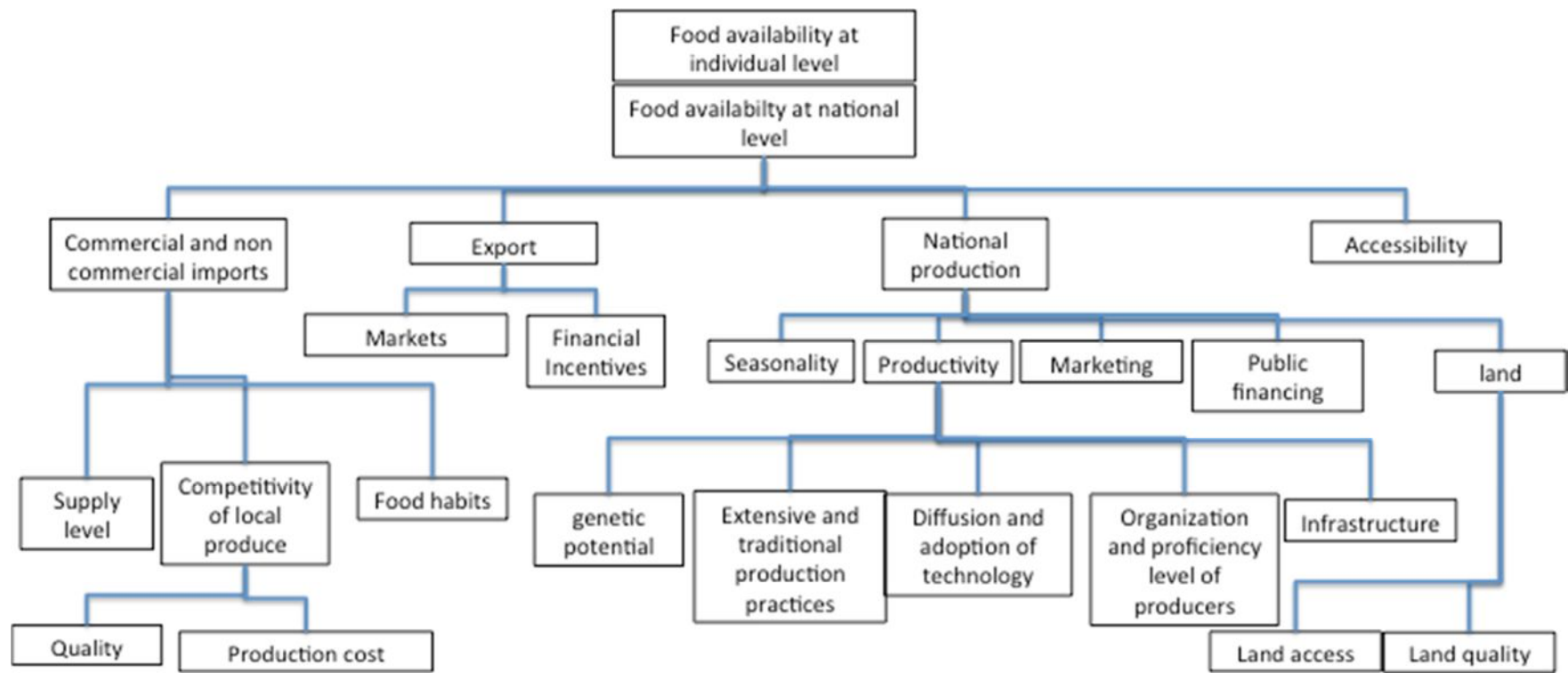


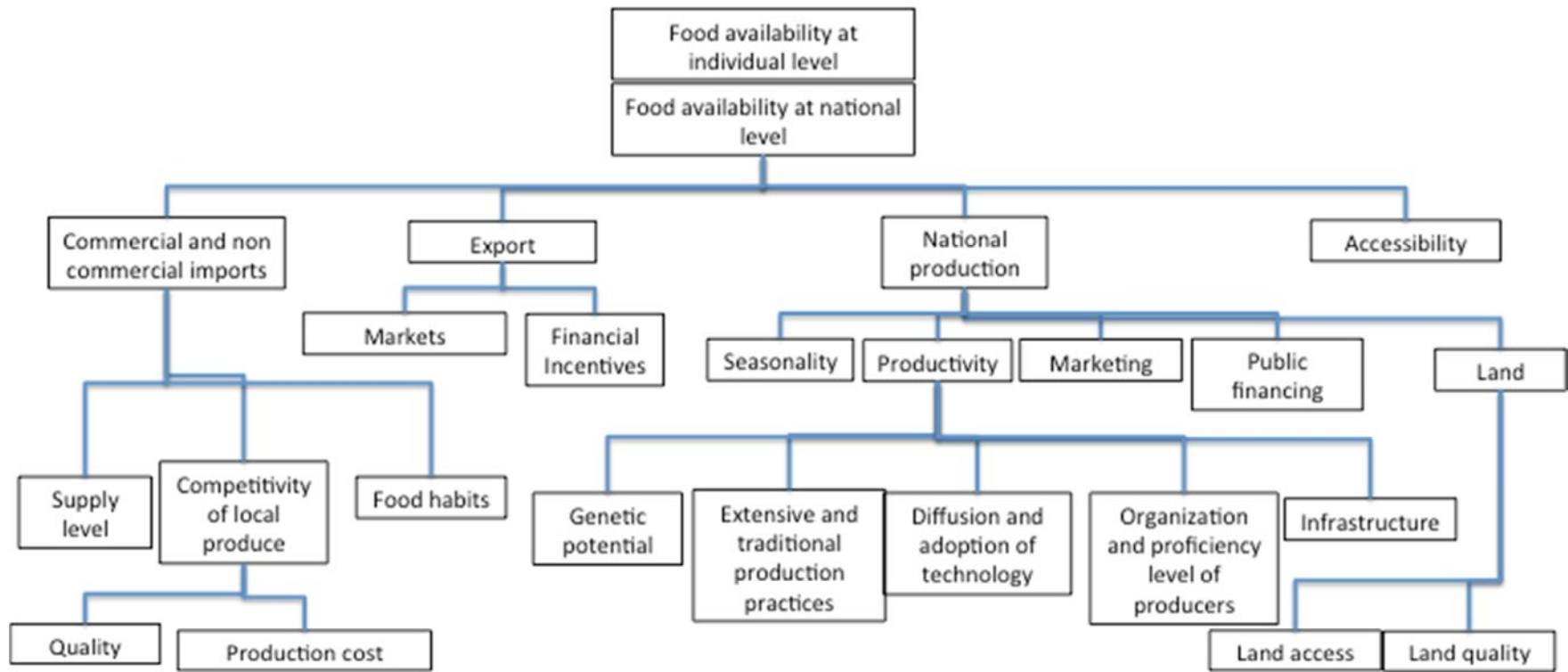
* Food safety contains various determinants: chemical (heavy metals, pesticide residues), biological (virus, bacteria and molds) and physical (external objects)











Annex 8 Curriculum of agriculture training in Thiès

Document A-1: Résumé Formation Générale — Tronc commun

Nom de l'Institution:

_____ ENSA _____ Année

Académique: _____ 2011-2012 _____

Dénomination Officielle du Programme (semestre/année): _____ première
année _____

Tronc commun	Total Heures - Crédit		Cours (Elément Constitutif)	Cours	Magistra ux	Travaux Pratiques	Travaux Personn els	Stage	Total	
	Unité de formation	Numéro								
Sciences de base non-biologiques			Physique						125	
			Chimie						125	
			Mathématiques						125	
Sciences de base biologiques			Biologie cellulaire						60	
			Zoologie I						50	
			Botanique						50	
			Biologie végétale						50	
Etude de milieu			Géologie						65	
Socio-économie et langues			Introduction à la sociologie rurale							30
			Anglais							30
Travaux de terrain			Travaux dirigé de terrain							120
Total Heures - Crédit (addition de toutes les pages d'A-1)										830

Document A-1: Résumé Formation Générale — Tronc commun

Nom de l'Institution:

_____ ENSA _____ Année

Académique: _____ 2011-2012 _____

Dénomination Officielle du Programme (semestre/année): _____ deuxième
année _____

Tronc commun			Total Heures - Crédit				
Unité de formation	Numéro	Cours (Elément Constitutif)	Cours Magistraux	Travaux Pratiques	Travaux Personnels	Stage	Total
Sciences de base non-biologiques		Informatique					35
		Statistique générale					35
		Dessin technique					35
Sciences de base biologiques		Génétique					50
		Zoologie II					60
		Microbiologie générale					35
		Physiologie végétale					80
		Physiologie animale					45
		Biochimie					60
Total Heures - Crédit (addition de toutes les pages d'A-1)							840

**Document A-1: Résumé Formation Générale — Tronc Commun
(suite.) page: _2_**

Nom de l'Institution:

_____ ENSA _____ Année

Académique: _____ 2011-2012 _____

Dénomination Officielle du Programme (semestre/année): _____ deuxième
année _____

Tronc commun			Total Heures - Crédit				
Unité de formation	Numéro	Cours (Elément Constitutif)	Cours Magistraux	Travaux Pratiques	Travaux Personnels	Stage	Total
Socio-économie et langues		Economie générale					60
		Sociologie					35
		Anglais					20
		Techniques d'expression					20
Milieu		Ecologie					40
		Bioclimatologie					30
		Pédologie générale					50
		Physique de sols					30
Travaux de terrain		Travaux dirigé de terrain					120

Document A-1: Résumé Formation Générale — Tronc commun

Nom de l'Institution:

_____ ENSA _____ Année

Académique: _____ 2011-2012 _____

Dénomination Officielle du Programme (semestre/année): _____ troisième
année _____

Tronc commun			Total Heures - Crédit				
Unité de formation	Numéro	Cours (Elément Constitutif)	Cours Magistraux	Travaux Pratiques	Travaux Personnels	Stage	Total
Science de base		Informatique					50
		Biométrie					50
Production végétales et défenses des cultures		Agronomie					80
		Phytopathologie					70
		Entomologie agricole					60
Production animale		Zooteknique générale					35
		Alimentation					60
		Hygiène et prophylaxie					35
Milieu		Biologie du sol					30
		Chimie et fertilité des sols					50
		Cartographie, photo interprétation, télédétection					40
Total Heures - Crédit (addition de toutes les pages d'A-1)							990

**Document A-1: Résumé Formation Générale — Tronc Commun
(suite.) page: _2_**

Nom de l'Institution:

_____ ENSA _____ Année

Académique: _____ 2011-2012 _____

Dénomination Officielle du Programme (semestre/année): _____ troisième
année _____

Tronc commun			Total Heures - Crédit				
Unité de formation	Numéro	Cours (Elément Constitutif)	Cours Magistraux	Travaux Pratiques	Travaux Personnels	Stage	Total
Génie rurale		Hygiénique					40
		Hydraulique					60
		Hydrologie					30
		Hydrogéologie					20
		Topographie					30
Socio-économie et langues		Economie rurale					60
		Comptabilité					40
		Anglais					30
Travaux de terrain		Travaux dirigé de terrain					120

Document A-1: Résumé Formation Générale — Tronc commun

Nom de l'Institution:

_____ ENSA _____ Année

Académique: _____ 2011-2012 _____

Dénomination Officielle du Programme (semestre/année): _____ quatrième année _____

Tronc commun			Total Heures - Crédit				
Unité de formation	Numéro	Cours (Elément Constitutif)	Cours Magistraux	Travaux Pratiques	Travaux Personnels	Stage	Total
Production végétales et défenses des cultures		Amélioration des plantes					30
		Arboriculture					30
		Horticulture					30
		Phytotechnie spéciale					50
		Protection des cultures					40
		Plans expérimentaux					40
Production animale		Halieutique					25
		Agropastoralisme, cultures fourragères					40
		Système de production animale					45
Total Heures - Crédit (addition de toutes les pages d'A-1)							745

**Document A-1: Résumé Formation Générale — Tronc Commun
(suite.) page: _2_**

Nom de l'Institution:

_____ ENSA _____ Année

Académique: _____ 2011-2012 _____

Dénomination Officielle du Programme (semestre/année): _____ quatrième
année _____

Tronc commun			Total Heures - Crédit				
Unité de formation	Numéro	Cours (Elément Constitutif)	Cours Magistraux	Travaux Pratiques	Travaux Personnels	Stage	Total
Milieu		Pédologie appliqué I					30
		Foresterie I					30
		Energies nouvelles et renouvelables					20
Génie rural		Industrie agroalimentaire					30
		Résistances des matériaux et constructions rurales					45
		Machines hydrauliques					30
Socio-économie et langues		Evaluation et gestion des projets					45
		Planification					35
		Droit des affaires					30
Stage		Exploitation agricole					120

Document A-2: Résumé Formation Générale — Options

Nom de l'Institution:

_____ ENSA _____ Année

Académique: ___ 2011-2012 _____

Dénomination Officielle du Programme: _____ quatrième année –

Production Animale _____

Titre	Heures crédit
Zootecnie spéciale volaille	35
Agropastoralisme et cultures fourragères	30
Amélioration et sélection des animaux	35
Plan de développement élevage	50
Pédologie appliquée II	30
Total Heures-crédit des Options (addition de toutes les pages d'A-2)	180

Document A-2: Résumé Formation Générale — Options

Nom de l'Institution:

_____ ENSA _____ Année

Académique: _____ 2011-2012 _____

Dénomination Officielle du Programme: _____ quatrième année – Genie Rural _____

Titre	Heures crédit
Hydrologie spéciale	30
Pédologie appliquée II	30
Hydrodynamique souterraine	30
Topographie II	30
Machinisme II	40
Aménagements hydroagricoles	50
Total Heures-crédit des Options (addition de toutes les pages d'A-2)	210

UNITED NATIONS SYSTEM

**STANDING COMMITTEE
ON NUTRITION**

The United Nations System Standing Committee on Nutrition (UNSCN) is the food and nutrition policy harmonization forum of the United Nations. Its vision is a world free from hunger and malnutrition, where there are no longer impediments to human development.

UNSCN

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