

# The Case for Investment in Nutrition in Senegal

Julie Ruel-Bergeron



Cellule de Lutte contre la Malnutrition

ANALYSIS & PERSPECTIVE: 15 YEARS OF EXPERIENCE IN THE DEVELOPMENT OF NUTRITION POLICY IN SENEGAL



WORLD BANK GROUP



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Analysis & Perspective: 15 Years of Experience in the  
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1818 H Street NW  
Washington DC 20433  
Telephone: 202-473-1000  
Internet: [www.worldbank.org](http://www.worldbank.org)

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# About the Series

The government of Senegal, through the Cellule de Lutte contre la Malnutrition (Nutrition Coordination Unit) (CLM) in the Prime Minister's Office is embarking on the development of a new Plan Stratégique Multisectoriel de Nutrition (Multisectoral Strategic Nutrition Plan) (PSMN), which will have two broad focus areas: (1) expanding and improving nutrition services; and (2) a reform agenda for the sector. The reform agenda will include policy reorientation, governance, and financing of the PSMN. The PSMN will discuss the framework and timeline for the development of a nutrition financing strategy, which will require specific analysis of the sector spending and financial basis, linking it to the coverage and quality of nutrition services.

Senegal is known for having one of the most effective and far-reaching nutrition service delivery systems in Africa. Chronic malnutrition has dropped to less than 20 percent, one of the lowest in continental Sub-Saharan Africa. Government ownership of the nutrition program has grown from US\$0.3 million a year in 2002 to US\$5.7 million a year in 2015, increasing from approximately 0.02% to 0.12% of the national budget. Yet, these developments have not led to enhanced visibility of nutrition-sensitive interventions in relevant sectors such as agriculture, education, water and sanitation, social protection, and health. The absence of nutrition-sensitive interventions in the relevant sectors, combined with the recent series of external shocks, has favored continued fragmentation of approaches, discourse, and interventions that address nutrition. In addition, there is no overall framework for investment decision making around nutrition, which puts achievements made to date in jeopardy. Meanwhile, nutrition indicators are stagnating and other issues with major implications (such as low birth weight, iron deficiency anemia, maternal undernutrition, and acute malnutrition) have received little or no attention.

A review of policy effectiveness can help raise the importance of these issues, including household and community resilience to food and nutrition insecurity shocks, as a new priority in nutrition policy development. This series of analytical and advisory activities, collectively entitled *Analysis & Perspective: 15 Years of Experience in the Development of Nutrition Policy in Senegal* ("the series"), aims to support the government of Senegal in providing policy and strategic leadership for nutrition. Further, the series will inform an investment case for nutrition (*The Case for Investment in Nutrition in Senegal*) that will: (1) rationalize the use of resources for cost-effective interventions; (2) mobilize actors and resources; (3) strengthen the visibility of nutrition interventions in different sectors; and (4) favor synergy of interventions and investments.

The series was produced with guidance from a task force of development partner organizations under the leadership of the World Bank, and in close collaboration with the CLM. The task force comprised representatives from the following organizations: Government of Canada, REACH, UNICEF and the World Bank.

## Documents in the series:

Report	Description
Nutrition Situation in Senegal <i>Marc Nene</i>	An analysis of the nutritional status of key demographic groups in Senegal, including the geographic and sociodemographic inequalities in nutrition outcomes and their determinants.
Evolution of Nutrition Policy in Senegal <i>Andrea L. Spray</i>	An historical analysis of the nutrition policy landscape in Senegal, including the evolution of nutrition policies and institutions, and their respective implications for programming and prioritization of interventions.
Political Economy of Nutrition Policy in Senegal <i>Ashley M. Fox</i>	An analysis of the policy and political levers that can be used in Senegal to foster government leadership and galvanize intersectoral coordination needed to mainstream nutrition into government policies and programs and effectively, efficiently, and sustainably deliver nutrition interventions.
Nutrition Financing in Senegal <i>Marie-Jeanne Offosse N.</i>	An analysis of the allocated funding to nutrition interventions in Senegal from 2016 to 2019, estimates of budgetary availability for financing nutrition by government, and estimated costs for selected high-impact interventions.
Capacities of the Nutrition Sector in Senegal <i>Gabriel Deussom, Victoria Wise, Marie Solange Ndione, Aida Gadiaga</i>	An analysis of the organizational and institutional capacities for addressing nutrition in Senegal, covering the CLM, key ministries, and other stakeholders contributing to achieving improvements in nutrition at central, regional, and local levels.
Cost and Benefits of Scaling Up Nutrition Interventions in Senegal <i>Christian Yao</i>	Analysis of the relative costs and effectiveness of alternative scenarios for scaling up nutrition interventions in Senegal over the five years covering the PSMN.
Risks for Scaling Up Nutrition in Senegal <i>Babacar Ba</i>	Analysis of the potential risks to the scale-up of nutrition in Senegal, likelihood of occurrence, potential impact, and potential mitigation measures.
A Decade of World Bank Support to Senegal's Nutrition Program <i>Denise Vaillancourt</i>	The World Bank Independent Evaluation Group (IEG) Project Performance Assessment Report (PPAR) on the recent 10 years of support for nutrition in Senegal, which evaluates the extent to which World Bank operations achieved their intended outcomes and draws lessons to inform future investment.

# Acronyms

Acronym	English	Acronyme	Français
AEC	Community Executing Agency	AEC	Agence d'Exécution Communautaire
BEN	National Executive Bureau	BEN	Bureau Exécutif National
BMI	body-mass index	IMC	indice de masse corporelle
CL	Local Government Collectives	CL	Collectivités Locales
CLM	Nutrition Coordination Unit	CLM	Cellule de Lutte contre la Malnutrition
DALY	disability-adjusted life year	AVAI	année de vie ajustée en fonction de l'incapacité
DHS	Demographic and Health Survey	EDS	Enquête sur la Démographie et la Santé
DPNDN	National Policy for the Development of Nutrition	DPNDN	Document de Politique Nationale de Développement de la Nutrition
GDP	Gross Domestic Product	PIB	Produit Intérieur Brut
IQ	intelligence quotient	QI	quotient intellectuel
IYCF	Infant and Young Child Feeding	ANJE	Alimentation du Nourrisson et du Jeune Enfant
MAD	Minimum Acceptable Diet	MAD	Régime alimentaire minimum acceptable
MICS	Multiple Indicator Cluster Survey	MICS	Enquête à indicateurs multiples
NGO	Nongovernmental Organization	ONG	Organisation Non Gouvernementale
PQDES	Quadrennial Economic and Social Development Plan	PQDES	Plan Quadriennal de Développement Économique et Social
PRN	Nutrition Enhancement Program	PRN	Programme de Renforcement de la Nutrition
PSMN	Multisectoral Strategic Nutrition Plan	PSMN	Plan Stratégique Multisectoriel de la Nutrition
SDG	Sustainable Development Goals	ODD	Objectif de Développement Durable
SUN	Scaling Up Nutrition Movement	SUN	Mouvement pour le Renforcement de la Nutrition

<b>Acronym</b>	<b>English</b>	<b>Acronyme</b>	<b>Français</b>
UNICEF	United Nations Children's Fund	UNICEF	Fonds des Nations Unies pour l'Enfance
WASH	water, sanitation, and hygiene	EAH	eau, assainissement, et hygiène
WHA	World Health Assembly	AMS	Assemblée Mondiale de la Santé
WHO	World Health Organization	OMS	Organisation Mondiale de la Santé

Unless otherwise indicated, child nutrition indicators referenced in this report are taken from the UNICEF-WHO-World Bank Joint Child Malnutrition Estimates<sup>1</sup>.



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# Executive Summary

Senegal has made impressive gains in improving the nutritional status of its population in recent decades. The prevalence of all forms of child undernutrition, whether stunting, wasting, or underweight, is lower than that in most other countries in the region, even among the poorest segments of the population. These gains are largely the result of decades-long political, financial, and capacity building efforts. Nevertheless, the remaining burden of undernutrition across all population groups continues to threaten child survival, contributing to 45 percent of deaths among children under five globally every year and accounting for at least 13,000 under-five deaths per year in Senegal. Given the progress that has been achieved in recent decades, reversals in global funding for nutrition in Senegal constitute a significant threat to the economic and social development of the country, especially if the remaining high and growing burdens of under- and overnutrition are not addressed.

This investment case is based on a synthesis of eight analytical documents that delve into various aspects of nutrition in Senegal: *The Nutrition Situation in Senegal*; *The Evolution of, and Political Economy of Nutrition Policy*; *Nutrition Financing*; *Capacity Assessment of The Nutrition Sector*; *The Cost of Scale-Up*

*for Nutrition Interventions*; *The Risks of Scaling Up Nutrition*; and *An Independent Review of a Decade of World Bank Support of Nutrition*. Based on this series of reports, this investment case will outline future directions for Senegal in alignment with the country's new Plan Stratégique Multisectoriel de la Nutrition (Multisectoral Strategic Nutrition Plan) (PSMN) and Document de Politique Nationale de Développement de la Nutrition (National Policy for the Development of Nutrition) (DPNDN), while stimulating the mobilization of resources for the scaled-up implementation of cost-effective interventions across sectors in Senegal.

## Why Invest In Nutrition in Senegal?

People who are well nourished throughout their lives are better able to achieve their full physical and developmental potential. Poor nutrition often starts in utero and continues to deteriorate during childhood, adolescence, and pregnancy, contributing to an intergenerational cycle of undernutrition. Thus, ensuring good nutrition during each of these critical life phases contributes directly to healthy and productive populations and to economic development and poverty reduction at a national and global level.

In addition to the importance of investing in nutrition for improved individual and national development outcomes, Senegal is well-placed to implement nutrition interventions. The country has prioritized nutrition since the birth of the republic and has institutionalized nutrition policy, programming, and coordination at the highest level, under the office of the Prime Minister's Nutrition Coordination Unit (CLM). The political placement of the CLM is of crucial importance to Senegal's ability to absorb, coordinate, and implement funding, policies, and programs throughout the country, and across line ministries.

Finally, Senegal has demonstrated that it can achieve progress in nutrition. Between 1992 and 2012, and in contrast to many of its African neighbors who saw either a stagnation or deterioration in child nutrition indicators, Senegal reduced the prevalence of child stunting from 34.4 percent to 19.2 percent. Though still high, child anemia also saw some improvement, with a reduction from 82.6 percent in 2005 to 66.3 percent in 2015 (Ndiaye and Ayad 2006; ANSD 2016; Nene 2018).<sup>2</sup> And despite persistent overweight and obesity among women, the proportion of children under five who are overweight remains quite low, affecting only 1.2 percent of children in 2014 (ANSD 2015b; Nene 2018).

### What are the Barriers to Good Nutrition in Senegal?

The nutrition profile of children in Senegal is characterized by a moderate prevalence of stunting, high prevalence of wasting and anemia, and low prevalence of overweight and obesity (Nene 2018). Among women of reproductive age, anemia, thinness, and growing rates of diet-related noncommunicable diseases continue to be problematic (Nene 2018). New and emerging threats to nutrition—including external global economic and climate-related shocks that risk destabilizing international, national, and household-level food production, access, and availability—further constitute barriers to good nutrition in Senegal. Senegal has been particularly affected by the successive economic

shocks from rising food and fuel prices, the global financial crisis, floods and droughts, and health-related crises (such as the Ebola outbreak) in recent years. Economic and climatic shocks have led to sharp declines in agricultural production, stagnation in poverty reduction, and high levels of food insecurity (16 percent in 2014) (FEWS NET 2014; WFP 2014). The health consequences brought on by a rising burden of overweight and obesity among adults and children also constitute an unanticipated threat. In the midst of its nutrition transition, Senegal bears a double and triple burden of malnutrition, under which undernutrition, overnutrition, and micronutrient deficiencies coincide in households and individuals.

The determinants of malnutrition in Senegal are complex, interrelated, and deeply rooted in the social, economic, and political contexts in which populations grow and develop. Immediate causes of undernutrition among children are poor diet and high morbidity. Children's diets are inadequate both in terms of quality and frequency, with an all-too-low proportion of 33.3 percent of children who are exclusively breastfed (ANSD 2016). Adding insult to poor nutrition among young children is the high burden of common childhood illnesses, such as diarrhea, fever, and acute respiratory infection (ANSD 2016). Poor dietary diversity that contributes to inadequate complementary diets among young children is a consequence of other, more distal factors, such as household food insecurity and insufficient maternal knowledge. Even if a mother has knowledge of appropriate feeding and care-giving practices, gender norms may inhibit her power to make health, food, and nutrition-related decisions.

Though the determinants discussed are relevant across all regions in Senegal, this investment case emphasizes the importance of both regional determinants and burdens. Geographic and sociodemographic differences in nutrition indicators highlight important regional disparities (Nene 2018). For example, along the poverty incidence lines, the more urban and wealthy northern and western regions exhibit a much lower prevalence of stunting than do the central and southern regions. Some regions that have extremely

high levels of poverty also exhibit uncharacteristically high levels of stunting (Nene 2018). Residence, wealth, and sex are important determinants of child stunting in Senegal. Although almost all sociodemographic groups shared in the recent reduction in child stunting, wealthier, female, and urban-based children have experienced the greatest reductions in child stunting over time (Nene 2018).

In addition to physical, sociodemographic, and geographic barriers to good nutrition, several other risks have been identified as threats to the implementation of the PSMN. These include, inadequate engagement by relevant political authorities and the private sector; significant human capacity gaps; the inability of critical personnel to effectively mainstream nutrition through relevant sectors; and inadequate intrasectoral coordination (Deussom N. et al. forthcoming; Ba forthcoming). The human capacity gap, in particular, presents a challenge to integrating nutrition both horizontally (across sectors) and vertically (at various political and organizational levels), given the dearth of skilled people who are adequately trained in both nutrition and their sectoral specialty (Deussom N. et al. forthcoming; Ba forthcoming).

Although the barriers presented here are long and daunting, Senegal has demonstrated that, with adequate technical and financial support, it can move the needle on nutrition indicators and achieve improved nutrition outcomes for all its people.

### What is Needed to Address Nutrition in Senegal?

The important variations in the nutrition profile of women and children across regions within the country, where malnutrition does not affect all equally, require regionally tailored nutrition interventions. The broad goal is to strengthen community and household resilience against malnutrition using specific actions that are developed on the basis of each region's epidemiological, sociodemographic, and geographical profile and how these interact to affect nutritional status.

The DPNDN, on which the PSMN is based, lays out a conceptual framework for multisectoral action in nutrition. This framework integrates four pillars, or categories, of intervention that support an optimal nutritional status, as well as transversal, cross-cutting issues at the base of each of those pillars. The intervention pillars include: production of nutritionally rich foods in sufficient quantities; adequate processing, distribution, and tariffication (appropriate distribution and import-export taxation schemes) of nutritionally rich foods; education, sanitation, and hygiene; and essential health and nutrition services. Cross-cutting issues include: ownership through local governance and territorial development; sustainable financing; advocacy and communication for social and behavior change; multisectorality through community participation and equity; and research through monitoring and evaluation, capacity building, and coordination. Operationally, the institution of a common results framework that translates national targets at the regional, district, and community levels, will become essential for tracking nutrition progress across sectors, as well as across geographic regions and populations.

Beyond the four pillars and their bases are three strategic objectives that are meant to guide actors in the development and implementation of key interventions that will contribute to the final seven targets that represent an optimal nutritional status, as laid out in the PSMN. The three strategic objectives are meant to be applied to each of the four pillars of intervention discussed above and include: mainstreaming nutrition across sectors; decentralization of program delivery; and use of a community-based approach. Finally, Senegal recognizes four principles of engagement that are aligned with those that are used for all public service delivery: proximity and subsidiarity; equity and social justice; good governance; and contracting. These principles constitute the ethical, legal, and moral guidance for nutrition interventions implemented across all sectors.

The institutional arrangements needed to deliver nutrition services to the Senegalese population are in place. The CLM supports the Prime Minister

in technical matters relating to nutrition and in the implementation, monitoring, and evaluation of corresponding action plans and activities for nutrition at the national level. Line (technical) ministries, including those in charge of agriculture, health, education, water, sanitation and hygiene, social protection, commerce, industry, and local government collectives (CLs), fall under the CLM, which ensures that nutrition activities are mainstreamed into each sector. Also under the CLM, but responsible for the operationalization and management of community-level nutrition activities, is the Bureau Exécutif pour la Nutrition (National Executive Bureau for Nutrition) (BEN). All community-level activities are managed directly by CLs, which reach communities and individuals through Agences d'Exécution Communautaire (Community Execution Agencies) (AEC) that operate across the country's 14 regions. The AECs are directly responsible for the recruitment, capacity building, monitoring, and supervision of direct service providers and service delivery to communities, households, and individuals.

This institutional arrangement for nutrition in Senegal is ideally primed for the mainstreaming of nutrition across sectors, as it enables the country to “think multisectorally, and act sectorally” (World Bank 2013). Sectors have the freedom and mandate to implement relevant nutrition activities sectorally (vertically), while benefitting from the CLM's transversal view and coordination across all sectors (horizontally). In parallel, the Programme de Renforcement de la Nutrition (Nutrition Enhancement Program) (PRN) has developed the foundation for a well-functioning service delivery platform for maternal and child nutrition services at the community level using partnerships between CLs and AECs.

## What Will it Cost?

Over the period from 2017 through 2021, the budget needed to operationalize the DPNDN and the PSMN and implement nutrition-specific and nutrition-sensitive interventions across all sectors will grow to an estimated average of US\$71 million per year. This number is derived from a total budget of US\$355 million required

for nutrition-specific and nutrition-sensitive activities for all children under the age of five. This estimate corresponds to an investment of US\$5 per person per year, and US\$29 per child under the age of five per year, and includes funding for the implementation of a full package of nutrition-specific (30 percent of budget) and nutrition-sensitive (70 percent of budget) activities from the following sectors: health; water, sanitation, and hygiene; social protection; agriculture; fisheries; livestock; education; higher education and research; CLs (which are responsible for the delivery of most nutrition-specific interventions); industry; environment; and commerce.

Parallel to these nutrition-specific and nutrition-sensitive interventions, a certain number of investments have been identified in 12 sectors with the goal of improving the global nutrition environment in Senegal. These favorable nutrition investments aim to improve the quality of life of the Senegalese population through the development and enforcement of policies in all sectors associated with nutrition, but also through employment, infrastructure, and equipment that are necessary for the delivery of nutrition-specific and nutrition-sensitive services. These global investments are estimated at 650 billion F CFA (approximately \$US 1 billion) (République du Sénégal, forthcoming).

An analysis of returns on investment for implementing a package of nutrition-specific and nutrition-sensitive (health, water, and sanitation) activities (smaller in scope than that which is proposed by PSMN) at scale or that prioritizes regions with a heavy burden of undernutrition with specific interventions demonstrates that all of the scenarios considered would bring high returns to investment (Yao forthcoming). In other words, the choice between the various scenarios presented depend on the amount of public resources that can be mobilized for nutrition in Senegal.

## Call to Action

The rationale for investing in nutrition in Senegal is well established in this investment case. Good nu-

trition is essential for ensuring good health, saving lives, and building human capital for a prosperous and economically productive Senegal. The timing for intervening in nutrition in Senegal is equally critical: The country has entered its nutrition transition, with an unfinished agenda in undernutrition parallel to a rising threat of overweight, obesity, and their associated consequences on health, well-being, and longevity. Most importantly, and to tackle the double and triple burdens of malnutrition, Senegal is embarking on a new, multisectoral approach that deviates from “business as usual”<sup>3</sup> to achieve its ambitious nutrition goals. The next decade marks a new era for nutrition in Senegal, where continued and renewed efforts are needed to:

- ◆ Expand the delivery of nutrition services from the current coverage of 400 to a goal of 571 communes (municipalities);
- ◆ Intensify and reach full coverage of nutrition services for all children under five in the 400 communes in which the national nutrition program is already operational;

- ◆ Support the integration of nutrition activities into other sectors, as dictated by the DPNDN and PSMN;
- ◆ Adequately prepare for additional nutrition challenges that lie ahead, such as the growing burden of overweight and obesity.

This investment case urges the global community to support and contribute to Senegal’s momentum in redefining the country’s nutrition policies and operations and to sustain longstanding efforts in nutrition, not only to prevent a stagnation—or worse, a deterioration—in progress that has been made in nutrition in recent decades, but also to increase the ability of even the most vulnerable members of society to be nutrition secure. Today, Senegal is at a critical stage of ramping up key nutrition interventions to scale and in an unconventional way that engages multiple, relevant sectors, with a focus on capacity building that will yield sustained changes in behavior and improved nutrition for all of Senegal’s people. The time to invest in the country’s new, exciting era for nutrition is now.



Photo: Adama Cissé/CLM

# Introduction

Senegal is among the few countries in Sub-Saharan Africa that have succeeded in improving their population's nutritional status in recent decades. The prevalence of key nutrition indicators, such as the proportion of children stunted, wasted, and underweight, is lower than that in most other countries in the region, and even among the poorest segments of the population. Such gains likely could not have been achieved without significant political, financial, and capacity building investments including the establishment of the CLM and the scale-up of community-based nutrition interventions throughout the country. Government ownership of nutrition programming and intervention, in the form of increased financial investment over time, further demonstrates the importance placed on nutrition policy, planning, coordination, and programming at the country's highest political levels.

Despite a significant reduction in child stunting of 15 percentage points between 1992 and 2012, the burden of malnutrition in all its forms continues to contribute to excess morbidity and mortality, especially in the most vulnerable segments of the population. Child undernutrition contributes to 45 percent of deaths among children under five globally and accounts for at least

13,000 under-five deaths per year in Senegal (Black et al. 2013). Progress against malnutrition achieved over time notwithstanding, reversals in global funding for nutrition in Senegal neglect the still-too-high prevalence of child stunting, wasting, and micronutrient deficiencies, as well as the persistent prevalence of under- and overweight and anemia among women. This unfinished agenda for nutrition in Senegal will be presented in this investment case.

Good nutrition is a fundamental and necessary driver of human capital because of its major role in cognitive and physical development (Black et al. 2008). Nutrition in early childhood has been deemed by the global community to be a key determinant of both labor productivity and economic growth (World Bank 2006). In economic terms, it is estimated that global annual productivity losses associated with all forms of undernutrition (most of which occur during childhood and result in short stature and poorer cognition and school attainment for both adolescents and adults) can reach 6 percent of gross domestic product (GDP) (Horton and Steckel 2013). For this reason, many of the interventions that seek to improve the nutritional status of children during the critical window of opportunity, that is, the first 1,000 days of a child's life, are understood

to be the most cost-effective investment a country can make. Recent analysis suggests that, in Africa, every dollar invested to reduce child stunting generates US\$16 in economic returns (Hoddinott 2016).

In Senegal, a cost-effectiveness analysis of nutrition-specific and handwashing interventions found that a US\$11.2 million investment to scale up coverage to 100 percent would prevent 5,280 deaths, 159,398 disability-adjusted life years (DALYs), and 101,587 cases of stunting (Yao forthcoming). The comparison of various scenarios to implement a package of activities—at scale or that prioritize regions with the highest burden, or with interventions specific to the type of burden in each region—demonstrates that all of the considered scenarios promise a high return on investment (Yao forthcoming). Therefore, the choice of which scenario to implement will depend more on the amount of public resources made available to address nutrition, rather than on the cost-effectiveness of each scenario (Yao forthcoming).

The importance of nutrition for human development is widely known and increasingly being represented in global initiatives, such as the World Health Assembly (WHA) and the United Nations' new Sustainable Development Goal (SDG) nutrition targets. Both of these include ambitious targets for the reduction of stunting and wasting, with the WHA also broadening its focus to include targets for improved breastfeeding practices and reductions in micronutrient deficiencies, low birthweight, and childhood overweight.

For Senegal, which has arguably entered its nutrition transition and which is embarking on a new, multisectoral approach to tackle the double and triple burdens of malnutrition, there is no better time to ramp up nutrition investment. At this turning of the tide for nutrition programming nationwide, new, innovative, and resolute

efforts are needed to carry out an ambitious nutrition agenda that deviates from the business-as-usual approach to reach the WHA goals and the SDGs and to continue to yield progress in nutrition indicators. Specifically, such activities include an expansion of the scale and operation of nutrition programming, the integration of nutrition activities into other sectors, as dictated by the DPNDN and the PSMN, and the use of innovative funding mechanisms that will enable improved results.

This investment case outlines future directions in nutrition for Senegal on the basis of the PSMN and synthesizes a series of eight reports (box 1) prepared for the purpose of understanding the country's progress to date, while highlighting remaining gaps in funding and implementation for nutrition. The first section presents the developmental and economic rationales for investing in nutrition, including a review of Senegal's unique political climate, which lends itself to the development of new, unconventional policies. The second section draws from a situation analysis, a political economy study, and an institutional performance assessment to describe ongoing barriers to good nutrition in Senegal, while the third section proposes solutions on how to overcome them, in alignment with the PSMN. The fourth section presents the financial requirements for these activities, which are based on a calculation of sector-specific financial needs costed during the development of the PSMN, secured funding identified in the financing analysis study (Offosse N. 2017), and the costs of scaling up to 90 percent coverage as calculated in the economic analysis report (Yao forthcoming). This investment case concludes with a call to action, with the objective of stimulating the mobilization of resources for the scaled-up implementation of cost-effective interventions, while strengthening the visibility and synergy of nutrition interventions and investments across sectors in Senegal.

**BOX 1:** Reports in the series Analysis & Perspective: 15 Years of Experience in the Development of Nutrition Policy in Senegal

- **Nutrition Situation in Senegal.** An analysis of the nutritional status of key demographic groups in Senegal, including the geographic and sociodemographic inequalities in nutrition outcomes and their determinants.
- **Evolution of Nutrition Policy in Senegal.** An historical analysis of the nutrition policy landscape in Senegal, including the evolution of nutrition policies and institutions and their respective implications for programming and prioritization of interventions.
- **Political Economy of Nutrition Policy in Senegal.** An analysis of the policy and political levers that can be used in Senegal to foster government leadership and galvanize the intersectoral coordination needed to mainstream nutrition into government policies and programs, and effectively, efficiently, and sustainably deliver nutrition interventions.
- **Nutrition Financing in Senegal.** An analysis of the allocated funding to nutrition interventions in Senegal from 2016 to 2019, estimates of budgetary capacity for financing nutrition by government, and estimated costs for selected high-impact interventions.
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- **Cost and Benefits of Scaling Up Nutrition Interventions in Senegal.** Analysis of the relative costs and effectiveness of alternative scenarios for scaling up nutrition interventions in Senegal over the five years covering the PSMN.
- **Risks for Scaling Up Nutrition in Senegal.** Analysis of the potential risks to the scale-up of nutrition in Senegal, their likelihood of occurrence, potential impact, and potential mitigation measures.
- **A Decade of World Bank Support to Senegal's Nutrition Program.** The World Bank Independent Evaluation Group Project Performance Assessment Report, which evaluates the extent to which World Bank operations supporting nutrition in Senegal from 2002–14 achieved their intended outcomes and draws lessons to inform future investments.



Photo: Adama Cissé/CLM

# The Case for Investment in Nutrition in Senegal

## Nutrition is Central to Development

People who are well nourished throughout their early lives—that is, from conception through the intrauterine period and during the periods of rapid growth in childhood and adolescence—are better able to achieve their full physical and developmental potential (Black et al. 2008). Nutrition intervention during the first 1,000 days of a child’s life (from conception to age 2), also referred to as “the critical window of opportunity,” is important because of the irreversibility of the negative effects of undernutrition on cognitive and physical development after this period.

Poor nutrition often starts in utero and continues to deteriorate during childhood, adolescence, and pregnancy, contributing to an intergenerational cycle of undernutrition (United Nations and IFPRI 2000). Ensuring good nutrition during each of these critical life phases contributes directly to healthy and productive populations, and more broadly, to economic development and poverty reduction at a national and global level (World Bank 2006). Improvements in cognitive development, school performance, physical development and work capacity, and health result

from reductions in disease, mortality, and increases in health care expenditures (World Bank 2006).

The intergenerational transmission of undernutrition is important in Senegal, where, in 2010–11, women underweight (thinness) hovered at 22.0 percent, and more than half (54.3 percent)<sup>4</sup> of all women of reproductive age were anemic (ANSD 2012). In addition, 16.3 percent of mothers interviewed in the 2015 Demographic and Health Survey (DHS) reported that their children suffered from low birthweight, setting them on poor growth trajectories for the remainder of their early childhood and beyond (ANSD 2016). Breaking this cycle requires a comprehensive and holistic approach that addresses the multiple determinants of malnutrition to most effectively change the human development trajectory of children and of the nation. As estimated in the cost-effectiveness analysis undertaken by Yao (2017), scaling up the coverage of nutrition-specific and nutrition-sensitive interventions as early as adolescence (for young mothers) and throughout the reproductive and early childhood periods holds enormous potential for preventing undernutrition and saving children’s lives.

Finally, investing in nutrition is necessary to fulfill Senegal's ambition to become an emerging economy by 2035. Nutrition investments are perfectly aligned with the second strategic axis of the Emerging Senegal Plan to improve the population's human capital through significant improvements in "access to health care, safe drinking water and sanitation, as well as strengthening nutrition" (République du Sénégal 2014, 62). Moreover, investments in nutrition will indirectly contribute to the Emerging Senegal Plan's first strategic axis of a structural transformation of the economy, through the links between nutrition and cognitive and physical development and, subsequently, economic productivity.

### Senegal's Political Climate Promotes and Facilitates Nutrition Investments

Nutrition has been prioritized in Senegal since the birth of the Republic, as evidenced in key social and development policies that date back to the 1950s. Since then, nutrition policy has evolved over a series of distinct generations described in detail in Spray (2018); the various "generations" of nutrition policy and programming highlight "a constant interplay between social, environmental, and economic events; politics; the state of nutrition knowledge; and the engagement and influence of external stakeholders" (Spray 2018).

Most notable across time was the importance of nutrition in the Quadrennial Economic and Social Development Plans (PQDESs), which led to the development of institutions dedicated to food and nutrition and making maternal and infant protection a national priority as early as the 1960s. The institutionalization of nutrition in the 1990s, the shift toward the prevention of malnutrition using a community-based and preventive approach, and the subsequent creation of the CLM in 2001 to coordinate the large-scale implementation of these activities across pertinent sectors, all contributed to the significant and rapid improvements in nutrition the country has seen to date (Spray 2018). The parallel addition of an investment line to the national budget—and its growth over time, from

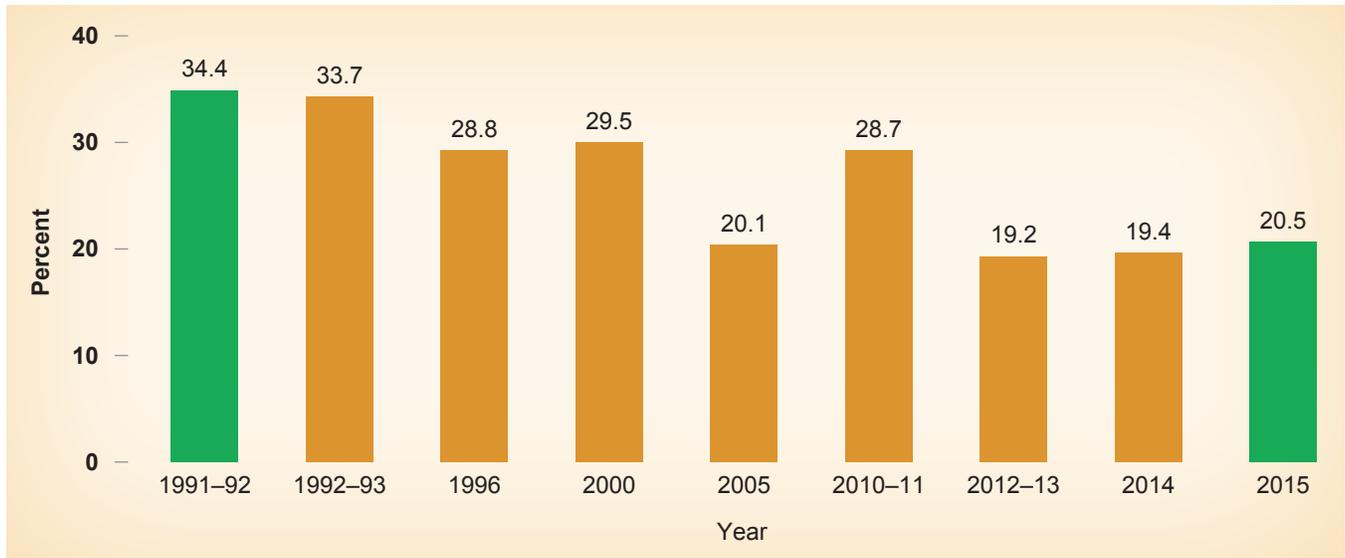
US\$0.3 million in 2002 to US\$5.7 million annually in 2015<sup>5</sup>—further demonstrates the administration's commitment to nutrition through institutionalizing "funding for nutrition beyond the life of any single project or administration" (Spray 2018).

The political placement of the CLM was—and continues to be—of crucial importance to Senegal's ability to absorb, coordinate, and implement funding, policies, and programs throughout the country. At the time of its inception, the CLM represented a much-needed restructuring of the previous entity, the Commission Nationale de Lutte contre la Malnutrition (National Committee for the Fight against Malnutrition), which had been widely criticized for its failure to coordinate across ministries (Spray 2018). Today, and under continued efforts to scale up nutrition activities in accordance with the DPNDN and the PSMN, the CLM is aptly placed to mainstream nutrition across major line ministries and to support the implementation of both nutrition-specific and nutrition-sensitive interventions at scale (Fox 2018). Furthermore, it represents a platform that coordinates external funding and partnerships and sets clear lines of accountability (Spray 2018).

Senegal solidified its already extensive and long-standing political support for nutrition by its public and international pledge to join the Scaling Up Nutrition (SUN) Movement, which it did in 2011. Senegal and the CLM have adopted—and are working toward reaching—the SUN Movement vision of becoming a country free from malnutrition in all its forms by building an enabling environment for nutrition, mobilizing the necessary resources to do so, and aligning implementation of activities across sectors to maximize results.

Senegal has emerged as a pioneer in the fight against malnutrition and is uniquely placed to drive the ambitious and complex multisectoral agenda for nutrition. The country has a long and strong track record for improving nutrition and an even stronger foundation from which to draw valuable lessons to support future efforts to face continuing and emerging nutrition chal-

**FIGURE 1:** Stunting in Children under Five in Senegal



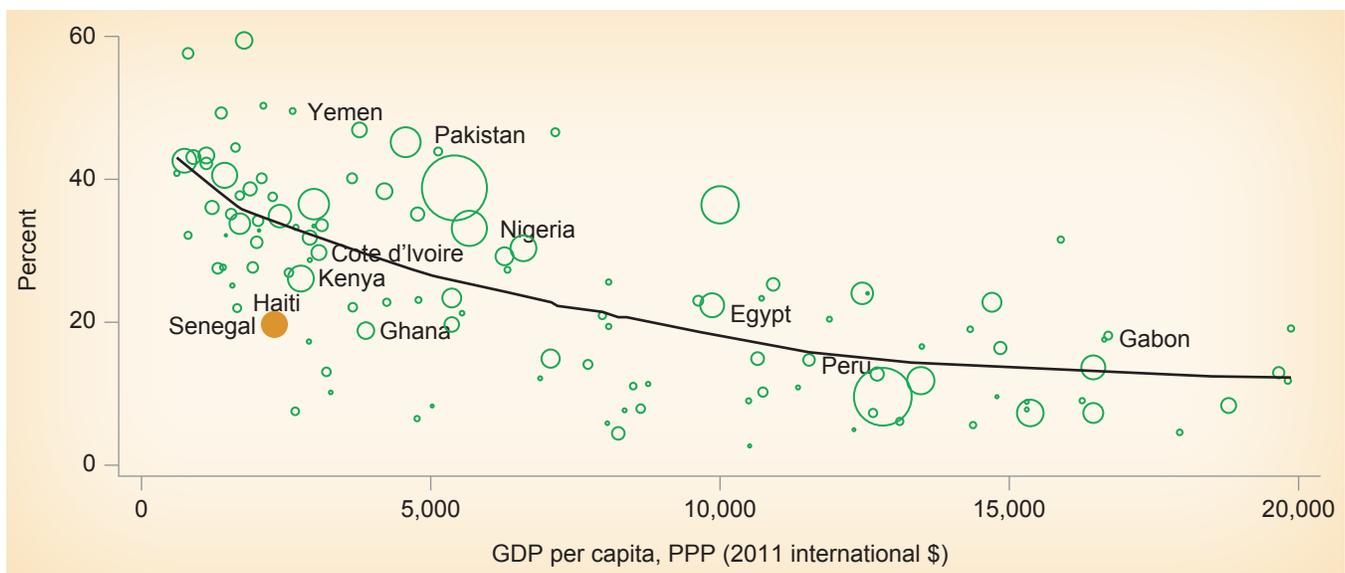
Source: UNICEF-WHO-World Bank Joint Child Malnutrition Estimates, UNICEF (United Nations Children’s Fund), WHO (World Health Organization) and World Bank (accessed 2017), <http://datatopics.worldbank.org/child-malnutrition/>, and Spray 2018.

allenges. The various political factors discussed here have been—and will continue to be—indispensable for mobilizing both internal and external resources, without which the achievement of the WHA and SDG targets will not be possible.

### Maintaining Nutrition Gains to Ensure a Prosperous and Stable Senegal

Senegal has demonstrated rapid and significant gains across various nutrition indicators in recent decades,

**FIGURE 2:** Stunting in Children under Five by Per Capita GDP



Source: Nene 2018. Based on data from World Development Indicators (database), World Bank, Washington, DC (accessed 2016), <http://data.worldbank.org/data-catalog/world-development-indicators>; UN DESA 2015; STATcompiler (database), USAID, Washington, DC (accessed 2016), <http://www.statcompiler.com/en/>. Note: The sizes of the circles are proportional to the number of children under the age of five. The red line indicates the model’s prediction. PPP = purchasing power parity.

and its success is even more pronounced when compared to many of its Sub-Saharan African neighbors, which saw deterioration in nutritional status during the same period. Most notable is its performance in child stunting: Between 1992 and 2012, the prevalence of stunting fell from 34.4 percent to 19.2 percent, with the most rapid reduction occurring between 2000 and 2005 (figure 1). The reductions in child stunting coincided closely with the establishment of the CLM in 2001, despite the slow annual average per capita GDP growth rate of 1.8 percent during that same period (Nene 2018). The extent to which income growth leads to nutritional improvements is still a topic of debate, but irrespective of its economic growth, Senegal performed exceptionally well in child stunting (Ruel and Alderman 2013; Nene 2018). As shown in figure 2, the prevalence of stunting is much lower than that observed in countries with comparable per capita income and on a par with countries that have much higher income levels (Nene 2018). Child anemia has also seen some improvement, falling from 82.6 percent in 2005 to 66.3 percent in 2015, though it remains high (Ndiaye and Ayad 2006; ANSD 2016; Nene 2018). Despite persistent overweight and obesity among women, the proportion of children under five who are overweight remains quite low, at only 1.2 percent of children in 2014 (ANSD 2015b; Nene 2018).

Despite the nutrition gains among children under five, recent data show that certain nutrition indicators continue to lag and threaten progress toward the achievement of WHA and SDG targets. The most recent DHS survey, conducted in 2016, indicates an increase in child stunting, with the prevalence creeping back up to 20.5 percent from 19.2 percent and 19.4 percent in 2012–13 and 2014, respectively (figure 1) (ANSD 2016). In addition, prevalence of wasting demonstrated a near complete stagnation, hovering at about, or just under, 10 percent, beginning in 1991–92, with the exception of 2014, when it reached a record low of 5.8 percent. The 2015 DHS, however, indicated an increase to 7.8 percent (ANSD 2016). The World Health Organization (WHO) classifies a prevalence of wasting of 10–14 percent as a serious public health emergency because of the risks of wasting on mortality and on the intelligence

quotient (IQ) of those who survive (WHO 2000). Moreover, given the acute nature of wasting, children tend to go in and out of the state of wasting, which leads to an IQ estimated to be 8–18 points lower than the level they could have achieved in the absence of wasting (Alif Ailaan 2015). In fact, the relationship between undernutrition and IQ is graded and linear; even less severe forms of undernutrition negatively affect cognitive performance (Venables and Raine 2016).

Nutrition indicators among women of reproductive age also demonstrate slow progress, particularly in anemia, which affects more than half of all women of reproductive age and remained largely unchanged between 2005 and 2010–11, when it was last measured (Nene 2018). Among women who are pregnant—a time during which anemia typically worsens as a result of increased blood volume needs and hemodilution—anemia presents among the most responsive outcomes: scale-up to 90 percent coverage of intermittent iron folate supplementation could yield a reduction in anemia of more than half, from 64 percent to 29 percent, or more than 200,000 cases averted in the five years from 2016 to 2021.<sup>6</sup>

Finally, the rapidly changing epidemiology of nutrition cannot be ignored, further challenging the country as it attempts to address the persistent burden of overweight and obesity in this period of transition. The country continues to struggle with maternal underweight (22.0 percent in 2010–11) and anemia (54.3 percent in 2010–11),<sup>7</sup> while almost the same proportion of women (21.3 percent) was estimated to be overweight or obese (ANSD 2012; Nene 2018). And despite a dearth of data on how much overweight and obesity currently contribute to the development of non-communicable diseases, small surveys in the urban areas of Dakar and Saint-Louis point to an alarmingly high prevalence of associated risk factors, such as high blood pressure, high cholesterol, and metabolic syndrome (Duboz 2012; Seck 2015; Pessinaba et al. 2013; Nene 2018).

In sum, Senegal has registered impressive gains in certain areas of child and maternal nutrition thanks

to the establishment of a national implementation and service delivery framework. However, significant challenges and threats remain to ensuring optimal nutrition for the Senegalese population, especially in the context of the country's ambitious goals to become an emerging economy by 2035. There is no better time to invest in nutrition in Senegal than now. Despite the favorable political climate for nutrition, mainstreaming nutrition-sensitive and nutrition-specific interventions across multiple sectors, while expanding the coverage

of a more comprehensive package of interventions to an unprecedented 80–90 percent, is a complex, resource-intensive endeavor, particularly with new political leadership and frequent economic and environmental shocks. Supporting the country—technically and financially—through this key transitional phase, and readying it to tackle an entirely new dimension of nutritional challenges, present a unique opportunity to pave the way toward ensuring a prosperous and stable Senegal for generations to come.



Photo: Adama Cissé/CLM

# Barriers to Good Nutrition in Senegal

## Nutrition challenges in Senegal

The nutrition profile of children in Senegal is characterized by moderate stunting, high wasting and anemia, and low overweight and obesity (Nene 2018). In the most recent decade, the prevalence of stunting has hovered around 20 percent. The prevalence of wasting among children under five also represents a case of stagnation over time, yet at a more alarming 8–10 percent, which borders on the WHO threshold for a “serious” situation (WHO 2000). It dropped to an all-time low of 5.8 percent in 2014, but rose again slightly in 2015 to 7.8 percent, remaining at unacceptably high levels, given the strong association of wasting with child mortality and impaired cognitive development (Black et al. 2008). Wasting, unlike stunting, is also more sensitive to shocks, thus the high prevalence that has been documented over time is likely a result of the frequent and successive economic shocks that have been brought on by environmental and climate changes, rising food and fuel prices, and the global financial crisis (WHO, UNICEF, and WFP 2014; Nene 2018). The prevalence of wasting may also reflect the season during which the survey is conducted; for example, rates generally surge during rainy seasons and before the harvest as a result of food shortages, in-

creased morbidity from exposure to pathogens, and greater female participation in the labor market, which often separates mothers from their children (Martorell and Young 2012; Schwinger et al. 2014; Nene 2018).

Child anemia has seen an average decline of 3.4 percentage points per year since 2005 when it affected 82.6 percent of children under five, yet remains very high, with 66.3 percent of children affected (Ndiaye and Ayad 2006; ANSD 2016). Reductions in child anemia registered their most impressive gains in recent years, falling from 76.4 percent in 2010–11 to the current rate of 66.3 percent (ANSD 2012; ANSD 2016). The burden of anemia sees significant variation across different regions in the country, with Ziguinchor registering the lowest prevalence at 54.4 percent and Diourbel the highest, at 77.3 percent (ANSD 2015a). Deficiency of iodine, an important micronutrient, continues to be problematic in Senegal, with just over half (53.3 percent) of children under five living in households without adequately iodized salt (15ppm) in 2015 (ANSD 2016). Though this represents an improvement since 2005 when the proportion of children living in households with adequately iodized salt was only 35.8 percent, the low availability of iodine and the potential for iodine deficiency presents a significant threat to the

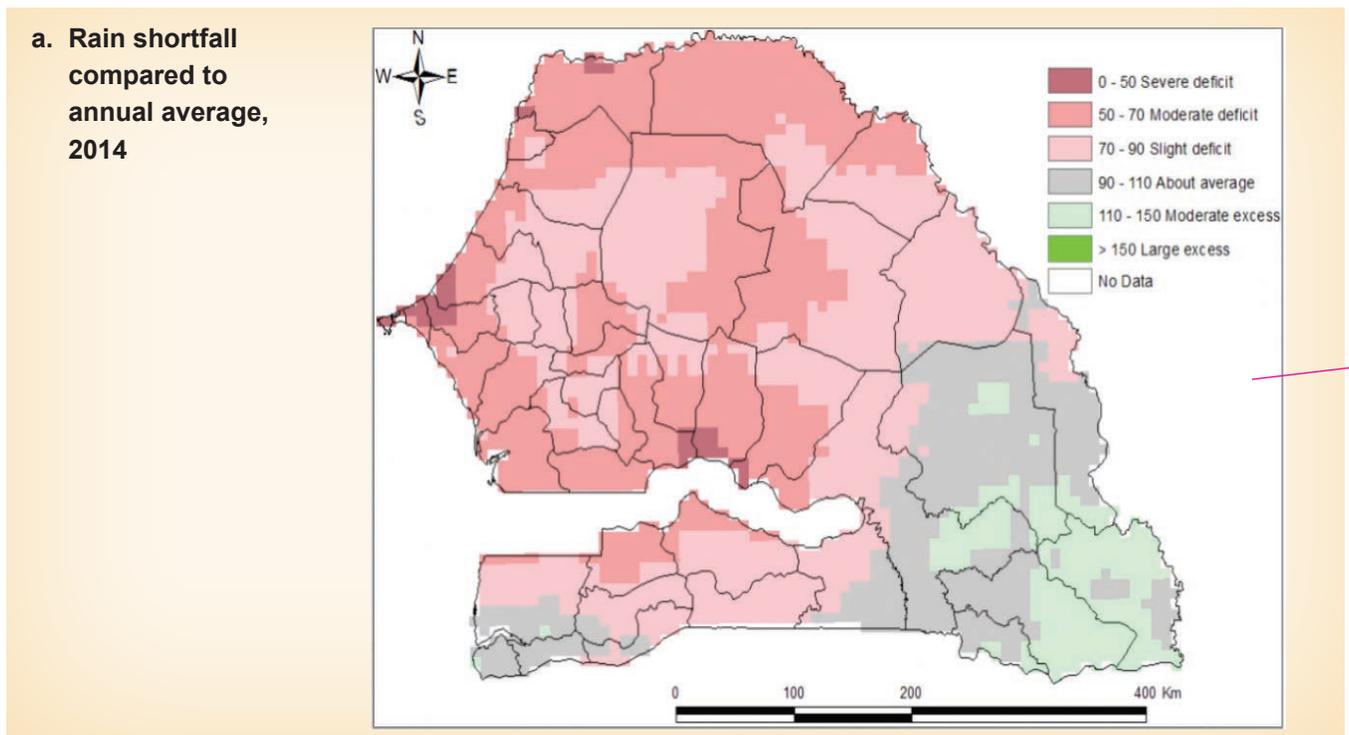
cognitive and brain development of children (Ndiaye and Ayad 2006). Iodine deficiency disorders, which can begin in utero, lead to an irreversible mental impairment that lowers an individual’s ability to perform well at home, in school, and at work (WHO 2017).

Among women of reproductive age, anemia, thinness, and overweight continue to be problematic. Anemia remains the third highest in the region (behind Gabon and The Gambia), with a 54.3 percent prevalence rate in 2010–11.<sup>8</sup> Progress in this indicator over time has been very slow, with only a minimal decrease from 2005, when the prevalence rate was 59.1 percent (Ndiaye and Ayad 2006). Maternal thinness (22.0 percent) and overweight (21.3 percent) both hovered at about 20 percent in 2010–11, holding different yet important consequences for the health of the child and the mother (ANSD 2015b). Maternal thinness has increased from 18.2 percent in 2005 to 22.0 percent in 2010–11, while overweight was 21.9 percent and 21.3 percent in 2005 and 2010–11, respectively (Ndiaye

and Ayad 2006; ANSD 2015b). Also holding important implications for the health and nutrition of a mother and her child, are pregnancies that occur among young mothers (17.6 percent of women aged 15–19 have begun childbearing), for whom nutritional vulnerability is essentially doubled because of the increased requirements needed to sustain the growth of both the mother and her fetus (ANSD 2015b).

Although not accounted for in the national statistics presented here—but critical for planning purposes and thus deserving mention—are new and emerging threats to nutrition. These include external global economic and climate-related shocks that risk destabilizing international, national, and household-level food production, access, and availability. Senegal has been particularly affected by successive economic shocks from rising food and fuel prices, the global financial crisis, and floods and droughts in recent years. These external shocks contributed to poor economic growth, sharp declines in cereal, groundnut (the country’s main cash

**MAP 1:** Effects of Shortfalls in Rain on Food Insecurity and Undernutrition



Source: FEWS NET 2014.

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crop), and pulses production, and an observed stagnation in poverty reduction in the last decade, especially among the more vulnerable, rural populations. In late 2014, for example, the cereal harvest was estimated to be more than 20 percent below average due to poor rainfall in the northern and central regions of the country (FEWS NET 2014). Lower production levels, in combination with border closures resulting from the Ebola outbreak in West Africa in 2014, drove up coarse grain prices (FEWS NET 2014); consequently, 16 percent of the population was found to be food insecure in 2014 (WFP 2014). As shown in map 1 below, food insecurity is closely tied to dietary intake and nutritional status; areas that experience climatic shocks are the same as those that suffer the brunt of food insecurity and undernutrition (FEWS NET 2014; WFP 2014; ANSD 2015b).

Finally, it is important to acknowledge the health consequences of increasing overweight and obesity among adults and children, their associated risk factors, and the resulting strain on the health care system. Although the quantification of these costs in low- and middle-income countries is limited, a study in the Asia-Pacific region finds that the economic burden of overweight and obesity accounts for between 2 percent and 10 percent of a country's total health expenditures (Hoque et al. 2016). In addition, overweight and obese individuals incur health care costs 7–10 percent and 17–22 percent higher, respectively, than their normal-weight counterparts (Hoque et al. 2016).

With its moderate levels of child stunting and high levels of child anemia, and persistent prevalence of under- and overweight and anemia among women, Senegal bears a double and triple burden of malnutrition, exhibiting clear characteristics of a country in the midst of its transition (Popkin 2002).

### **Determinants of Poor Maternal and Child Nutrition in Senegal**

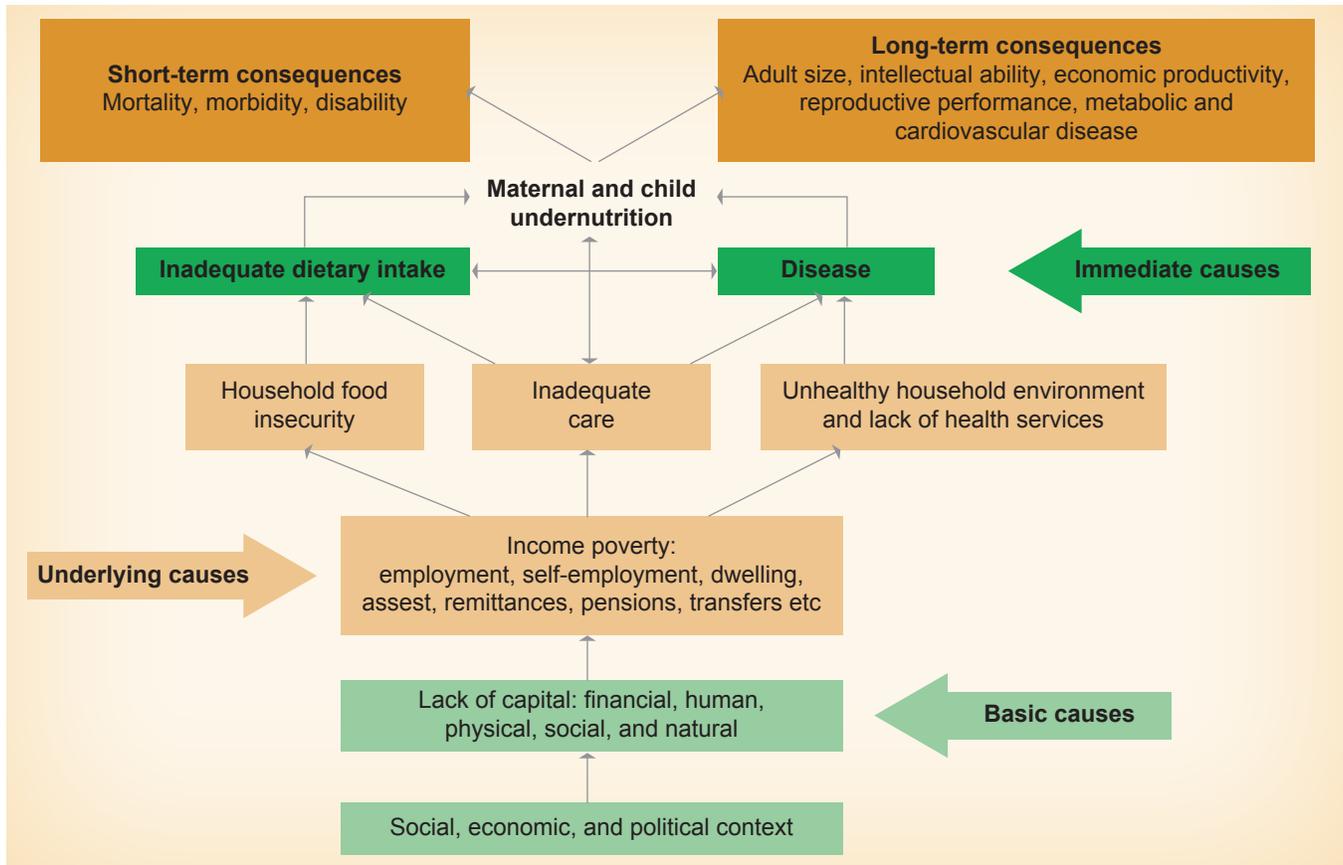
In this section, we summarize the various, complex, and interrelated determinants of maternal and child nutrition. Although this may appear to be a dauntingly

long list of often deeply rooted societal influences on nutrition, Senegal represents a strong example of how progress in nutrition can be achieved. Cost-effective, efficacious interventions to address nutrition exist, are known, and can be—or already are being—implemented in Senegal. Rather than allowing the sheer complexity of malnutrition to discourage action, this section presents various means through which nutrition can be improved, while highlighting the necessity of a multisectoral approach.

The determinants of child growth and nutritional status are numerous, linked, and deeply rooted in the social, economic, and political context in which children and populations grow and develop (figure 3) (Black et al. 2008; Black et al. 2013). Dietary intake and disease—both of which act synergistically—are the two proximal determinants of nutrition, followed by the underlying causes that influence them, such as household food insecurity, inadequate care, and household environment and access to health services. These underlying causes can be quite broad, are often interrelated, and are largely driven by various dimensions of poverty; essentially, they represent an inability to fulfill the specific, yet basic, needs of women and children. Within the realm of food insecurity, issues of household distribution of food also arise and influence nutrition both at the individual and household levels, more so in some contexts than others. Inadequate care, on the other hand, encompasses both maternal and child care practices as they relate to behavioral aspects of nutritional care during pregnancy and lactation, as well as IYCF, including early initiation and exclusive breastfeeding in the first six months and continued breastfeeding until age two, parenting and caregiving, and stimulation. Household environment includes access to safe water and both environmental and personal hygiene and sanitation practices, which are being increasingly understood to play a role in nutrient absorption and nutritional status through environmental enteric dysfunction, even in the absence of clinical symptoms or illness (Prendergast and Humphrey 2014).

Even more distal are the basic causes of undernutrition, which encompass the broader socioeconomic

**FIGURE 3:** Conceptual Model of the Determinants of Undernutrition



Source: Black et al. 2008, adapted from UNICEF 1990.

environment, policies, and availability and access to social programs that support economic, human, and physical growth and development (Black et al. 2008). These include the ways in which political structures, ideologies, and legal systems—both formal and informal institutions—converge and permeate through a society to influence the more proximal and underlying determinants of undernutrition referred to above.

The determinants of undernutrition in Senegal are presented below. An important theme of this investment case and of nutrition in Senegal more generally, however, is the variation among determinants and consequently, of burdens, that are specific to each region within the country. A critical component of the PSMN’s development, for example, is the analysis of regional-level data and indicators on the determinants

of undernutrition, which is necessary for program planning and intervention design purposes. Nevertheless, the presentation of determinants at the national level provides a global picture of the challenges of achieving good nutrition in Senegal, some of which are more pronounced in some regions than in others.

The diets of children are inadequate in both quality and frequency: Less than half of children are exclusively breastfed from birth to six months (33.3 percent), and only 10.2 percent of children consume a minimum acceptable diet (MAD) through age two (ANSD 2016). Of the two indicators used to construct the MAD, however, dietary diversity is particularly problematic: just 40.5 percent of all children achieve the meal frequency requirement for their age, while not even one-fourth (19.3 percent) meet the minimum dietary diversity of four food groups (ANSD 2016).

Despite acceptable levels of completed childhood vaccinations (67.8 percent of children 12–23 months having received all required vaccines), the prevalence of common childhood illnesses remains high (ANSD 2016). For instance, in 2015, 18.1 percent, 15.0 percent, and 3.5 percent of children suffered from diarrhea, fever, and symptoms of acute respiratory infection, respectively (ANSD 2016). This is equivalent to approximately five episodes of diarrhea per child per year, for which less than half (39.4 percent) of all mothers seek treatment (ANSD 2016).

The lack of dietary diversity is a consequence of many more distal factors, namely household food insecurity and insufficient maternal knowledge. Even if a mother has the knowledge of appropriate feeding and care-giving practices, gender norms, which are discussed in more detail below, may further inhibit a mother's power to make health, food, and nutrition-related decisions.

Although the average available calories per capita (2,480 kilocalories per person per day, as of 2015) are sufficient to meet the population's daily needs, 60 percent of calories come from staple foods and less than 10 percent come from protein (FAO 2015). Seasonality also plays a role in food insecurity and influences dietary intake of nutrient-rich foods, as well as nutritional status, among children.

Regarding maternal knowledge and care seeking, less than half of all mothers seek care when their child is ill with symptoms of diarrhea, fever, or acute respiratory illness (39.4 percent, 41.4 percent, and 48.2 percent, respectively), which represents a missed opportunity for health staff not only to provide needed services but also to deliver essential nutrition messages (ANSD 2016). Moreover, frequent exposure to such common childhood illnesses, because of their high prevalence, compromises children's immune systems and can have devastating consequences for their nutritional status—and vice versa—given the deteriorative nature of the infection-nutrition cycle (Tomkins 1989).

As briefly mentioned, gender norms weigh heavily on women—beginning as early as adolescence, when

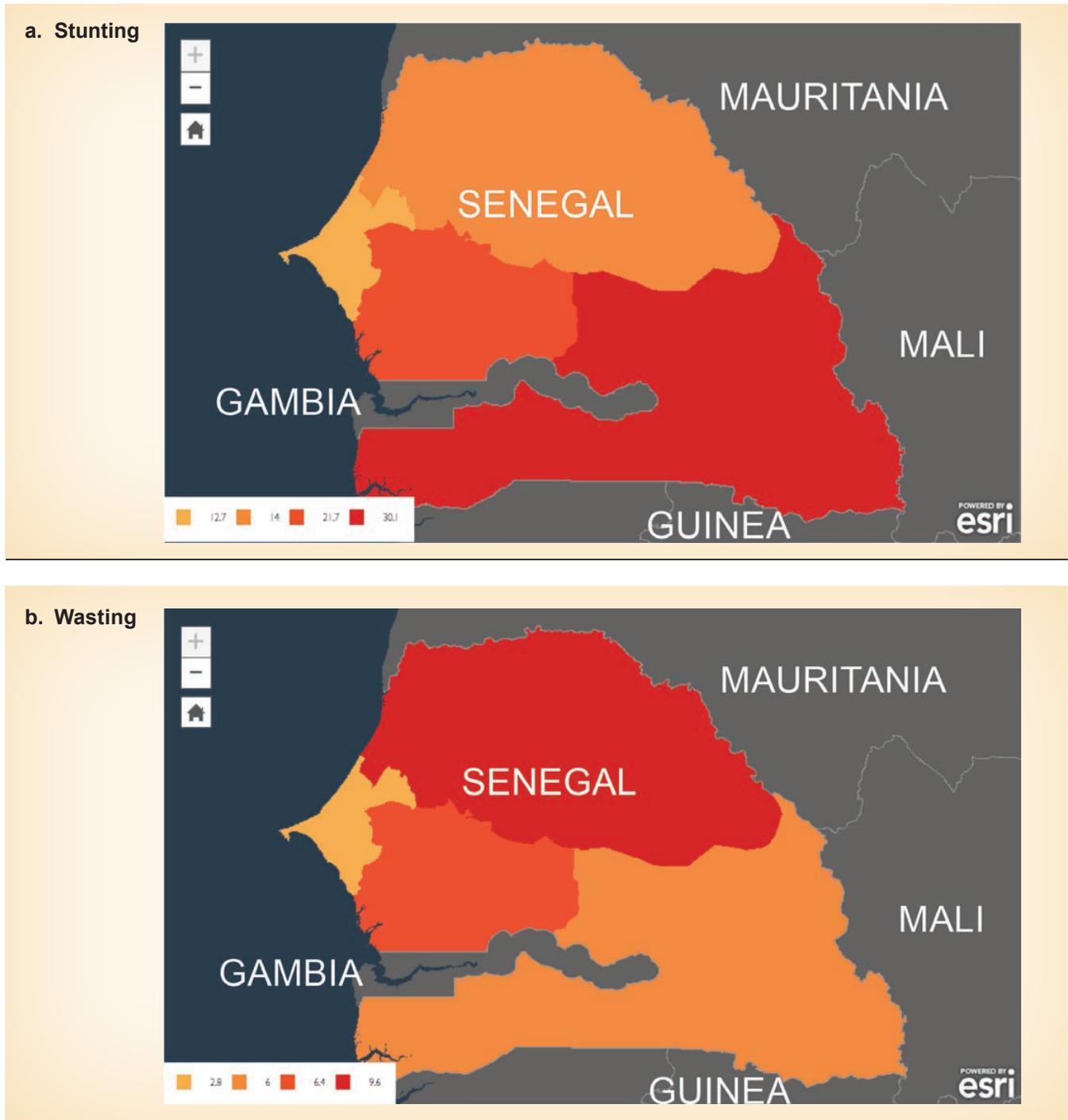
many women begin childbearing—and limit their access to resources and decision-making power. These deeply rooted social constructs hold consequences for the health and nutrition of the mother, but also affect time allocation and its relationship to child care practices. Women with less influence or power within their household and community are limited in their ability to guarantee a fair distribution of food and resources within the household, are less likely or able to use health services in cases of child illness, and spend less time interacting with their children (Oniang 2002). Improving gender equality to provide more equal access to and control over household resources and assets has significant pay-offs, including higher agricultural output through improved access to land, credit, and information; increased investment in child education; improved frequency of visits to health facilities for infants; food security; and accelerated child growth and development (Oniang 2002).

Taking a closer look at the variations in nutritional status across Senegal, we also see geographic and sociodemographic differences in the basic and underlying causes that highlight important regional disparities. Stunting prevalence is correlated with socioeconomic poverty and urbanization; along the poverty incidence lines, the more urban and wealthy northern and western regions exhibit a much lower prevalence of stunting (less than 20 percent) than do the central and southern regions (ranging from 21 percent to 29 percent) (Nene 2018).

This trend remains evident in the latest DHS (ANSD 2016) (map 2). Kolda, for example, a southern region with an extremely high level of poverty, exhibits an exceptionally high stunting prevalence of 36 percent (Nene 2018). Moreover, the national gains in stunting that were seen from 1990–2005 were uneven across regions, with some experiencing large decreases in stunting prevalence while others saw stagnation and even increases in prevalence.

Residence, wealth, and sex are important determinants of child stunting in Senegal. Wealthier, female, and urban-based children experienced the greatest reductions in child stunting over time (Nene 2018).

**MAP 2:** Regional Divides of Prevalence of Stunting and Wasting in Senegal, 2015



Source: Based on DHS Program STATcompiler (database), USAID, Washington, DC (accessed 2016), <http://www.statcompiler.com/en/>.

Wasting prevalence, on the other hand, is less dependent on poverty and more heavily influenced by external shocks, many of which are environmental and geographical. Interestingly, the regions of Saint-Louis, Louga, and Tambacounda, which exhibit some of the

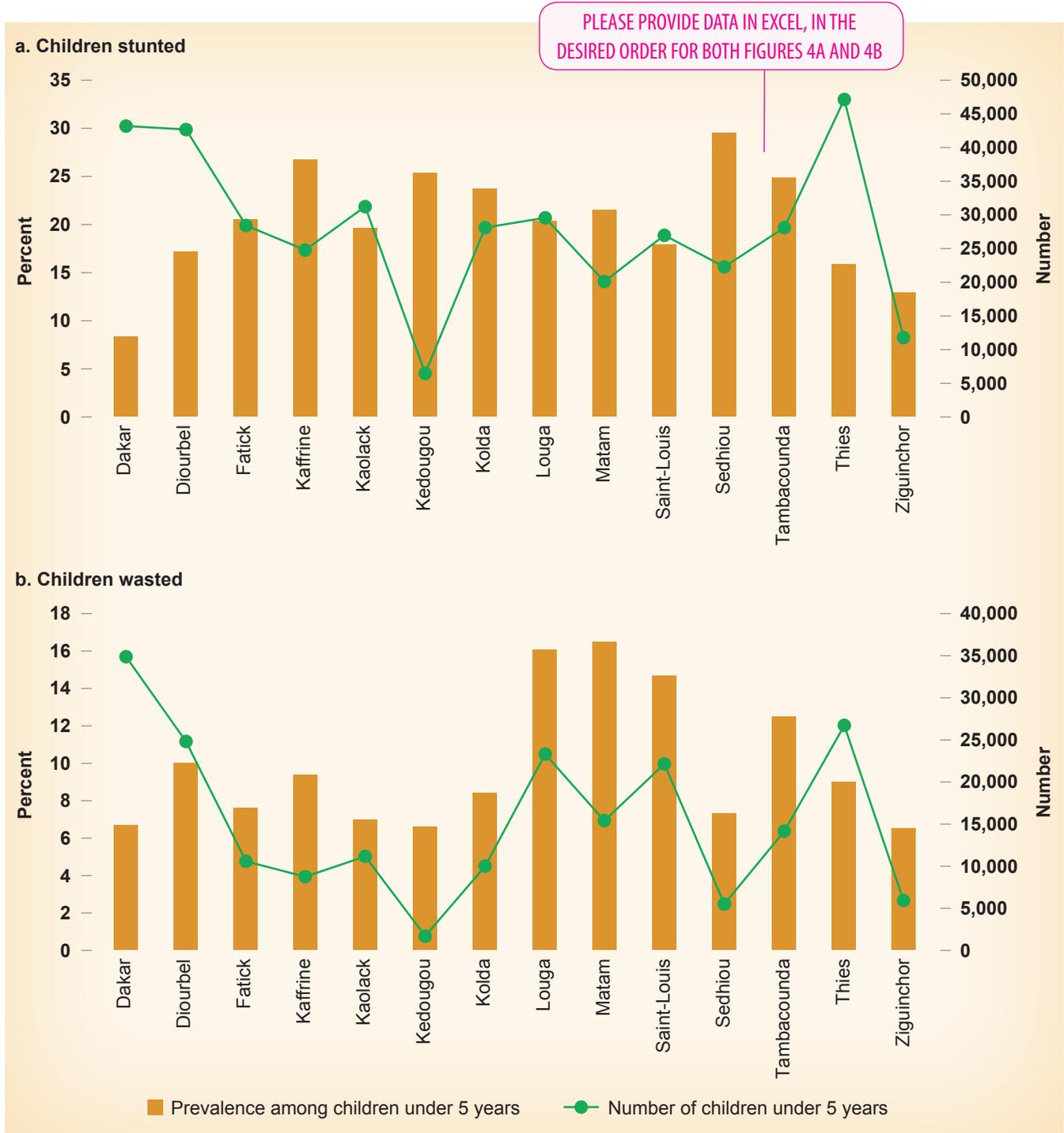
lowest prevalences of child stunting, are those most affected by wasting, with prevalence estimates ranging from 10–14 percent (Nene 2018). Conversely, the extremely poor region of Kolda, which has a high prevalence of stunting, consistently performs better than

Saint-Louis and Louga on the prevalence of wasting (Nene 2018).

Figure 4 shows the estimated regional distributions of the prevalence and number of children affected

by stunting and wasting in Senegal in 2015, respectively. An understanding of both the number and the prevalence of children suffering from various types of undernutrition is critical for planning purposes, as a high prevalence or burden of undernutrition does not

**FIGURE 4:** Prevalence and Absolute Number of Stunted and Wasted Children in Senegal by Region



Source: Calculations based on the national-level percentage of children under five as reported in ANSD (2016) (16.6 percent). Population data are based on the 2013 census.

always equate with a high number of children. This is highlighted in the region of Kedougou, for instance, which exhibits a high prevalence of both wasting and stunting but low numbers of children affected. On the contrary, the regions of Dakar and Thies, which exhibit relatively low prevalence of stunting, have large numbers of stunted children because of the size of the population in each of these regions.

### Gaps in Human Resource Capacity to Deliver Nutrition Services

Perhaps the biggest gap in the implementation of the PSMN is the gap in human resource capacity to mainstream nutrition throughout relevant sectors of health, agriculture, commerce, fisheries and livestock, education, and social protection. Despite the existence of a university-level curriculum and training (Master of Science and Ph.D.) for nutrition at the University of Cheikh Anta Diop in Dakar since 1998, there continues to be a dearth of skilled people who are adequately trained in both nutrition and their sectoral specialty (Fox 2018). This widespread absence of skilled individuals who are able to sensitize their sectors to more strongly support nutrition poses a significant challenge to mainstreaming nutrition, both vertically (at all administrative levels) and horizontally (across sectors) (Fox 2018; Deussom N. et al. forthcoming; Ba forthcoming).

More specifically, the vertical human resource capacity gap begins at the highest levels of government and trickles down to front-line workers at the community level (Deussom N. et al. forthcoming). The lack of capacity beyond sectoral specialties at the ministerial level of government is a barrier not only to the implementation of nutrition activities, but also to the championing and raising of funds for nutrition, and the ability to lead and think creatively to maximize investment in nutrition from within each sector (Deussom N. et al. forthcoming). In addition, the lack of explicit attention to nutrition in other sectors' activities and policy documents could further inhibit the prioritizing of nutrition, as the CLM expands its coordination role to central-level sector institutions in addition to

CLs and local service providers (Deussom N. et al. forthcoming).

The analysis of risks associated with the implementation of the PSMN further highlights the significant risk posed by the instability of critical nutrition personnel at the highest levels of government, especially within the CLM (Deussom N. et al. forthcoming; Ba forthcoming). Strengthening human resource capacity by improving remuneration and investing in capacity building and research efforts are among the actions that are recommended to strengthen the organizational and leadership capacity of the CLM to enable it to effectively carry out its mandate (Deussom N. et al. forthcoming; Ba forthcoming).

Capacity at the local midgovernmental level in Senegal is especially important given the operational schematic for the PRN, which is coordinated by the CLM but depends on a highly decentralized arrangement in which CLs are the entry point and responsible for the PRN (Deussom N. et al. forthcoming). Although much of the responsibility for financing and implementing the PRN, through partnerships with local nongovernmental organizations (NGOs), has been transferred to the CLs, it is widely accepted that their capacity to self-finance and implement nutrition initiatives remains weak, for many of the reasons described above, including insufficient or inadequate training in nutrition (Deussom N. et al. forthcoming; Ba forthcoming). CLs will need more support, including investments in capacity building, to successfully carry out their mandate (Deussom N. et al. forthcoming; Ba forthcoming).

At the lowest level, that is, within the communities themselves, the PRN depends on front-line staff to deliver effective and individually tailored nutrition messages to mothers, households, and communities, to collectively improve IYCF and caring behaviors. Currently, the program depends on about 12,500 community volunteers nationwide; according to the CLM information system, coverage stands at a high level of approximately 80 percent for a basic package of interventions in intervention communes. Nevertheless, an expansion and intensification of PRN activities to

deliver an extended package of interventions will not be feasible without a concerted effort to expand the army of front-line workers and build their capacity to deliver individualized nutrition services and messages to target communities on a monthly basis.

### **Institutional, financial, and operational risks to the implementation of the PSMN**

Additional threats or risks to the implementation of the PSMN, which constitute barriers to good nutrition in Senegal, were identified in the risk analysis conducted by Ba (2017). In addition to the human resource capacity risks discussed above, other issues that were identified as constituting severe threats to the successful implementation of the PSMN included institutional, financial, operational, and organizational risks.

There is a risk that prioritization of the PSMN may be limited by the lack of political engagement at the highest institutional levels, thereby rendering inadequate the capacity to mobilize relevant actors to implement it (Ba forthcoming). Specifically, nutrition does not feature strongly in the discourse of political leaders, other than in extreme and highly visible situations such as those involving famine (Ba forthcoming).

A later section discusses the financial needs for the implementation of the PSMN. In addition to general insufficiency of public and donor investments for

nutrition, perhaps the biggest financial risk lies in the lack of engagement of the private sector (Deussom N. et al. forthcoming; Ba forthcoming). To date, the private sector has not made significant financial contributions to nutrition despite its potential role in increasing the availability, processing, and marketing of foods with high nutritional value (Offosse N. 2017; Ba forthcoming). Advocacy for increased private sector engagement has been insufficient; the formal establishment of public-private partnerships should be considered (Ba forthcoming).

Although the PSMN has taken important steps to involve relevant sectors and create sectoral plans and accompanying budgets for the integration of nutrition into their activities, the lack of clarity in the articulation of each sector's activities renders the implementation of a coordinated response more difficult, especially given the human resource gaps in those sectors (Deussom N. 2017; Ba forthcoming). The CLM is the institutional home for intersectoral coordination for nutrition, but many see it as an operational, rather than a coordinating, entity. Links between sectors are indeed facilitated by the CLM, but the absence of nutrition representatives within each sector makes communication between sectors and the CLM more challenging (Deussom N. 2017; Ba forthcoming). Furthermore, the variability of skills and nutrition knowledge hampers the effectiveness with which nutrition can be addressed within each sector (Deussom N. 2017; Ba forthcoming).

# What is Needed?

## Tailored Nutrition Intervention Schematic

As described above, the nutrition profile of women and children varies widely across the country, with some regions bearing a higher burden of stunting while others are more challenged by wasting, and yet others are challenged by both, in addition to a high prevalence of micronutrient deficiencies and persistent overweight and obesity among certain population groups. Where malnutrition does not affect all equally, the broad goal is to strengthen community and household resilience to malnutrition with very specific actions developed on the basis of each region's epidemiological, sociodemographic, and geographical profile.

Despite variations in methodology and representativeness, the frequent reporting of nutrition and child health statistics through large-scale national surveys like the DHS and Multiple Indicator Cluster Survey (MICS) in Senegal provides a continuous picture of the changing nutritional landscape, which further provides the opportunity for informed decision-making at the regional level.

To implement a tailored and multisectoral nutrition intervention schematic, as well as to maximize the

efficiency of available resources for nutrition, each region is first asked to describe its "nutrition profile." A nutrition profile brings to light the region's performance on key nutrition indicators and populations affected and analyzes the determinants contributing to those indicators, to provide guidance for prioritizing the interventions that are well-targeted and most likely to provide results. Following the example of the PSMN, regional plans should also be costed, with interventions linked to specific goals, timelines, and lines of accountability.

Using regional and tailored plans for nutrition, the PRN can deliver the chosen interventions: All regions of the country are covered by the PRN and have an entry point with local leaders, giving them the ability to convene actors across all sectors. With a clear definition of the region-specific nutrition challenges, key determinants, and populations affected, locally relevant and tailored plans of action can be designed and implemented using existing structures and programs. Progress toward nutrition goals can be accelerated when human and financial resources are allocated based on evidence and existing programs are leveraged to maximize the scope and reach of nutrition activities.

## Strategic Approaches

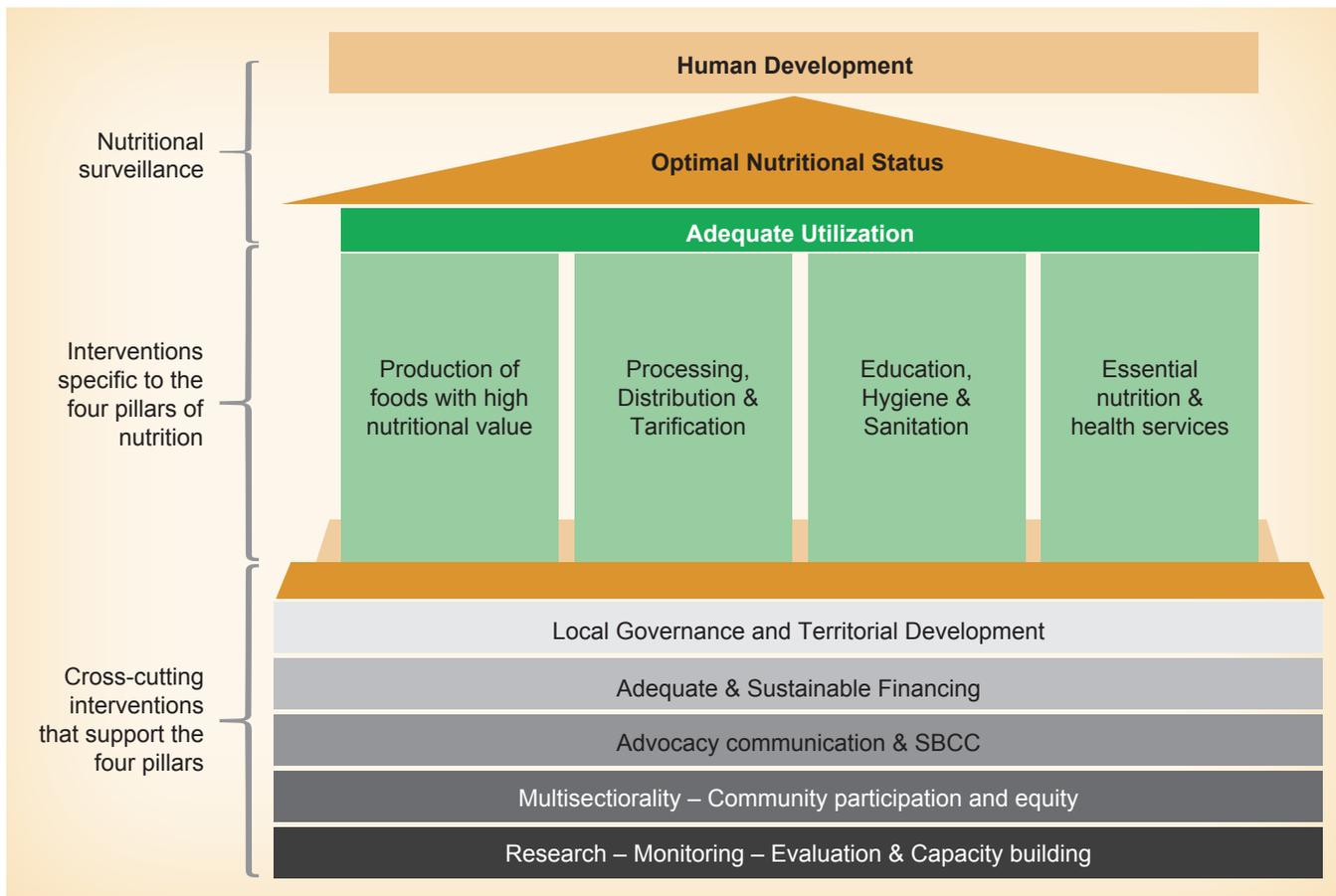
The DPNDN lays out a conceptual framework for acting multisectorally in nutrition; both the policy's strategic objectives and the PSMN are built upon this framework (figure 5). Of note in the framework is the integration not only of the four pillars, or categories, of intervention that support optimal nutritional status, but also of transversal, cross-cutting issues at the base of each pillar: local governance and territorial development; adequate and sustainable financing; advocacy communication and social and behavior change communication; multisectorality through community participation and equity; and research, monitoring, and evaluation and capacity building. Operationally, the institution of a common results framework that translates national targets to the regional, district, and

community levels, will become essential for tracking nutrition progress across sectors, as well as across geographic regions and populations.

The four pillars of nutrition-specific and nutrition-sensitive activities are: (1) production of foods with high nutritional value; (2) processing, distribution, and tariffication; (3) education, hygiene, and sanitation; and (4) essential nutrition and health services.

Beyond the four pillars and their base are three strategic objectives that are meant to guide actors in the development and implementation of key interventions that will contribute to the final seven targets that represent optimal nutritional status, as laid out in the PSMN. The three strategic objectives apply to each of the four pillars of intervention and include:

**FIGURE 5:** Conceptual Framework of the Multisectoral Approach for Nutrition



Source: République du Sénégal forthcoming.

- ◆ *Mainstreaming of nutrition across sectors:* Multi-sectorality is at the crux of Senegal's new era for nutrition. It is understood that the mainstreaming of nutrition within each sector is at the foundation of policy dialogue and program planning, especially within sectors that directly affect the determinants of nutrition. Further, the multisectoral approach demands a shift in public service delivery mechanisms, in which horizontal, community-based management of nutrition activities is used to strengthen delivery.
- ◆ *Decentralization of program delivery:* Among the many innovative and unique features of Senegal's nutrition program is the highly decentralized approach to the delivery of nutrition services. The multisectoral approach to nutrition intervention, as well as the reinforcement of local electorates, presents a new opportunity for the decentralization of nutrition. This strategic objective calls for the development of partnerships among local authorities to coordinate the implementation of nutrition activities to promote synergy and complementarity, while encouraging dynamic exchanges and interactions among relevant partners and stakeholders. Decentralization also implies increased support for local initiatives, which have until now been suppressed by limitations in knowledge, motivation, and budgetary support.
- ◆ *Use of a community-based approach:* The use of a community-based approach has long been understood as essential for increasing ownership, investment, and participation in any initiative or movement, with nutrition no exception. As a strategic orientation, the community-based approach emphasizes community engagement as fundamental to the process of sustainably optimizing both individual and community-wide nutritional status. Capacity building of individuals and local authorities will enable communities to become both partners as well as active participants in the improvement of the health and nutrition of their constituents, promoting shared responsibility and mutual accountability.

Finally, Senegal recognizes four principles of engagement that are aligned with those used for all its public service delivery: proximity and subsidiarity; equity and

social justice; good governance; and contracting. These principles constitute ethical, legal, and moral guidance for nutrition interventions implemented across all sectors.

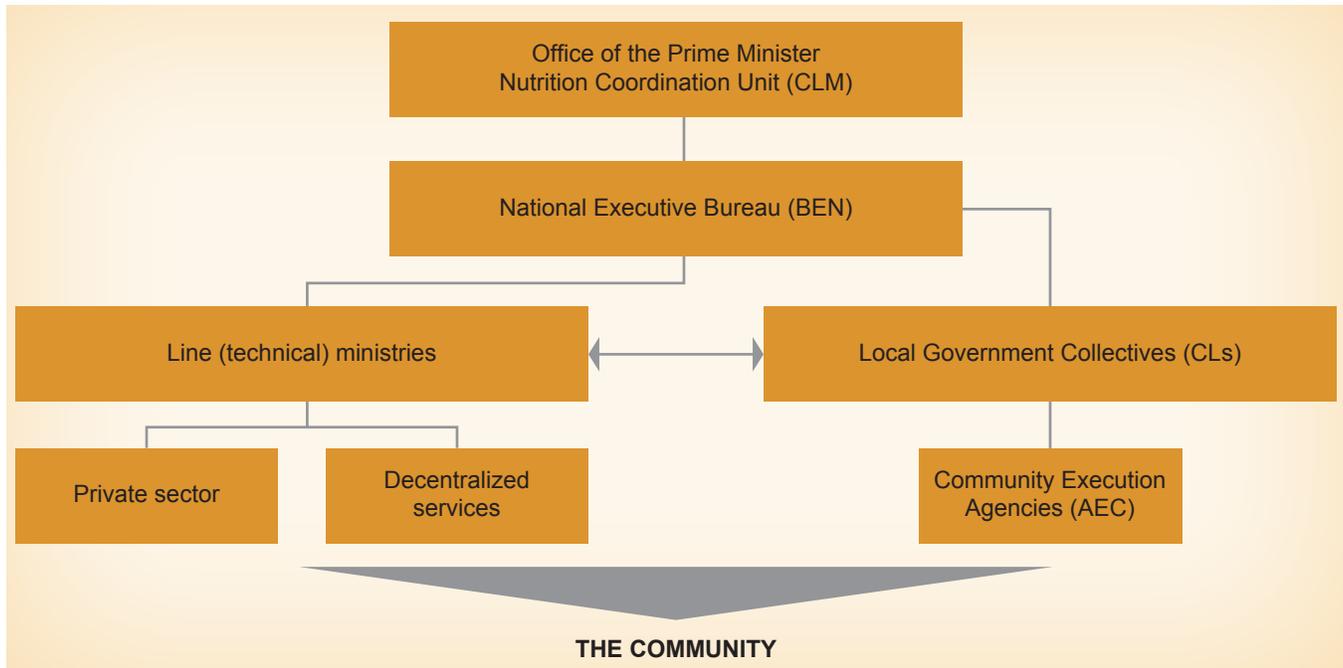
## Governance and Management

The governance and management of nutrition activities in Senegal are unique not only because of the highly visible and central placement of the CLM, but also because of the level of decentralization and corresponding systems that are in place to extend service delivery to communities and individuals across the country.

Figure 6 shows the institutional arrangements for the delivery of nutrition services in Senegal. The CLM was created in 2001 by Presidential decree and is under the authority of the Prime Minister. Its main role is to support the Prime Minister in technical matters relating to nutrition, in particular in the development of nutrition policy and strategies, and the implementation, monitoring, and evaluation of action plans and activities for nutrition at the national level. Line (technical) ministries fall under the CLM, which highlights the CLM's additional role of coordinating and maintaining synergy for nutrition activities across sectors and mainstreaming relevant nutrition activities into each of them. The CLM is led by the Director of the Cabinet (Chief of Staff) for the Prime Minister and comprises representatives from the technical ministries of economy and finance, health, education, agriculture, fisheries, livestock, commerce, industry, interior, youth, water, sanitation and hygiene, social protection, and CLs. This arrangement allows for direct input, technical discussion, and planning with the support and coordination of the CLM.

Also under the guidance, leadership, and coordination of the CLM but responsible for the operationalization and management of community-level nutrition activities, is the BEN. All community-level activities are managed directly by CLs, which operate to reach communities and individuals through 18 AECs, each of which varies in form (for example, local NGO, inter-

**FIGURE 6:** Institutional Arrangements for the Delivery of Nutrition Services in Senegal



Source: CLM.

national NGO, civil society organization, and specific interest association) and operate across the country’s 14 regions. The AECs are directly responsible for the recruitment, capacity building, monitoring, and supervision of direct service providers and service delivery to communities, households, and individuals.

The evolution of this institutional arrangement for nutrition in Senegal over more than a decade enables the country to “think multisectorally, and act sectorally” by mainstreaming nutrition across sectors (World Bank 2013). Sectors have the freedom and mandate to implement relevant nutrition activities sectorally (vertically), while benefitting from the CLM’s transversal view and coordination across all sectors (horizontally). In parallel, the PRN has developed over a similar period the foundation for a well-functioning service delivery platform for maternal and child nutrition services at the community level, through partnerships between CLs and AECs. This platform is operational in all 14 regions and 69 health districts, and involves 400 communes (72 percent of which are rural) out of a total of 571, reaching 223,000 children under the age of two

on a monthly basis, and more than one million children under five on a quarterly basis, with essential nutrition services at the community level.

Given the existence and widespread reach of this system, the main challenges moving forward are: (1) the amplification of the breadth of services that are offered and delivered under the PRN, from basic to more comprehensive; (2) the expansion of service coverage to the remaining 171 communes and possibly contracting with new AECs to do so; (3) streamlining the communication, collaboration, and implementation of nutrition activities among key actors and sectors working in nutrition toward a common results framework; and (4) building public-private partnerships with the private sector to increase the availability, processing, and marketing of foods with high nutritional value.

### The Role of Relevant Sectors under the PSMN

Senegal is uniquely positioned to implement and scale up a renewed multisectoral effort toward addressing

malnutrition as a result of its long evolution toward nutrition championship, institutional ownership, multisectoral coordination and collaboration, community ownership, integrated services and delivery platforms, and partner engagement (Spray 2018). The strategic placement of the CLM under the Prime Minister's office supports the operationalization of the PSMN in accordance with its direct mandate to coordinate nutrition activities throughout the country and across ministries. Under this arrangement, the CLM directly finances ministerial activities for nutrition as well as community-level activities through CLs and NGOs. Moving forward, the CLM carries the heavy burden of enabling the synergy of interventions and investments across relevant sectors, which it is poised to do in today's environment of renewed enthusiasm to address malnutrition. Equally important, however, is the clear definition of the CLM's role as a coordinator rather than an implementer; too much reliance on the CLM as an implementer may result in the CLM's being overburdened and unable to keep up with its coordinating responsibilities.

The PSMN, which serves as the rubric for the operationalization of the DPNDN, is well under way to becoming active in 2017. As part of the process of defining institutional and operational arrangements, two preliminary activities were required of the relevant sectors: (1) the elaboration of sectoral action plans for nutrition; and (2) the integration of nutrition-sensitive and nutrition-specific activities into those action plans in a way that ensures that all activities are equitably covered. As suggested by the CLM, sectoral action plans include: strategic objectives; essential nutrition interventions identified by the sector and how they will be implemented; estimated costs of these activities; and a results framework that includes nutrition indicators. All of these activities are underway and are expected to be finalized in 2017. Although the suggested nutrition activities for each sector are presented "vertically" below, readers are urged to recognize the critical role of the CLM in coordinating each of the listed activities so that they complement one another and effectively reach the goals of a common results framework, while addressing transversal issues such as vulnerability, gender, and communication.

The **agriculture** sector plays a central role in the fight against malnutrition by promoting food production and processing, both of which are necessary to fulfill the caloric and micronutrient needs of the population. The opportunity to encourage the year-round production and availability of nutritious and varied foods, through activities such as crop diversification and homestead gardens, render the agriculture sector an obvious means of implementing nutrition-sensitive interventions. More distal to food production, but still relevant because of the significant involvement of women in agriculture, are gender-sensitive activities focused on income generation, such as microcredit programming, time-saving technologies in production and transformation, and food transformation training and initiatives.

Increasing access to and ownership of **livestock** and **fisheries** can have important implications not only for improving the nutritional quality of the household diet, but for increasing a household's resilience to external shocks. Animal-sourced foods are excellent sources of essential micronutrients (such as vitamin A, iron, zinc, and calcium), protein, and fat, filling an important nutritional gap, especially among vulnerable populations such as pregnant women and young children, whose needs are disproportionately high and difficult to meet.

The importance of **health** for nutrition is well known. Good nutrition is not possible without good health and vice versa. The health sector's role in preventing disease and promoting optimal health through improved access to and quality of health services contributes to improved nutrition. Moreover, and given the health sector's access to populations at important life stages, the health sector is also well-placed to use those contacts to deliver nutritional services.

**Education** and nutrition are inextricably linked; good nutrition is important for cognitive and physical development, both of which contribute to improved learning capacity, beginning at a very young age, and school performance. Higher education among women contributes to better nutrition outcomes through improved IYCF knowledge and practices, care during illness (including care-seeking behaviors), and increased

decision-making power and gender equity. The education sector's goals of providing universal access to primary and secondary education contribute indirectly to improvements in nutrition. Less explicit, but of equal or perhaps stronger importance for nutrition, is the sector's role in reaching children in their preschool years with early child development services that support adequate nutrition, stimulation, and responsive care during this critical period of brain development. Finally, the education sector can also play an important role in the provision of life skills development and literacy training for adolescent girls and adult women.

**Water, sanitation, and hygiene** have an increasingly better understood role in nutrient absorption and nutritional status through environmental enteric dysfunction and inflammation, even in the absence of clinical symptoms or illness. Thus, individuals and households that lack access to proper hygiene facilities and potable water suffer a greater burden of intestinal pathologies that contribute to increased susceptibility to diarrhea, with dire consequences for nutritional status, especially among children. This sector—by improving the access to and use of practices related to improved water, sanitation, and hygiene—can greatly contribute to a reduction in malnutrition.

The link between nutrition and **social protection** is especially relevant given the targeting mechanisms that are central to social protection programming and that allow for the provision of services to households and individuals identified as being nutritionally vulnerable, such as pregnant women and young children. Beyond targeting, the integration of nutrition into social protection programs, such as growth monitoring, nutrition education, and behavior change communication, or other health-related conditionalities among beneficiaries, can contribute to gains in nutrition. Furthermore, social protection programs have a role to play in facilitating access for vulnerable populations to basic social services, including health, water, sanitation, and hygiene, and education.

The **commerce** sector facilitates access to foods through mechanisms of economic regulation, taxation

(including negative taxation and subsidies), consumer safety, and special exceptions or considerations that favor food provision for marginalized populations. In this role, the commerce sector contributes to nutritional status through the oversight and enforcement of industrial food production and food fortification that complies with national policies, laws, and regulations.

The **industry** sector prolongs the life of food products, whether through the reduction of food waste or loss or conservation and preservation of foods, which allows households greater protection from external shocks.

In countries like Senegal, which are beginning a nutrition transition, the **sporting** sector can make important contributions to the prevention of overweight and obesity and the management of adequate weight among at-risk populations. Physical activity has also been associated with lifelong health benefits, including the reduction of noncommunicable diseases, such as hypertension and diabetes, for which overweight and obesity are important risk factors.

## Stakeholders

The well-established and far-reaching service delivery platform is an attractive mechanism to enable stakeholders to deliver nutrition interventions. However, concerns remain regarding the myriad stakeholders intervening in nutrition, whose interventions, monitoring and evaluation activities, and financing schemes are not always well coordinated, which can lead to duplication of effort and inefficiencies in the provision of services.

In this section, we briefly describe the various stakeholders—communities, service providers, AECs, CLs, and development partners—all of which have a unique and essential role to play in not only maintaining, but also strengthening, the delivery of nutrition services to households and individuals across Senegal. The clear definition of roles, collaboration, and communication among these stakeholders is the key to effective, equitable, and sustainable implementation at all levels; this

task is facilitated by the CLM, which builds the bridges among these entities.

Communities represent both the recipients of services and the service providers who enable and drive sustained, nutrition-related behavioral change at the community, household, and individual levels. Service providers require the proper tools as well as the knowledge of how to use them to communicate messages, all of which fall under the capacity-building efforts discussed in this report. Both communities and service providers are directly supported by AECs, which work in partnership with, and on behalf of, CLs through service delivery contracts. AECs bear the greatest responsibility for the mobilization, organization, monitoring, supervision, and evaluation of service delivery by community workers at the community level, while CLs oversee their implementation and activities with technical and operational support from the CLM and BEN. Working in parallel—under a tripartite arrangement with CLs and AECs to support community nutrition development activities—are sector-specific public service providers (for health, agriculture, education, and livestock), who have an indirect impact on nutrition through their activities, which include: (1) the provision of essential services, including immunizations, vitamin A supplementation, deworming, and veterinary services; (2) the training and supervision of community workers; and (3) their advisory role to CLs.

CLs are especially critical, as they are responsible for all community-level development activities, and thus constitute the entry point for the delivery of nutrition services through AECs, both operationally and financially. Under the country's decentralization scheme, CLs are the direct recipients of nutrition-related funding from the CLM, which is used to finance service delivery contracts with AECs. Although an important proportion of the CLM's budget is funded internally, development partners also contribute, both financially and technically, to the delivery of nutrition services, through the CLM and the respective community implementation mechanisms described herein.

The diverse number of partners working toward improved nutrition in Senegal represent both a challenge and an opportunity. The building blocks needed to ensure efficient and coordinated programming, such as policies, protocols, monitoring and evaluation frameworks, and a network to implement activities are largely in place. However, other critical elements, such as costed sectoral plans, partners' use of the PRN's network and structures rather than the development of parallel systems, and strengthening of systems to enable coordination and collaboration across partners and sectors, are still needed. Given the significant task that lies ahead as Senegal enters its new nutrition era, development partners have an even greater mandate and opportunity to support the country in expanding the coverage and breadth of nutrition activities in the coming decade.



Photo: Adama Cissé/CLM

## Economic Analysis

Significant and increasing financial resources—both from the government and from external donor agencies—have been invested in nutrition in Senegal over the last two to three decades, especially since the establishment of the CLM in 2001. Although 88 percent of funding for nutrition in Senegal comes from external sources, nutrition funding represents only 2 percent of total development assistance to Senegal (Offosse N. 2017). The remaining 12 percent comes from the Senegalese government, of which nutrition similarly represents only approximately 2 percent of total national annual expenditures (Offosse N. 2017).

A budgetary analysis of recent commitment to nutrition indicates that total spending for nutrition reached US\$195 million for the period from 2012 to 2015, equivalent to approximately US\$49 million per year, or US\$4 per person per year (Offosse N. 2017). More than half (58 percent) of this funding comes from other sectors, which have larger budgets, for the implementation of nutrition-sensitive activities (Offosse N. 2017). Nutrition-sensitive activities are those that “address the underlying determinants of fetal and child nutrition and development and incorporate specific nutrition goals and actions” (Ruel and Alderman

2013, 2). They broadly encompass interventions that address “food security; adequate caregiving resources at the maternal, household and community levels; and access to health services and a hygienic environment” (Ruel and Alderman 2013, 2). In the case of Senegal, funding for nutrition-sensitive activities is focused largely on food security programming and interventions. Nutrition-specific activities, those that “address the immediate determinants of fetal and child nutrition and development” (Ruel and Alderman 2013, 2), incurred an annual cost of US\$17 million, equivalent to US\$1.30 per person per year (Offosse N. 2017). Nutrition-specific interventions in Senegal include community-based nutrition interventions (such as promotion of improved food and nutrient intake, child feeding, caregiving, and parenting practices), support to the health system to deliver essential child health and growth monitoring services, micronutrient supplementation, and fortification of staple foods.

As stated in the PSMN, to operationalize the DPNDN over the five years from 2017 to 2021, the budget to implement nutrition-specific and nutrition-sensitive interventions across all sectors in Senegal will need to grow to an estimated average of US\$71 million per year. This number is derived from a total budget of US\$355

million shown in table 1. This translates to an investment that averages US\$5 per person per year (assuming a total population of 15.1 million people), or US\$29 per child under five per year (assuming a population of 2.51 million children). The US\$71 million estimated average and the total budget of US\$355 million for nutrition represent increases not only in the breadth of activities, but also of a country-wide scale-up of a more comprehensive and intensive package of nutrition activities from the current 30 percent coverage rate to the target of 80 percent. An analysis of returns on investment for implementing a package of nutrition-specific (30 percent of total budgetary needs) and nutrition-sensitive (70 percent of total budgetary needs) activities (smaller in scope than that proposed by PSMN) demonstrates that increasing coverage to 100 percent would prevent 5,280 child deaths, 159,398 DALYs, and 101,587 cases of stunting (Yao forthcoming). We can expect that the cost-effectiveness of increasing the full package of activities as outlined and budgeted in the PSMN would only increase the impact on these indicators.

A breakdown of costs required to finance nutrition activities in the next five years is shown in table 1, which shows costs estimated by each sector during plan-

ning workshops for their respective action plans for nutrition. These estimates include funding for the implementation of a full package of nutrition-specific and nutrition-sensitive activities from the following sectors: health; water, sanitation, and hygiene; social protection; agriculture; fisheries; livestock; education; higher education and research; CLs (which are responsible for the delivery of most nutrition-specific interventions); industry; environment; and commerce. Table 2 shows the distribution of costs by type of nutrition intervention (nutrition-specific or nutrition-sensitive), by sector and as a proportion of the total required budget. For details regarding specific types of activities that each sector has accounted for in their budgetary preparations and that generated the numbers referenced in this investment case, please refer to appendix A. As shown in table 1, the highest costs over the five-year period from 2017 to 2021 are accrued by the health sector (US\$105.2 million) and CLs, which are responsible for the delivery of essential nutrition services (US\$88.5 million), followed by social protection (US\$81.5 million) and water, sanitation, and hygiene (US\$38.7 million). Estimated costs for each sector, by category of activity, are broken down further, by sector and activity in table 3.

**TABLE 1:** Estimated Costs by Sector and Year for Nutrition in Senegal, 2017–21  
US\$, millions

Sector	2017	2018	2019	2020	2021	Cost per sector
Agriculture	1.4	2.3	4.5	5.3	4.2	17.6
Commerce	0.1	0.1	0.09	0.09	0.09	0.5
Education	0.8	0.8	1.1	1.2	0.8	4.6
Environment	0.5	0.5	0.6	0.6	0.6	2.8
Fisheries	0.1	0.3	0.2	0.2	0.01	0.8
Health	27.8	22.4	19.2	18.2	17.5	105.2
High-level education and research	0.1	0.5	0.6	1.0	1.0	3.1
Industry	0.5	0.1	0.08	0.04	0.04	0.8
Livestock	1.4	4.1	1.8	1.8	1.9	11.0
Local government collectives	15.3	19.1	18.8	17.4	17.9	88.5
Social protection	16.2	16.3	16.3	16.3	16.4	81.5
Water, sanitation, and hygiene	23.0	8.4	5.8	0.7	0.8	38.7
Total						355.2

Source: CLM.

**TABLE 2:** Budget Breakdown by Type of Nutrition Intervention by Sector and as a Proportion of the Total Budget, 2017–21  
Percent

	HTH	AGR	FSH	LVS	EDU	HLE	CL	IND	COM	SP	WSH	ENV	Budget total
Nutrition-specific	56	0	0	0	34	0	52	0	0	0	0	0	30
Nutrition-sensitive	44	100	100	100	66	100	48	100	100	100	100	100	70

Source: CLM.

Note: HTH: health; AGR: agriculture; FSH: fisheries; LVS: livestock; EDU: education; HLE: high-level education and research; CL: local government collectives; IND: industry; COM: commerce; SP: social protection; WSH: water, sanitation, and hygiene; ENV: environment.

**TABLE 3:** Financial Analysis of Sector-Specific Budgetary Needs and Sources, 2017–21  
US\$, millions

	HTH	AGR	FSH	LVS	EDU	HLE	CL	IND	COM	SP	WSH	ENV
Goods and services	104.7	0.06	0.06	0.1	4.6	3.1	86.8	0.8	0.5	0	3.9	0.8
Internal investments	0.3	14.2	0.2	9.6	0	0	1.7	0	0	78.1	34.8	2.0
Personnel	0.2	0	0.5	0	0	0	0	0	0	0	0	0
Current and capital transfers	0	3.4	0	1.3	0	0	0	0	0	3.4	0	0
Total	105.2	17.6	0.8	11.0	4.6	3.1	88.5	0.8	0.5	81.5	38.7	2.8

Source: CLM.

Note: HTH: health; AGR: agriculture; FSH: fisheries; LVS: livestock; EDU: education; HLE: high-level education and research; CL: local government collectives; IND: industry; COM: commerce; SP: social protection; WSH: water, sanitation, and hygiene; ENV: environment.

Further analysis of current and future operations in the sectors of agriculture, fisheries and livestock, research, and education, also present opportunities for the expansion of nutrition services with relatively minimal added costs. These expansions require additional investment in capacity building not only for nutrition, but for multisectoral programming and governance, none of which should be underestimated.

Financing for multisectoral activities in nutrition can quickly become complicated. This is especially true in Senegal, where the technical and financial needs to address nutrition differ significantly by region, not only as a result of varying patterns and trends in undernutrition, but also due to differences in demographics, local economy, and consumption behaviors. The main challenge is the development of a financing mechanism that includes multiple channels and inputs but is still accountable to and based on a common results framework. The responsibility of finding and managing funding extends beyond that of the CLM to involve all sectors and regions. Nevertheless, the targeted sources

of funding for nutrition activities include the national budget, CL budgets, national and international partners and NGOs, and innovative financing mechanisms through foundations and the private sector.

In addition, innovations in financing mechanisms, such as results-based financing, have already been piloted in Senegal as well as in other parts of Africa and have the potential to improve both nutrition and health outcomes through increasing both the demand for, and the supply of, essential services for mothers and children. The results-based financing pilot project in Senegal is targeted toward mothers in four regions, with the objective of reducing neonatal, infant, and maternal mortality by increasing the use and quality of health and nutrition services among the poorest and most vulnerable mothers and children. Similar, innovative financing schemes in the health sector and beyond, which have the common objective of improving nutrition either by nutrition-specific or nutrition-sensitive approaches, are encouraged given the known absorptive capacity of the CLM.



Photo: Adama Cissé/CLM

## Summary and Conclusions: A Call to Action

The rationale for investing in nutrition in Senegal has been well established in this investment case. Good nutrition is essential for ensuring good health, saving lives, and building human capital for a prosperous and economically productive Senegal. The timing for intervening in nutrition in Senegal is equally critical: The country has entered into its nutrition transition, with an unfinished agenda in undernutrition that is parallel to a rising threat of overweight, obesity, and their associated consequences on health, well-being, and longevity. Most importantly, and to tackle these double and triple burdens of malnutrition, Senegal is embarking on a new, multisectoral approach that deviates from business as usual to achieve its ambitious nutrition goals.

In the context of increased attention to nutrition and of the central role nutrition plays in global initiatives such as the World Bank's Investing in the Early Years, as well as in meeting the ambitious WHA and SDG targets, there is no better time to invest in nutrition than now. The next decade marks a new era for nutrition in Senegal, where continued and renewed efforts are needed to:

- ◆ Expand the delivery of nutrition services from the current coverage of 400 to 571 communes (municipalities);
- ◆ Intensify and reach full coverage of nutrition services for all children under five in the 400 communes in which the PRN is already operational;
- ◆ Support the integration of nutrition activities into other sectors, as dictated by the DPNDN and PSMN
- ◆ Adequately prepare for additional nutritional challenges that lie ahead, such as the growing burden of overweight and obesity.

Senegal has a history of unprecedented commitment to nutrition at the highest political levels, beginning with its coordination of nutrition activities under the Office of the Prime Minister, which increased visibility and involvement of all sectors in improving nutrition. Furthermore, the decentralization of nutrition activities to CLs has increased ownership at all levels, as have long-standing and increasing national budgetary commitments to nutrition.

This investment case urges the global community to support and contribute to Senegal's momentum in redefining its nutrition policies and operations, and to sustain longstanding efforts in nutrition, not only to prevent a stagnation—or worse, a deterioration—in progress that has been made in nutrition in recent decades, but also to increase the ability of even the most vulnerable members of society to be nutrition secure. Although the determinants of nutritional status are complex and multifaceted, there is a growing body of evidence that outlines the effectiveness and cost of nutrition-specific and nutrition-sensitive interventions. Senegal has demonstrated its ability to move the needle on stunting not only because of its scaled implementation of efficacious nutrition interventions, but

because of persistent leadership of nutrition champions, institutional ownership, multisectoral coordination and collaboration, establishment of a well-functioning, community-based system for delivery of integrated services, partner engagement and responsible leveraging of donor investments.

Today, Senegal is at yet another critical stage of ramping up key nutrition interventions to scale in an unconventional way that engages multiple, relevant sectors, with a focus on capacity building that will yield sustained changes in behaviors and improved nutrition for all of Senegal's people. The time to invest in the country's new, exciting era for nutrition is now.

# APPENDIX A

## Nutrition Activities Included in Budgetary Projections, by Sector

Sector	Types of activity and services
Health	<p><i>Governance and management:</i> protocol and policy development; product supply chain management; advocacy; central and local coordination activities; capacity building; nutrition surveys and research; enforcement of food safety rules and regulations; routine monitoring and evaluation; routine local and national meetings</p> <p><i>Provision of essential health services:</i> management of acute malnutrition (surveillance and treatment); growth monitoring and promotion; nutrient supplementation for vulnerable groups (pregnant women, adolescents, young children); nutrition education; management of acute and chronic illnesses; mobilization activities</p> <p><i>Health referral services:</i> advocacy and support for use of health and other social services</p>
Agriculture	<p><i>Governance and management:</i> integration of agricultural and nutritional initiatives in public policy; communication and advocacy</p> <p><i>Agricultural productivity:</i> increase in production, transport, and processing of agricultural products; homestead, community, and microgardens; training activities for agricultural producers on both nutrition and agricultural practices; pesticide management; proper handling of food products and food safety; seed production</p> <p><i>Research:</i> financing; capacity building and training; biofortification</p>
Fisheries	<p><i>Governance and management:</i> training and capacity building on fishery development and maintenance; monitoring and evaluation of fishery activities; food safety control; integration of fishery education into school curricula; research program on edible algae and micronutrient qualities of fish and algae; mobilization and advocacy</p> <p><i>Development of fisheries:</i> stock-taking of fish species; construction and maintenance of fisheries; installation and rehabilitation of refrigeration complexes; fish repopulation in natural habitats; construction and maintenance of edible algae farms; rehabilitation of docks and fish processing and production points</p>
Livestock	<p><i>Governance and management:</i> training and capacity building</p> <p><i>Livestock development and maintenance:</i> livestock vaccination and deworming; animal feed production; construction and maintenance of stables; livestock and poultry purchasing and reproduction; purchase and distribution of transport, conservation, and quality control materials; dairy production</p>
Education	<p><i>Governance and management:</i> development of education materials; support, management, supervision, and monitoring of capacity building; development of school feeding nutritional standards and requirements policies; updating of school feeding recipes; management and oversight of school feeding activities</p> <p><i>Nutrition education:</i> capacity building for nutrition education at all levels of the education system; community mobilization for utilization of school-based nutrition services and initiatives</p> <p><i>School-based interventions:</i> reinstatement of preschool and primary school gardens; physical activity; nutrient supplementation (such as iron folate) and deworming for school-aged children; support to early childhood centers with provision of equipment, materials, and capacity building; school feeding and links with local, smallholder producers</p>
High-level education and research	<p><i>Nutrition education:</i> strengthening of nutrition education, research, and innovation programs in upper-level education; promotion of improved feeding and physical activity practices in upper-level education facilities</p>
Local government collectives	<p><i>Governance and management:</i> contracting with, and management of local NGOs for delivery of community-based nutrition services; motivation of community volunteers; baby-friendly hospital and community initiatives; sensitization and mobilization of local leaders; financial and budgetary management and oversight</p> <p><i>Community-based nutrition activities:</i> identification, establishment, and functioning of nutrition community centers; social mobilization for nutrition; implementation of nutrition-sensitive approaches (such as homestead gardens and aquaculture); processing of food products; establishment and management of local flour fortification production; point-of-use fortification (such as micronutrient powders)</p> <p><i>Other community-based activities:</i> birth registration; construction of latrines; construction and maintenance of wells and boreholes; construction or rehabilitation of health posts for the delivery of essential health services; financing of water, sanitation, and hygiene (WASH) microprojects</p>
Industry	<p><i>Governance and management:</i> supervision and support for adherence to food fortification legislation; policy development and review for food fortification for specific population groups; quality assurance; capacity building</p> <p><i>Nutrition activities:</i> establishment of salt iodization plants in areas of local production; development of local quality-control groups</p> <p><i>Research:</i> feasibility of expansion of various food fortification initiatives</p>

(continued on next page)

(continued)

Sector	Types of activity and services
Commerce	<p><i>Governance and management:</i> quality control and verification of adherence to fortification policies and guidelines; capacity building; support for breastmilk-substitute policy process; updating of policies as needed; food content regulations</p> <p><i>Operations and research:</i> maintenance of food fortification equipment; routine analysis of fortified foods to ensure compliance; support of local food processing, transport, and marketing initiatives; implementation of a food information network (detailing geographically driven food prices and stocks); food labeling research and guidelines</p>
Social protection	<p><i>Governance and management:</i> capacity building for community-based personnel involved in social protection programs and child care; provision of nutrition communication supplies and materials</p> <p><i>Community-based nutrition activities:</i> provision of supplies and financial scholarships for women's organizations; nutrition training for female scholarship recipients, including processing of locally available and nutritious food products; construction and maintenance of child care centers; microcredit and income generation activities for women; cash transfer programs, food vouchers, and agriculture insurance for pregnant and lactating women and vulnerable households; growth monitoring and promotion and school feeding for children from birth to three years in early child care centers; provision of nutrition support kits for malnourished children under five in daaras (traditional Koranic schools)</p> <p><i>Research:</i> census of the number of children under five in daaras</p>
Water, sanitation, and hygiene	<p><i>Governance and management:</i> capacity building for community-based WASH and other personnel involved in nutrition-sensitive WASH promotion; provision of nutrition communication supplies and materials</p> <p><i>Community-based nutrition activities:</i> improved access to sanitation through building of latrines (public and household), pump stations, water and sludge treatment plants, and household connections to piped water; use of the Total Sanitation approach to promote essential hygiene actions (such as household handwashing stations, household-level water treatment, and latrine use); provision of "WASH kits" to health facilities, Foyers d'Amélioration et de Récupération Nutritionnelle (Nutrition Improvement and Recovery Homes), and Centers of Recovery and Nutritional Education; celebration of WASH day</p>



# Endnotes

1. Joint Child Malnutrition Estimates, UNICEF (United Nations Children's Fund), WHO (World Health Organization) and World Bank (accessed 2018), <http://datatopics.worldbank.org/child-malnutrition/>.
2. For more information on nutrition trends, see Nene (2018) in this series.
3. This investment case emphasizes a transition from the current business-as-usual approach to a new, innovative, and resolute shift toward a multisectoral approach for nutrition. As detailed below, the new approach expands the coverage and reach of nutrition services, comprehensively through relevant and multiple sectors, and adequately prepares the country for additional and unforeseen nutritional challenges that may lie ahead, such as the growing burden of overweight and obesity and external shocks. Yao forthcoming in this series, describes what is meant by "business as usual."
4. STATcompiler (database), USAID, Washington, DC (accessed 2017), <http://www.statcompiler.com/en/>.
5. Representing an increase from approximately 0.02 percent to 0.12 percent of the national budget.
6. World Bank calculations based on ROS MSAS (2016) and Onehealth-LiST. The OneHealth tool (<http://www.avenirhealth.org/software-onehealth.php>) is new software created to strengthen the analysis of health systems and their cost, and to develop different funding scenarios at the country level. The primary purpose of this tool is to assess health-related investment needs in low- and middle-income countries for the medium and long term. The Lives Saved tool (<http://www.livessavedtool.org/>) uses linear modeling to estimate the effects of nutrition-specific and nutrition-sensitive interventions on malnutrition (number of cases of stunting avoided) and infant mortality (number of lives saved).
7. STATcompiler (database), USAID, Washington, DC (accessed 2017), <http://www.statcompiler.com/en/>.
8. STATcompiler (database), USAID, Washington, DC (accessed 2017), <http://www.statcompiler.com/en/>.



# References

- Alif Ailaan. 2015. "Nutrition and Learning Ability." Islamabad: Alif Ailaan.
- ANSD (Agence Nationale de la Statistique et de la Démographie) and ICF International. 2012. Enquête démographique et de santé à indicateurs multiples au Sénégal (EDS-MICS 2010–11). Calverton, Maryland, United States: ANSD and ICF.
- . 2015a. Sénégal: Enquête démographique et de santé continue (EDS-Continue 2012–14), Rapport Régional. Rockville, Maryland, United States: ANSD and ICF.
- . 2015b. Enquête démographique et de santé continue (EDS: 2014). Calverton, Maryland, United States: ANSD and ICF.
- . 2016. Enquête démographique et de santé continue (EDS: 2015): Rapport sur les Indicateurs Clés 3ème Année. Calverton, Maryland, U.S.: ANSD and ICF.
- Ba, B. Forthcoming. "Risks for Scaling Up Nutrition in Senegal." *Analysis & Perspective: 15 Years of Experience in the Development of Nutrition Policy in Senegal*. Washington, DC: World Bank; Dakar, Sénégal: CLM.
- Black, R.E., L.H. Allen, Z.A. Bhutta, L.E. Caulfield, M. de Onis, M. Ezzati, C. Mathers, and J. Rivera. 2008. "Maternal and Child Undernutrition: Global and Regional Exposures and Health Consequences." *Lancet* 371 (9608): 243–60.
- Black, R.E., C.G. Victora, S.P. Walker, Z.A. Bhutta, P. Christian, M. de Onis, M. Ezzati, S. Grantham-McGregor, J. Katz, R. Martorell, and R. Uauy. 2013. "Maternal and Child Undernutrition and Overweight in Low-Income and Middle-Income Countries." *Lancet* 382 (9890): 427–51.
- Deussom N., G., V. Wise, M.-S. Ndione, and A. Gadiaga. Forthcoming. "Capacities and Gaps of the Nutrition Sector in Senegal." *Analysis & Perspective: 15 Years of Experience in the Development of Nutrition Policy in Senegal*. Washington, DC: World Bank; Dakar, Sénégal: CLM.

- Duboz P., N. Chapuis-Lucciani, G. Boetsch, and L. Gueye. 2012. "Prevalence of Diabetes and Associated Risk Factors in a Senegalese Urban (Dakar) Population." *Diabetes and Metabolism* 38 (4): 332–6.
- FAO (Food and Agriculture Organization of the United Nations). 2016. *FAO Statistical Pocketbook 2015*. Washington, DC: FAO.
- FEWS NET (Famine Early Warning Systems Network). 2014. "Expected Harvest Production Losses Heighten the Risk of Food Insecurity Later in 2015." <http://www.fews.net/west-africa/senegal/remote-monitoring-report/october-2014>.
- Fox, A.M. 2018. "Political Economy of Nutrition Policy in Senegal." *Analysis & Perspective: 15 Years of Experience in the Development of Nutrition Policy in Senegal*. Washington, DC: World Bank; Dakar, Sénégal: CLM.
- Hoddinott, J. 2016. "The Economics for Reducing Malnutrition in Sub-Saharan Africa." Global Panel on Agriculture and Food Systems for Nutrition Working Paper. [http://www.glopan.org/sites/default/files/Global\\_Panel\\_Working\\_Paper.pdf](http://www.glopan.org/sites/default/files/Global_Panel_Working_Paper.pdf).
- Hoddinott, J.F., M. Rosegrant, and M. Torero. 2012. "Investments to Reduce Hunger and Undernutrition." Copenhagen, Denmark: Copenhagen Consensus. <http://www.copenhagenconsensus.com/sites/default/files/Hunger+and+Malnutrition.pdf>.
- Hoque, M.E., M. Mannan, K.Z. Long, and A. Al Mamun. 2016. "Economic Burden of Underweight and Overweight among Adults in the Asia-Pacific Region: A Systematic Review." *Tropical Medicine and International Health* 21 (4): 458–69.
- Horton, S., and R. Steckel. 2013. "Malnutrition: Global Economic Losses Attributable to Malnutrition 1900–2000 and Projections to 2050." Copenhagen, Denmark: Copenhagen Consensus.
- Martorell, R., and M.F. Young. 2012. "Patterns of Stunting and Wasting: Potential Explanatory Factors." *Advances in Nutrition: An International Review Journal* 3 (2): 227–33.
- Ndiaye, S., and M. Ayad. 2006. *Enquête démographique et de santé au Sénégal 2005*. Calverton, Maryland, United States: Centre de Recherche pour le Développement Humain et ORC Macro.
- Nene, Marc. 2018. "Nutrition Situation in Senegal." *Analysis & Perspective: 15 Years of Experience in the Development of Nutrition Policy in Senegal*. Washington, DC: World Bank; Dakar, Sénégal: CLM.
- Offosse N., M-J. Forthcoming. "Nutrition Financing in Senegal." *Analysis & Perspective: 15 Years of Experience in the Development of Nutrition Policy in Senegal*. Washington, DC: World Bank; Dakar, Sénégal: CLM.
- Oniang'O, R., and E. Mukudi E. 2002. "Nutrition and Gender." In *Nutrition: A Foundation for Development*. Geneva, Switzerland: ACC/SCN.
- Pessinaba, S., A. Mbaye, G.A.D. Yabéta, H. Harouna, A.E. Sib, A.D. Kane, M. Bodian, M.B. Ndiaye, M. Mbaye-Ndour, and K. Niang. 2013. "Enquête de prévalence des facteurs de risque cardiovasculaire en population générale à Saint-Louis (Sénégal)." *Annales de Cardiologie et d'Angéiologie* 62 (4): 253–58.
- Popkin, B.M. 2002. "An Overview on the Nutrition Transition and its Health Implications: the Bellagio Meeting." *Public Health Nutrition* 5 (1A): 93–103.
- Prendergast, A.J., and J.H. Humphrey. 2014. "The Stunting Syndrome in Developing Countries." *Paediatrics and International Child Health* 34 (4): 250–65.
- République du Sénégal. 2014. *Plan Sénégal Emergent*. Dakar, Senegal: République du Sénégal.

- <https://www.sec.gouv.sn/-Plan-Senegal-Emergent-PSE,65-.html>.
- . Forthcoming. *Multisectoral Strategic Nutrition Plan*. Dakar, Sénégal: République du Sénégal.
- Ruel, M.T., and H. Alderman. 2013. “Nutrition-Sensitive Interventions and Programmes: How Can They Help to Accelerate Progress in Improving Maternal and Child Nutrition?” *Lancet* 382 (9891): 536–51.
- Seck, S.M., D.G Dia, D. Doupa, A. Diop-Dia, I. Thiam, M. Ndong, and L. Gueye. 2015. “Diabetes Burden in Urban and Rural Senegalese Populations: A Cross-Sectional Study in 2012.” *International Journal of Endocrinology*, September 30. <http://dx.doi.org/10.1155/2015/163641>.
- Schwinger, C., T.M. Lunde, P. Andersen, H. Kismul, and J. Van den Broeck. 2014. “Seasonal and Spatial Factors Related to Longitudinal Patterns of Child Growth in Bwamanda, DR Congo.” *Earth Perspectives* 1 (1): 1–11.
- Spray, A.L. 2018. “Evolution of Nutrition Policy in Senegal.” *Analysis & Perspective: 15 Years of Experience in the Development of Nutrition Policy in Senegal*. Washington, DC: World Bank; Dakar, Sénégal: CLM.
- Tomkins, A., and F. Watson. 1989. “Malnutrition and Infection—A Review—Nutrition Policy Discussion Paper No. 5.” Geneva, Switzerland: United Nations.
- World Bank. 2006. *Repositioning Nutrition as Central to Development*. Washington, DC: World Bank.
- . 2013. “Improving Nutrition through Multisectoral Approaches. Washington, D.C.: World Bank. <http://documents.worldbank.org/curated/en/625661468329649726/pdf/75102-REVISED-PUBLIC-MultisectoralApproachestoNutrition.pdf>.
- WFP (World Food Programme). 2014. *Analyse globale de la vulnérabilité, de la sécurité alimentaire et de la nutrition*. Rome, Italy: WFP.
- WHO (World Health Organization). 2000. *The Management of Nutrition in Major Emergencies*. Geneva, Switzerland: WHO.
- . 2017. “Micronutrient Deficiencies: Iodine Deficiency Disorders.” Geneva, Switzerland: WHO.
- WHO (World Health Organization), UNICEF (United Nations Children’s Fund), and WFP (World Food Programme). 2014. “Global Nutrition Targets 2025: Wasting Policy Brief.” Geneva, Switzerland: WHO.
- United Nations and IFPRI (International Food Policy Research Institute). 2000. *4th Report on The World Nutrition Situation: Nutrition Throughout the Life Cycle*. Geneva, Switzerland: United Nations.
- UNICEF (United Nations Children’s Fund). 1990. *Strategy for Improved Nutrition of Infant and Women in Developing Countries*. New York: UNICEF.
- UNICEF (United Nations Children’s Fund), WHO (World Health Organization) and World Bank. 2017. Joint Child Malnutrition Estimates. New York: UNICEF. <http://datatopics.worldbank.org/child-malnutrition/>.
- Venables, P., and A. Raine. 2016. “The Impact of Malnutrition on Intelligence at 3 and 11 Years of Age: The Mediating Role of Temperament.” *Developmental Psychology* 52 (2): 205–20.
- Yao, C. Forthcoming. “Cost and Benefits of Scaling Up Nutrition Interventions in Senegal.” *Analysis & Perspective: 15 Years of Experience in the Development of Nutrition Policy in Senegal*. Washington, DC: World Bank; Dakar, Sénégal: CLM.



# Glossary

**Anemia:** often due to a deficiency in iron, but can also be the result of deficiencies of other micronutrients (such as vitamins B9 or B12) or infection (with malaria or intestinal parasites). Anemia occurs when hemoglobin falls below the acceptable level for a person's age, sex, and physiological status. The consequences of anemia include reduced physical and cognitive development that can translate to lower school performance among children and economic productivity among adults.

**CLM:** the nutrition coordination unit in Senegal, which is under the authority of the Prime Minister and whose main role is to support the Prime Minister in technical matters related to nutrition, including the development of nutrition policies, strategies, and coordination of nutrition activities across sectors (horizontally) and down to the community level (vertically).

**Child undernutrition:** typically broken down into three types: stunting, wasting, and underweight. Each of these indicators is defined using the anthropometric measures of height or weight or both, is specific to the child's age and sex, and results from various types of food deprivation (chronic, acute, or micronu-

trient-specific). Each type of undernutrition has varying consequences for the health and well-being of the child, with some holding greater risks for child survival.

**Stunting:** defined as a length- or height-for-age below  $-2$  standard deviations from the median length- or height-for-age of the reference population (children of the same age and sex). Stunting often reflects a chronic deficiency of essential calories and nutrients or sustained periods of illness that contribute to poor appetite and food consumption over extended periods of time.

**Wasting:** defined as a weight-for-height or -length below  $-2$  standard deviations from the median weight-for-height or -length of the reference population (children of the same age and sex). Wasting is categorized by two forms of severity: severe acute malnutrition (below  $-3$  standard deviations from the median weight-for-height or -length of the reference population) and moderate acute malnutrition (between  $-3$  and  $-2$  standard deviations from the median weight-for-height or -length of the reference population). Wasting often reflects an acute shock or acute absence of calories.

**Underweight:** defined as a weight-for-age below  $-2$  standard deviations from the weight-for-age of the reference population (children of the same age and sex).

**Complementary feeding:** the period during which a child receives age-appropriate foods in addition to breastmilk. This period typically begins at 6 months, when breastmilk alone is no longer sufficient to sustain the nutrient requirements of the infant, and lasts for the duration of continued breastfeeding, typically 24 months.

**Double and triple burden of malnutrition:** A term used to describe the coexistence of two or three types of malnutrition within one individual, household, or population, throughout life. Typically, the double burden of malnutrition refers to a coexistence of undernutrition and overweight or obesity; the triple burden adds micronutrient deficiencies.

**Exclusive breastfeeding:** the provision of breastmilk only, with no other liquids or foods added to the diet, typically from birth to 6 months.

**Household food security:** when all people within a household, at all times, have physical, social, and economic access to safe, sufficient, and nutritious food that meets their dietary needs and food preferences for an active and healthy life.

**Infant and young child feeding (IYCF):** a set of internationally vetted recommendations that have been developed to address the nutritional needs of infants from birth to 24 months (that is, from birth through the periods of exclusive breastfeeding and complementary feeding).

**Low birth weight:** defined as a child whose weight at birth is less than 2,500 grams (5 pounds, 8 ounces). Low birthweight is typically a consequence of poor nutrition in utero, which may result from poor maternal nutritional status before and during pregnancy.

**Maternal thinness:** defined as a woman of childbearing age (15–49 years) with a body-mass index (BMI) of or below 18.5. Maternal thinness has been linked to

many consequences for both maternal and birth outcomes, including low birthweight.

**Micronutrient deficiency:** a deficiency in one or more micronutrients, with vitamin A, iron, iodine, and zinc the most often studied. Depending on the micronutrient, the severity of the deficiency, and the development stage during which the deficiency occurs, consequences range from impaired cognitive and physical development to severe mental retardation and death.

**Nutrition-sensitive:** interventions or programs that address the underlying determinants of fetal and child nutrition and development—food security; adequate caregiving resources at the maternal, household, and community levels; and access to health services and a safe and hygienic environment—and incorporate specific nutrition goals and actions. Nutrition-sensitive programs can serve as delivery platforms for nutrition-specific interventions, potentially increasing their scale, coverage, and effectiveness.

**Nutrition-specific:** interventions or programs that address the immediate determinants of fetal and child nutrition and development—adequate food and nutrient intake, feeding, caregiving, and parenting practices, and low burden of infectious diseases.

**Overweight and obesity:** an excess of adipose tissue, which is measured among children and adults using anthropometric measures of height and weight, and summarized as a BMI above an age- and sex-specific threshold. Overweight and obesity typically result from shifts in diet and physical activity that accompany national-level changes in economic growth and migration. Overweight and obesity also constitute important risk factors for many noncommunicable and chronic diseases, such as diabetes, heart disease, and certain cancers. Thus, increases in overweight and obesity at the population level typically are accompanied by shifting patterns in disease epidemiology.

**Child overweight:** defined as a child with a BMI at or above the 85th percentile and below the 95th percentile for children of the same age and sex.

**Child obesity:** defined as a child with a BMI at or above the 95th percentile for children of the same age and sex.

**Maternal overweight:** defined as a woman of child-bearing age (15–49 years) with a BMI at or above 25 and below 30.

**Maternal obesity:** defined as a woman of childbearing age (15–49 years) with a BMI at or above 30.







**WORLD BANK GROUP**

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