The Social and Economic Impact of Child Undernutrition in The Gambia

THE CO$T OF
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IN AFRICA

COHA

SOCIAL AND ECONOMIC IMPACT
OF CHILD UNDERNUTRITION

THE GAMBIA

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When a child is undernourished , the negative consequence follow that child for his/her entire life. These negative consequences also have grave effects on the economies where s/he lives, learns and works

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Foreword

The Gambia Cost of Hunger in Africa (COHA) Report

Over the past decade, The Gambia has registered some progress in improving the nutritional status of children, particularly the reduction of stunting, wasting and underweight among children under five years of age. According to the recently published report of The Gambia Micronutrient Survey (GMNS) conducted in 2018, stunting among children under five years was 15.7 %, down from 24.5 % according to the 2013 Gambia Demographic and Health Survey (GDHS). Underweight and wasting were 10.6 % and 5.8 % down from 16.2 and 11.5 % respectively. Despite this overall progress, child undernutrition including micronutrient deficiencies remains unacceptably high in The Gambia.

With this high prevalence of malnutrition, the Government of The Gambia has put in place the necessary policy and strategic frameworks as outlined in the National Development Plan (NDP) 2018-2021 and the National Nutrition Policy (2018 – 2025) to reduce the burden and consequences of malnutrition. In its effort to achieve the targets the Sustainable Development Goals (SDGs), World Health Assembly (WHA) Targets, African Regional Nutrition Strategy (2015 – 2025), Africa Agenda 2063, the Malabo Declaration on the total elimination of stunting in Africa, the Government has set itself nutrition related targets in Strategic Priority 4 of the NDP to specifically reduce underweight, stunting and wasting among children under five to 8.5 percent, 12.5 percent and 5.0 percent respectively by 2021.

In March 2012, the African Union Commission (AUC), supported by the Economic Commission for Africa (ECA) and the World Food Programme, launched The Cost of Hunger in Africa (COHA) study to assist member states in establishing the social and economic impact of undernutrition on children and by extension on national development. The Study sought to estimate in a given year the additional cases of morbidity, mortality, school repetition, school drop-out rates, and reduced physical capacity that could be associated with a person's undernutrition status before age 5.

The findings of The Gambia COHA study underscore the importance and implications of undernutrition for the country's long-term national development. The report highlights the importance of nutrition in human capital development and by extension the socio-economic transformation of the country. It particularly demonstrates that for children, undernutrition has adverse implications for health and school performance while for workers it reduces productivity and ultimately earnings. The combined effect of these consequences is a cycle of poverty that undermines not only national development but also the continental and global development efforts.

The Gambia COHA report estimates the associated cost of undernutrition to the economy through health, education and labour productivity in a single year. For The Gambia, the total losses associated with undernutrition in 2018 (base year for analysis) are estimated at GMD 3.96 billion or USD 83.4 million which equivalent to 5.1 % of GDP. This is based on the estimation of the model on the current population that identifies the percentage of that population who were undernourished before the age of five, and then estimates the associated negative impacts experienced by the population in the year of analysis. The report finds that positioning nutrition interventions as a top priority for human capital development has a lasting effect on the socio-economic development of a country.

The report strongly recommends an increase investment in nutrition, strengthening of multi-sectoral coordination and collaboration mechanisms for nutrition, mobilising resources for sustainable provision of nutrition, health and education services through an Innovative Financing Strategy and enhancing the implementation of the National Development Plan, Zero Hunger Strategy and the Comprehensive Multi-Sectoral Nutrition Action Plan.

It is hoped that The Gambia COHA Report will help raise awareness among policy makers and development partners about the importance of adequate investment in nutrition-related interventions to achieve National targets.

H.E Dr. Isatou Touray
Vice President
Republic of The Gambia

Acknowledgements

This initiative was made possible by the institutional leadership provided to this project by H. E. Moussa Faki Mahamat, Chairperson of the African Union Commission (AUC); Dr. Ibrahim Mayaki, Executive Secretary, New Partnership for African Development (NEPAD); Ms. Alicia Barcena, Executive Secretary, Economic Community of Latin American and Caribbean (ECLAC); H.E. Mr. David Beasley, Executive Director, World Food Programme (WFP). The implementation of the agreement was coordinated by H.E Mrs. Amira Elfadil Mohammed Elfadil, Commissioner for Social Affairs to the African Union (AU), and Ms. Angelline Rudakubana, Director of WFP Africa Office.

The Government of The Gambia is grateful to the many individuals and institutions whose support and commitment made this study a reality and wish to take this opportunity to thank all of them for their immense contributions. On behalf of the Gvernment, I would like to thank The Gambia COHA National Implementation Team (NIT) comprising of Modou Cheyassin Phall, Executive Director and National COHA Coordinator, Malang N. Fofana, Programme Manager and Chair of the NIT, Catherine K. Gibba, M&E Officer, Bakary Jallow, Programme Manager, Babucarr N. Joof, Data Analyst and Lamin Njie, Financial Management Specialist - all from the National Nutrition Agency (NaNA); Momodou Cham, Director of Planning – Ministry of Basic and Secondary Education (MoBSE); Ebrima Suso, Senior Statistician – Gambia Bureau of Statistics (GBoS); Phebian Ina Grant Sagnia, Principal Health Researcher, Abdoulie Bah, Senior Health Information Officer and Famata Colley, Health Economist - all of the Ministry of Health (MoH); Jumu Wally, Principal Economist – Ministry of Finance and Economic Affairs (MoFEA); Tete Bawuyeh Sambou, Program Associate – National Population Commission Secretariat (NPCS); Bai Mass Mbaye, Senior Planner – Ministry of Women, Children and Social Welfare (MoWCSW); Sabina K Mendy, Senior Planner – Ministry of Agriculture (MoA); Wanja Kaaria, Country Representative and Director, Margie Rehm former Deputy Country Director, Dawda Samba, Nutrition Officer and Dr. Sadaf Sardar, Nutrition Consultant – all from WFP, Yankuba Sawo, Nutrition Specialist – UNICEF and Halimatou Bah, Nutrition Officer – FAO, for their tremendous efforts in successfully conducting this study in The Gambia.

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This study involved a lot of financial and technical resources, without which the study would not have been possible. The lead role taken by United Nations World Food Program Country Office particularly Ms. Wanja Kaaria the Country Representative and Director is highly recgnised and the technical experts and contribution towards the success of the Study from the WFP Africa Office namely; Ms. Magdalena Moshi, Ms. Priscilla Wanjiru, Mr. Addisu Bekele, Mr. Anwar Seid and Ms. Beza Berhanu is exemplary. Thanks and gratitude also goes to Heads of other Ministries and Departments such as OVP, MoFEA, MoH, MoBSE, MoA, MWCSW, GBoS, NaNA, NPCS, WFP, FAO, UNICEF for their moral and technical support during the course of the study.

I am greatly thankful to the management and staff of NaNA for their leadership role in making this study a success and for spearheading the launching of the study and the report. I would also like to congratulate the Government of The Gambia especially H.E the Vice President for officially requesting the COHA study to be conducted in the country. My sincere appreciation is also extended to the European Union in The Gambia for supporting the Study.

Mr. Modou Cheyassin Phall

Executive Director and COHA Coordinator, NaNA

Acronyms

ADS	Acute Diarrhoeal syndromes
ALN	African Leaders for Nutrition
ANR	Agriculture and Natural Resources
ARI	Acute Respiratory Diseases
ARNS	African Regional Nutrition Strategy
ATYS-VMD	Africa Ten Year Strategy for the Reduction of Vitamin and Mineral Deficiencies
AU	Africa Union
AUDA	African Union Development Agency
CAADP	Comprehensive Africa Agriculture Development Programme
CMNAP	Comprehensive Multi-sectoral Nutrition Action Plan
COHA	Cost of Hunger in Africa
DHS	Demographic and Health Survey
ECLAC	Economic Commission for Latin America and the Caribbean
ECOWAS	Economic Community of West African States
EMIS	Education Management Information System
EU	European Union
FAO	Food and Agriculture Organization
GAM	Global Acute Malnutrition
GBoS	Gambia Bureau of Statistics
GDP	Gross Domestic Product
GMD	Gambian Dalasi
HINI	High Impact Nutrition Interventions
HK	Human Capital
HSC	Health Care Sector
IFMIS	Integrated Financial Management Information System
IMAM	Integrated Management of Acute Malnutrition
IMNCI	Integrated Management of Neonatal and Childhood Illnesses
IUGR	Intra Uterine Growth Retardation
MDA	Ministries, Department and Agencies
MDG	Millennium Development Goal
MICS	Multiple Indicator Clustor Survey
MoA	Ministry of Agriculture
MOBSE	Ministry of Basic and Secondary Education
MoFEA	Ministry of Finance and Economics Affairs
MoH	Ministry of Health
MoHERST	Ministry of High Education, Research, Science and Technology
MWCSW	Ministry of Women, Children and Social Welfare
NaNA	National Nutrition Agency
NDP	National Development Plan
NEPAD	The New Partnership for Africa's Development
NHA	National Health Account
NIT	National Implementation Team

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NDP	National Development Plan
NEPAD	New Partnership for Africa's Development
NHA	National Health Account
NIT	National Implementation Team
NNP	National Nutrition Policy
NPCS	National Population Commission Secretariat
P4P	Purchase for Progress
REACH	Renewed Efforts Against Child Hunger
SDG	Sustainable Development Goal
SUN	Scaling Up Nutrition
UHC	Universal Health Coverage
UNDESA	United Nations Department of Economic and Social Affairs
UNECA	United Nations Economic Commission for Africa
UNICEF	United Nations Children's Fund
WFP	World Food Programme

Preface

Child undernutrition is one of the major challenges facing the world today with the African continent facing the highest prevalence. In a bid to curb the challenge, the African Ministers of Finance, Planning and Economic Development made a declaration, commonly known as Resolution 898, which underscored the importance of undertaking the COHA Study in African Countries in 2012. In 2014, the African Heads of State and Government made a commitment "Malabo Declaration" on Nutrition Security for Inclusive Economic Growth and Sustainable Development in Africa, where they called on Governments to scale up implementation of the COHA study continent-wide.

In The Gambia, the National Development Plan 2018 - 2021 and several National Policies and Strategies give prominence to reducing child undernutrition. The Gambia is a signatory to several international development blueprints including the global Sustainable Development Goals (SDGs), African Regional Nutrition Strategy (2015 – 2025), Africa Agenda 2063 and the World Health Assembly Targets for nutrition all of which aimed to address child undernutrition. Although there have been some improvement in the reduction of malnutrition in the country over the past decade, child undernutrition remains a persistent threat to the lives of Gambian children, particularly the under five year old. Evidence shows that malnutrition during childhood and pregnancy has many adverse consequences for child survival, development and long-term well-being. It is evident that investing in nutrition is judicious and beneficial as it improves health, by reducing morbidity and mortality, school performance, cognitive development and physical work capacity, which in turn, leads to increased productivity, socio-economic growth and development, and poverty reduction.

To further understand the economic and social impacts of child undernutrition in terms of monetary loss and consequently the loss to the Gross Domestic Product (GDP) and well-being of the Gambians, the Government of The Gambia has committed itself to undertake this study. The Study was spearheaded by Government Ministries, Departments and Agencies (MDAs) including the National Nutrition Agency under the Office of the Vice President, The Gambia Bureau of Statistics, Ministry of Finance and Economic Affairs, Ministry of Health, Ministry of Basic and Secondary Education, Ministry of Agriculture, Ministry of Women, Children and Social Welfare and the National Population Commission Secretariat in collaboration with various local development partners that included WFP, FAO, UNICEF and several other stakeholders representing the interest of the Government.

The specific objectives of undertaking the COHA Gambia Study included estimating the social and economic impacts of child undernutrition, generating policy evidence to justify the need for increased investment in nutrition, and recommending actions to inform human capital development that will help bolster implementation of The Gambia's NDP and other commitments. The findings of the Study give policy insights that shall be key in the development and/or revision of key policies and strategies geared towards reducing child undernutrition in The Gambia. The Government, our respective ministries, are fully committed to the implementation of the recommendations of this Study.
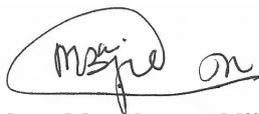
Hon. Mamburay Njie
Minister of Finance and
Economic Affairs

Hon. Ahmadou Lamin Samateh
Minister of Health

Hon. Claudiana Cole
Minister of Basic and
Secondary Education

Executive Summary

The Cost of Hunger in Africa (COHA) study is an African Union Commission (AUC) led initiative through which countries are able to estimate the social and economic impact of child undernutrition in a given year. In March 2012, the regional COHA study was presented to African Ministers of Finance, Planning and Economic Development at the 5th Joint African Union (AU) and Economic Commission for Africa (ECA) Conference of Ministers of Economic Planning and Finance held in Addis Ababa, Ethiopia. At the meeting, the Ministers issued a resolution affirming the importance of the Study and recommending that it should progress beyond the initial stage. Eighteen countries have so far completed the study and The Gambia is among eight countries in the second phase that are embarking on the study.

Over the past decade, the Gambia has registered some progress in improving the nutritional status of children, particularly the reduction of the prevalence of stunting, wasting and underweight among children under five years of age. According to the recently published Gambia Micronutrient Survey (GMNS) conducted in 2018, stunting among children under five years was 15.7 %, down from 24.5 % according to the 2013 Gambia Demographic and Health Survey (GDHS). Underweight and wasting were 10.6 % and 5.8 % down from 16.2 and 11.5 % respectively. Despite this overall progress, child undernutrition remains unacceptably high in The Gambia. It is evident that positioning nutrition interventions as a top priority for development and poverty reduction is often challenging, partly due to the lack of credible data on both short- and long-term returns. Indeed, there is not enough country-specific evidence to demonstrate how improved nutrition can have a direct impact on school performance, and thereby improving opportunities in the labour market and physical work. Additionally, nutrition is too often regarded as a health issue and is highly medicalied in many countries, disregarding the ripple social and economic effects it has on other areas of development.

The specific objectives of undertaking the COHA Gambia Study included estimating the social and economic impacts of child undernutrition, generating policy evidence to justify the need to increase investment in nutrition, and recommending actions to inform human capital development that will help bolster implementation of The Gambia's NDP and other commitments. The findings of the study give policy insights that shall be key in the development and revision of key policies and strategies geared towards reducing child undernutrition in The Gambia.

The Study was spearheaded by Government Ministries, Departments and Agencies (MDAs) including the National Nutrition Agency under the Office of the Vice President, The Gambia Bureau of Statistics, Ministry of Finance and Economic Affairs, Ministry of Health, Ministry of Basic and Secondary Education, Ministry of Agriculture, Ministry of Women, Children and Social Welfare, National Population Commission Secretariat in collaboration with various development partners including WFP, FAO and UNICEF. Several other national and development partners representing the interest of the Government also participated in the Study.

The COHA model is used to estimate the additional cases of morbidity, mortality, school repetitions, dropouts and reduced physical capacity that can be associated with a person's undernutrition status before the age of five. In order to estimate these social impacts for a single year, the model focuses on the current population, identifies the percentage of that population who were undernourished before the age of five, and then estimates the associated negative impacts experienced by the population in the year of analysis. Using this information and the data provided by the NIT, the model estimates the associated economic losses incurred by the country in health, education and labour productivity in a single year. The reference year used in the analysis of the study model is 2018, which is referred throughout the text as 'base year'. The data for The Gambia COHA study was collected from national data sources which include: GDHS (2013), GMNS (2018) and MICS 2006 and 2010, the SMART Surveys 2012 and 2015 and the National Health Account (NHA) 2015. Additional data was obtained from the World Health Organization and the United Nations Department of Economic and Social Affairs (UNDESA). Primary data was collected by conducting a survey and interviews at the Kanifing General Hospital.

The report outlines the social and economic costs of child undernutrition affecting three sub sectors namely; health, education and labour and productivity. The study estimated that in 2018, there was an increase of 64,094 episodes of illnesses related to diseases that are associated with underweight. In addition, pathologies related to calorie and protein deficiencies and low birth weight associated with Intrauterine Growth Retardation (IUGR), totalled to more than 4,462 episodes. As a result, The Gambia had to address 68, 557 illnesses in children that required medical attention and generated costs both to families and to the health sector.

Between 2013 and 2018, it is estimated that 6,316 child deaths in The Gambia were directly associated with undernutrition. These deaths represent 20.3 % of all child mortalities for this period. Thus, it is evident that undernutrition significantly exacerbates the rates of death among children and limits The Gambia's capacity to reduce child mortality. In the last five years precedings 2018, it is estimated that 68,557 illnesses in children that required medical attention in The Gambia were directly associated with the incremental risk to illnesses associated with children being underweight. This generated an estimated cost of GMD 280.7 million. The model estimates that an equivalent of 35.3 % of the current workforce has been lost due to the contribution of undernutrition to child mortality rates. This represents 48,066 people who would have been 15-64 years old by 2018, and part of the working age population of The Gambia.

The study showed that in The Gambia, it is estimated that in 2018 families bear 38% of the costs associated with undernutrition, while the remaining 62% are borne by the health system. Although the families of undernourished children incur a high percentage of the health costs related to undernutrition, the burden of this phenomenon is still an important expenditure component in the public sector. In 2018, the annual estimated cost to the public sector was equivalent to 9.7% of the total budget allocated to health. In summary, the economic impact of undernutrition in health-related aspects was equivalent to 0.4 % of total GDP in 2018.

A total number of 23,429 children repeated grades one to twelve in 2018 (representing 4.6% repetition rate in 2018). Using data on increased risk of repetition among stunted students, the model estimated that out of the 23,429 children of grades one to twelve who repeated in 2018, the repetition rate for stunted children was 8.3 %, while the repetition rate for non-stunted children was 3.4 %. Thus, given the proportion of stunted students, the model estimates that 8,106 students, or 34.6 % of all repetitions in 2018 were associated with stunting.

As in the case of health, the social cost of undernutrition in education is shared between the public sector and the families (Households). Of the overall costs, a total of GMD 37 million (USD 780,261) are being covered by the caretakers, while GMD 22.6 million (USD 476,592) is borne by the public education system. Nevertheless, the distribution of this cost varies depending on whether the child repeated grades in primary or secondary education. In primary and lower secondary education, the families respectively cover - 58.4 % and 56.7 % of the associated costs of repeating a year, whereas in upper secondary education the burden on the families is increased to 71.2 %. In both cases, the households cover a larger proportion of the burden.

For the education sector, the model estimated that 35.3 % of the working-age population in The Gambia were stunted as children. Research shows that adults who suffered from stunting as children are less productive than non-stunted workers and are less able to contribute to the economy. This represents 399,694 people whose potential productivity is affected by undernutrition.

The model estimated that 537,268 people in The Gambia are engaged in manual activities, of which 446,088 were stunted as children. This represented an annual loss in potential income that surpasses GMD 1.305 billion or USD 27.5 million equivalent to 1.7 % of the GDP in potential income lost due to lower productivity. Overall, The Gambia is estimated to have lost an equivalent of about GMD 3.956 billion in 2018, which represented 5.1 % of the GDP. Productivity related losses contributed the largest costs at 4.7 % of GDP followed by Health and Education at 0.4 % and 0.002 % respectively.

In addition to calculating a retrospective cost for 2018, the model also highlighted potential savings, based on different scenarios. These scenarios are constructed based on the estimated net present value of the costs associated with undernutrition of the children born in each year, from 2018 to 2030. The methodology follows each group of children and, based on each scenario, estimates a progressive path towards its achievement. The following four scenarios and their potential gains were constructed

Baseline: The Cost of Inaction. Progress in reduction of stunting and underweight children stops.

Scenario #1: Cutting by half the prevalence of child undernutrition by 2025.

Scenario #2: The 'Goal' Scenario. Reduce stunting and underweight in children to 10% and 5% respectively by 2025.

Scenario #3: Gambia Policy Scenario 2030, based on the National Development Plan and National Nutrition Policy.

With the different scenarios, it is expected that stunting will reduced to different levels and rates. It is also expected that annual average savings and possible economic returns that can be gained if appropriate investments in nutrition are undertaken

based on the different scenarios ranged from GMD 3.146 billion to GMD 4.957 billion by 2030.

The report underscores the importance of nutrition in human capital development and by extension the socio-economic transformation of The Gambia. It particularly demonstrates that for children, undernutrition has adverse implications for school performance, health and for workers it reduces productivity and ultimately earnings. The Gambia COHA report estimates the associated cost of undernutrition to the economy through health, education and labor productivity in a single year. In 2018, an estimated GMD 3.956 billion (or USD 83.4 million) equivalent to 5.1 % of GDP was lost to the economy as a result of child undernutrition. The report finds that positioning nutrition interventions as a top priority for human capital development has a lasting effect on the socio-economic development of a country.

The Report strongly recommends an increase investment in nutrition, strengthening of multi-sectoral coordination and collaboration mechanisms for nutrition, mobilizing resources for sustainable provision of nutrition, health and education services through an Innovative Financing Strategy and enhancing the implementation of the National Development Plan, Zero Hunger Strategy and the Comprehensive Multi-Sectoral Nutrition Action Plan.

Section

Introduction
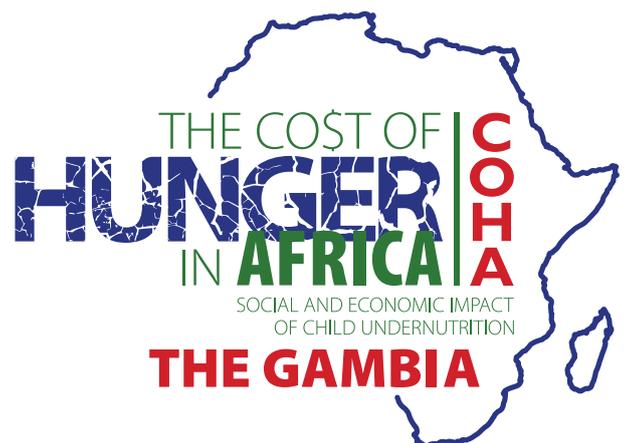
Section I: Introduction

The Cost of Hunger in Africa (COHA) study is a continental initiative commissioned and led by the African Union Commission (AUC) and New Partnership for Africa's Development (NEPAD) Agency now African Union Development Agency (AUDA) and implemented by the United Nations World Food Programme (WFP), with the support of the Economic Commission for Latin America and the Caribbean (ECLAC). The COHA study, which is implemented within the framework of the revised African Regional Nutrition Strategy (2015 – 2025), estimates the economic and social impact of child under-nutrition in each African country. The study also shows the possible economic returns that can be gained if appropriate investments in nutrition are undertaken.

The COHA study fills a gap in the narrative towards the social and economic transformation of Africa. The study resonates from pillar 3 of the Comprehensive Africa Agriculture Development Programme (CAADP) on increasing food supply and reducing hunger across the region by increasing smallholder productivity and improving responses to food emergencies. The pillar recognises the role hunger plays in undermining people's health, their ability to study and productivity at work.

In March 2012, during the 5th joint African Union and Economic Commission for Africa Conference of Ministers of Finance, Planning and Economic Development, a declaration on COHA (Resolution 898) confirming the importance of the study as well as recommending its expansion beyond the pilot phase was issued. The Ministers underscored the importance of the study and recommended its continuation beyond the initial stage. Subsequently, in 2014, African Heads of State and Government, during their meeting in Malabo, made a commitment, that is, the 'Malabo Declaration' on Nutrition Security for Inclusive Economic Growth and Sustainable Development in Africa (Assembly/AU/Decl.4 (XXIII), where they called on Governments to scale up implementation of the COHA study continent-wide.

Consequently, the COHA study was officially requested by the Government of The Gambia in June 2018 and led to the kickoff of the study in December of the same year. The COHA study aims to reinforce the commitment to achieve the National Development Agenda. The study shall catalyze efforts towards social and economic transformation and human development for The Gambia and achievements of the SDG especially goals 1 to 4 (end poverty in all its forms everywhere; end hunger, achieve food security and improved nutrition, and promote sustainable agriculture; ensure healthy lives and promote well-being for all at all ages; ensure inclusive and equitable quality education and promote life-long learning opportunities for all). The COHA study in The Gambia, like other countries where the study has been implemented, will provide the foundation and rationale for the implementation of these strategies, influence increased efficiency and coordination, in addition to influencing increased investment in nutrition programmes.

In The Gambia, stunting affects approximately one in five children under five years of age. Its consequences include: poor health, poor cognitive development and loss in productivity. The study thus helps to flag an urgent call for action and will be critical in facilitating dialogue between the relevant Government Ministries, Departments and Agencies; United Nations Agencies; Donors; Private Sector and International Organizations.

In Africa, the study has been implemented in over 18 countries including Burkina Faso, Chad, Democratic Republic of Congo, Egypt, Ethiopia, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, Swaziland, Uganda and Zimbabwe.

A. Justification of the Study

Over the past decade, African countries have experienced remarkable economic performance that has made the continent increasingly attractive for global investment and trade. The pace of real GDP growth on the continent has increased in the last decade, and six of the world's fastest growing economies are in Africa[1] . Yet, the continent still displays some of the highest rates of child undernutrition in the world.

Human capital is the foundation of social and economic development, as articulated in the African Agenda 2063 and the Sustainable Development Goals (SDGs). Improved nutritional status of people has a direct impact on economic performance

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[1] "World Economic Outlook Database October 2012. www.imf.org/external/pubs/ft/weo/2012/02/weodata/index.aspx.

through increased productivity and enhanced national comparative advantage. For Africa to maximize its present and future economic prospects, there is an urgent need for sustainable, cost-effective interventions that address the nutritional situation of the most vulnerable members of its society.

As noted by the African Heads of State and Government in 2014, food security without improved nutrition will not deliver the desired socio-economic outcomes, as the number of those affected by hunger and malnutrition has continued to increase over the past few years. Undernutrition is the single most important contributor to child mortality and leads to a significant loss in human and economic potential. Therefore, reducing child undernutrition has direct impact on increasing child survival[2] .

The World Bank estimates that undernourished children are at risk of losing about 10% of their lifetime earning potential, thus affecting national productivity. A panel of expert economists at the Copenhagen Consensus Conference concluded that fighting malnourishment should be the top priority for policymakers and philanthropists[3]. At that conference, Nobel Laureate Economist, Vernon Smith stated that: "One of the most compelling investments is to get nutrients to the world's undernourished. The benefits from doing so – in terms of increased health, schooling, and productivity – are tremendous." Improving the nutritional status of children is therefore a priority that needs urgent policy attention to accelerate socio-economic progress and development in Africa. However, despite the compelling economic value of nutrition interventions, investments with apparent shorter-term returns are prioritised in social budgets. Hence, efforts need to be scaled up to sensitise the general population, policymakers and development partners on the high costs of undernutrition in order to strengthen national and international commitments and ensure that young children in Africa grow healthy and are properly nourished.

Positioning nutrition interventions as a top priority for development and poverty reduction is often a challenge, partly due to the lack of credible data on both short- and long-term returns. Indeed, there is not enough country-specific evidence to demonstrate how improved nutrition can have a direct impact on school performance, and thereby improving opportunities in the labour market and physical work. Additionally, nutrition is too often regarded as a health issue and is highly medicalised in many countries, disregarding the ripple social and economic effects it has on other areas of development.

Despite the challenges, there are interventions at the national, regional and global levels to address the issues of undernutrition and hunger. At the regional level, these efforts include initiatives, such as the African Regional Nutrition Strategy (ARNS) 2015 – 2025, the Comprehensive Africa Agriculture Development Programme (CAADP), especially CAADP Pillar III that focuses on reducing hunger and improving food and nutrition security, the Pan-African Nutrition Initiative (PANI), the Framework for African Food Security, the Africa Ten-Year Strategy for the Reduction of Vitamin and Mineral Deficiencies (ATYS-VMD), the Africa Day for Food and Nutrition Security (ADFNS), and the Africa Day for School Feeding.

At the global level, initiatives include: Renewed Efforts Against Child Hunger (REACH), Purchase for Progress (P4P), Scaling Up Nutrition (SUN), Feed the Future, the "1,000 Days" partnership, as well as the Abuja Food Security Summit of 2006. All these efforts are designed to reduce hunger, malnutrition and vulnerability in a bid to also achieve the Sustainable Development Goals.

The African Union, the New Partnership for Africa's Development (NEPAD), African Union Development Agency (AUDA), the United Nations Economic Commission for Africa (UNECA), and the United Nations World Food Programme (WFP) combined their efforts to conduct the Cost of Hunger Study on the Social and Economic Impact of Child Undernutrition in Africa.[4]

This study is built on a model developed by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) and WFP Latin America and Caribbean regional bureau. Through a South-South cooperation agreement, ECLAC supported the adaptation of the model to the African context and continues to support the implementation of the study in the ongoing countries.

B. Objectives of Cost of Hunger Study in The Gambia

This study aims to generate evidence to inform key decision-makers and the general public about the cost African societies are already paying for not addressing the problem of child undernutrition. The results provide compelling evidence to guide

[2] Robert E. Black et al. Maternal and Child Undernutrition: Global and Regional Exposures and Health Consequences. The Lancet, 371, No. 9608, 2008. doi: 10.1016/S0140- 6736(07)61690-0.

[3] Copenhagen Consensus 2012. Top Economists Identify the Smartest Investments for Policy-Makers and Philanthropists. 14 May 2012. www.copenhagenconsensus.com/Default. aspx?ID=1637.

[4] African Union, "CAHM5 moves into gear with meeting on food and nutrition development", 14 April 2011, http://www.au.int/en/sites/default/files/task%20force%20on%20food%20and%20nutrition%20 development.pdf

policy dialogue and increase advocacy around the importance of preventing child undernutrition. Ultimately, it is expected that the study will encourage revision of current budgetary allocation practices in each participating country to ensure provision of the human and financial resources needed to effectively combat child undernutrition, specifically during the first 1,000 days of life when most of the damage occurs.

The specific objectives of the study are to:

- Provide the evidence base to justify the need to increase investment in nutrition;
- Provide compelling arguments to support the concept of human capital gain that will help consolidate The Gambia`s economic expansion.
- Estimate the social and economic impact of undernutrition of children under 5 - at the level of the health sector, education and labor productivity.

C. Guiding Principles of COHA

Throughout the adaptation, implementation and utilisation of the COHA model, four guiding principles were developed. With the overall goal of improving the nutritional situation in Africa, these principles allowed the team to approach the study in a holistic manner, considering the necessary steps for its implementation. The four guiding principles are described below:

National Ownership of the Process

One of the guiding principles in the development of the COHA study is to engage regional experts and policy makers as the main actors of the process. To achieve this, a feasibility workshop was carried out in the early stages of the process, bringing together practitioners across various sectors in order to analyse the challenges and jointly produce a roadmap. Representatives from the 12 initial countries and major partners met to assess the process and provided key recommendations for the adaptation of the ECLAC model. Some of these elements included capacity building, strong communication strategies and synergies with other on-going costing initiatives.

As a result of this feasibility workshop, NITs were established in each of the four first-phase countries, and an initial training on the model and data requirements was carried out. A key milestone of the adaptation process was a regional technical meeting held in Entebbe, Uganda, where NITs presented a series of specific recommendations to the process based on the constraints and lessons learned. This feedback allowed the Regional Secretariat to develop a final roadmap for methodological adaptation, adjust the data collection instruments and develop a final proposal for the COHA. As a result of this feasibility workshop, NITs were established in each of the four first-phase countries, and an initial training on the model and data requirements was carried out. A key milestone of the adaptation process was a regional technical meeting held in Entebbe, Uganda, where NITs presented a series of specific recommendations to the process based on the constraints and lessons learned. This feedback allowed the Regional Secretariat to develop a final roadmap for methodological adaptation, adjust the data collection instruments and develop a final proposal for the COHA model for Africa. In subsequent years, all participating countries have established an NIT to lead on the analysis of COHA. Furthermore, in-country trainings were complemented by three continental trainings organised by WFP and ECLAC under the leadership of NEPAD and AU.

Building national capacity to advocate for child nutrition

A second guiding principle for the COHA is to ensure that national capacity is strengthened during the implementation of the study. Similar costing initiatives have had limited impact due, in part, to the lack of national ownership and limited understanding by the stakeholders of the technical aspects of the study. These elements hinder the national stakeholders' capacities to effectively communicate the results, which could limit the policy impact of the study.

The main implementing actors of COHA in each country are specialists from the key government institutions, academics and practitioners, often led by the Ministry of Economy and/or Planning or the Ministry of Health. Once a team of eight to ten specialists is established, a training workshop should be convened to review all technical aspects of the model, form a task force for data collection and develop an initial communication strategy. In this workshop, a work plan must be developed by the NIT that served as a guideline for future activities.

The Regional Secretariat supports the capacity building process of the NITs by holding regular teleconferences with representatives from each team and by providing technical assistance in the analysis of data and initial results. However, a NIT-led approach and use of nationally-validated information are the two critical aspects in achieving national ownership

of the study. Once a country report is drafted, a national validation workshop of the results is held by the NIT and specific advocacy documents are prepared for key stakeholders.

A major advantage of this process is the drive towards sustainability of the initiative, alignment, and maximisation of potential contribution, is the integration of COHA by NITs within their national nutritional strategies as they are the same professionals shaping national nutritional strategies.

Engagement of COHA with global nutrition initiatives and movements.

The third guiding principle for the COHA is to enhance collaboration with partners including countries with high burdens of malnutrition, and global initiatives to maximize synergies. To achieve this, strong efforts were made to link the COHA with relevant initiatives that contribute to reducing child undernutrition including the Scaling-Up Nutrition (SUN) initiative launched in 2010.

The SUN Movement aims to unite all stakeholders – peoples, governments, civil society, the United Nations, donors, businesses and scientists – in a collective effort to improve nutrition. The Movement recognizes that good nutrition in the first 1,000 days from conception to the first years of a child is an essential requirement and right for each world citizen to stay healthy, learn, earn, and achieve his or her lifetime potential. The SUN Movement is founded on the compelling evidence that investment in nutrition yields major economic returns.

The COHA study contributes to the Zero Hunger Strategy and Scaling Up Nutrition (SUN) by presenting strong arguments for investing in child nutrition in specific country contexts. By doing so, countries have developed the capacity to generate change in the nutritional situation of their populations.

Another important global actor in the nutrition context is the Renewed Efforts Against Child Hunger (REACH) Initiative. This joint initiative proposed by WFP, WHO, UNICEF and FAO provides technical assistance to national governments in developing plans and strategies to scale up nutrition investments. An important part of their advocacy at the country level includes engaging non-traditional actors in discussions on nutrition, to mainstream nutrition in their policies, plans and activities. The COHA also represents an opportunity for collaboration, as it provides strong evidence on the consequences of stunting in educational performance, the loss of working hours as well as loss in productivity by the working age population – thus helping to position nutrition in the wider development agenda. REACH facilitators are also typically members of the NIT in each country where REACH is present.

The African Leaders for Nutrition (ALN) Initiative is another platform for high-level political engagement to advance nutrition in Africa. It is led by a group of ALN Champions, comprising current and former heads of state, finance ministers and eminent leaders with the power to catalyse and sustain high-level political leadership and commitment to end malnutrition in Africa. The Assembly of Heads of State and Governments of the African Union (AU) at the 30th Ordinary AU Summit, held in Addis Ababa, Ethiopia, on 31 January 2018, endorsed the ALN initiative. The initiative aims to influence and generate innovative investments towards nutrition and food security that will build a foundation for productive human capital in Africa. It has a special focus on the first 1,000 days of a child's life and the grey matter infrastructure.

Strategic advocacy for change

The fourth guiding principle of the COHA is to ensure that the results reach key stakeholders with the capacity to make a change. The communication strategy of the COHA is a basic component of the project. As a result, strong efforts are carried out by each NIT to reach decision-makers with the appropriate information to increase their interest and understand the consequences of child undernutrition. In this regard, a six-step approach has been developed. Briefly, the approach follows the following steps:

    i.   Familiarises the NIT with the problems contributing to undernutrition and proven nutrition interventions;

    ii.   Identifies and categorises key actors;

    iii.   Develops objectives for each actor;

    iv.   Produces information materials and brief stakeholders;

    v.   Adapts results and present them to target decision-makers; and follow up and provide support.

    vi.   Provides each NIT with detailed information on the process (six steps).

Section II

Conceptual Framework and Methodology

THE COST OF HUNGER IN AFRICA

SOCIAL AND ECONOMIC IMPACT
OF CHILD UNDERNUTRITION
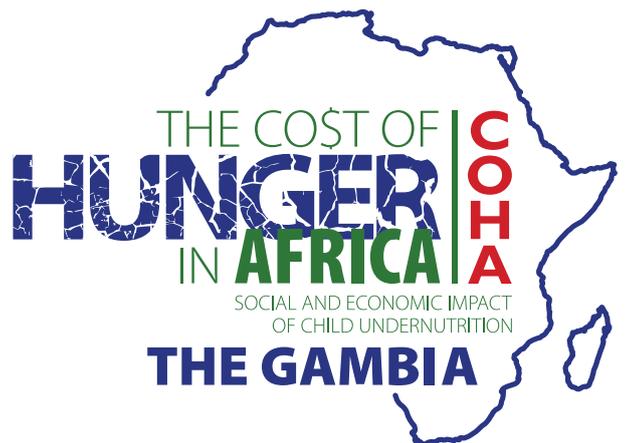
THE GAMBIA

Section II: Conceptual Framework and Methodology

This section describes the conceptual framework and methodology for the COHA in The Gambia. The conceptual framework and methodology presented here are adapted from the Operational Manual for Analyzing the Social and Economic Impact of Child Undernutrition in Latin America and Caribbean (ECLAC, 2007).

Hunger is caused and affected by a set of contextual factors. "Hunger" is an overarching term that reflects an individual's food and nutrition insecurity. Food and nutrition insecurity occur when part of the population does not have assured physical, social and economic access to safe and nutritionally adequate food.

Nutrition security, therefore, depends on a person's food security or insecurity. Specifically, nutrition security can be described as the "appropriate quantity and combination of food, nutrition, health services and caretaker's time needed to ensure adequate nutritional status for an active and healthy life at all times for all people." A direct and measurable consequence of nutrition insecurity is low birth weight, underweight and/or lower than normal height-for-age. Levels of nutrition security in a country are related to epidemiological and nutritional transitions which can be evaluated to assess the population's nutritional situation. Furthermore, a person's nutritional situation is part of a process that is expressed differently depending on the stage of the life cycle: intrauterine and neonatal life, infancy and pre-school, school years or adult life. This is because the nutrient requirements are different for each stage.

A. Conceptual Framework

This conceptual framework explains two broad interrelated relationships, that is, the causes of undernutrition on the one hand and the consequences of undernutrition on the other.

Causes of Undernutrition

The main factors associated with undernutrition can be grouped into three broad causes. These are; environmental (natural or entropic) causes, sociocultural-economic causes (linked to poverty and inequality) and political-institutional causes (Figure 1.1). Environmental factors encompass the surroundings in which the individual or household lives – and the risks arising from the natural environment such as hazards from floods, droughts, frosts and other phenomena. It also includes those risks produced more directly by humans such as contamination of water, air and food.

Figure 1.1: Causes of Malnutrition
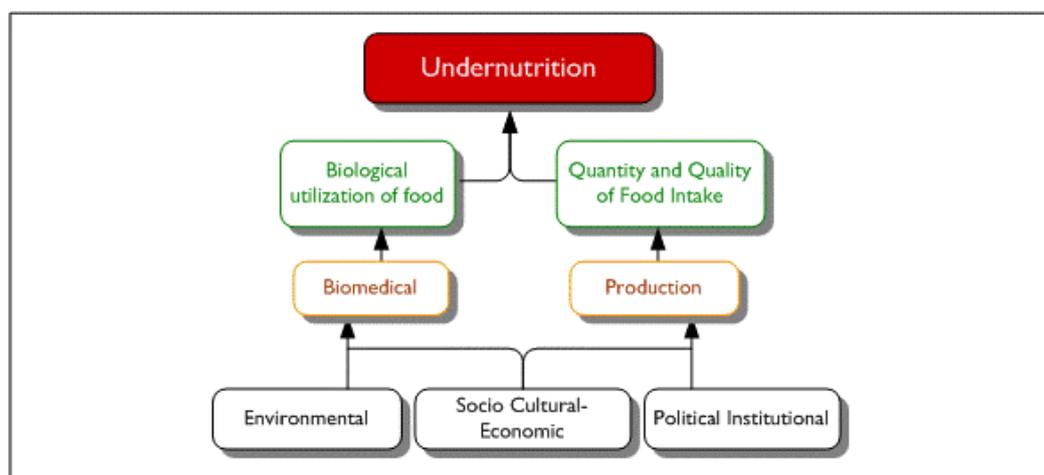
Source: Rodrigo Martinez and Andrés Fernández, Model for analysing the social and economic impact of child undernutrition in Latin America (see footnote) based on consultations carried out by authors.[5]

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[5] Rodrigo Martínez and Andrés Fernández, Model for analysing the social and economic impact of child undernutrition in Latin America, Naciones Unidas, CEPAL, Social Development Division, Santiago de Chile, 2007.

The sociocultural-economic determinants include elements associated with poverty and inequality, education and cultural norms, employment and wages, access to social security and coverage of aid programmes. The political-institutional factors encompass government policies and programmes aimed specifically at solving the population's food and nutritional problems.

Together, these three broad factors influence biomedical and production vulnerabilities. Biomedical vulnerabilities include the individuals' deficiencies that limit the capacity to make biological use of the food consumed regardless of quantity and quality available.[6] On the other hand, production vulnerabilities or factors include those directly associated with both the production and access to food. Each of these factors helps increase or decrease the likelihood of a person to suffer from undernutrition. Furthermore, the importance of each of these factors depends on the level of the country's demographic and epidemiological transition as well as on the person's current stage in the life cycle. Together these factors determine the intensity of the resulting vulnerability to undernutrition.

Consequences of Undernutrition

Child undernutrition has long-term negative effects on a person's life in the interrelated aspects of health, education, and productivity, quantifiable in costs and expenditures to the public and private sectors (Figure 1.2).[7]

In health, the focus is on morbidity and mortality attributed to undernutrition. Health studies have shown that undernutrition increases the chance of death (higher mortality risk) during specific stages of the life cycle and also leads to increased appearance or intensified severity of specific illnesses (or higher morbidity risk).[8] Thus, undernutrition may result in lower productivity (due to avoidable deaths) and increased demand for social services (due to morbidity) and consequently higher public and private costs to society.

Figure 1.2: Consequences of Undernutrition
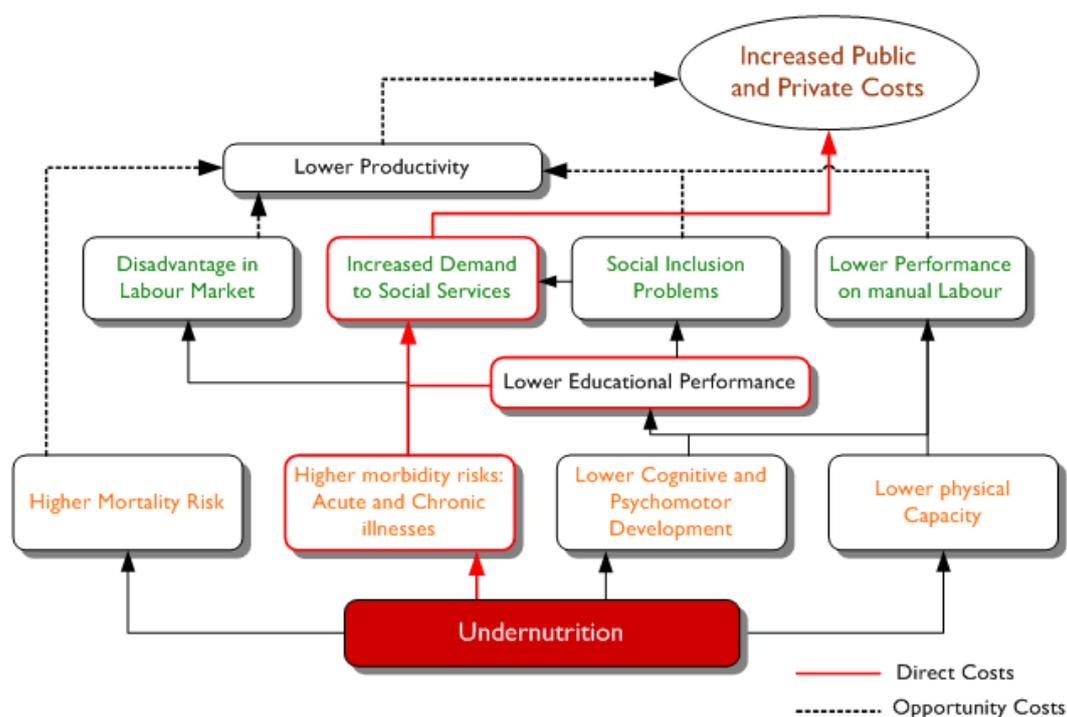
Source: Modified from Rodrigo Martínez and Andrés Fernández, Model for analyzing the social and economic impact of child undernutrition in Latin America (see footnote) based on consultations carried out by authors.[9]

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[6] Rodrigo Martínez and Andrés Fernández, Model for analysing the social and economic impact of child undernutrition in Latin America, Naciones Unidas, CEPAL, Social Development Division, Santiago de Chile, 2007.

[7] Alderman H., et al., "Long-term consequences of early childhood malnutrition", FCND Discussion Paper No. 168, IFPRI, 2003

[8] Amy L. Rice et al., "Malnutrition as an underlying cause of childhood deaths associated with infectious diseases in developing countries," Bulletin of the World Health Organization 78, No. 2000,

[9] Rodrigo Martínez and Andrés Fernández, Model for Analysing the Social and Economic Impact of Child Undernutrition in Latin America (Santiago de Chile: Naciones Unidas, CEPAL, Social Development Division, 2007).

In education, undernutrition is known to negatively affect cognitive and psychomotor development of an individual and thus results in lower educational attainment.[10] Undernourished children have a greater probability of starting school at a later age, repeating grades, dropping out of school and ultimately obtaining a lower level of education. These effects exacerbate problems in social inclusion and increase or intensify poverty, both of which increase demand for social services including increased need for social protection interventions. The effects of undernutrition on education attainment also perpetuates a vicious cycle as vulnerability to undernutrition grows.

Undernutrition also impacts on productivity at later years of life. Individuals affected by undernutrition may experience lower physical capacity in manual labour as a result of stunting[11]. Stunting is observable in the low height-for-age measurements during childhood. In adulthood, it leads to an overall reduced body mass when compared to the full adult potential. Thus, undernutrition may lower physical capacity of individuals which may in turn lower performance on manual labour resulting in declines in productivity. This imposes increased public and private costs to society.

Cumulatively, each of the negative impacts in health, education, and productivity, described above, leads to a social, as well as an economic, loss to the individual or the society. The subsequent subsection briefly highlights the costs that this study measured.

B. Methodology

This subsection outlines the central elements considered in the Cost of Hunger model to estimate the effects and costs of child undernutrition. The discussion describes the dimensions of analysis, process of estimating costs of undernutrition and variables as well as data used in the model[12]. An overview of the COHA model and how it was adapted for Africa is provided in Annex 3.

The methodology used adopted the COHA model which estimates additional cases of morbidity, mortality, school repetitions, school dropouts and reduced physical capacity that can be directly associated with undernutrition in children under the age of five. To estimate these social impacts for a single year, the model focuses on the current[13] population, identifies the percentage of that population who were undernourished before the age of five, and then estimates the associated negative impacts experienced by the population in the study year. Using this information and economic data provided by the NIT, the model then estimated the associated economic losses incurred by the economy in health, education, and in potential productivity in the year of study.

Estimation of Costs of Undernutrition - Dimensions of Analysis

Cost of hunger studies have traditionally adopted a two-dimensional analysis model to estimate the costs arising from the consequences of child undernutrition in health, education and productivity. These two dimensions are:

Incidental retrospective dimension. This dimension focuses on the cost of undernutrition in a country's population for a given year. In the case of The Gambia, 2018 has been used as the base year. Thus, it is possible to estimate the health costs of children under five years of age who suffer from undernutrition during the year of analysis, the education costs stemming from children now in school who suffered undernutrition during the first five years of life, and the economic costs due to lost productivity by working-age individuals who were exposed to undernutrition before the age of five.

Prospective or potential savings dimension. This dimension makes it possible to project the present and future losses incurred due to medical treatment, repetition of grades in school, and lower productivity caused by undernutrition among children under the age of five in each country, in a specific year. Based on that, potential savings derived from actions taken to achieve nutritional objectives can be estimated (for example, in the case of The Gambia what is the potential saving if the country achieves the NDP targets of reduction of stunting to 12.5 % by 2021).

As shown in Figure 1.3, the incidental retrospective dimension includes the social and economic consequences of undernutrition in a specific year (for the purposes of this report, 2018 was set as the base year) for cohorts that have been affected (0 to 5 years of age for health, 6 to 18 years for education and 15 to 64 years for productivity). The prospective dimension on the

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[10] Melissa C. Daniels and Linda S. Adair, "Growth in young Filipino children predicts schooling trajectories through high school," The Journal of Nutrition, March 22, 2004, Jn.nutrition.org.

[11] Lawrence J. Haddad and Howarth E. Bouis, "The impact of nutritional status on agricultural productivity: wage evidence from the Philippines," Oxford Bulletin of Economics and Statistics 53, No. 1, February 1991, doi:10.1111/j.1468-0084.1991.mp53001004.x.

[12] A summarized version of the theoretical background and the basic characteristics considered in the model of analysis are presented here. For a more detailed discussion of the model, see Rodrigo Martínez and Andrés Fernández, Model for analysing the social and economic impact of child undernutrition in Latin America, Naciones Unidas, CEPAL, Social Development Division, Santiago De Chile, 2007

[13] The model set 2014 as the base year, given the availability of data for that year and in order to insure the continuity of the study. As it is the most recent possible study year, it is referred to as "current" in this report.

other hand, projects the costs and effects of undernutrition recorded in the reference year of the study (2018). These are based on the number of children born during the period selected in the analysis and with the application of a discount rate, on the present value estimates of future costs to be incurred due to the consequences of undernutrition. The prospective dimension is the basis for establishing scenarios to estimate the economic and social savings of an improved nutritional situation.

Figure 1.3: Dimensions of analysis by population age and year when effects occur 2018
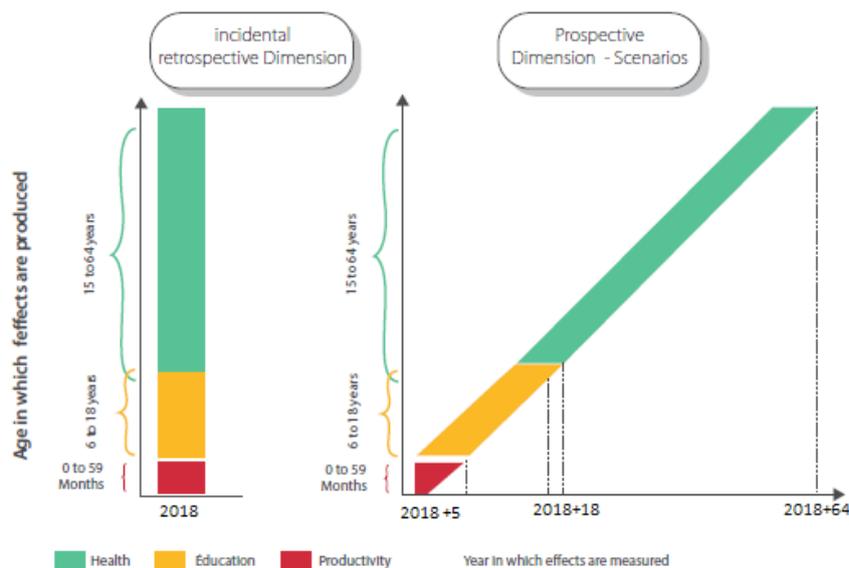
Source: Rodrigo Martinez and Andrés Fernández, Model for analysing the social and economic impact of child undernutrition in Latin America (see footnote) based on consultations carried out by authors.

C. Estimating the Cost of Hunger

Stemming from our conceptual framework, the total cost of undernutrition (TC^U) is a function of higher health-care spending (HC^U), inefficiencies in education (EC^U) and lower productivity (PC^U). This total cost (TC^U) function can be expressed as:

$$TCU = f\,(HC^U, EC^U, PC^U)\quad (1)$$

In the area of health, the high probability resulting from the epidemiological profile of individuals suffering from undernutrition increases the costs in the healthcare sector (HSC^U). In aggregate, this is equal to the sum of the interactions between the probability of undernutrition in each age group, the probability that a particular group will suffer from the diseases because of undernutrition, and the costs of treating the illnesses (HSC^U) that typically includes diagnosis, treatment and control. Added to these, are the costs paid by individuals and their families as a result of lost time and quality of life (IHC^U). The general function associated with the health costs (HC^U) can be expressed in functional form as:

$$HC^U = f\,(HSC^U, IHC^U)\quad (2)$$

In education, the reduced learning capacity and attainment of those who have suffered from child undernutrition increase costs to the educational system (ESC^U). Repeating one or more grades commensurately increases the demand that the educational system must meet, with the resulting extra costs in infrastructure, equipment, human resources and educational inputs. In addition, the private costs (incurred by students and their families) derived from the larger quantity of inputs, external educational supplementation and more time devoted to solving or mitigating low performance problems (IEC^U) are added to the above costs. The education cost (EC^U), can be represented by equation 3 as:

$$EC^U = f\,(ESC^U, IEC^U)\quad (3)$$

The productivity cost associated with undernutrition is equal to the loss in human capital (HK) incurred by a society, stemming from a lower educational level achieved by these individuals (ELC^U), a lower productivity in manual labour experienced by

individuals who suffered from stunting (MLC^U) and the loss of productive capacity resulting from a higher number of deaths caused by undernutrition (MMC^U). In the model these costs are reflected as losses in potential productivity (PC^U) and can be represented in functional form as:

$$PC^U = f(ELC^U, MLC^U, MMC^U) \quad (4)$$

As a result, in order to comprehensively analyse the phenomenon of undernutrition, the model considers its consequences on health, education and productivity by translating them into costs. The details of the process used in computing the costs of undernutrition are elaborated in the Operational Manual for Analysing the Social and Economic Impact of Child Undernutrition in Latin America and the Caribbean (ECLAC).

Implementation Process of Estimating Costs of Undernutrition

To implement the methodology developed in the analytical model the following broad steps were followed:

1. An information system was designed that identifies variables and indicators of the model; adapts indicators for each dimension and identifies potential sources of data for each dimension.

2. Data was collected and the database populated at a workshop, where four working groups (nutrition, health, education and labour) of about 5 experts each were formed to compile the database. After the compilation, the data was validated by the NIT. This process involved contrasting data from different sources and filling of the database.

3. The effects and costs of undernutrition were calculated based on two broad dimensions i.e. retrospective and prospective. In the retrospective dimension the team:

   i. Estimated cases and events in health and education variables. In health these encompassed number of morbidity events and cases and number of mortality cases. In education the number of cases of repetition and difference in education attainment were estimated.

   ii. Estimated the health costs (associated with morbidity), education costs (associated with repetition), and computation of productivity costs (due to mortality and lower attainment in education).

   iii. The total costs in the retrospective dimension were summed up.

In the prospective dimension:

   i. Projected cases and events in health and education variables. In health, these encompassed number of morbidity events and cases and number of mortality cases. In education, the number of cases of repetition and differences in education attainment were projected.

   ii. Estimated the projected health costs (associated with morbidity), projected education costs (associated with repetition), and computation of productivity costs (due to mortality and lower attainment in education).

   iii. The total costs in the prospective dimension were summed up.

4. Scenarios were analysed.

The team defined relevant scenarios based on The Gambia's policy environment, national aspirations and global targets. The four broad scenarios are:

   i. Baseline: The Cost of Inaction. Progress in reduction of stunting and underweight children stops.

   ii. Scenario #1 Cutting by half the prevalence of child undernutrition by 2025.

   iii. Scenario #2: The 'Goal' Scenario. Reduce stunting to meet the Malabo Declaration.

   iv. Scenario #3: Policy Scenario 2030, Based on the National Development Plan and National Nutrition

   Policy.

Table 1.1: Summary of Scenarios

Scenario	Baseline: The Cost of Inaction by 2025	Scenario #1. Halving the Prevalence of Child Undernutrition by 2025	Scenario #2 The 'Goal' Scenario: "10% and 5% by 2025	Scenario #3: Gambia Policy scenario by 2030
Description	Prevalence of stunted and underweight children stops at the level recorded in 2018 (15.7% and 10.6% respectively)	Prevalence of stunted and underweight children is halved to 7.8% and 5.6% respectively by 2025	Prevalence of stunted and underweight children reduced to 10% and 5% respectively by 2025	Prevalence of stunted and underweight children would be reduced to 9.6% and 6% respectively by 2030
Implications	No increase or decrease in percentage points, but an increase in total number of stunted children and higher burden on the society	An average annual reduction of 1.1% and 0.7% in the prevalence of stunting and underweight respectively is required	Average annual reduction 0.8% and 0.8% in the prevalence of stunting and underweight respectively is required	An average annual reduction of 1.7 and 1.1% in the prevalence of stunted and underweight is required respectively
Estimated Change in period	Cost decrease of up to 8 % by 2025 compared to the values in 2018	Cost decrease of up to 43 % by 2025 compared to the values in 2018	Cost decrease of up to 35 % by 2025 compared to the values in 2018	Cost decrease of up to 23 % by 2030 compared to the values in 2018
Annual Average Savings	none	GMD 4.172 Billion USD 87.98 Million	GMD 3.146 Billion US$ 66.35 Million	GMD 4.957 Billion US$ 104.53 Million

5. Based on these findings, a report was prepared focusing on the costs associated with undernutrition impact to health, education and productivity

D. Data and Data Sources

The data collection process was led by the members of the National Implementation Team. The process was initiated with a regional training held in Nairobi, Kenya in June 2018 involving two professionals from The Gambia, one from The Gambia Bureau of Statistics and the other from the National Nutrition Agency. These two officers laid the foundation for the establishment of the NIT as they brought along much needed technical capacity on COHA to the team.

The high-level launching of the COHA study and inauguration of the NIT by H.E the Vice President of The Republic of The Gambia in December 2018 marked the official kick-off of the COHA study in The Gambia. The event was punctuated with encouraging speeches from high-level policy makers including the Honorable Ministers of Finance and Economic Affairs and Basic and Secondary Education. In addition, the entire UN family notably the WFP Country Representative, UNICEF, WHO, UNAIDS, FAO and UNDP were present. In addition, the WFP Addis Office as well as NEPAD sent in representatives. The event was widely covered by the media fraternity.

Following the launching, the team from WFP Africa Office in Addis Ababa facilitated a three days training for the NIT in December 2018. The Objectives of the training was to introduce to the NIT the data requirements and their potential sources for the COHA study, development of a work plan for the data collection process and how to populate the data on the COHA standard excel sheets.

Following the three days induction of the NIT on the data collection processes, the NIT held series of meetings under the coordination of the COHA Secretariat to review the collated secondary data. Having used all the available secondary data, there was need to collect primary data on health protocols and associated costs in one of the busiest Hospitals in The Gambia, Kanifing General Hospital.

Having collated relevant secondary and primary data, the excel sheets were shared with the Addis team for review. A small technical team of 4 members from the NIT was constituted to directly interface with the Addis and the ECLAC team on the data sheets and to provide swift response as well as also filled in gaps as identified by the Addis and ECLAC teams.

Following the finalisation of the data sheets with the team from Africa Office and ECLAC, a two days data validation workshop was held in October 2019. Following the validation of the data by Heads of institutions and partners, the, NIT then initiated the report writing in November 2019. A team of seven NIT members travelled to Addis Ababa, Ethiopia for 6 days to work with the WFP Africa Office to finalize the report. The draft report was then shared with the heads of institutions and partners for comments before the official launch of the COHA report in January 2020.

For the health sector, The Gambia Demographic and Health Survey (GDHS) 2013, The Gambia Micronutrient Survey (GMNS) 2018, the Multiple Indicator Cluster Surveys (MICS) 2006 and 2010, the SMART Surveys 2012 and 2015 and the National Health Account (NHA) 2015 were used. Additional data was obtained from the World Health Organization and the United Nations Department of Economic and Social Affairs (UNDESA). Primary data was collected by conducting surveys and interviews at Kanifing General Hospital involving the Administrator, Medical Officers at the Paediatric Unit, Out-patient Department, Laboratory Technician and Pharmacist to get expert opinion on some of the variables, as well as other relevant international sources. The rationale for selecting Kanifing General Hospital by the NIT was premised on two major factors; first, Kanifing General Hospital is one of the 7 public hospitals in The Gambia credited for having a functional Medical Records Unit and secondly, serving as the main referral hospital for most residents within the Kanifing Municipal Area as evident in the high volume of monthly health service statistics generated by the Health Information Management System (HMIS).

Education data was obtained from 2018 Basic Education Statistical Year Book, Education Management Information System (EMIS), Education Policy 2016-2030 and the Comprehensive Education Public Expenditure Review, 2017.

Labour and productivity data was mainly obtained from the Labour Force Survey 2012 and 2018, Integrated Household Survey of 2015/16. These surveys provide information related to income, expenditure, education, poverty and living conditions. In addition, the Integrated Financial Management Information System (IFMIS), the Budget Execution Report 2018, National Accounts Bulletins and African Economic Outlook 2018 were also used.

Parameters

To arrive at the results and figures, the following parameters based on relative risks were used as shown in the table below:

Table 1.2: Parameters

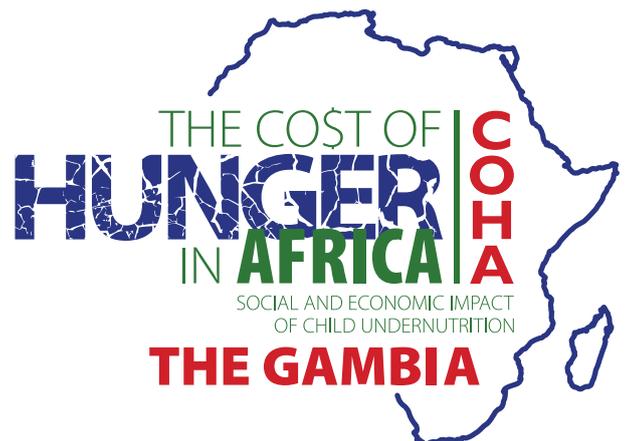| Indicators		Sources	Year
Probability ratio of death between those who suffered from underweight	2.63	Olofin et al (2013)	2013
Probability ratio of death between those who sufferred	2.28	Olofin et al (2013)	2013
Higher Probability (relative risk) of stunted of repeating grades	2.44	Daniels & Adair 2004	2004
Higher Probability (relative risk) of stunted of dropping out	2.86	Daniels & Adair 2004	2004
Productivty Difference between Stunted and Healthy in Manual Labour	6.30%		
Monthly hours worked	200		
Average travel time for ambulatory care	1 hour		
Social discount rate	8%		
% Reduction in manual labour productivity due to stunting	6.30		

Note: The values reported are only indicative

III

Section

Socio-Economic and
Nutrition Situation

THE COST OF
HUNGER
IN AFRICA | COHA

SOCIAL AND ECONOMIC IMPACT
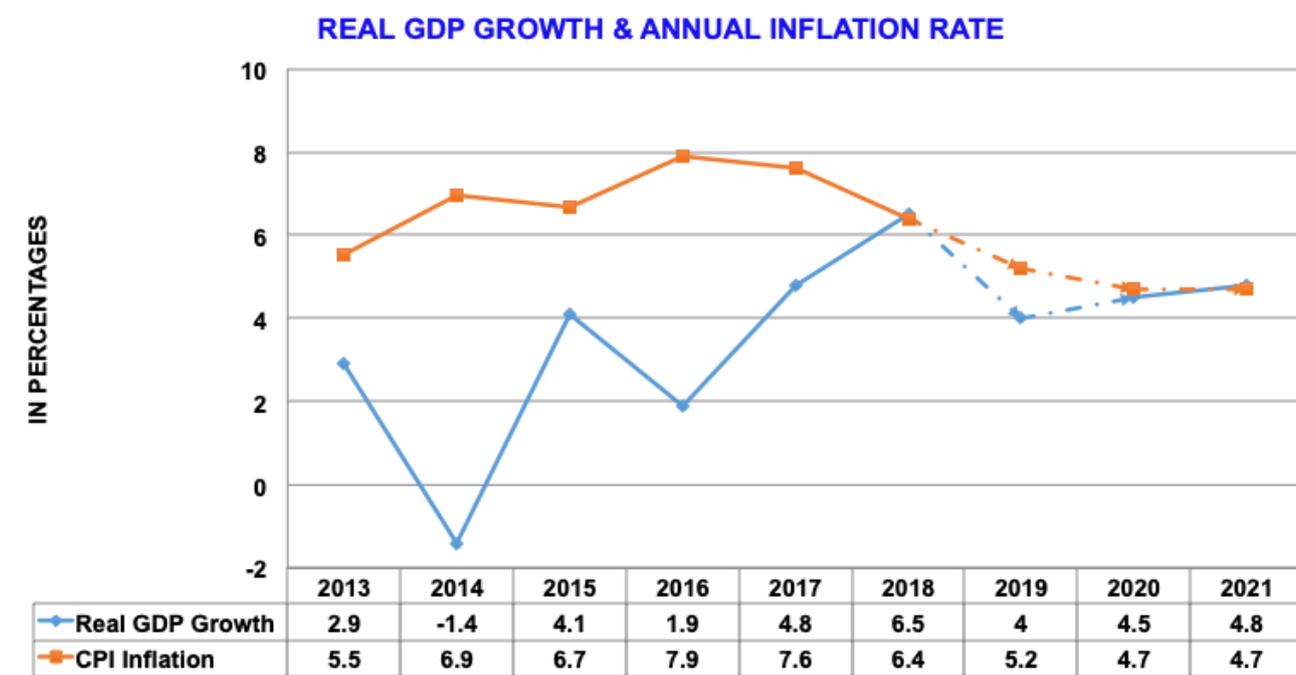OF CHILD UNDERNUTRITION

THE GAMBIA

Section III: Socio-Economic and Nutrition Situation

A. Brief Socio-Economic Background

The Gambia is one of the smallest countries in Sub Saharan Africa with a population of 2,335,507 with a GNI Per Capita Income of USD 709.91 in 2018[14]. The country recorded a GINI index of 45.8 % and 35.9 % in 2010 and 2015 respectively. The GDP of The Gambia was estimated to be USD 1.235 billion, USD 1.358 billion, USD 1.479 billion and USD 1.658 billion for 2015, 2016, 2017 and 2018 respectively. It is projected to accelerate over the medium-term, driven mainly by agriculture and the service sector. The real GDP growth rate as a result of the rebasing was estimated at 2.9 %, -1.4 %, 4.1 %, 1.9 %, 4.8 % and 6.5 % for 2013, 2014, 2015, 2016, 2017 and 2018 respectively, representing an average growth rate of about 3.1 % for the period 2013-2018. It is projected to be 4.0 %, 4.5 % and 4.8 % in 2019, 2020 and 2021 respectively.

The average end period inflation for the period (2013 – 2018) was estimated at 6.8 %. It is projected to be 5.2 %, 4.7 % and 4.7 % in 2019, 2020 and 2021 respectively. The graph below shows the Real GDP growth and annual inflation rate.

Figure 1.4: Real GDP Growth and Annual Inflation Rate

REAL GDP GROWTH & ANNUAL INFLATION RATE

	2013	2014	2015	2016	2017	2018	2019	2020	2021
Real GDP Growth	2.9	-1.4	4.1	1.9	4.8	6.5	4	4.5	4.8
CPI Inflation	5.5	6.9	6.7	7.9	7.6	6.4	5.2	4.7	4.7

The government of The Gambia in its stride to achieve the objectives of SDG2, the WHA Targets, Africa Regional Initiatives, Africa Agenda 2063, and the Malabo Declaration on the total elimination of stunting in Africa, has set itself targets in the National Development Plan (NDP) and National Nutrition Policy 2018 - 2025.

There are also high-levels of inequality (with a GINI index of 35.9 % in 2015) and food insecurity (with a Global Hunger Index of 21.8 categorized as "serious" in 2018 (World Bank, 2019)) due to undernourishment, child undernutrition and child mortality. These pose serious challenges for The Gambia's development.

Despite recent improvements, poverty remains a continuous challenge for The Gambia. In 2015, approximately 48.6 % of the population was living on less than USD 1.25 a day. The incidence of poverty is higher in rural areas where approximately 69.5 % of the population lives below the poverty line, as compared to 31.6 % in urban areas. (Gambia Bureau of Statistics, 2015). This illustrates a higher burden of poverty on rural communities.

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[14] Gambia Labour Force Survey, 2018

Figure 1.5: Real GDP Growth in Selected Sub Saharan Africa Countries, 2016-2019
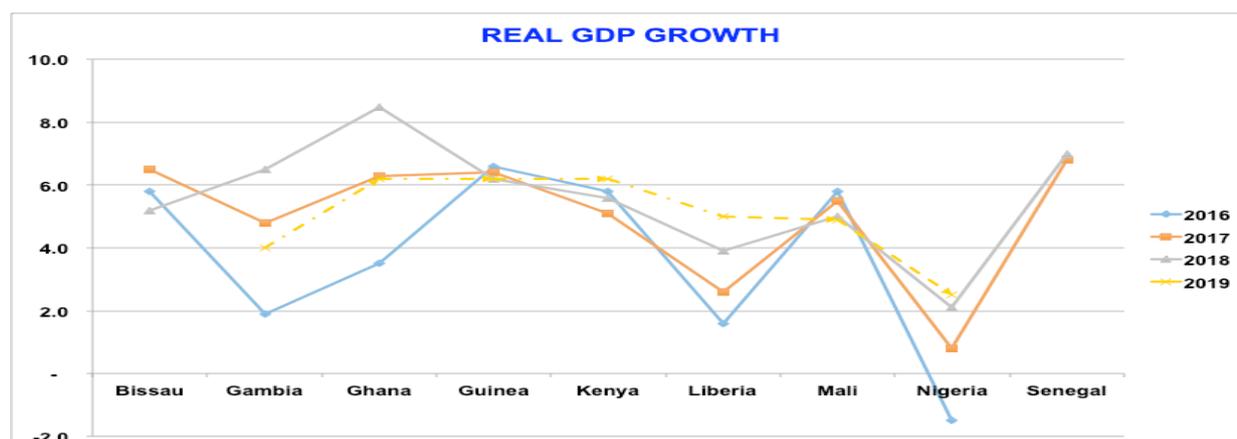
The graph above shows the real GDP growth rate of nine countries in sub Saharan Africa. The trend showcases the volatility in the growth though not severe in some countries apart from Liberia and Nigeria. The graph indicated that Guinea Bissau, Mali and Guinea Conakry had a better GDP Growth. Ghana, Kenya, Senegal and The Gambia also suffer from similar volatility in growth from 2016 to 2018. Looking at the current state of The Gambia, the 2019 projected growth is very optimistic.

With high-levels of poverty, The Gambia also reports high unemployment rates with 35.2 % of people aged 15 -64 years and 41.5 % of youth aged 15-35 reported as being unemployed in 2018.[15]

Table 1.3: Socioeconomic Indicators

Indicators	2013	2014	2015	2016	2017	2018
GDP, total in billions of (currency via/ in USD	1,043,013,668	1,082,013,482	1,235,366,124	1,357,864,599	1,479,168,879	1,658,004,210
GNI per capita (atlas method current US$)	716	641	686	675	688	709
Poverty- $1.25 a day (PPP) (% of population)	48.6 (2010)		48.4			
population below the national line (1% of the Population)	42.5		40.2			
GINI Index			35.9			
Unemployement, % of total labour force	38.4 year (2012)					
Unemployment, youth total (% of total labour forces ages 15-35)	35.3 (15-35 years 2012)					
Population growth (annual %)	3.1	3.1	3.1	3	3	3.2
Life expectancy at birth, total (years)	60.4	60.7	60.9	61.2	61.4	61.9
Gambia real GDP Growth %	2.9	-1.4	4.1	1.9	4.8	6.5

| West Africa real GDP Growth %						
Africa real GDP growth %	5.2	6.1	5.9	6.2	6.5	3.1

Source: African Economic Outlook 2018, GDP Rebased 2018, His 2015 and Labour Survey, 2018

B. Nutrition Profile

The Gambia is experiencing the 'double burden of malnutrition' whereby overweight and obesity co-exist with under-nutrition, while micronutrient deficiencies namely Iron Deficiency Anaemia (IDA), Vitamin A Deficiency (VAD) and Iodine Deficiency Disorders (IDD) are prevalent with dire consequences for the population especially women and children. Under-nutrition continues to be a major public health problem exacerbated by poverty, food deficit, rural-urban migration, environmental degradation, poor dietary habits, low literacy level, poor sanitation, infections, and a high population growth rate. The most vulnerable groups are women and children under - five years of age. The Gambia is ranked medium for stunting and wasting and high for underweight according to the WHO Classification of malnutrition with 15.7% stunting, 5.8% wasting and 10.6% underweight (GMNS 2018).

Nutrition is recognised as a critical component of sustainable human, social and capital development as nutritional well-being is a prerequisite for a healthy and productive living. The Government of The Gambia has placed nutrition high on national development agenda as enshrined in the National Development Plan 2018 – 2021. Over the years there has been some improvements in the prevalence of malnutrition among the under-fives as shown on the figure below:

Figure 1.6: Trends in Malnutrition, 2000 to 2018

Malnutrition Trend
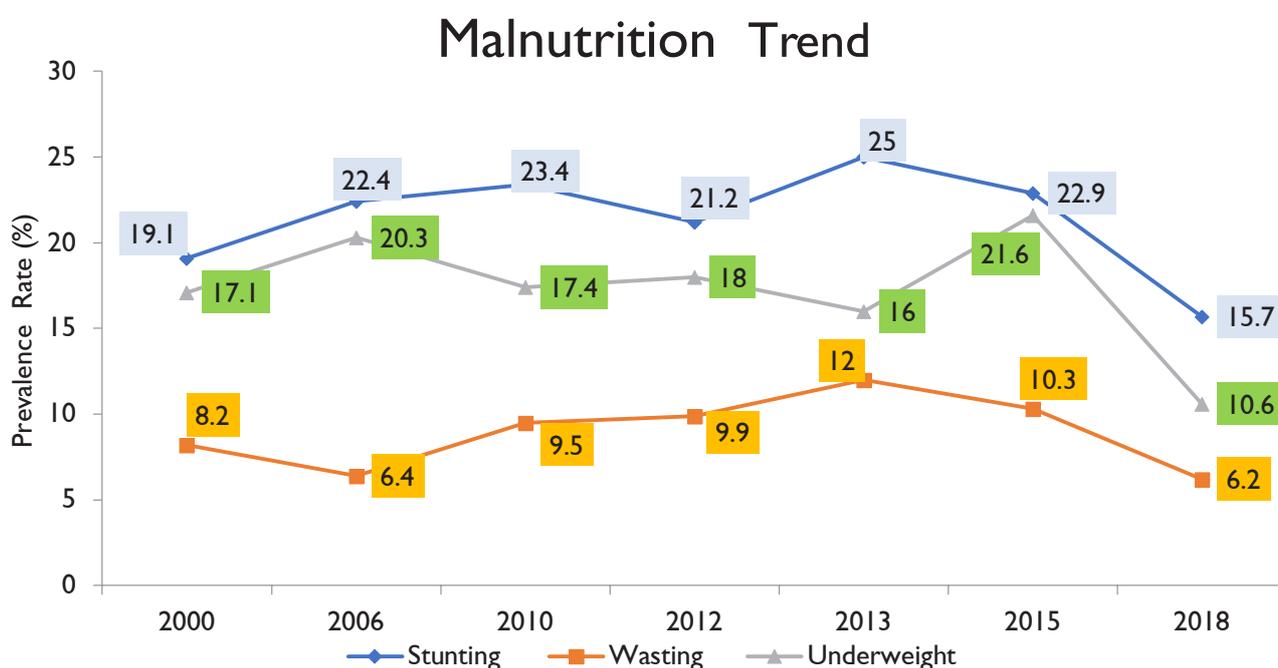
C. Policy Environment in The Gambia

The over-arching direction for nutrition sector planning in The Gambia is guided by the National Nutrition Policy 2018-2025 focusing on the following themes; Improving Maternal Nutrition; Promoting Optimal Infant and Young Child Feeding; Improving Food and Nutrition Security at the National, Community and Household Levels; Improving Food Standards, Quality and Safety; Nutrition and Infectious Diseases; Preventing and Managing Micronutrient Malnutrition; Preventing and Managing Diet-Related Non-Communicable Diseases; Caring for the Socio-Economically Deprived and Nutritionally Vulnerable; Nutrition and HIV/AIDS; Nutrition in Emergencies; Nutrition Surveillance; and Nutrition Research.

Another high-level policy directive is the National Development Plan 2018 - 2021 agenda, where Universal Health Coverage (UHC), Food and Nutrition Security formed part of the pillars. Nutrition-related actions in the UHC (2018-2022) include: investing in preventive and promotive services; increased budgetary allocation to public health programmes and nutrition; supervision and monitoring of rational use of commodities; and commitment to work with ministries for nutrition.

The Gambia is currently implementing the structural reforms and projects outlined in the NDP that would accelerate growth in the area of nutrition to achieve the objective of enhancing the nutritional status of the Gambian populace thus significantly reducing or totally eliminating the rate and the number of stunted children in our society. In order to achieve this, the Government of The Gambia through the National Nutrition Agency, Ministries of Health, Basic and Secondary Education and Finance and Economic affairs have set a target under the Strategic Priority 4 of the NDP which is (Investing in our people through improved education and health services, and building a caring society).

 Specifically, these targets include:

- Improved nutritional well-being of all Gambians, particularly mothers and children

    o Decrease prevalence of underweight among children under 5 from 16% to 8.5% by 2021

    o Decrease prevalence of stunting among children under 5 from 22.9% to 12.5% by 2021

    o Decrease prevalence of GAM among children under 5 from 10.3% to 5.0% by 2021

    o Increase prevalence of exclusive breastfeeding rate for six months from 48% to 60% by 2021

    o Decrease the proportion of pregnant women with anaemia from 67.9% to 40% by 2021

    o Decrease prevalence of underweight in non-pregnant women from 16.7% to 10% by 2021

    o Decrease the proportion of the population who are food insecure from 37.2% to 20% by 2021.

Having achieved these targets, the Gambian child would be ready both cognitively, physically and the sanity of the body together with the prevalence of the conducive environment to achieve the required academic qualification to withstand the surging high challenges in the workforce upon completion.

Without doubt, if the health, the physical condition and the educational attainment of a Gambian child is improved, then the productivity level of the country would increase in the long run. An increment of the productivity level means an ultimate increase of the Gross Domestic Product (GDP). This increment of the GDP would consequently drive economic growth and thus enhance the disposable income of the participants in the economy.

The Health Sector Strategic focus for The Gambia is anchored on the National Health Policy 2012-2020 (Health is Wealth). The actions undertaken by the Ministry of Health are linked to the National Development Plans, notably the right to health, and the decentralisation of healthcare services. The long-term objective for the health sector is the provision of adequate, effective and affordable healthcare for all Gambians. The short-term objectives are to improve the administration and management of healthcare services, improve in the referral system, expand Primary Health Care services in all communities, have a well-motivated and trained staff and ensure an efficient procurement and supply chain management for a responsive and comprehensive healthcare delivery. The National Health Policy 2012 – 2020 seeks to achieve this goal through supporting the provision of equitable, affordable and quality health and related services at the highest attainable standards to every Gambian. The operationalisation of the Health Policy is directed by the National Health Sector Strategic Plan 2014-2020 and is geared towards progressive reorientation of the health services to deliver quality healthcare as a means to achieving the envisaged socio-economic development of The Gambia.

The current health profile of The Gambia according to the 2013 GDHS is characterised by high maternal mortality ratio (433/100,000 live births), high neonatal mortality rate (22 per 1,000 live births), high infant mortality rate (34 per 1,000 live births), high child mortality rate (54 per 1,000 live births). The crude birth rate is 40.5 %. The Contraceptive Prevalence Rate has dropped from 17 % in 2001 to 9 % in 2013.

The Gambia Education Policy 2016 -2030 had envisaged an integrated approach of addressing the nutritional needs of the learner through the School Feeding Programme to enhance the provision of a conducive environment that takes cognizance of the importance of hygiene, water and sanitation.

The Home-Grown School Feeding Programme was launched in 2012 followed by the development of a Home-Grown School Feeding Framework that aims to enhance government's commitment towards full ownership and management of a nationwide School Feeding Programme by 2020. Before 2015, the World Food Programme supported School Feeding Programme across the country providing food to all Lower Basic Schools, but in 2015 WFP began a gradual handing of some regions to the Government. However, there is need for government to expand coverage to all regions and all levels including the Madrassah Schools. In facilitating the gradual take over, capacities are being built to support the management of the programme.

In this regard, school agriculture in the form of the school Farms and Garden Programme is supported and promoted to enhance the Home-Grown School Feeding Programme (HSFP) initiative. In addition, both the Ministry of Basic and Secondary Education (MoBSE) and Ministry of Higher Education Research Science and Technology (MoHERST) encourage relevant institutions under their purview to develop tools and protocols in support of the School Feeding Programme initiative in view of the national food security drive.

To this end, the sectors will collaborate with local authorities to provide institutions with suitable land for farming and gardening. The School of Agriculture at The Gambia College is strengthened and capacitated to produce the relevant technical professional staff. Agriculture biased senior secondary schools are also established.

The education sector partners with the National Nutrition Agency and other stakeholders to implement nutrition education in lower basic schools focusing on the integration of nutrition education into the curriculum of lower basic schools, building capacities of teachers and providing teaching and learning materials that links schools, community and the learning environment.

Integrating a comprehensive inclusive school-based School Health and Nutrition Education program, supported by a formal agreement between the health and education sectors, into the sector plan is supposedly to lead to implementation of interventions that prevent many children from dropping out of school, and positively impacts on the performance of children. Enhanced understanding of basic health especially school-based de-worming and eye health (vision screening) serves as a tool to implementing more comprehensive, inclusive life skills and school health programming.

The education sector collaborates with the MoH to implement school-based health service delivery and school health and nutrition education to move away from the medical approach to school based programmes, that will seek to improve access and retention, school based de-worming, awareness creation about neglected tropical diseases and vision screening.

Public investment in the social sector has also been maintained in the last decade, but is still below the average, by proportion compared to the Sub Saharan Africa. Public spending in education is estimated at 2.1 % while health expenditures is estimated at 1.1 % of GDP in 2018.

Table 1.4: Social Investment Indicators

Indicators	2014	2015	2016	2017	2018
Publics spending on education, total (% of gov.exp)	11.8	10.4		20.4	
Health expenditure per capita (current US$)	23	20.9	21.6	20.9	
Health expenditure total (%of GDP)	5.3	4.8	4		1.1
General government expenditure on health as % of total expenditure on health	14.5	34.4	37.4	40.4	

National Health Accounts 2013, 2015, World Bank Atlas, Gambia Health, Education Statistical Year Book, 2012-2018

The recent improvement in economic growth has been accompanied by a reduction in child undernutrition, particularly in stunting. According to the GDHS 2013, the stunting rate was recorded as 24.5 % which was reduced to 15.7 % according to the GMNS 2018. The prevalence of underweight children has also reduced from 16.2 % in 2013 to 10.6 % in 2018. For that same period, the level of low birth weight prevalence in children has also reduced from 12 % in 2013 to 10.1 % in 2017/2018.

The current levels of child undernutrition illustrate the continuing challenges for reduction of child hunger. It is estimated that 62,778 of the 392,909 children under the age of five in The Gambia were affected by stunting in 2018 and almost 42,348 children were underweight. This situation is especially critical for children between 12 and 23 months, where 18.3 % of children are affected by stunting.

Figure 1.7: Estimated Undernutrition and Stunting Trends in Children Under-Five, 2013-2018
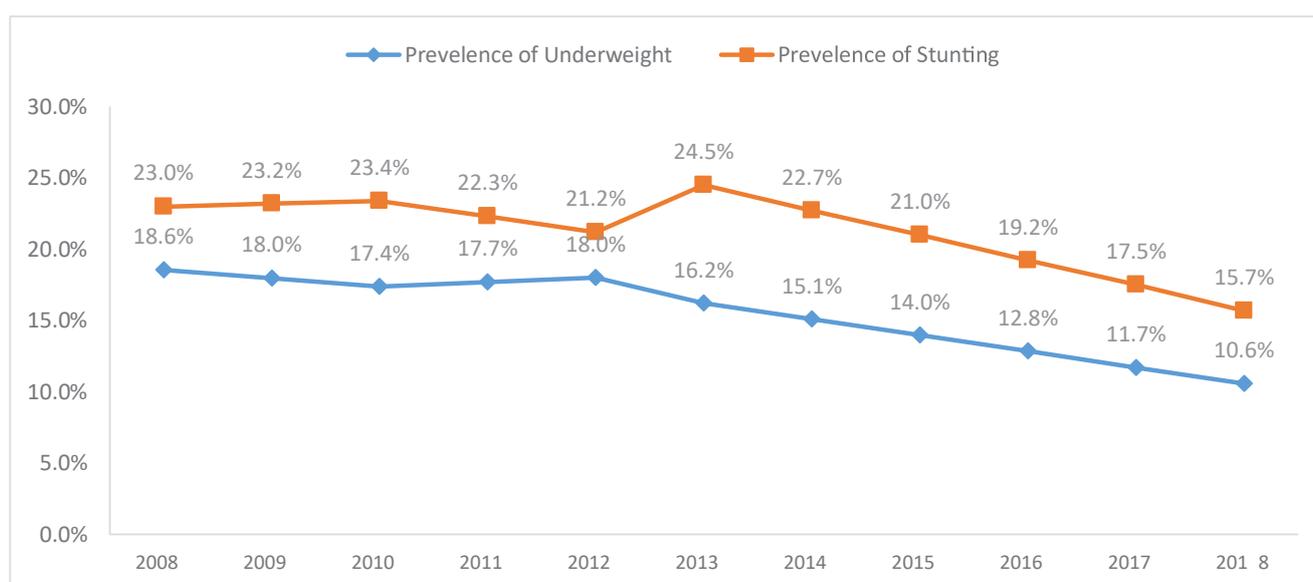
Table 1.5: Population and Child Undernutrition, 2018

Age groups	Population size (2018) a/	Low Birth Weight		Underweight		Stunting	
		Population affected (2018)	Prevalence (2018)b	Population affected (2018)	Under-weight prevalence (2018)b/	Population affected (2018)	Stunting prevalence (2018)b/
Newborn (IUGR)a		8,396	10.1 %				
0 to 11 months	83,1304			4,489	5.4%	11,128	13.4%
12 to 23 months	80,731			11,060	13.7%	14,774	18.3%
24 to 59 months	229,048			26,799	11.7%	36,877	16.1%
Total	392,909	8,396	10.1%	42,348	10.6%	62,778	15.7%

Section IV

Section

Effects and Costs of Child Undernutrition

THE COST OF
HUNGER
IN AFRICA

COHA

SOCIAL AND ECONOMIC IMPACT
OF CHILD UNDERNUTRITION

THE GAMBIA
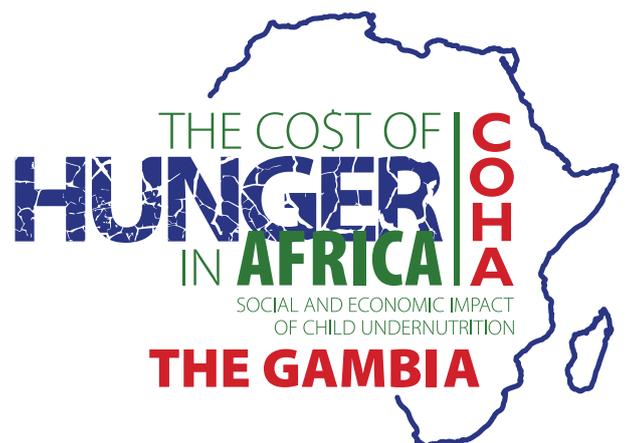
Section IV: Effects and Costs of Child Undernutrition

Undernutrition is principally defined as wasting (low weight-for-height), stunting (low-height-for-age) and underweight (low-weight-for-age). From early childhood, undernutrition could pose adverse long term and intergenerational effects because undernourished children are more likely to seek medical care as a result of undernutrition-related morbidity and deficiencies[17]. This increases the burden on public social services and health costs incurred by the Government and the affected families. In the absence of quality and comprehensive care, underweight and wasting among children leads to higher risk of mortality. On the educational front, stunted children are more likely to repeat grades and drop out of school thereby lowering their income-earning potentials later in life. In addition, adults who were stunted as children are less likely to achieve their expected physical and cognitive development, thereby reducing their productivity.

Figure1.8: Framework for actions to achieve optimum fetal and child nutrition and development

Adopted from: Black et al. 2013; Framework for actions to achieve optimum fetal and child nutrition and development

Black et al 2013 "Maternal and Child Undernutrition and Overweight in Low-Income and Middle-Income Countries"

A: Social and Economic Costs of undernutrition in the Health Sector

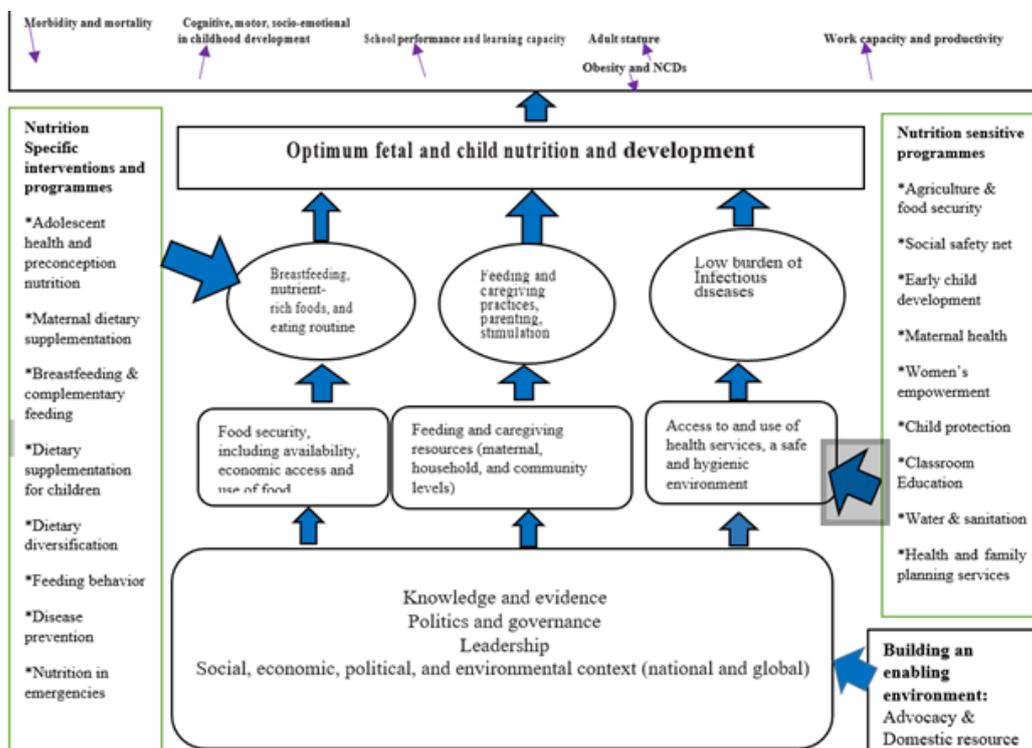Children who are undernourished at an early age have a higher risk of morbidity and mortality. The risk of becoming ill due to undernutrition was estimated using probability differentials in the COHA study as described in the methodology in table 1.2 (parameters). In essence, the study examined medical costs incurred during treatment of low birth weight (LBW), underweight, anaemia, acute respiratory infections (ARI), acute diarrheal syndrome (ADS), and fever/malaria associated with undernutrition in children under the age of five.

Stunting levels of the Working Age Population

Undernutrition leads to stunting in children, which can impact on their productivity at later stages in life. The Gambia has made progress in reducing stunting in children; from 24.5 % in 2013 to 15.7 % in 2018, although it is still high (GDHS 2013; GMNS 2018). As illustrated in figure 1.9, the study estimated that 399,694 adults in the working-age population suffered from growth retardation before reaching the age of five. In 2018, this represented 35.3 % of the population aged 15-64 who were in a disadvantaged position as compared to those who were well nourished as children.

Figure 1.9: Working Age Population Affected by Childhood Stunting by age (in thousands of People)
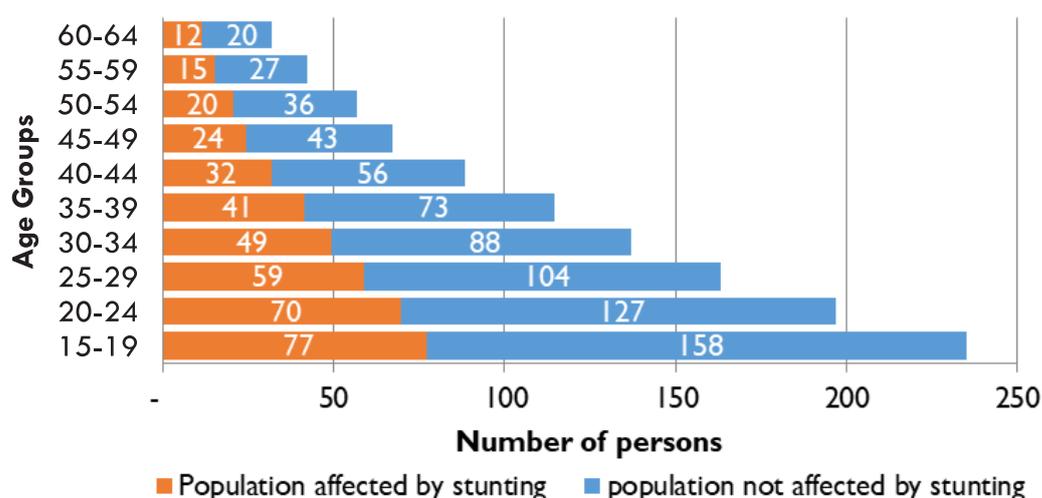
Effects on Morbidity

Undernourished children are more susceptible to recurring illnesses. Based on the differential probability analysis of the 2013 GDHS, children under five years of age and were underweight have 10.7 % increased risk of anaemia, 3.1 % increased risk of diarrhoea, and 0.2 % increased risk of respiratory infection.

The study also estimated that in 2018, there was an increase of 64,094 episodes of illness related to diseases that are associated with underweight. In addition, pathologies related to calorie and protein deficiencies and low birth weight associated with intrauterine growth retardation (IUGR), totalled to more than 4,462 episodes in 2018. As a result, The Gambia had to address 68, 557 illnesses in children that required medical attention and generated costs both to families and to the health sector.

Table 1.6: Morbidities for Children under-five associated with underweight, by pathology, 2018

Pathology	Number of Episodes	Distribution of Episodes
Anaemia	14,564	67.0%
Diarrhoea	3,480	16.0%
ARI-Acute Respiratory Infections	1,797	8.3%
Fever / Malaria	1,906	8.8%
Subtotal	**21,747**	
LBW	4,462	9.5%
Underweight	42,348	90.5%
Subtotal	**46,810**	
Total	**68,557**	

Effects on Mortality

Child undernutrition can lead to increased cases of mortality most often associated with episodes of diarrhoea, pneumonia and malaria[16]. Notwithstanding, when the cause of death is determined, it is rarely attributed to the nutritional deficiencies of the child, but rather to the related illnesses. Given this limitation in attribution, the model utilises relative risk factors[17] to estimate the risk of increased child mortality as a result of child undernutrition. Mortality risk associated with undernutrition was calculated using these relative risk factors, historical survival and mortality rates[18], as well as historical nutrition information.

Between 2013 and 2018, it is estimated that 6,316 child deaths in The Gambia were directly associated with undernutrition. These deaths represent 20.3 % of all child mortalities for this period. Thus, it is evident that undernutrition significantly exacerbates the rates of death among children and limits The Gambia's capacity to reduce child mortality.

Table 1.7: Impact of Undernutrition on child mortality, adjusted by survival rate, 1954-2018 (in number of mortalities)

Period	Number of mortalities associated to undernutrition
1954-1963	4,721
1964-1973	7,138
1974-1983	9,821
1984-1993	12,669
1994-2003	13,716
2004-2013	13,443
2014-2018	6,316
Total	**67,824**

Source: ECA on the basis of life tables provided by UN Population Division

These historical mortality rates also have an impact on national productivity. The model estimates that an equivalent of 35.3 % of the current workforce has been lost due to the contribution of undernutrition to child mortality rates. This represents 48,066 people who would have between 15-64 years old, and part of the working age population of The Gambia.

Estimation of Public and Private Health costs

The treatment of undernutrition and related illnesses is a critical recurrent cost for the health system. Treating a severely underweight child for example, requires a comprehensive care and protocol[19] that is often costlier than the monetary value and effort needed to prevent undernutrition. The economic cost of each episode is often increased by inefficiencies when such cases are treated without adequate guidance from a qualified health-care professional or owing to lack of access to appropriate health and nutrition services. In the last five years to 2018, it is estimated that 68,557 illnesses in children that required medical attention in The Gambia were directly associated with the incremental risk to illnesses associated with children being underweight. These costs generate a significant important burden not just to the public sector but to society as a whole. The commitments of Governments through the Zero Hunger Goal as enshrined in the SDGs and the incorporation of the nutrition targets into National Development Plan 2018-2021 and National Nutrition Policy 2018-2025 should act as a catalyst to an increase investment in nutrition as every dollar spent on nutrition has 15-20 dollar return to the economy of The Gambia.

It is estimated that the 68,557 clinical episodes in The Gambia in 2018, were associated with the higher risk of pathologies in underweight children that generated an estimated cost of GMD 280.7 million as indicated in Tables 1.6, 1.7 and 1.8..

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[16] Robert E. Black et al., "Maternal and child undernutrition: global and regional exposures and health consequences," The Lancet 371, No. 9608, 2008, doi:10.1016/S0140- 6736(07)61690-0

[17] Robert E. Black et al., "Maternal and child undernutrition: global and regional exposures and health consequences," The Lancet 371, No. 9608, 2008, doi:10.1016/S0140-6736(07)61690-0

[18] Data provided by the UN Population Division, http://www.un.org/esa/population/unpop.htm

[19] Integrated Management of Acute Malnutrition, Integrated Management of Neonatal and Childhood Illnesses, Nutrition Guidelines for PLHIV in Support of the AIDS and TB Response in the Gambia 2014

Table 1.8: Health Costs of Undernutrition-related Pathologies, 2018

| Pathology	% of episodes	Cost in Millions GMD	Cost in Millions USD	% of Cost
Underweight	61.8%	214.3	4.52	76.3%
LBW/IUGR	6.5%	6.8	0.14	2.4%
ADS	5.1%	10.6	0.22	3.8%
Fever	2.8%	4.7	0.1	1.7%
ARI	2.6%	18.5	0.39	6.6%
Anaemia	21.2%	25.8	0.54	9.2%
Total Cost		**280.7**	**5.9**	

Most of these costs incurred were associated with the protocol required to bring an underweight child back to a proper nutritional status, which often requires therapeutic feeding and the treatment of other complications[20]. A critical aspect to mention is the costs generated by the treatment of underweight children. These cases represented 61.8 % of all the episodes and generated more than two-third of the total cost (76.3 %). This is due to the special management as indicated in the Integrated Management of Childhood and Neonatal Illnesses (IMNCI) and Integrated Management of Acute Malnutrition (IMAM) protocols required for underweight children which often includes hospitalisation and intensive care.

Figure 1.10: Distribution of incremental episodes and costs of illness associated with undernutrition by age group
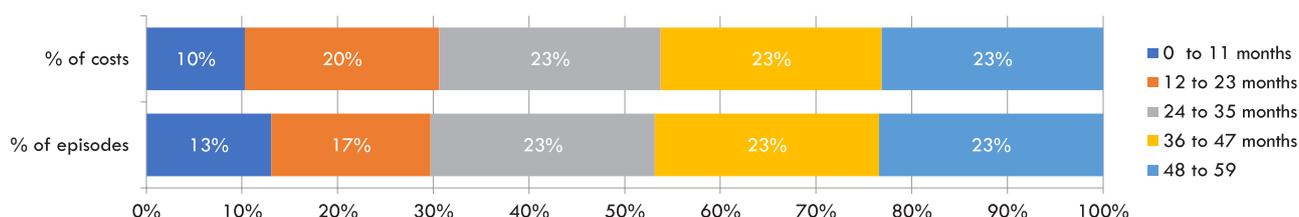
A large proportion of costs related to undernutrition are borne by families as these children are often not provided with comprehensive healthcare. The model estimated that only 7.1 % of these episodes presented receive proper healthcare of therapeutic and supplementary feeding and the management of complications or other opportunistic illnesses. As explained in the methodology section of this report, medical costs incurred in a treatment facility are used as a proxy cost to estimate the burden borne by families. Figure 2.5 summarises the institutional (public system) and costs to caretakers of treating pathologies associated with undernutrition. In The Gambia, it is estimated that families bear 38 % of the costs associated with undernutrition, while the remaining 62 % is borne by the health system in 2018.

Figure 1.11 Distribution of Private and Public Costs in 2018 (In Percentages and Millions of GMD)
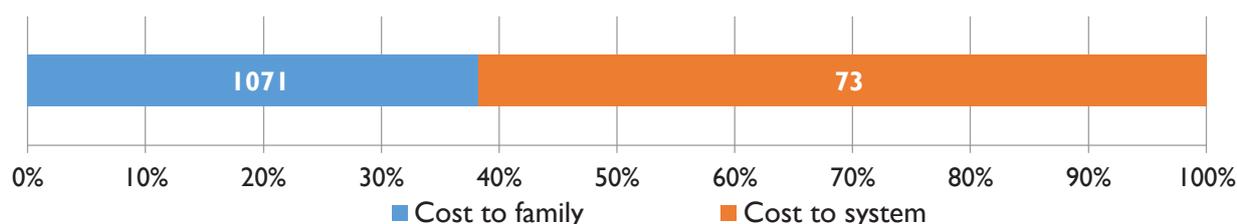
Although the families of undernourished children incur a high percentage of the health costs related to undernutrition, the burden of this phenomenon is still an important expenditure component in the public sector. In 2018, the annual estimated cost to the public sector was equivalent to 9.7 % of the total budget allocated to health. In summary, the economic impact of undernutrition in health-related aspects was equivalent to 0.4 % of total GDP in 2018.

20 IMAM Protocol, IMNCI

In the last few years, world leaders have begun to prioritise nutrition. Countries including The Gambia at the 2012 World Health Assembly agreed to the first-ever set of global nutrition targets where world leaders committed to ending "all forms of malnutrition" by 2030 as part of the Sustainable Development Goals. However, reaching these targets requires a scale up in global investment in nutrition. Nutrition for human capital and socio-economic growth is an opportunity for countries and other partners to make specific, measurable commitments towards achieving these targets and putting The Gambia on a path to greater prosperity and Zero Hunger.

# B: Social and Economic Cost of Undernutrition in the Education Sector

There is no single cause for repetition and dropout; however, there is substantive research that shows that students who were stunted before the age of five are more likely to underperform in school. The number of repetition and dropout cases considered in this section result from applying a differential risk factor associated with stunted children to the official government information on grade repetition and dropouts in 2018. The cost estimations are based on information provided by the Ministry of Basic and Secondary Education from the 2018 Statistical Year Book, EMIS and Education Sector Public Expenditure Review (2017) on the average cost of a child to attend primary and secondary school in The Gambia in 2018, as well as estimations of costs incurred by families to support schooling.

Effects on Repetition

Children who suffered from undernutrition before five years of age are more likely to repeat grades, compared to those that were not affected by undernutrition[21]. In The Gambia in 2018, enrolment rates were relatively high, with 112.7 % gross enrolment in primary education, 68.1 % and 47.8 % for lower and upper secondary education respectively[22].

Based on official information provided by the Ministry of Basic and Secondary Education, the total number of 23,429 children repeated grades one to twelve in 2018 (representing 4.6 % repetition rate in 2018[23]). Using data on increased risk of repetition among stunted students, the model estimated that out of the 23,429 children of grades one to twelve repeating classes in 2018, the repetition rate for stunted children was 8.3 %, while the repetition rate for non-stunted children was 3.4 %. Thus, given the proportion of stunted students, the model estimates that 8,106 students, or 34.6 % of all repetitions in 2018 were associated with stunting.

Figure 1.12: Repetition rate for stunted and non-stunted children, 2018
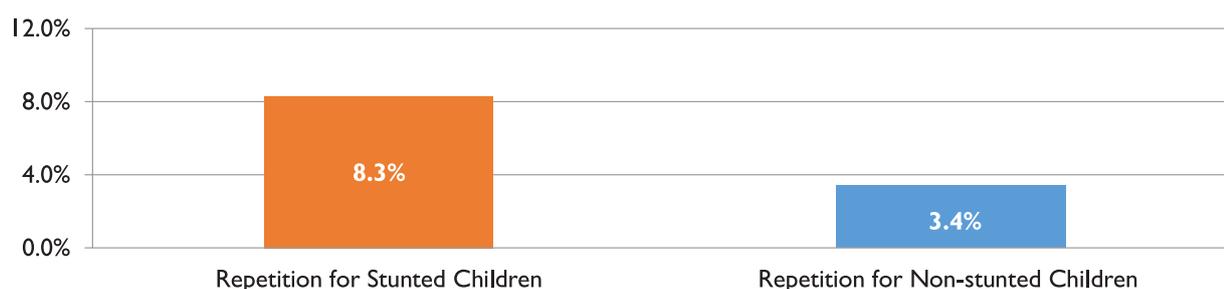
As shown in Figure 2.7, most of these grade repetitions happened during the primary and preparatory school. There are far fewer children who repeat grades in the secondary school; this is largely due to the fact that many underperforming students would have dropped out of school before reaching secondary school.

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[21] idem

[22] UNESCO,.(http://www.uis.unesco.org/Pages/default.aspx). May 2014

[23] Education Management Information System 2018

Figure 1.13: Grade repetition of stunted children, by Grade, 2018
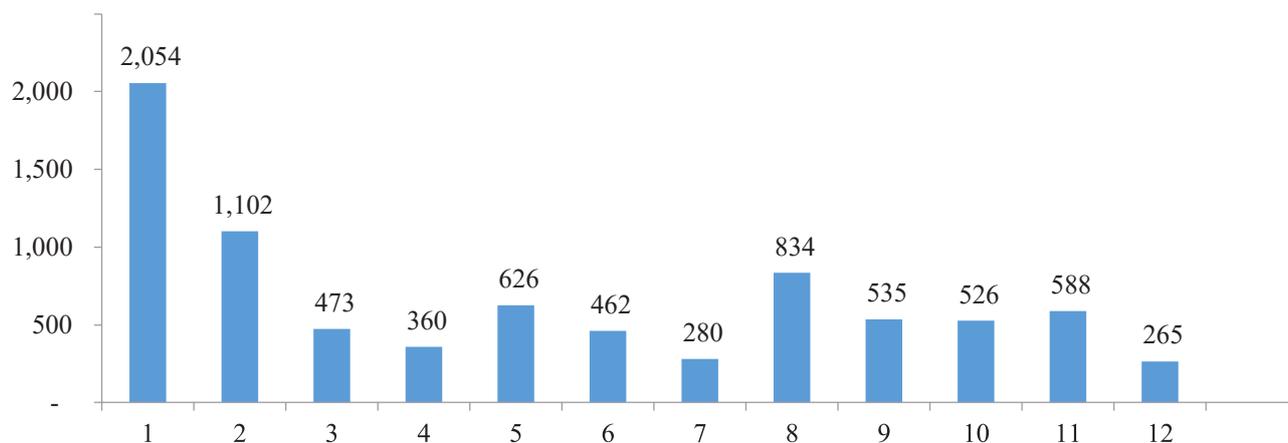
Effects on Retention

Research shows that students who were stunted as children are more likely to drop out of school[24]. According to available data and taking into account relative risks relating to the consequences of stunting on educational performance, there is an important gap in school completion between those who suffered from stunting as children and those with a healthy childhood.

The costs associated with school dropouts are reflected in the productivity losses experienced by individuals searching for opportunities in the labour market. As such, the impact is not reflected in the school age population, but in the working-age population. Hence, in order to assess the social and economic costs in 2018, the analysis focused on the differential in schooling levels achieved by the population who suffered from stunting as children and the schooling levels of the population who were never stunted.

Estimation of Public and Private Education Costs

Repetition in schooling has direct cost implications for families and the school system. Students who repeat grades generate an incremental cost to the education system, as they require twice as many resources to repeat the year. In addition, the caretakers also have to pay for an additional year of education.

In 2018, the 8,106 students (representing 34.6 % of the 23,429 students of grades 1 to 12 that repeated in 2018) who repeated grades (and whose repetitions are considered to be associated with undernutrition) incurred a cost of GMD 59.6 million. The largest proportion of repetitions occurred during primary school, where the cost burden falls mostly on the households. The following chart summarises the public and private education costs associated with stunting. The School Improvement Grant by the Government of The Gambia plays a critical role in the educational cost.

Table 1.9: Costs of Grade Repetitions associated with Stunting (In millions of GMD and USD)

	Lower Basic		Upper Basic		Upper Secondary		Total	
	In GMD	In USD	In GMD	In USD	In GMD	In USD	In Millions GMD	In USD
Number of repetitions associated with stunting		5078		1649		1349		8106
Public Costs per student	2,030.00	42.8	4,132.00	87.1	3,979.00	83.9		

Total Public Costs (in Millions)	10.3	0.2	6.8	0.1	5.5	0.1	22.6	0.4768
Private Costs per student	2,854.00	60.2	5,407.00	114	9,843.00	207.6		
Total Private Costs (in Millions)	14.5	0.3	8.9	0.2	13.6	0.3	37	0.8
Total Costs	24.8	0.5	15.7	0.3	19.1	0.4	59.6	1.3
% Social expenditure on education							**0.0003**	

As in the case of health, the social cost of undernutrition in education is shared between the public sector and the families (households)[25]. Of the overall costs, a total of GMD 37 million (USD 780,261) are being covered by the caretakers, while GMD 22.6 million (USD 476,592) is borne by the public education system. Nevertheless, the distribution of this cost varied depending on whether the child repeated grades in primary or secondary education. In primary and lower secondary education, the families respectively covered 58.4 % and 56.7 % of the associated costs of repeating a year respectively, whereas in upper secondary, the burden on the families increased to 71.2 %. In both cases, the households cover a larger proportion of the burden.

Figure 1.14: Distribution of Costs in Education (In Percentages and Millions of GMD)
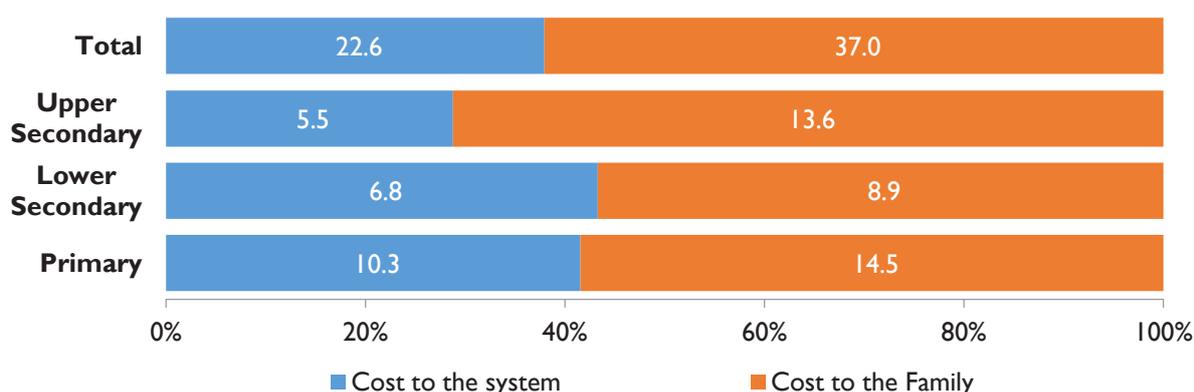
As described in the Social and Economic Cost of Undernutrition in the Health Sector, the model estimated that 35.3 % of the working-age population in The Gambia were stunted as children. Research shows that adults who suffered from stunting as children are less productive than non-stunted workers and are less able to contribute to the economy. This represents 399,694 people whose potential productivity is affected by undernutrition.

C: Social and Economic Costs of Undernutrition in Productivity

The productivity of an economy is adversely affected by historical rates of child undernutrition. Research showed that workers who were stunted during childhood are less productive and thus contribute less to the economy than their non-stunted counterparts. Workers who were stunted during childhood and engaged in manual activities tend to have less lean body mass[26] and are more likely to be less productive in manual activities than those who were never affected by growth retardation[27]. In addition, population lost due to child mortality hinders economic growth, and inhibits their potential to be productive members of society. As described in the Social and Economic Cost of Undernutrition in the Education Sector, it was confirmed that on average, stunted people have achieved fewer years of schooling than non-stunted people[28]. Similarly, as in the health sector, the model estimated that 35.3 % of the total working-age population in The Gambia were stunted as children.

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[25] The Gambia: Education Sector Public Expenditure Review An Efficiency, Effectiveness, Equity, Adequacy, and Sustainability Analysis

[26] C. Nascimento et al., "Stunted Children gain Less Lean Body Mass and More Fat Mass than Their Non-stunted Counterparts: A Prospective Study. Sao Paulo: Federal University of Sao Paulo, 2004.

[27] Lawrence J. Haddad and Howarth E. Bouis, "The impact of nutritional status on agricultural productivity: wage evidence from the Philippines," Oxford Bulletin of Economics and Statistics 53, No. 1, February 1991, doi: 10.1111/j.1468-0084.1991.mp53001004.x.

[28] Melissa C. Daniels and Linda S. Adair, "Growth in young Filipino children predicts schooling trajectories through high school, "The Journal of Nutrition, March 22, 2004, pp. 1439- 1446, accessed November 15, 2019, Jn.nutrition.org

The model utilises historical nutritional information, The Gambia Demographic Projections, adjusted mortality rates, and data reported in the GDHS (2013) to estimate the proportion of the population whose labour productivity is affected by childhood nutrition.

The cost estimates in labour productivity were estimated by identifying differential income associated with lower schooling in non-manual activities, as well as the lower productivity associated with stunted people in manual work, such as agriculture. The opportunity cost of productivity due to mortality is based on the expected income that a healthy person would have been earning, had he or she been part of the workforce in 2018.

National productivity is significantly affected by historical rates of child undernutrition. Firstly, stunted people, on average, have had fewer years of schooling than non-stunted people[29]. In non-manual activities, lengthier schooling is directly correlated with higher income. Research shows that workers who were stunted in childhood and are engaged in manual activities tend to have less lean body mass and are more likely to be less productive in manual activities than those who were never affected by growth retardation. Secondly, the population lost due to child mortality represents forgone economic growth, as they could have been healthy and productive members of the society.

Figure 1.15: Distribution of manual and non-manual workers
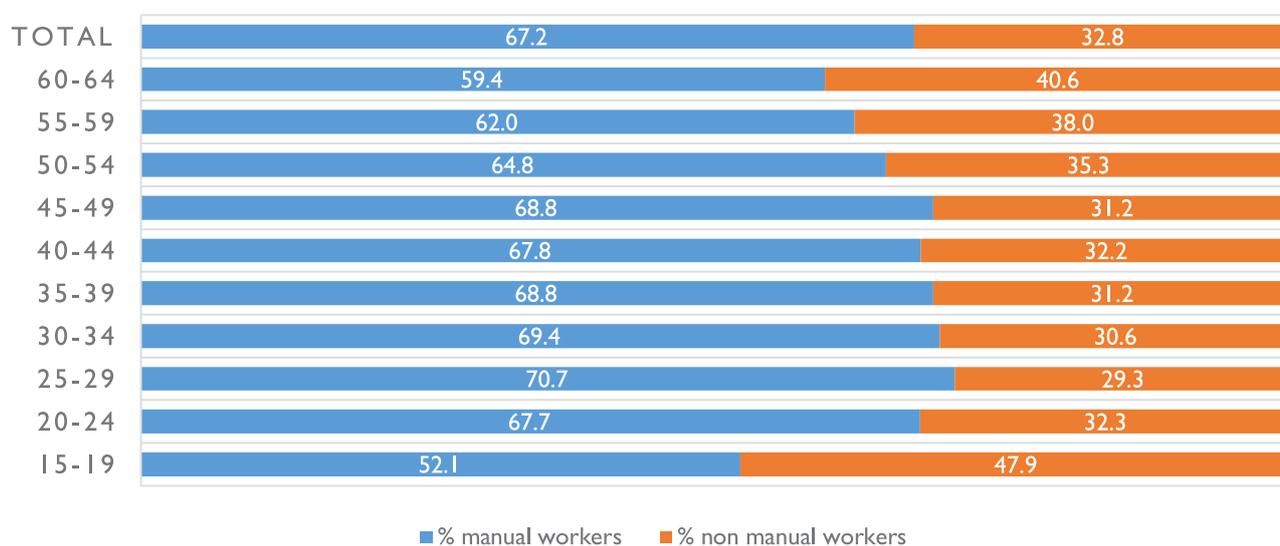
The distribution of the labour market is an important contextual element in determining the impact of under nutrition on national productivity. As illustrated in Figure 1.15, 67.2 % of the working-age population is engaged in manual activities. The tendency to work in manual activities seems to increase for age category 15-35 years, where at least one in three people are engaged in non- manual work.

Losses in Manual Activities

In The Gambia, manual activities are mainly observed in the productive sectors of the economy, most notably the Agriculture and Natural Resources (ANR) sector, which employs approximately 67.2 % of the population. The agricultural sector is one of the leading contributors to GDP accounting for 20-30 %. It is a major employer and key contributor to poverty reduction[30]. Earlier research shows that workers who were stunted as children and engaged in manual activities tend to have less lean body mass[31] and are more likely to be less productive than those who were never affected by growth retardation.[32]

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29 National Development Plan 2018-2021

30 National Development Plan 2018-2021

31 C. Nascimento et al., Stunted Children gain Less Lean Body Mass and More Fat Mass than Their Non-stunted Counterparts: A Prospective Study. Sao Paulo: Federal University of Sao Paulo, 2004.

32 Lawrence J. Haddad and Howarth E. Bouis, "The impact of nutritional status on agricultural productivity: wage evidence from the Philippines," Oxford Bulletin of Economics and Statistics 53, No. 1, February 1991, doi: 10.1111/j.1468-0084.1991.mp53001004.x.

The model estimated that out of the total working age population, 537,268 people were engaged in manual activities, of which 446,088 workers were stunted as children. This represented a loss in potential income of GMD 1.305 billion (USD 27.5 million), equivalent to 1.7 % of the GDP due to lower productivity. Table 1.10 below shows the cumulative loss of income by the different age cohorts within the working age population due to low productivity attributed to stunting.

Table 1.10: Losses in potential productivity in manual activities due to Stunting, 2018

Age in 2018	Population working in manual labour who were stunted as children	Income losses in manual labour	
		millions of GMD	millions of USD
15-19	81,512	237.8	5
20-24	75,693	87.1	1.8
25-29	66,392	344.3	7.3
30-34	54,062	148.7	3.1
35-39	44,658	186.1	3.9
40-44	35,244	84.2	1.8
45-49	29,847	77.7	1.6
50-54	22,892	41.4	0.9
55-59	19,959	44.1	0.9
60-64	15,830	53.5	1.1
Total	446,088	1,304.90	27.5
%GDP		**1.70%**	

Opportunity Cost due to Mortality

Population loss due to child mortality deters economic growth as they could have been healthy productive members of society. As shown earlier, there is an increased risk of child mortality associated with undernutrition.[33] The model estimated that 48,066 people of working age were absent from The Gambia's workforce in 2018 due to child mortality associated with undernutrition. This represents a 3.2 % reduction in the current workforce.

Considering the productive levels of the population, by their age and sector of labour, the model estimated that in 2018, the economic losses (measured by working hours lost due to undernutrition-related child mortality) were GMD 2.37 billion, which represented 3.0 % of the The Gambia's GDP.

Table 1.11: Losses in potential productivity due to mortality associated with undernutrition, 2018

Age in 2018	Working Hours Lost due to Higher mortality of under-weight children	Income losses due to mortality	
	(in millions of hours)	Millions of GMD	millions of USD
15-19	6,754	332.5	7
20-24	6,962	135.2	2.9
25-29	6,546	572.7	12.1
30-34	6,124	284.2	6
35-39	5,446	383	8.1
40-44	4,375	176.3	3.7
45-49	3,798	166.9	3.5
50-54	3,340	101.9	2.1
55-59	2,652	98.9	2.1
60-64	2,069	117.9	2.5
Total	48,066	2369.5	50
%GDP		**3.0%**	

[33] Robert E. Black et al 2008., "Maternal and child undernutrition: global and regional exposures and health consequences," The Lancet 371, No. 9608, 2008, doi:10.1016/S0140-6736(07)61690-0

Overall Productivity Losses

The total loss in productivity in 2018 was estimated at GMD 3.674 billion (USD 77.5 million), which is equivalent to 4.7 % of The Gambia's GDP. The largest share of productivity loss as presented in Figure 1.17 is attributed to reduced productivity due to undernutrition-related mortality which represents 64.5 % of the total cost. The income differential in manual labour, due to the lower physical and cognitive capacity of people who suffered from growth retardation as children represents 35.5 % of the total costs.

Figure 1.17: Distribution of losses in Productivity (in percentages and millions of GMD)
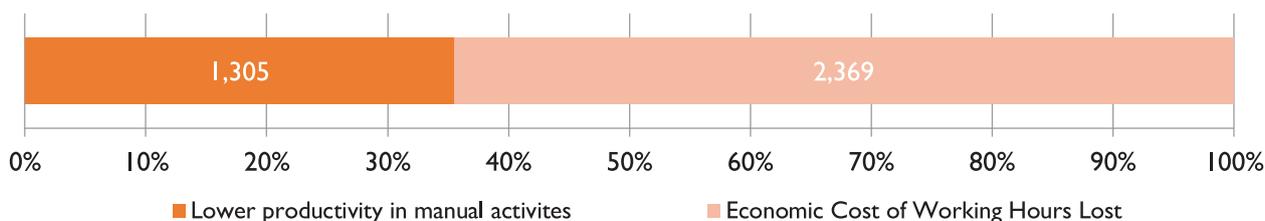
Summary of Effects and Costs

The methodology is used to analyse the impact of child undernutrition in different stages of the life cycle, without generating overlaps. As a result, the individual sectoral costs can be aggregated to establish a total social and economic cost of child undernutrition.

For The Gambia, the total losses associated with undernutrition are estimated at GMD 3.96 billion or USD 83.4 million for the year 2018. These losses are equivalent to 5.1 % of GDP of that year. The highest element in this cost is the loss in potential productivity as a result of undernutrition-related mortalities.

Table 1.12: Summary of Costs, 2018

	Episodes	Cost in Millions of GMD	Cost in Millions of USD	Percentage of GDP
Heath Costs				
LBW and Underweight	46,810	221.1	4.7	
Increased Morbidity	21,747	59.6	1.3	
Total for Health	68,557	280.7	5.9	0.4%
Education Costs				
Increased Repetition - Primary	5,078	0.5	0.011	
Increased Repetition-College	1,649	0.3	0.007	
Increased Repetition – Senior Secondary	1,379	0.4	0.008	
Total for Education	8,106	1	0.03	0.002%
Productivity Costs				
Lower Productivity - Manual Activities	446,088	1,304.9	27.5	1.7%
Lower Productivity - Mortality	48,066	2,369.5	50.0	3.0%
Total for Productivity	494,153	3,674.4	77.5	4.7%
TOTAL COSTS		**3,956.3**	**83.4**	**5.1%**

Section

Analysis of Scenarios

THE COST OF
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SOCIAL AND ECONOMIC IMPACT
OF CHILD UNDERNUTRITION

THE GAMBIA
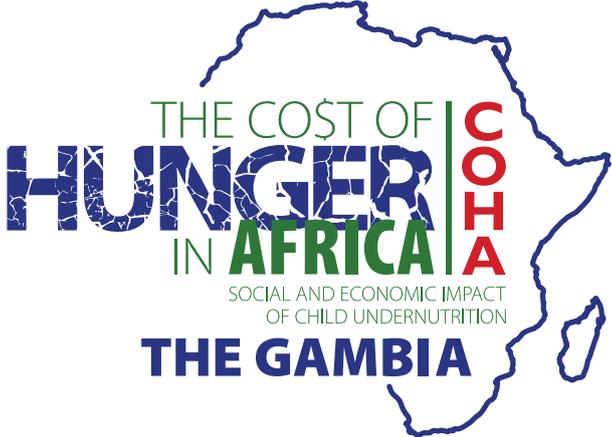
Section V: Analysis of Scenarios

Section IV of this report showed the social and economic costs that affected The Gambia in 2018 due to high historical trends of child undernutrition. Most of these costs are already cemented in the society and policies must be put in place and implemented to improve the lives and livelihood of not only those already affected but also those that may be affected by childhood undernutrition. Nevertheless, there is still room to prevent these costs in the future. Currently, approximately one out of every five children under the age of five in The Gambia is stunted.

This section analyses the impact that a reduction in child undernutrition could have on the socio-economic context of the country. The results presented in this section project the additional costs to the health and education sectors as well as losses in productivity that Gambian children would bear in the future. It also indicates potential savings to be achieved, should the recommendations of this study and the Zero Hunger Strategy be implemented. This is a call for action to take preventive measures and reduce the number of undernourished children to avoid high future costs to the society.

The model generates a baseline that allows development of various scenarios based on nutritional goals established in each country using the prospective dimension. The generated outcomes can be used to advocate for increased investments in proven cost-effective nutrition interventions. These scenarios are constructed based on the estimated net present value of the costs of children born in each year between 2018-2030. The methodology follows each group of children and, based on each scenario, estimates a progressive path towards achieving the set nutritional goals.

The scenarios developed for this report are as follows:

1. Baseline: The Cost of Inaction. Progress in reduction of stunting and underweight children stops.

For the baseline, the progress of reduction of the prevalence of undernutrition stops at the levels achieved in 2018 (i.e. 15.7% and 10.6% for stunting and underweight respectively). It also assumes that the population growth would maintain the pace reported in the year of the analysis, hence increasing the number of undernourished children and the estimated cost. As this scenario is highly unlikely, its main purpose is to establish a baseline, to which any improvements in the nutritional situation are compared in order to determine the potential savings in economic costs.

2. Scenario #1: Cutting by half the prevalence of child undernutrition by 2025.

In this scenario, the prevalence of underweight and stunted children would be reduced to half of the 2018 values corresponding to the reference year. In the case of The Gambia, this would mean a constant reduction of 1.1% annually in the stunting rate from 15.7% in 2018 to 7.8% in 2025. Underweight will be cut by an annual average of 0.7% from 10.6% in 2018 to 5.6% in 2025.

3. Scenario #2: The 'Goal' Scenario. Reduce stunting to 10% and underweight children to 5% by 2025.

In this scenario, the prevalence of stunted children would be reduced to 10% and the prevalence of underweight children under the age of five to 5%. Currently, the global stunting rate is estimated at 26%, with Africa having the highest prevalence at 36%. This Goal Scenario would require a true call for action and would represent an important regional challenge, in which countries of the region could collaborate in its achievement. The progress rate required to achieve this scenario in The Gambia would be 0.8% annual reduction for both stunting and underweight for a period of 7 years, from 2018 to 2025.

4. Scenario #3: Gambia Policy Scenario 2030, Based on the National Development Plan and National Nutrition Policy

In this scenario, the prevalence of underweight and stunted children would be reduced to 12.5% (NDP 2021) and 13% (NNP 2025) of the 2018 values corresponding to the reference year. This would mean an approximate annual average reduction rate of 0.8 % and 0.5 % for stunting and underweight from 15.7% and 10.6% in 2018 to 9.6% and 6% in 2030 respectively. Concerted efforts have to be carried out through improved coordination and investment to complete this scenario that would require a revision of the effectiveness of on-going interventions for the reduction of stunting and underweight as the average rate of annual reduction for stunting between 2013 and 2018 was estimated at 1.7% and 1.1% respectively.

As shown in Figure 1.18, the progressive reduction of child undernutrition generates a similar reduction in the costs associated to it. The distances between the trend lines would indicate the savings that would be achieved in each scenario.

Figure 1.18: Scenarios
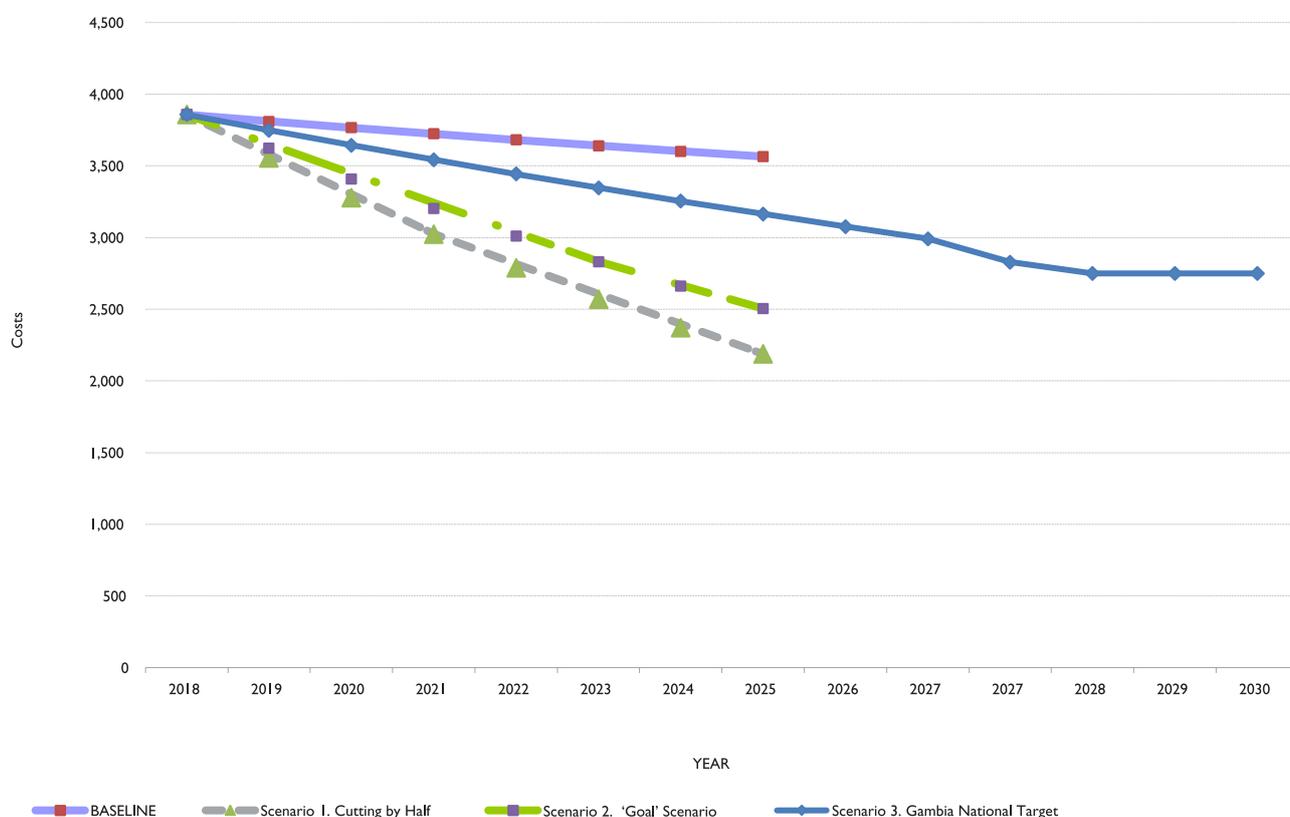
In the baseline, where the progress of reduction of child undernutrition would stop at the levels of 2018, the total cost would reduce by 8%, from GMD 3.857 Billion to GMD 3.565 Billion, during the period leading to 2030. Similarly, in Scenario 1, in which a reduction by half of the current is achieved, the total cost would reduce by 43% to GMD 2.187 billion while the Goal Scenario (Scenario 2) on the other hand, there would be a 35% decrease in the estimated total costs, amounting to GMD 2.504 billion. In Scenario 3, in which by national target of the current prevalence is achieved, the total cost would reduce by 23% to GMD 2.750 billion.

Table 1.13: Estimated Total Costs of Child Undernutrition, by Scenario 2015 (In Millions of GMD)

| | 2018 | Scenarios for the Year 2025 | | | |
| | | Millions of GMD | | | |
	Millions of GMD	S1. The Cost of Inaction	S2. Cutting by Half	S3. Goal Scenario	S4. National Target-2030
Heath Costs					
Increased Morbidity	355	409	204	193	253
Education Cost					
Increased Grade Repetition	32.3	60.3	19.9	25.4	29.2
Productivity Costs					
Lower Productivity in Non-Manual Activities	0	0			
Lower Productivity in Manual Activities	1,015	950	618	709	807
Lower Productivity due to Mortality	2,454	2,146	1,345	1,577	1,660
Total Costs	3,857	3,565	2,187	2,504	2,750
		-292	1,669	1,352	815
		- 8%	- 43%	-35%	- 23%

The potential economic benefits of reducing undernutrition are a key element in making a case for nutrition investments. The reduction in clinical cases in the health system, lowered grade repetition and improved educational performance as well as physical capacity are elements that contribute directly to the national productivity.

As presented in Table 1.13, The Gambia National Target would represent a reduction cost of GMD 2.75 billion equivalent to USD 58.4 million for the periods of 2018 up to 2030 respectively. Although the tendency of savings would not be linear, as they would increase over time with the achieved progress, a simple average of the annual savings would represent USD 4.9 million per year.

Cutting undernutrition by half by 2025 would represent a reduction in costs of over GMD 2.19 billion, equivalent to USD 45.83 million for the period of 7 years, from 2018 to 2025. Although the tendency of savings would not be linear, as they would decrease over time with the achieved progress, a simple average of the annual savings would represent USD 6.5 million per year. In the case of the Goal Scenario, the savings would be GMD 2.5 billion, or USD 52.31 million, which represent a simple average of USD 7.5 million per year.

Table 1.14: Estimated Savings, by Scenario, 2018 (In Millions)

SAVINGS	Cutting Undernutrition by Half by 2025	Goal Scenario	National Targets	Cutting Undernutrition by Half by 2025	Goal Scenario	National Target
	Millions GMD	Millions GMD	Millions GMD	Millions USD	Millions USD	Millions USD
Heath Costs						
Reduced Morbidity	596	634	452	12.57	13.37	9.54
Education Costs						
Reduced Grade Repetition	106	89	20	2.24	1.88	0.43
Productivity Costs						
Higher Productivity in Non-Manual Activities						
Higher Productivity in Manual Activities	997	709	1,032	21.02	14.94	21.75
Increased Working Hours	2,473	1,714	3,453	$52.16	$36.15	72.81
Total Savings	**4,172**	**3,146**	**4,957**	**87.98**	**66.35**	**104.53**

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Section VI: Conclusion and Recommendations

A.   Conclusion

The economic impact associated with child malnutrition particularly underweight and stunted children, is quite significant with far reaching consequences on health, education and productivity. The COHA studies that have already been concluded in several African countries including Burkina Faso, Chad, Egypt, Ethiopia, Ghana, Lesotho, Madagascar, Malawi, Rwanda, Swaziland, Kenya and Uganda show that these economies suffered an estimated annual loss ranging from 1.9 % to 16.5 % of the Gross Domestic Product as a result of undernutrition.

The findings of The Gambia COHA study reaffirmed the results of COHA studies conducted in Africa, Latin America and the Caribbean countries which revealed that undernutrition in children has significant impacts on the economy. The country is estimated to have lost an equivalent of about GMD 3.956 billion in 2018, which represented 5.1 % of the GDP. Productivity related losses contributed the largest costs at 4.7 % of GDP, followed by Health and Education at 0.4 % and 0.002 % respectively. The huge loss implies the need for concerted efforts to address this ongoing challenge.

B.   Recommendations Towards Eradicating Child Undernutrition

In recognition of ongoing efforts, there is need to eradicate undernutrition through three broad avenues encompassing coordination, resource mobilisation and enhanced implementation of programmes.

Coordination

There is need to strengthen and synergise multi-sectoral approaches in tackling undernutrition in The Gambia. With respect to coordination and collaboration, the government and other stakeholders can:

Support the strengthening of multi-sectoral coordination and collaboration for nutrition – in the short to medium term. This can be achieved through: strengthening leadership and governance for nutrition across sectors; and strengthening partnerships and collaborations with private sectors. This should encompass.

(i) developing a Comprehensive Multi-Sectoral Nutrition Action Plan with a Common Results Framework on nutrition endorsed and owned by all stakeholders

(ii) supporting the effective functioning of the governance structures:

      a. National Nutrition Council,

      b. Nutrition Technical Advisory Committee/Multi-sectoral Platform and

      c. Regional Technical Advisory Committees

(iii) supporting implementation of Home-Grown School Meals and nutrition programmes,

(iv) advocating for the mainstreaming and policy alignment of nutrition into national development targets and Zero Hunger strategies,

(v) support the National Alliance for Food Fortification to fortify commonly consumed foods with the required micronutrients and

(vi) advocating for the sharing of all expenditures on nutrition and related interventions with coordination bodies and where possible categorize under nutrition specific and nutrition sensitive financing.

Resource Mobilisation

Domestic Resource Mobilisation for Nutrition Financing: The government with support from other stakeholders need to make deliberate efforts in mobilising resources for sustainable provision of nutrition and health services in view of reduced donor funding. This can be done through:

(i) Developing an Innovative Financing Strategy on nutrition accompanying the multi-sectoral action plan with the establishment of a National Nutrition Fund to be domiciled at the MoFEA

(ii) Advocating for the introduction of nutrition levy on some key services and commodities such as fizzy and sugary drinks;

(iii) Aligning spending to address nutrition and health outcomes and the disease burden, as well as address missed opportunities in implementing high impact preventive interventions.

The additional resources should support not only an increased budgetary allocation but also: human resource capacity development in Nutrition, health, agriculture, education and other sectors; and frameworks for tracking finance towards nutrition.

Implementation of Programmes

The government and other stakeholders need to enhance the implementation of the National Nutrition Policy 2018 – 2025 and the Comprehensive Multi-Sectoral Nutrition Action Plan through adequate funding and continuous tracking of progress. Specifically, there is need to:

1. Reaffirm the governments commitments in the implementation and continuous tracking of national and international policies, declarations, aspirations related to nutrition including: the NDP 2018 - 2021, WHA targets, ARNS, Malabo Declaration, Abuja Declaration and Agenda 2063.

2. Scale up High Impact Nutrition Interventions (HINI) as outlined in National Nutrition Policy 2018 – 2025 and the Comprehensive Multi-Sectoral Nutrition Action Plan (CMNAP). It has been estimated that if the CMNAP is fully implemented, it can prevent malnutrition and reduce child mortality by 30% (Lancet). It is imperative to strengthen implementation of nutrition and health interventions and programs on prevention of child malnutrition, since they have long-lasting improvements in the nutritional status of children under five years.

3. Scale up Nutrition Specific and Sensitive Interventions as guided by the National Nutrition Policy of 2018 - 2015. The Policy aims to fight hunger and free The Gambia from all forms of malnutrition and the scale up calls for nutrition to be mainstreamed across other sectors, policies and plans.

4. Strengthen advocacy efforts for (i) increased investment in Agricultural production and productivity through increased investment in physical agricultural infrastructure focusing on smallholder farmers, labour saving and value chain addition; (ii) the enactment and enforcement of laws related to food and nutrition security; (iii) the strengthening of social protection to support the poor and vulnerable groups, especially women and children; (iv) building regular and detailed assessment on food insecurity and malnutrition levels and (v) the incorporation of a Community Nutrition module and establishment of a Nutrition Program/Course at the higher learning institutions.

5. Promote Food and Nutrition research to have up-to-date information for informed decision making linked to a functional Early Warning Food and Nutrition Security Information System.

6. Strengthen the capacity of policy makers and legislators on nutrition and related activities.

7. Communication, Advocacy and Social Mobilisation: Advocacy is an important key result area if a good nutrition outcome is to be achieved in the country. Political commitment and prioritisation of nutrition at national, regional and local government levels should be key to the establishment of nutrition-specific budget lines at national, regional and local government level budgets. Support the implementation of a communication strategy on nutrition and advocate for the implementation of the recommendations of the Zero Hunger Strategic review.

8. Monitoring and Evaluation: Scale up and strengthening sectoral nutrition information systems and facilitation of tracking program interventions. This should be supported by monitoring and evaluation of performance set targets, as well as ensuring accountability and learning framework mechanisms for the various nutrition stakeholders.

Besides these broad interventions the following are interventions specific to the education sector:

(i) Essential package interventions. The Home-Grown School Meals Programme should be integrated with an essential package of interventions that include: assessments of nutritional status of children, micronutrient supplements, use of fuel-efficient stoves, correct waste management, provision of safe drinking water, nutrition education, education on hygiene and sanitation.

(ii) Promote nutritional awareness and intake of adequate, locally available and nutritious foods among school children and communities. This should encompass (i) awareness of nutritional policies adopted at the national government level;

(iii) Social and Behavioural Change Communication to sensitise communities including schools (teachers, learners, cooks, parents); Village Development Committees, Village Support Groups, and Traditional Communicators on appropriate nutrition practices and behaviours to prevent malnutrition.

C. Limitations of the Study

• Data availability and gaps - The Gambia Labour Force Survey 2018 was the major source of data for the average income data for both manual and non-manual workers. However, there were some inconsistencies in the interval used in the income ranges and hence, challenges were faced in computing average income especially for non-manual workers. Therefore, estimations were done to fill the data gaps.

• At the time of data collation, the MICS 2018 data was not launched and as a result it could not be used for the estimation of malnutrition prevalence in this study. Therefore, the GMNS 2018 which was conducted and validated was used.
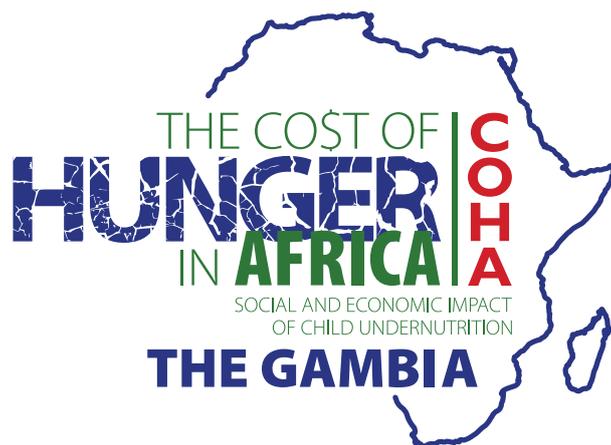
VII

Section

Annexes

THE CO$T OF
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Section VII: Annexes

Annex 1 Glossary of Terms

1.   **Average number of days required for hospitalisation:** The average number of days a child needs to stay in a hospital when hospitalised, to receive adequate care.

2.   **Average number of days required for ICU:** The average number of days a child needs to stay in the ICU when put in ICU care, to receive adequate care.

3.   **Average number of primary care visits per episode:** When a child experiences a given pathology, he/she may require medical care multiple times. This variable is the average number of primary (outpatient) medical care visits a child requires per episode.

4.   **Average waiting time spent at primary care:** When a caretaker brings a child to a primary care facility, the time the parent and child spend at the facility for waiting and receiving care.

5.   **Child Undernutrition:** The result of prolonged low levels of food intake (hunger) and/or low absorption of food consumed. It is generally applied to energy or protein deficiency, but it may also relate to vitamin and mineral deficiencies. Anthropometric measurements (stunting, underweight and wasting) are the most widely used indicators of undernutrition.

6.   **Chronic Hunger:** The status of people, whose food intake regularly provides less than their minimum energy requirements leading to undernutrition.

7.   **Cost of medical inputs per event during hospitalisation:** This variable includes the medical materials (medicines, procedures) that are covered by the hospital for treatment of each pathology case.

8.   **Cost of medical inputs per event in ICU:** This variable includes the medical materials (medicines, procedures) that are covered by the hospital for treatment of each pathology case in ICU.

9.   **Cost of medical inputs per event in primary care:** This variable includes the medical materials (medicines, procedures) that are covered by the health facility for treatment of each pathology case.

10.   **Costs not covered by the health system:** This variable includes the value of the inputs (i.e. medications) that are paid for by the family.

11.   **Daily cost of hospital bed during hospitalisation:** This variable includes the total cost to the hospital calculated per day per patient staying in the hospital. This value includes the cost of staff, facilities and equipment, as a unit cost per patient.

12.   **Daily cost of hospital bed in ICU:** This variable includes the total cost to the hospital calculated per day per patient staying in the ICU. This value includes the cost of staff, facilities and equipment, as a unit cost per patient.

13.   **Daily hours lost due to hospitalisation:** The number of hours the caretaker spends at the hospital each day with the child when he/she brings a child to a primary care facility.

14.   **Differential Probability (DP):** Refers to the difference between the probability of occurrence of a consequence (i.e., disease, grade repetition and lower productivity) given a specific condition. The model uses this variable specifically to determine the risk among those suffering from undernutrition and those who are not (ECLAC).

15.   Discount rate: The interest rate used to assess a present value of a future value by discounting (FAO). In the model it is utilised to obtain the present value in the scenario section.

16.   Dropout rate per grade: Percentage of students who drop out of a grade in a given school year (UNESCO).

17.   Episodes: It is the number of disease events occurring for a given pathology. In the model it is based on a one-year period, i.e. the number of times a specific pathology occurs in one year (ECLAC).

18.   Food insecurity: Exists when people lack access to a sufficient amount of safe and nutritious food and therefore, are not consuming enough for an active and healthy life. This may be due to the unavailability of food, inadequate purchasing power or inappropriate utilisation at household level (FAO).

19.   Food vulnerability: Reflects the probability of an acute decline in food access or consumption, often in reference to some critical value that defines minimum levels of human wellbeing (WFP).

20.   Hunger: The status of persons, whose food intake regularly provides less than their minimum energy requirements, i.e. about 1800 kcal per day. It is operationally expressed by the undernourishment indicator (FAO).

21.   Incidental retrospective dimension: Used to estimate the cost of undernutrition in a country's population in a given year. The model applies it by looking at the health costs of pre-school children (0 to 5-year-olds) suffering from undernutrition, the education costs of school-age children (6 to 18-year-olds) and the economic costs resulting from lost productivity by working-age individuals (15 to 64-year-olds) (ECLAC).

22.   Intrauterine growth restriction (IUGR): Refers to the foetal weight that is below the 10th percentile for gestational age (WHO). In the model, this is the only type of condition considered in the estimation of cost for low birth weight children.

23.   Low Birth Weight (LBW): A new-born is considered to have low birth weight when he/she weighs less than 2,500 grams (WHO).

24.   Malnutrition: A broad term for a range of conditions that hinder good health caused by inadequate or unbalanced food intake or by poor absorption of the food consumed. It refers to both undernutrition (food deprivation) and over nutrition (excessive food intake in relation to energy requirements) (FAO).

25.   Mortality rate: The proportion of deaths per year in a given population, usually multiplied by a 10th population size so it is expressed as the number per 1,000, 10,000, or 100,000, individuals per year.

26.   Percentage of cases that attend health services: The proportion of episodes for which a caretaker brings a child to a primary health facility for treatment.

27.   Productivity/Labour productivity: Measures the amount of goods and services produced by each member of the labour force or the output per unit of labour (ILO). In the model, it refers to the average contribution that an individual can make to the economy, measured by consumption or income, depending on data availability.

28.   Proportion of episodes requiring hospitalisation: When a child experiences pathology, he/she may require inpatient care. This variable identifies the proportion of the episodes by pathology, for which a child requires hospitalization.

29.   Proportion of episodes requiring ICU: When a child experiences pathology, he/she may require care in an ICU facility. This variable identifies the proportion of the episodes by pathology, for which a child requires ICU care.

30.   Prospective or potential savings dimension: This dimension makes it possible to project the present and future losses incurred as a result of medical treatment, repetition of grades in school and lower productivity caused by undernutrition among children under the age of five in each country, in a specific year (ECLAC).

31.   Public social spending: Social expenditure is the provision by public (and private) institutions of benefits to, and financial contributions targeted at, households and individuals in order to provide support during circumstances, which adversely affect their welfare, provided that the provision of the benefits and financial contributions constitutes neither a direct payment for a particular good or service nor an individual contract or transfer (OECD).

32.   Relative risk: Refers to the risk of an event occurring, given a specific condition. It is expressed as a ratio of the probability of the event occurring in the exposed group versus a non-exposed group. In the model it is used to establish the risk level of disease, lower educational performance or lower productivity relative to exposure to undernutrition.

33.   Repetition rate per grade: Number of repeaters in a given grade in a given school year, expressed as a percentage of enrolment in that grade in the previous school year (UNESCO).

34.   Stunting: Reflects shortness-for-age; an indicator of chronic malnutrition, calculated by comparing the height-for-age of a child with a reference population of well-nourished and healthy children (WFP). The model uses it as the indicator to analyse the impact on educational performance and productivity.

35.   Survival rate: A rate calculated for a given geographic area that presents the likelihood of a person surviving in a given period of time.

36.   Undernourishment: Food intake that is continuously insufficient to meet dietary energy requirements. This term is used interchangeably with chronic hunger, or, in this report, hunger (FAO).

37.   Undernutrition: The result of prolonged low levels of food intake and/or low absorption of food consumed (undernourishment). It is generally applied to energy (or protein and energy) deficiency, but it may also relate to vitamin and mineral deficiencies (FAO).

38.   Underweight: Measured by comparing the weight-for-age of a child with a reference population of well-nourished and healthy children (WFP). The model utilises it to analyse the impact of child undernutrition on health.

39.   Unit cost per attention in primary care: This variable includes the total cost to the health facility per attention, comprising the cost of staff, facilities and equipment, as a unit cost per patient.

40.   Wasting: Reflects a recent and severe process that led to substantial weight loss, usually associated with starvation and/ or disease. Wasting is calculated by comparing weight-for-height of a child with a reference population of well-nourished and healthy children (WFP).

Annex II Technical Notes on Methods and Assumptions

Index	Source
First Economic Data	
Gross Domestic Product	Gambia Bureau of Statistics, Rebase Figures 2013-2018
USD exchange rate	Central Bank of the Gambia, www.cbg.gm
Purchasing Power Parity	Knoema.com 2017
Health Expenditure	National Health Account, 2015
Education Expenditure	Education Sector Public Expenditure Review 2017
Average transport cost (two public transportation tickets in urban areas in GMD)	Nationwide Passenger Transport Fares, Ministry of Transport, Works and Infrastructure, 2018
Minimum wage per hour	Government Integrated Pay Scale, Personnel Management Office
Annual Consumer Price Index	Obtained from GBoS
Average income per years of schooling	Gambia Labour force Survey 2018
Annual average income related to productive work, manual intensive activities (Agriculture, Forestry, Fishery, Mining) by age	Gambia Labour Force Survey 2018
Annual average income related to productive work, NON manual intensive activities (Excluding Agriculture, Forestry, Fishery, Mining) per years of schooling and age	Gambia Labour Force Survey 2018
Average working hours per week	Gambia Labour Force Survey 2018
Annual worked hours per age group	Gambia Labour Force Survey 2018
Employment rate	Gambia Labour Force Survey 2018
Second Demographic Data	
Death rate	UNDESA
Distribution of workers by Manual and Non-Manual Labour per age group	Gambia Labour Force Survey 2018
Distribution of workers by educational status	Gambia Labour Force Survey 2018
Working age population (WAP) by educational level	Gambia Labour Force Survey 2018
Third Health Data	
Underweight prevalence for the year of analysis or last available.	Gambia Micronutrient Survey (GMNS), 2018
Stunting prevalence for the year of analysis or last available.	Gambia Micronutrient Survey, 2018
Underweight prevalence of children under five years old	Gambia Demographic and Health Survey 2013, SMART 2012, 2015, MICS 1996, 2000, 2005, 2010, GMNS 2018,
Underweight mode prevalence	Calculated from GDHS 2013, SMART 2012 and MICS 1996, 2000, 2005, 2010, GMNS 2018
Stunting prevalence of children under five years old	Gambia Micronutrient Survey (GMNS), 2018.

Stunting mode prevalence	Calculated from GDHS 2013, SMART 2012 and MICS 1996, 2000, 2005, 2010, GMNS 2018.
Number of annual disease events (anaemia, ADS, ARI, Stunting, Underweight, Wasting) by Age group	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital. Other data source: Health Management Information System, National Health Account 2015, For stunted and underweight - GDHS 2013, SMART 2012 and MICS 1996, 2000, 2005, 2010, GMNS 2018. The incidence rate for diarrhoea for 28 days -11 months is 1 incident per child, 12-23 months is 2 incidents per child and 24 -59 months is 3 incidents per child. The incidence rate for fever/malaria for 28 days -11 months is 1 incident per child, 12-23 months is 1 incident per child and 24 -59 months is 2 incident per child. The incidence rate for ARI for 28 days -11 months is 3 incidents per child, 12-23 months is 3 incident per child and 24 -59 months is 3 incidents per child. The incidence rate for underweight for 28 days -11 months is 1 incidents per child, 12-23 months is 1 incident per child and 24 -59 months is 1 incidents per child. The incidence rate for anaemia for 28 days -11 months is 1 incidents per child, 12-23 months is 1 incident per child and 24 -59 months is 2 incident per child.
Average number of primary care visits for each pathology (anaemia, ADS, ARI, Stunting, Underweight, Wasting) by Age group	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital. Other data source: Health Management Information System, National Health Account 2015, For stunted and underweight - GDHS 2013, SMART 2012 and MICS 1996, 2000, 2005, 2010, GMNS 2018 The average visits for primary care for Diarrhoea for 28 days -11 months is 1 visits per child, 12-23 months is 1 visits per child and 24 -59 months is 1 visits per child. The average visits for primary care for Fever/Malaria for 28 days -11 months is 2 per child, 12-23 months is 2 visit per child and 24 -59 months is 2 visit per child The average visits for primary care for ARI for 28 days -11 months is 2 visits per child, 12-23 months is 2 visits per child and 24 -59 months is 2 visits per child The average visits for primary care for Underweight for 28 days -11 months is 6 visits per child, 12-23 months is 6 visits per child and 24 -59 months is 6 visit per child The average visits for primary care for Anaemia for 28 days -11 months is 2 visits per child, 12-23 months is 2 visits per child and 24 -59 months is 2 visit per child
Proportion of events of pathology (anaemia, ADS, ARI, Stunting, Underweight, Wasting) by Age group requiring hospitalisation	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital. Other data source: Health Management Information System, National Health Account 2015, For stunted and underweight - GDHS 2013, SMART 2012 and MICS 1996, 2000, 2005, 2010, GMNS 2018 Diarrhoea episodes between 28 days- 11 months 25 %, 12 -23 months 30 % and 24-59 months is 30 %. Fever/malaria episodes between 28 days- 11 months 25 %, 12 -23 months 30 % and 24-59 months is 30 %. ARI episodes between 28 days- 11 months 40 %, 12 -23 months 40 % and 24-59 months is 40 %. Underweight episodes between 28 days- 11 months 10 %, 12 -23 months 30 % and 24-59 months is 30 %. Anaemia episodes between 28 days- 11 months 10 %, 12 -23 months 10 % and 24-59 months is 10 %

Average number of days of hospital treatment for each event (anaemia, ADS, ARI, Stunting, Underweight, Wasting) by Age group	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital. Other data source: Health Management Information System, National Health Account 2015,
	For stunted and underweight - GDHS 2013, SMART 2012 and MICS 1996, 2000, 2005, 2010, GMNS 2018
	The average days for hospital treatment for diarrhoea for 28 days -11 months is 3 days per child, 12-23 months is 3 days per child and 24 -59 months is 3 days per child
	The average days for hospital treatment for fever/malaria for 28 days -11 months is 5 days per child, 12-23 months is 5 days per child and 24 -59 months is 5 days per child.
	The average days for hospital treatment for ARI for 28 days -11 months is 5 days per child, 12-23 months is 5 days per child and 24 -59 months is 5 days per child
	The average days for hospital treatment for underweight for 28 days -11 months is 7 days per child, 12-23 months is 7 days per child and 24 -59 months is 7 days per child
	The average days for hospital treatment for 28 days -11 months is 5 days per child, 12-23 months is 5 days per child and 24 -59 months is 5 days per child
Proportion of events of pathology (anaemia, ADS, ARI, Stunting, Underweight, Wasting) by Age group requiring intensive treatment (ICU)	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital.
Average number of days of intensive treatment UTI / UCI for each event (anaemia, ADS, ARI, Stunting, Underweight, Wasting) by Age group	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital.
Average waiting time spent at primary care attention (anaemia, ADS, ARI, Stunting, Underweight, Wasting) by Age group	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital.
	Average waiting time for diarrhea 28 days-11 months 60 minutes, 12-23 months 60 minutes, 24 -59 months 60 months.
	Average waiting time for fever/malaria 28 days-11 months 60 minutes, 12-23 months 60 minutes, 24 -59 months 60 months
	Average waiting time for ARI 28 days-11 months 60 minutes, 12-23 months 60 minutes, 24 -59 months 50 months
	Average waiting time for underweight 28 days-11 months 60 minutes, 12-23 months 60 minutes, 24 -5 months 60 minutes
	Average waiting time for anaemia 28 days-11 months 60 minutes, 12-23 months 60 minutes, 24 -5 months 60 minutes.
Daily hours lost due to hospitalisation (anaemia, ADS, ARI, Stunting, Underweight, Wasting) by Age group	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital.
	An average estimate of 8 hours was observed across all the pathological incidences

Average unit cost for attention in primary care by age group and pathology (anaemia, ADS, ARI, Stunting, Underweight, Wasting), for the year of analysis (2018) in GMD,	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital. Standard laboratory Charges published by the MoH, Costs includes extra cost of care borne by the family Calculation of health cost includes; Consultation fee, cost of bed, cost of laboratory tests, General Services for children under five are free but medications and test are procured when not available at the public hospital.
Average cost of medical inputs for event in primary care by age group and pathology (anaemia, ADS, ARI, Stunting, Underweight, Wasting), for the year of analysis (x) in GMD,	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital.
Average unit cost for attention in hospital by age group and pathology (anaemia, ADS, ARI, Stunting, Underweight, Wasting), for the year of analysis (x) in GMD,	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital.
Average cost of medical inputs for event in hospital by age group and pathology (anaemia, ADS, ARI, Stunting, Underweight, Wasting), for the year of analysis (x) in GMD,	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital.
Average unit cost for attention in hospital intensive care unit by age group and pathology (anaemia, ADS, ARI, Stunting, Underweight, Wasting), for the year of analysis (x) in GMD,	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital.
Average cost of medical inputs for event in hospital intensive care unit by age group and pathology (anaemia, ADS, ARI, Stunting, Underweight, Wasting), for the year of analysis (x) in GMD,	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital.
Average unit private cost by age group and pathology (anaemia, ADS, ARI, Stunting, Underweight, Wasting), for the year of analysis (x) in GMD,	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital.
Average private cost of medical inputs for event by age group and pathology (anaemia, ADS, ARI, Stunting, Underweight, Wasting), for the year of analysis (x) in GMD,	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital.
Percentage of low birth weight children	MICS 2018

Proportion of events of LBW requiring/access hospitalisation	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital.
Average number of days of hospital treatment	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital.
Proportion of events of LBW requiring intensive treatment UTI / UCI	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital.
Average number of days of intensive treatment	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital.
Average waiting time (in hours) spent by an adult accompanying a child patient requiring hospitalisation	Estimated by health specialists and experts through in-depth interview at Kanifing General Hospital.
Education Data	
Initial enrolment by years of education	Data were obtained from Ministry of Basic and Secondary Education. EMIS
Final enrolment by years of education	Data were obtained from Ministry of Basic and Secondary Education. EMIS
Number of passes by years of education	Estimates were obtained from Ministry of Basic and Secondary Education. EMIS promotion data
Number of dropouts (rate) by years of education	Education Statistics Year Book
Number of population repeating grades (rate) by years of education	Data were obtained from Ministry of Basic and Secondary Education. EMIS
Private cost per student / year by educational grade	The Gambia: Public Education Sector Review Report 2017
Total Number of students year 2018	Data were obtained from Ministry of Basic and Secondary Education. EMIS
Public cost per student	Estimated based on The Gambia: Public Education Sector Review Report 2017
Morbidity differential probability for anaemia among healthy versus underweight children by age groups.	Calculated from GMNS 2018 and primary data collected from Kanifing General Hospital.
Morbidity differential probability for ADS among healthy versus underweight children by age groups.	Calculated from GMNS 2018 and primary data collected from Kanifing General Hospital.
Morbidity differential probability for ARI among healthy versus underweight children by age groups.	Calculated from GMNS 2018 and primary data collected from Kanifing General Hospital.
Morbidity differential probability for anaemia among healthy versus stunted children by age groups.	Calculated from GMNS 2018 and primary data collected from Kanifing General Hospital.
Morbidity differential probability for ADS among healthy versus stunted children by age groups.	Calculated from GMNS 2018 and primary data collected from Kanifing General Hospital.

Morbidity differential probability for ARI among healthy versus stunted children by age groups.	Calculated from GMNS 2018 and primary data collected from Kanifing General Hospital.
Probability ratio of death between those who suffered from undernutrition	Calculated from GMNS 2018 and UNDESA.
Probability ratio of death between those who suffered from stunting.	Calculated from GMNS 2018 and UNDESA.
Higher Probability (relative risk) of stunted of repeating grades.	Calculated from EMIS 2018 and GMNS 2018.
Higher Probability (relative risk) of stunted of dropping out.	Calculated from EMIS 2018 and GMNS 2018.
Monthly hours worked.	Gambia Labour Force Survey 2018
Average travel time for ambulatory care.	Estimated by health specialists and experts through in-depth interviews at Kanifing General Hospital.

Annex III Overview of the COHA Model

The model for the COHA study represents a step forward in estimating the social and economic consequences of child undernutrition in Africa. Several national and regional efforts have been implemented to assess the costs of undernutrition globally and in the region. Notable initiatives at the regional level include those led by ECLAC, carried out jointly with WFP in Latin America and the Caribbean (LAC) and the PROFILES initiatives[34] which developed similar country-level estimations in selected countries worldwide. The COHA, however, represents the only effort constructed for the African continent, involving nutrition experts from the continent, who provided recommendations during the adaptation process, with critical support of country teams. The model developed by ECLAC to estimate the social and economic consequences on child undernutrition in LAC[35] presented the most appropriate base to develop a model for Africa. In the development of the model for LAC, the authors focused on the consequences of child undernutrition from a life-cycle approach, avoiding the potential overlaps with other nutritional deficiencies. This approach proved to be an important political instrument to mobilize stakeholders around nutrition in LAC and was considered by many to be state-of-the-art knowledge in this field.

The development of the COHA model proved to be a good practice of South-South collaboration between two regional UN Economic Commissions. ECLAC, AUC and WFP Africa office worked together in a series of joint technical activities and consultations to transfer knowledge and generate the adjustments for the development of the new model to Africa. An interdivisional working group was created within ECA that included the African Centre for Statistics, the African Centre for Gender and Social Development, the Economic Development and NEPAD Division of the ECA as well as a number of UN partners, namely WFP, UNICEF, the International Labour Organization (ILO) and WHO – to ensure multidisciplinary contributions in the development of the model.

At the regional level, the technical validation of the COHA model was provided by the African Task Force for Food and Nutrition Development (ATFFND). The Task Force, which brings together regional nutrition experts and practitioners, was the ideal body to provide guidance in the development of the model. In consecutive meetings, the ATFFND provided key recommendations, thus laying out a roadmap for the adaptation process, and finally expressed its satisfaction with the proposed COHA model.

Adapting the COHA Process

To facilitate the implementation of the project, leadership roles were identified: the AUC Department of Social Affairs and the NEPAD Planning and Coordinating Agency led the initiative; ECA/ECLAC coordinated its implementation, while WFP and other partners supported the capacity building process, both at regional and country levels. Further, the following governing structures were established:

1. The Steering Committee/ATFFND: The high-level Steering Committee is chaired by the AUC. The Steering Committee is charged with convening partner organizations, approving the study design and action plan and overseeing the implementation of the study and dissemination of results. The Steering Committee also provides political support to the initiative.

2. The Regional Secretariat: The Regional Secretariat, based at WFP Africa office, worked through a small technical team, drawn from NEPAD, AUC, WFP, ECLAC and other relevant organizations, to support the preparation, implementation and dissemination of the study, as well as to facilitate smooth and quality work of the national implementation teams and expert committees. The Secretariat reported to the Steering Committee and executed the study budget.

3. The National Implementation Team (NIT): The core implementation of the study was carried out by a national team in each participating country, drawn from relevant governmental institutions, such as the Ministry of Finance and Economic Affairs, Ministry of Health, Ministry of Basic and Secondary Education, Ministry of Women, Children and Social Welfare, Ministry of Agriculture, National Nutrition Agency, Gambia Bureau of Statistics, National Population Secretariat, WFP, UNICEF and FAO. The NIT is Chaired by NaNA and WFP country office in the Gambia facilitated the process.

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34 "FHI 360 Profiles," FHI 360 Profiles, accessed September 27, 2013, http://fhi360profiles.org/.

35 Rodrigo Martínez and Andrés Fernández, Model for Analysing the Social and Economic Impact of Child Undernutrition in Latin America (Santiago de Chile: Naciones Unidas, CEPAL, Social Development Division, 2007).

For the initial phase of the project, a number of criteria were agreed upon to select the initial countries. The requirements were as follows:

1. Data availability: The availability of at least two recent, nationally representative survey datasets on fertility, family planning, maternal and child health, gender, malaria and nutrition, preferably the Demographic and Health Survey (DHS).

2. Sub-regional coverage: At least one country selected from each AU region: Community of Sahel-Saharan States (CEN-SAD), Common Market for Eastern and Southern Africa (COMESA), Economic Community of Central African States (ECCAS), Economic Community of Western African States (ECOWAS), Intergovernmental Authority for Development (IGAD), Southern African Development Community (SADC) and Union du Maghreb Arabe (UMA). Overlapping membership to various Regional Economic Communities was also taken into account in the final selection of countries.

3. Socio-economic representation: Prevalence of poverty and under-nourishment in the overall population and occurrence of episodes of drought or other natural disasters.

4. Existence of a national platform on malnutrition and hunger.

Based on these criteria, 12 initial countries were selected. Eight of these countries, namely Egypt, Ethiopia, Swaziland, Uganda, Burkina Faso, Ghana, Malawi, and Rwanda have completed the study. Beyond the initial selection of countries studied, the study has been completed in Chad, Madagascar, Lesotho, Kenya, Mali, Mauritania, Mozambique, Niger, Zimbabwe and the Democratic Republic of Congo and now The Gambia.

Annex IV Brief Description of COHA Data Collection Process in The Gambia

The data collection process was led by the members of the National Implementation Team. The process was initiated with a regional training held in Nairobi, Kenya in June, 2018. The NIT team was introduced to COHA-Gambia and developed a work plan and assigned responsibilities among the specialists. In December 2018 a workshop was held in The Gambia where the NIT was trained on the methodology and a work plan was developed to implement the COHA study in The Gambia. For analysis, both primary and secondary data sources were utilised. The NIT collected data from relevant institutions that are part of the COHA.

For the health sector, The Gambia Demographic and Health Survey (GDHS) 2013, The Gambia Micronutrient Survey (GMNS) 2018, Multiple Indicator Cluster Surveys (MICS) 2006, 2010, the SMART Surveys 2012 and 2015 and the National Health Account (NHA) 2015 were used. Additional data was obtained from the World Health Organization and the United Nations Department of Economic and Social Affairs (UNDESA). Primary data was collected by conducting surveys and interviews at Kanifing General Hospital involving the Administrator, Medical Officers at the Paediatric Unit, Out-patient Department, Laboratory Technician and Pharmacist to get expert opinion on some of the variables, as well as other relevant international sources.

These questionnaires included a template on medical inputs per pathology, created on the basis of WHO guidelines, in order to assess which medical input is used and which not or which additional medical input per pathology in general is also given to the patient of the respective pathology. Subsequently, the costs of these medical inputs were estimated on the basis of the hospital records. The questionnaire was also used to calculate the amount of time each staff member dedicated to a certain case of pathology. Based on the hospital records the unit cost of attention was accordingly calculated by taking into account the individual salary of each staff member involved and the time they spend on a pathology case. Finally, the hospital records also formed the basis to estimate the cost of a hospital bed which was calculated by dividing the annual overhead costs (which consists of the operational costs such as water, electricity and staff) of the hospital by the annual number of in-patients.

Education data was obtained from 2018 Basic Education Statistical Year Book, Education Management Information System (EMIS), Education Policy 2016-2030 and the Comprehensive Education Public Expenditure Review, 2017.

Labour and productivity data was mainly obtained from the Labour Force Survey 2012 and 2018, Integrated Household Survey of 2015/16. These surveys provide information related to income, expenditure, education, poverty and living conditions. In addition, the Integrated Financial Management Information System (IFMIS), the Budget Execution Report 2018, National Accounts Bulletins and African Economic Outlook 2018. The Gambia Labour Force Survey 2018 was used to obtain information on labour. This survey provides information related to income, expenditure, education among many other related information.

After the data collection and collation process, the NIT team organised a validation workshop in Tendaba, The Gambia in October 2019. The purpose of the workshop was to validate the results of the Cost of Hunger in The Gambia and produce recommendations for the future. The final report of the Cost of Hunger in The Gambia was validated and approved by the African Union Commission and the Government of The Gambia in December 2019.

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The annual costs associated with child undernutrition in the Gambia is estimated at **USD 83.4 million (GMD 3.96 billion)** which is equivalent to **5.1 % of GDP**

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