Situation Analysis of the Nutrition Sector in Ethiopia

2000-2015

Main findings and recommendations

UNICEF

The Federal Democratic Republic of Ethiopia

Ministry of Health
The Federal Democratic Republic of Ethiopia is undergoing rapid growth and transformation and has already made great progress in improving the nutrition situation over the last decade, with very significant contributions and support from development partners.

The momentum for nutrition is strong and the time is right to rise to the challenges, and to this end, the government of Ethiopia has decided to end child under-nutrition by 2030 with a commitment to the ‘Seqota’ Declaration. The Declaration reflects the strong commitment that the Government of Ethiopia has to improving nutrition and recognising the role of nutrition to propel sustainable development. The NNP II also takes into account the multi-sectoral and multi-dimensional nature of nutrition and the need for evidence based programming.

In line with the above mentioned commitments and the ministerial recognition of the need for joint effort to improve undernutrition in Ethiopia, development partners were encouraged to provide support to the Government in an integrated manner through an evidence based programming. To this effect, a situational analysis of the nutrition sector for the past 15 years was undertaken aiming to provide evidence based guidance for future nutrition related policies and interventions in the country with the financial support received from European Union hereby known to be the key political, economic partner to the government of Ethiopia and with the technical support from UNICEF recognized as the leading agency working for the better health of children and women in Ethiopia. The Federal ministry of health has taken the lead in overseeing this assignment through the steering committee established at the ministry for this particular task.

This report, A Situation Analysis of Nutrition in Ethiopia 2000-2015 has come up with findings that state Ethiopia’s progress towards child nutrition in the last 10-15 years, fuelled by economic growth. There has also been the expansion of health and nutrition services through community-based health extension workers. The policies and programmes developed to support these efforts have been effective, but now need fine tuning to ensure a more equitable impact and have to be expanded in terms of coverage and participation as well as the links and coordination between humanitarian and longer term nutritional programmes.

Gaps in policies and programmes identified in this situational analysis should be filled to further improvement in nutrition for both children and women.

The Federal Ministry of Health would like to express its gratitude to EU and UNICEF as well as the steering committee members for the successful execution of this study.

Name: FMOH
A key political, economic and trading partner of Ethiopia, the EU has been one of the leading development partners to Ethiopia, providing significant financial support for both emergency humanitarian aid and long term development programmes through government, international organizations and non-state actors. Together with its member states, the EU contributes around 25-30% of external aid to Ethiopia.

As part of one of its development aid to the country the EU funded the study entitled Situation Analysis of the Nutrition Sector in Ethiopia 2000-2015, which was carried out by the Nutrition Section of UNICEF Ethiopia’s conjunction with Tulane University and independent consultants. The study consists of four parts: analysis of nutrition trends and risk factors; mapping of nutrition interventions; assessment of current programmes and resources; and analysis of gaps and opportunities. The study has then used these elements to provide evidence-based guidance for future nutrition related policies and interventions in the country.

The products of the study are meant to primarily inform the EU Nutrition Joint Strategy and Action Framework for Ethiopia so that it can develop a coherent and cohesive response to the National Nutrition Programme (NNP) and nutrition challenges in Ethiopia. The products of the study are also aimed at contributing to the formulation of nutrition-sensitive policies and programmes of Government ministries outside of health.

The EU Delegation would like to thank UNICEF and the Study Team for the successful undertaking of this study. EU hopes that the findings and recommendations of this study will be effectively utilised by key stakeholders in the field of nutrition.

Signature
Name: EU Delegation
Title:

As the world embarks a new Sustainable Development Agenda, the Government of Ethiopia and its development partners can look back on 15 years of remarkable progress in human development. Ethiopia's continued reduction of extreme poverty and chronic malnutrition has been internationally recognized and inspired the international community to remain ambitious in the level of progress it aims to achieve. In 2015, the Government of Ethiopia declared the goal of ending child malnutrition by 2030 with the launch of the Seqota Declaration. The renewed commitment by the Government to ending this most pervasive form of deprivation marks a critical opportunity for collective stocktaking and joint strategizing on a way forward that builds on the failures and successes of the past.

This report, A Situation Analysis of Nutrition in Ethiopia 2000-2015, provides recommendations for future nutrition and nutrition-sensitive programming in the country that are based on a comprehensive evidence base which includes an extensive analysis of the complex nutrition dynamics, gaps and opportunities in Ethiopia.

The study was commissioned by the European Union in Ethiopia and was carried out by UNICEF and Professor John Mason and his team at Tulane University and by Bjorn Ljungqvist, an independent consultant and former UNICEF country representative in Ethiopia (2003-2008) under the guidance of a steering committee chaired by Birara Melese of the Federal Ministry of Health. UNICEF Ethiopia would like to thank the Government of Ethiopia, the European Union and all partners and nutrition stakeholders involved in this exciting research project for their dedication and commitment, namely; USAID, DFID/UKAID, Irish Aid, (German)GIS. Save the Children/ENGINE, CONCERN, Alive and Thrive, FANTA/fhi360, Tufts University (Ethiopia), and United Nations sister agencies including REACH, WFP, WHO, FAO and OCHA.

I hope the findings are useful to inform programming for a wide range of nutrition and nutrition-sensitive stakeholders in Ethiopia in order to jointly support the Government in the realization of the Seqota Declaration and to make undernutrition, in particular child undernutrition, in Ethiopia history.

Signature
Name: UNICEF Ethiopia
Title:
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EXECUTIVE SUMMARY

INTRODUCTION

Ethiopia has experienced rapid, sustained improvement in undernutrition during the past 15 or so years. Progress has been stimulated by strong Government of Ethiopia (GoE) commitment to improving nutrition among children and women and encouraging continued development and expansion of policies and programmes for nutrition interventions. However, undernutrition among children and women remains an urgent concern, requiring greater multi-sectoral efforts. The GoE’s commitment to integrated, multi-sectoral efforts for improving nutrition has encouraged partners to consider nutrition interventions in the same manner. In line with this, the European Union Commission (EU), along with 20 member states represented in Ethiopia plus Norway (EU+), agreed to a joint strategy, using nutrition as a pilot sector for cooperative programming. Nutrition was well suited for this task, due to partners having current operations in sectors of nutrition, agriculture, education, water and sanitation, health, social protection and humanitarian response.

METHODS

The development of EU+ joint programming on nutrition required a situation analysis of the nutrition sector, and the European Union Delegation to Ethiopia has provided financial support to UNICEF to steer this task. Technical assistance was provided by Tulane University and an independent consultant, both with extensive knowledge of and experience in nutrition in Ethiopia. The situation analysis involved four main tasks: analysis of nutrition trends and risk factors; mapping of nutrition interventions; assessment of current programmes and resources; and analysis of gaps and opportunities. A variety of data sources were used, including Ethiopia Demographic and Health Survey (EDHS) data, The Community Based Nutrition (CBN) programme and evaluation data, The Development Assistance Committee (DAC) database of resources, 2013 Renewed Efforts Against Child Hunger and undernutrition (REACH)/Federal Ministry of Health (FMoH) database of programme presence, and qualitative project and woreda case studies.
RESULTS

This analysis demonstrates that there is vital need for enhanced efforts to bring about improvement in undernutrition in Ethiopia. Still, reduction in child undernutrition so far should be recognised as an achievement. Trends demonstrate rapid, sustained improvement, at a rate likely faster than anywhere else in Africa. In contrast, women’s nutritional status has improved little, and thinness and anaemia remain serious concerns. Increased income and household food availability likely accounted for much improvement in child nutrition in recent years. Risk factors found to be associated with undernutrition included the usual suspects; however, important effect modifiers of the factors found must be taken into account. Findings reveal that programme modifications to address identified risks are required to maximise improvement in nutrition. Water supply and sanitation interventions require education components before nutrition is improved, especially among mothers with no education to balance equity. Targeted, age-specific infant and young child feeding practices are needed to improve nutrition, and training materials and messaging must be amended. Extending access to health services likely requires sanitation and education components to achieve equitable, full nutrition improvement, though some further research is needed. Provision of services to communities that reduce risk factors for undernutrition is not sufficient for a beneficial effect on nutrition; household status must improve as well, that is they must be able to access the services. The Community Based Nutrition programme (CBN) for delivery of nutrition services is vital for improving nutritional status, and adequate participation in these services is needed. All programmes operating in line with the CBN programme in support of the National Nutrition Programme (NNP), should have harmonized activities and materials. Resources for nutrition are only just adequate for impact, and projects in sectors outside of health were only partially nutrition-sensitive, thus having possible indirect effects on nutrition that are difficult to assess. For all sectors, to ensure improvement in nutrition outcomes, resources must be applied to evidence-based programme design, and directed towards nutrition-relevant interventions. Mapping of need (high prevalences of risk factor and undernutrition) and programme presence by zone allows for targeting of nutrition interventions and resources. Across sectors, nutrition training (including modifications based on situation analysis findings) and skill enhancement is needed among community workers, both paid (Health Extension Workers) and volunteer (Health Development Army).

CONCLUSIONS

Ethiopia has made considerable progress in improving child nutrition, though more work must be done, and efforts for women require attention. Gaps in policies and programmes identified in this situation analysis should be filled to further improvement in nutrition for both children and women. Opportunities to fill these gaps and improving nutrition, include extending, reinforcing and targeting current programmes that are delivering nutrition-specific and nutrition-sensitive interventions, and mitigating effect modifiers that affect programme ability to improve nutrition, especially if improvement is inequitable among population sub-groups. This will often involve targeting those worse off (e.g. less educated, less well-off). Policies for economic growth should be supported, as these contribute to increased income, diverse food consumption and child growth. Gaps in programme coverage identified by maps should be used for targeting of populations most in need (those with high prevalences of risk factors and undernutrition). Increasing participation in Community Based Nutrition programmes within covered programme areas must be prioritised at policy and programme levels. Resources for nutrition-sensitive interventions in sectors other than health and nutrition should be applied to evidence-based interventions, more of which is needed in various local contexts within the country. Successful implementation of all nutrition interventions, whether specific or sensitive, requires quality service delivery achieved through adequate training, supervision and incentives for community workers.
## ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>AGP</td>
<td>Agricultural Growth Program</td>
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<td>ANC</td>
<td>Antenatal Care</td>
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<td>A&amp;T</td>
<td>Alive and Thrive</td>
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<td>AEWs</td>
<td>Agriculture Extension Workers</td>
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<td>B-G</td>
<td>Benishangul-Gumuz</td>
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<td>CBN</td>
<td>Community Based Nutrition</td>
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<td>CFI</td>
<td>Chronic Food Insecure</td>
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<td>CMAM</td>
<td>Community-based Management of Acute Malnutrition</td>
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<td>DRS</td>
<td>Developing Regional States</td>
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<td>ECHO</td>
<td>The European Commission’s Humanitarian Aid and Civil Protection department</td>
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<td>EDHS</td>
<td>Ethiopian Demographic and Health Surveys</td>
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<td>EHNRI</td>
<td>Ethiopia Health and Nutrition Research Institute</td>
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<td>ENA</td>
<td>Essential Nutrition Action</td>
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<td>ENGINE</td>
<td>Empowering New Generations to Improve Nutrition and Economic opportunities</td>
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<td>EOS</td>
<td>Enhanced Outreach Strategy</td>
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<td>EPHI</td>
<td>Ethiopia Public Health Institute</td>
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<tr>
<td>EU</td>
<td>European Union</td>
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<td>EU+</td>
<td>European Union Member States represented in Ethiopia plus Norway</td>
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<td>FAO</td>
<td>Food and Agriculture Organization</td>
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<td>FIES</td>
<td>Food Insecurity Experience Scale</td>
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<td>FMoH</td>
<td>Federal Ministry of Health</td>
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<td>GAM</td>
<td>Global Acute Malnutrition</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GMP</td>
<td>Growth Monitoring and Promotion</td>
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<td>GoE</td>
<td>Government of Ethiopia</td>
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<td>HABP</td>
<td>Household Asset Building Program</td>
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<td>Health Development Army</td>
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<td>HCA</td>
<td>Health Centre</td>
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<td>HEP</td>
<td>Health Extension Program</td>
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<td>HEW</td>
<td>Health Extension Workers</td>
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<td>HHFS</td>
<td>Household Food Security</td>
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<td>HP</td>
<td>Health Post</td>
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<td>ICCM</td>
<td>Integrated Community Case Management</td>
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<td>IFA</td>
<td>Iron Folic Acid</td>
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<td>IFPRI</td>
<td>International Food Policy and Research Institute</td>
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<tr>
<td>IMNCI</td>
<td>Integrated Management of Newborn and Child Illness</td>
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<td>IMR</td>
<td>Infant mortality rate</td>
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<td>IP</td>
<td>Implementing Partner</td>
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<td>IRT</td>
<td>Integrated Refresher Training</td>
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<td>IYCF</td>
<td>Infant and Young Child Feeding</td>
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<td>JAP</td>
<td>Joint Action Plan</td>
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<td>KAP</td>
<td>Knowledge, Attitudes and Practices</td>
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<td>LRRD</td>
<td>Linking Relief and Recovery to Development</td>
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<td>M&amp;E</td>
<td>Monitoring and Evaluation</td>
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<td>M2M</td>
<td>Mother-to-Mother Support Group</td>
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<td>MAM</td>
<td>Moderate Acute Malnutrition</td>
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<td>MDD-W</td>
<td>Minimum Dietary Diversity – Women</td>
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<td>MIS</td>
<td>Management Information System</td>
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<td>MoA</td>
<td>Ministry of Agriculture</td>
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<td>MoCYWA</td>
<td>Ministry of Children, Youth and Women Affairs</td>
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<td>MoE</td>
<td>Ministry of Education</td>
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<td>MoH</td>
<td>Ministry of Health</td>
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<td>MoLSA</td>
<td>Ministry of Labour and Social Affairs</td>
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<td>NCB</td>
<td>Nutrition Coordination Body</td>
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<td>NCBNP</td>
<td>National Community Based Nutrition Protocol</td>
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<td>NGO</td>
<td>Non-Governmental Organization</td>
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<td>NNP</td>
<td>National Nutrition Program</td>
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<td>NTC</td>
<td>Nutrition Technical Committee</td>
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<td>ODA</td>
<td>Official Development Assistance</td>
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<td>OFSP</td>
<td>Other Food Security Program</td>
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<td>OTP</td>
<td>Outpatient Therapeutic Program</td>
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<td>OWNP</td>
<td>One WASH National Program</td>
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<td>PLW</td>
<td>Pregnant and Lactating Women</td>
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<td>ppt</td>
<td>Percentage point</td>
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<td>PSNP</td>
<td>Productive Safety Nets Programme</td>
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<td>REACH</td>
<td>Renewed Efforts Against Child Hunger and Undernutrition</td>
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<td>SAM</td>
<td>Severe Acute Malnutrition</td>
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<td>SBCC</td>
<td>Social Behavioural Change Communication</td>
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<td>SITAN</td>
<td>Situation Analysis</td>
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<td>SNNPR</td>
<td>Southern Nations, Nationalities, and Peoples’ Region</td>
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<td>SUN</td>
<td>Scale-Up Nutrition</td>
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<td>TSF</td>
<td>Targeted Supplementary Feeding</td>
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<td>UN SCN</td>
<td>The United Nations Standing Committee on Nutrition</td>
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<td>UNICEF</td>
<td>The United Nations Children’s Fund</td>
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<td>WASH</td>
<td>Water, Sanitation and Hygiene</td>
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<td>WB</td>
<td>The World Bank</td>
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<td>WHO</td>
<td>World Health Organization</td>
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INTRODUCTION

As stated in the preamble to the 2013-2015 National Nutrition Programme (NNP): The Government of the Federal Democratic Republic of Ethiopia (GoE) "found the high malnutrition rates reported in EDHS and various surveys over the years completely unacceptable. We shall work through enhanced strategic partnerships to prioritize the elimination of malnutrition from Ethiopia as one of the most viable strategies for achieving the Growth and Transformation Plan and the Millennium Development Goals. Attainment of positive nutrition outcomes will be achieved through evidence-based programming and responsiveness and the promotion of accountability towards these results by each ministry here undersigned" [1]. Ministers signing the NNP included Health, Education, Industry, Water and Energy, Trade, Agriculture, Labour and Social Affairs, Finance and Economic Development, and Women, Children, and Youth Affairs.

In line with ministerial recognition of the need for joint effort to improve undernutrition in Ethiopia, development partners were encouraged to provide support to the government in an integrated manner. Early in 2013, the European Union (EU) along with the 20 EU member states represented in Ethiopia plus Norway (EU+) endorsed the EU+ Joint Cooperation Strategy for Ethiopia [2] to ensure a coherent and cohesive response to Ethiopia’s development challenges, to improve alignment, harmonization, results-based approach, predictability and transparency, while avoiding overlapping or fragmented interventions.2 It was recognized that most member states had the ability to improve nutrition in Ethiopia, as they were currently supporting programming in sectors of nutrition, agriculture, education, water and sanitation, health, social protection and humanitarian response. The theme of nutrition was selected as one of the pilot joint actions for collaborative programming.

The EU in 2014 put forward the Roadmap for EU+ Joint Programming on Nutrition [3], as seen in Figure 1, for the EU and partners with the Government of Ethiopia, in support of the new National Nutrition Plan (2015-2020). Part of this involved a situation analysis, which UNICEF agreed to implement in line with support provided by the EU, under the contribution agreement signed for the project ‘Integrated Nutrition Survives: Multisectoral Interventions to Improve Nutrition Security and Strengthen Resilience’. The overall intent of was to propose steps that could be followed in support of an EU+ Joint Programming on Nutrition, and an analysis of the nutrition situation was seen as one key component. UNICEF requested Tulane University [4] to undertake the situation analysis of the nutrition sector, with four main tasks: analysis of nutrition trends and risk factors (correlations with undernutrition); mapping of nutrition interventions; assessment of current programmes and resources; and analysis of gaps and opportunities. Bjorn Ljungqvist, an independent consultant and former UNICEF country representative in Ethiopia (2003-2008) was hired to contribute to the gap and opportunity analysis, with special emphasis on policy and programme options [5]. The work of the consultants was guided by a Steering Committee chaired by the Federal Ministry of Health and with participation from different government sectors as well as representatives from major development partners and donors involved in nutrition work in the Federal Democratic Republic of Ethiopia.

This report was prepared by Jennifer Crum (independent consultant) and Amal Tucker Brown (UNICEF) and summarizes the combined findings from these different efforts.
FRAMEWORK FOR THE SITUATION ANALYSIS

For the past 25 years, the nutrition community has generally accepted and used a conceptual framework outlining the causes of malnutrition proposed by UNICEF [6]. The original version of this conceptual framework is found in the Annex 1 (Figure A1). The framework has been adapted over the years, including for example the long-term impact of chronic undernutrition as seen in the 2008 Maternal and Child Undernutrition Series, published by The Lancet [7]. This model of the framework, as seen in Figure 2, served as a basic guide for the situation analysis as proposed by the EU+ Roadmap.

Figure 2. A model of the causal pathways leading to malnutrition.

In both forms, the framework maintains the essential understanding of the multi-level, multi-faceted factors potentially involved in the development of undernutrition. It serves as an important tool for understanding the causal pathways leading to undernutrition and providing initial guidance in the exploration of risk factors involved in these pathways.

For the purpose of exploring risk factors for undernutrition in Ethiopia, it is important to highlight a few aspects of the conceptual framework:

a) Importantly, the original UNICEF 1990 strategy clearly explains that a causality analysis should be part of an ongoing Assessment-Analysis-Action, Triple-A cycle, because ‘nutrition in society’ is a complex process[8] where the causal patterns are likely to be changing in ways that are not predictable and, hence, need to be regularly assessed and analysed in order to ensure effective actions.

b) The important principle that food, health and care are necessary conditions for adequate nutrition, but each by itself not sufficient is usually misunderstood, leading to situations where nutrition programmes include some activities in each of these areas without making sure that the right action reaches the right mother/child at the right time, i.e. when the particular condition is the reason for nutritional risk.

c) Food, health and care all require resources and in resource-poor households, communities and countries, there is often competition to address these needs, e.g. food production may require labour that undermine mothers’ ability to feed their children and keep them clean, etc. The only way to address these competing needs is to improve the resource base, i.e. the basic causes.

d) Almost invariably, causal analysis exercises do not address the important basic causes of the conceptual framework; often treating these issues as a given ‘enabling environment’ but rarely explicitly addressing issues like inequities and inequalities in access to resources and services, social exclusion, etc.

The conceptual framework offers an added value in that it brings clarity in design of programmes and the corresponding monitoring and evaluation frameworks. Hence, as stunting reduction is presently the main focus of many new initiatives in nutrition programming, great efforts are being made, including this situation analysis, to link stunting developments to potential risk factors or ‘drivers’ by applying different correlational analysis methods. The conceptual framework should guide these efforts to ensure proper categorization of variables and separating potential causal links between different causal levels. This contributes to better understanding of risk factors and targets for interventions, i.e. better guidance for policy and programme decisions. For example, Bhutta, et al. [9] suggest that water, sanitation and hygiene (WASH), diarrheal diseases and zinc deficiency are each critical intervention areas for stunting prevention in Ethiopia. While it is obvious that these are closely related factors/interventions at different levels of the stunting causal chain, they should be considered together in efforts to break this particular pathway to stunting. The GoE’s national plan for improving nutrition is appropriately multi-sectoral in nature and includes evidence-based interventions for achieving optimal foetal and child growth and development in Ethiopia, as suggested in the 2013 Lancet nutrition series [10]. These can be categorized as nutrition-specific and nutrition-sensitive, as performed in this situation analysis, for understanding what needs to be done within each sector to improve undernutrition. This is further detailed in Figure A2 in the Annex 1.
Putting the conceptual framework and framework for effective nutrition actions together, these become useful tools for helping to identify and target gaps and opportunities in nutrition programming in Ethiopia, especially among the country’s diverse populations. What is needed, however, is the adaptation of these general recommendations to the specific needs of Ethiopia. This requires rigorous evaluation of risk factors for undernutrition within Ethiopia, and evaluation of programmes (or lack thereof) to address identified risk factors; this is the approach taken for the situation analysis. Risk factors chosen for analysis were indeed based on these criteria – likely risk factor as identified in the conceptual framework, (mainly) EDHS data availability and presence of programme(s) targeting risk factors.

In order to assess the nutrition situation in Ethiopia in a holistic manner, a variety of analytical methods were employed. These included: quantitative data analysis, desk review of relevant projects, qualitative study (field observation and interviews) and key informant interviews from woreda to federal levels. A detailed description of the methodology undertaken to arrive at these findings may be found in the corresponding report “Situation Analysis of the Nutrition Sector in Ethiopia - Methodological Report” the link to this document can be found at the following website http://www.unicef.org/ethiopia/nutrition.html (under Nutrition Resources section). Due to the extensive volume of compiled results, "Supplementary Materials" containing detailed results that are not essential for the main document, but are important to keep associated with this report can be found at the following website: http://tulane.edu/publichealth/internut/ethiopia-nutrition-project.cfm. In sum, this situation analysis makes recommendations based on analyses specific to areas of intervention, both current and future, which directly leads to identification of gaps and opportunities.

For ease of reading this report is organized as follows:
1. Introduction
2. History of nutrition in Ethiopia,
3. Results and implications of analysis of trends
4. Results and implications of analysis of risk factors
5. Analysis of nutrition and agriculture linkages (Note: Analyses for this topic was not undertaken within situation analysis work, but relevant findings from other work are presented)
6. Mapping of nutrition interventions
7. Recommendations for (a) policy and (b) programme interests

HISTORY OF NUTRITION IN ETHIOPIA

It is worth recognising, even at this early stage, that this analysis demonstrates what appears to be an impressive success story. The recent sustained progress in Ethiopia has contributed to rapid improvement in nutritional status; improved living standards, education. Direct nutrition interventions (especially community-based) have contributed to this success.

Ethiopia has experienced a transition in nutrition and other relevant sectors that have likely contributed to the high improvement rate of stunting seen in this analysis. Comparing stunting trends with infant mortality rate (IMR) and total fertility rate (TFR) as seen in Figure 3.

Textbox 1: Ethiopia’s Nutrition Success Story
• Child nutrition, indicated by stunting, has rapidly improved during the past 10-15 years – likely faster than anywhere else in Africa.
• Progress has been sustained – added by improvement in living standards, education and community-based nutrition interventions.
• Near elimination of child undernutrition could occur in the next 20 or so years if economic growth continues, income and household food availability is further enhanced, education is supported and nutrition policies and programmes are extended and improved.
In Ethiopia, IMR started falling in the 1970’s, and then more rapidly after 2000; the fertility rate averaged seven children per woman in 1990, and since then has been falling to an estimated 4-5 children per woman at present; the IMR rate of change diverged from that of TFR around 2010. By the common definitions Ethiopia is starting the third stage of the transition, with birth rates falling, estimated by TFR. A possible projection from current trends suggests that the demographic transition will be complete by about 2030, and that stunting would reach < 10% at that time.

This does not imply that the only factor driving stunting is TFR – although this helps. Rather, the same factors that are causing the demographic changes are also likely to cause nutritional ones – immunization coverage for example. History does show that usually as these transitions take hold, they tend to continue until complete, unless there are major changes in causal factors (climate change could be one). Nonetheless, the nutrition improvement is enhanced by specific nutrition programmes, which almost always accompany the broader improvements. This has been seen primarily in Asia and Latin America, where the transitions started earlier and are more advanced, usually concurrently with national nutrition programmes (e.g. Thailand)[11], the effects of which are likely to improve the rate of stunting reduction.

At present in Ethiopia, the nutrition transition under way is mainly seen as reducing child malnutrition. The other side, a tendency towards overweight and non-communicable chronic diseases (NCCDs) coexisting with malnutrition, is probably only now beginning, but needs to be kept in mind. Within this, the increased risk of chronic diseases in adult life linked to poor intra-uterine growth and low birth weight [12, 13], with rapid environmental change (e.g. urbanisation) makes the Ethiopian population particularly vulnerable to rapid future swings towards increased NCCDs.

Commitment to the nutrition agenda is also a major contributor to improving nutrition status, which the government has demonstrated at a high political level, specifically as Ethiopia is one of the Scaling up Nutrition (SUN) early risers with effect from 2010. The State Minister of Health has been assigned as the Ethiopia SUN focal person. In addition, Ethiopia is part of the renewed global commitment to end under-nutrition and a REACH focal point has been assigned to the (FMoH), with a focus on coordination and collaboration with other sectors that impact nutrition, beyond health alone.

On 15th July 2015, Ethiopia further demonstrated its commitment to nutrition by declaring to end child malnutrition by 2030 with the launch of their Seqota Declaration. The launch was announced by Ethiopia’s Minister of Health, E Dr Kesetebirhan Admasu, during the Third International Conference on Financing for Development. The Seqota Declaration reflects the strong commitment that the GoE has to improve nutrition and recognise the role of nutrition to propel sustainable development. These actions have allowed for continued development of national policies and large-scale nutrition, health and food security programmes, as seen in Figure 4; details of the policies and programmes are found in Annex 2 [14]. While numerous health and nutrition projects existed in Ethiopia in the 1990s and early 2000s, these programmes were primarily classified as emergency responses and managed independently – or in small partnerships – by government ministries, UN Agencies, and NGOs. Nationwide health and nutrition programmes only began in 2003/04.

Definitions for Figure 4 abbreviations – CBN: Community Based Nutrition Programme; CMAM: Community Management of Acute Malnutrition; DHS: Demographic and Health Survey; EOS: Enhanced Outreach Strategy; GTP: Growth and Transformation Plan; HEP: Health Extension Programme; HSDP: Health Sector Development Plans; ICCM: Integrated Community Case Management; NNP: National Nutrition Programme; OFSP: Other Food Security Programme; PSNP: Productive Safety Net Programme; UAP: Universal Access Programme; TSF: Targeted Supplementary Food.
Following the GoE’s recognition that improving the nutritional status of children and women is vital to the country’s development, it was realized that the evidence base for understanding the current nutrition situation needed expansion. To this end, a number of studies have been undertaken to better understand the situation; important ones and relevant findings are highlighted here. Literature is also referenced within sections of this document to provide context, comparisons among findings, etc.

Appropriate Infant and Young Child Feeding (IYCF) practices are recognized as important for improvement in child nutritional status, and thus a target for Ethiopia’s nutrition activities, specifically the CBN programme, and thus the NNP. In Ethiopia, study has shown that timely and age-appropriate messages (TAAM) delivered to caregivers of children less than two years of age resulted in significant improvement in IYCF practices over a four-year period [15]. Findings from the current analysis of EDHS data further demonstrate poor water and sanitation access and practices, especially among children. Food security is important for proper child growth, and remains a concern in Ethiopia. As a social protection programme, the goal of the Productive Safety Net Programme (PSNP) is to improve household food security. Evaluations of the first three phases of PSNP demonstrate a two-month improvement in food security, but lack of improvement in quality of children’s diets (6-24 months) or outcomes of nutritional status (stunting, wasting, underweight and corresponding z-scores) [19]. These findings provide impetus for making the next phase of the PSNP more nutrition-oriented. In the fourth phase of the programme, the PSNP will be more relevant for improving nutrition outcomes, including nutrition-related behaviours and dietary diversity, by the targeting of individuals (rather than households), and providing extended direct support with soft conditions for pregnant and lactating women and caretakers of children with severe acute malnutrition (SAM).

Proper maternal nutrition is vital for optimal child growth (as well as for the mother herself), and, as shown in these analyses, it has improved little over the past 15 or so years. The intergenerational cycle of growth failure that occurs through small women contributes to stunting [20]. For the health of both women and children, nutrition status of women must be improved—ideally pre-pregnancy during adolescence. Further, anaemia prevalence among women in Ethiopia is high, especially among population subgroups (see analyses in this report).

Given that community-based programmes are effective in delivery of services to households and communities (see analysis in this report), it is important to understand the capacity of community workers to provide services in Ethiopia. A recent study of how Health Extension Workers (HEWs) spend their time demonstrates that a large proportion of work time is spent on waiting for clients at the health post (24.9%), travelling among work responsibilities (15.5%), building relationships with communities (13.3%) and providing health education and services (12.8%), of which nutrition was not specifically identified. A more effective community mobilisation and demand generation for services by the Health Development Army (HDA) could increase HEW impact [21].

Water, sanitation and hygiene (WASH) practices, known to have effects on nutritional status, are poor in Ethiopia, and thus targeted for improvement. In a recent evaluation, conducted in the four big regions (Amhara, Oromia, SNNPR and Tigray), one-third of children observed were in contact with animal faeces [17]. An evaluation of the relation between the exposure to poultry faeces and child undernutrition found increased stunting among children in households with poultry raised indoors [18]. Findings from the current analysis of EDHS data further demonstrate poor water and sanitation access and practices, especially among children.

Women learn how to cook a nutritious porridge made from locally available products for their children, during a session led by a health extension worker at the health post in the village of Maderia, in Gemechis, a woreda (district) of Oromia Region © UNICEF/NYHQ2014-3678/Nesbitt

Women learn how to cook a nutritious porridge made from locally available products for their children, during a session led by a health extension worker at the health post in the village of Maderia, in Gemechis, a woreda (district) of Oromia Region © UNICEF/NYHQ2014-3678/Nesbitt
RESULTS OF NUTRITION TRENDS ANALYSIS

KEY FINDINGS

- Child stunting improved at an average of 1.2-1.5 percentage points per year (ppts/yr) from 2000-2014 (1.5ppts/yr from 2000-2011).
- The rate of improvement was mostly consistent throughout the country, with the exception of some lowland areas, however regional variation in stunting prevalence remains high.
- Prevalence of stunting was not much different between livelihood groups. Therefore livelihood itself does not explain regional differences.
- At any one time between 2000 and 2011, stunting prevalence is the same across all but the richest income quintile (top 20% of the population).
- Improving child nutrition from reducing poverty has at least two routes.
  - First, improving income and expenditure likely accounts for the improvements seen in all wealth/poverty groups.
  - Second, acquiring assets (e.g. improved housing, sanitation, water supply) does improve stunting, but only when all three are acquired.
- Community effect – Reduction in risk factors at household level alone is not enough to reduce stunting. Both the household and community as a whole must have reduced risk factors for accelerated reduction in stunting.
- Short-term child undernutrition, indicated by wasting, remains pervasive in certain regions and zones in Ethiopia and has improved little through time.
- In contrast to child undernutrition, women’s nutritional status (body mass index, BMI) improved very little (0.2ppts/yr) from 2000-2014 – with important regional differences.
- Anaemia among women varies by geography, it is highest in the north and northeast, and improves only among those with relative greater wealth (richest quintile).
- At single points in time, maternal education is highly associated with improvement in child nutritional status, in contrast to lack of association seen through time. This requires further research.
- Micronutrient deficiencies were not assessed in this analysis and a similar trend analysis is needed once the national micronutrient survey is available.

At the same time the economy grew about 10% per year, and food consumption and expenditure increased on average from about 2,200 kcals/hh/day in 2000 to 2,450 kcals/hh/day in 2011.

Lower stunting prevalence and increased consumption in urban areas are risk factors for obesity and non-communicable chronic diseases (NCCDs) – this requires future analysis.

The proportion of people in absolute poverty (i.e. no assets) decreased from 54% in 2000 to 20% in 2011.

The rate of improvement in stunting was similar across all poverty categories: absolute and relative poverty.
SITUATION ANALYSIS OF THE NUTRITION SECTOR IN ETHIOPIA 2000-2015

EVIDENCE

Summary of findings
The national rate of improvement in stunting was estimated as 1.5 percentage points (ppts)/year, 2000-2011, likely continuing to 2014 (1.2-1.5ppts/yr). Comparing to data available through 2010, this is presently the fastest in Africa, and may be the fastest national African level estimated at any recent time [22]. In addition, the steady improvements in stunting are similar to those found in other countries with a history of success in elimination of undernutrition over sustained periods [23]. The rate of improvement was consistent across the country, except for the lowland pastoral areas possibly due to previous episodes of drought. Actual stunting prevalence was not much different between livelihood groups (pastoralist, agricultural, agro-pastoralist), at approximately 40% in each group.

When distinguishing groups by important determinants of child malnutrition (e.g. maternal education, asset ownership), almost all the population improved at about the same rate – e.g. the groups with no assets in 2000 and 2011 improved by the same difference in prevalence. Income, consumption and expenditure grew rapidly – income by 10% or more per year – and this accounted for much of the change. However, additional change due to, for instance, moving out of absolute poverty or increased education, can be seen. Each EDHS survey found that stunting is the same across all but the richest income quintile (the top 20% of the population).

Anaemia in women is very different by region – more than double the national average for example in Tigray and Afar. Anaemia is like stunting in relation to wealth, only improving in the richest quintile. Moreover it appears to have improved substantially for those areas with already relatively low levels, but hardly at all in those regions most affected in the north and north-east. On the other hand, women’s low body weight for height (i.e. thinness, measured by body mass index, BMI) – again relatively unaffected by wealth – has changed hardly at all in the last 15 years, and is at almost double the prevalence in Tigray and Afar. The reason for this lack of change, strikingly different to that in children, is not estimable from the data.

National and regional trends in child undernutrition from EDHS data
The estimated levels of child stunting at the national level are shown in Figure 5. The focus on rate of improvement should be from 2000-2011 due to limited assessment of 2014 data (see the Methodological Report for further explanation). Divergence from EDHS estimates is mainly in the 2011 data, probably due primarily to length/height mismeasurement. These estimates indicate that steady and substantial improvement in stunting occurred over the last 15 years. A number of checks were made to investigate whether these estimated changes were likely to be spurious, due to differences in sampling, age heaping, lying/standing mis-measurement, and drought and seasonality, as described in the Methodological Report. The samples were considered comparable through time as assessed by long term stable factors, such as respondents’ mean height, which was identical between surveys.

Textbox 2: Length/height mismeasurement
The most serious problem was the variation in the large extent of mismeasurement of length/height, such that for instance up to 15% of children (in 2011) were measured lying prone when, since their recorded age was >=24 months, they should have been measured standing; a similar problem is with children <24 months measured standing when they should have been measured lying prone (see the Methodological Report). Children measured wrongly standing were up to 4 cm taller for age: this is a very large amount and makes a substantial difference if not addressed. The fix chosen was to exclude children from the stunting estimates that were incorrectly measured, and (for this and other reasons) make estimates separately for age groups 0-23 months and 24-59 months. Excluding children (from all surveys) with the lying/standing error gives the ‘corrected’ line in Figure 5, which is likely to be the most accurate estimate.
Figure 6. Stunting prevalences (<-2SDs HAZ) in children 0-5 years, by region in Ethiopia, 2011.

Figure 7. Rate of improvement (decrease) in stunting prevalences in children 0-5 years by region: in percentage points per year, 2000-2011.

Rates of improvement by administrative region, shown in Figure 7, are compared with those calculated from EDHS reports (Table 2.9 in EDHS), and are slightly higher (in line with the data shown in Figure 5), but do not alter conclusions. Improvements were excellent in the highest population regions, like Amhara, Oromia, and SNNPR.

Somali rate of improvement was similar, but may have included some recovery from the 1999-2000 drought (see Textbox 3 on Drought Effects). Only Benishangul-Gumuz, Afar, and Dire Dawa were a long way behind the trend. Tigray, having one of the highest prevalences, improved more slowly.

Textbox 3: Drought effects
The effects of drought (see the Methodological Report) need to be assessed here as changing either the starting prevalence (2000), or the ending one (2011). From FAO reports at the time, the Somali region was badly hit by drought in 2000; and the belg rains (February – June) failed. These would have pushed the malnutrition rates up, and (certainly in Somali) increased stunting. In 2011, harvests were generally better according to FAO, except for southern pastoral areas; belg rains were not good, but again it is not clear whether the timing is such that stunting would be affected. This all means that for Somali, both years were poor, but 2000 probably the worse, so that the rate of improvement of -1.6 ppts/yr in Somali likely included some recovery from drought in 1999-2000. The high stunting prevalence and slower improvement rate in Tigray (-1.2 ppts/yr) may also be related to a number of drought episodes reported by FAO; this may well apply to Benishangul-Gumuz (-0.5 ppts/yr). Otherwise, the 2000 and 2011 estimates by region may be comparable with respect to drought effects – but further information is needed for confirmation.

Before looking further at trends by area, we need to consider how far different livelihoods are affecting the estimates, in particular the difference between growth patterns of pastoralist and agriculturalist children. However, estimates by livelihood (as coded in the EDHS survey) in Ethiopia showed surprisingly little difference by livelihood (agriculturalist, 39.9%; agro-pastoralist, 40.1%; pastoralist, 38.7%). Therefore livelihood itself does not explain differences between regions.

Throughout this period, child malnutrition as assessed by wasting prevalence was in the 10-20% range. We estimate that for those with agricultural livelihood, a prevalence of 10% indicates unusually high risk; for pastoralists this level is estimated at 20% [24] (see the Methodological Report for details). This differs from the usual WHO emergency cut-point of 15%, which does not take account of different livelihoods and growth patterns. Thus this data shows that Benishangul-Gumuz, and Tigray to a lesser extent, had wasting prevalences well above emergency levels for agriculturalists, and nearing emergency levels for pastoralists.

Thus, western Tigray and Benishangul-Gumuz should be high priority for nutrition and food security interventions with the highest prevalence of stunting, a below-average rate of improvement (for Benishangul-Gumuz the lowest rate in the country) and unusually high wasting rates. Ethiopia has seen a steady and impressive reduction in stunting (1.2-1.5 ppt/yr) in the last decade with rates of improvement consistent across the country, except for the lowland pastoral areas, possibly due to previous drought episodes. However regional variations in stunting remain high which is not explained by livelihoods as little difference in prevalence between the livelihood groups was observed. Short-term child undernutrition, indicated by wasting, remains pervasive in certain regions and zones in Ethiopia (namely Somali and Afar) and has improved little over time. Certain areas namely: western Tigray and Benishangul-Gumuz are particularly vulnerable as they have high levels of stunting with low rates of improvement and an unusually high level of wasting.
Trends in child under-nutrition in relation to key determinants

Maternal education
Almost all health surveys in poor countries, and Ethiopia is no exception, show a strong association of maternal education with child growth and nutritional status, when analysed cross-sectionally, and this has been interpreted as implying that improving maternal education would be an important driver of improving child growth.

Judging from the cross-sectional data, it is expected that moving children-mothers from uneducated to educated will increase child nutritional status. This takes some time, however, and Figure 10 demonstrates the mixed effects of education itself, and of moving to a better-educated situation. In this case prevalence might be expected to decrease faster in the educated group, but it does not – 46% to 33% is 13 percentage points, slightly less than the 15 percentage points for the uneducated group. This implies that, despite the association seen cross-sectionally, maternal education is not an important driver of child growth improvement over the 11 years 2000-11. Exactly the same conundrum is encountered with poverty, as discussed in the next section.

This inconsistent finding results from comparing cross-sectional data analysis – by far the most common – with analysis through time: EDHS data is not very suitable for such through-time analyses, and they are less common. This can be investigated at a later time, using data comparable over time, such as the evaluation data referred to earlier; for now we have to leave it that while maternal education is important to nutrition, its exact role in driving improvements needs further study.

Poverty
Using relative poverty (wealth quintiles). An assessment of household wealth, based mainly on assets, is calculated as a wealth index in EDHS survey data, splitting the population into fractions by their wealth index ranking, often as fifths, or quintiles. The wealth index is therefore relative cross-sectionally, and is calculated anew for each survey. Thus the quintiles are not directly comparable – they are not necessarily the same population groups – but they give a useful relative comparison both at-one-time, and with due caution across time, of correlates of relative wealth.

The prevalences of stunting by quintile and by survey are shown in Figure 11. The pattern in each survey means that there is virtually no reduction in stunting with increased wealth, or less poverty, until the top 20% -- the wealthiest group -- is reached. The increase did begin to be felt in the second highest quintile by 2014, but the pattern remains mainly flat in the lowest 80% (or four quintiles).
The differences over time are larger than those among the lowest four quintiles. Moreover, all the quintiles are improving at about the same rate – the lines are dropping in parallel to each other. Thus something is happening that is improving child nutritional status that is more important than relative wealth. This could be absolute wealth – for example the lowest quintiles in Figure 10 could be gaining assets over time, which would not be apparent from the figure, and which could account for some of the improvement. (Changes by estimated absolute poverty are discussed later.)

This pattern of child malnutrition, with income (similar to wealth) has been well established for countries at different stages of development. The lack of slope between the poorest groups has been found in the very poorest countries, and a slope develops with increased gross national income [25, 26]. So these results from Ethiopia are typical of progress among the poorest countries.

Using a proxy indicator of absolute poverty. While data seemed to show that improvement was general, it is important to know about the very poor, and specifically to see if those with no change in poverty improved like everyone else; they do if the relative poverty remains unchanged, see Figure 10. For comparison, a group that in 2011 is a subset of a similar poor group in 2000 is needed; if the lowest end of the distribution of wealth or poverty, defined the same way in both years, is used these are likely to be comparable. A group with no assets in 2000; and the assumption is made that only at all in 2011 is likely to be a similar population group with no assets in 2000; and the assumption is made that only a small proportion of those with assets in 2000 became asset-less in 2011.

The changes for this group are shown in Figure 12. The proportion of the population with no-asset fell greatly between 2000 and 2011, from 54% to 20%, i.e. 34% of the population transitioned from poorest to less-poor.

It would be expected that this must have contributed to improving child nutrition. The rapid improvement was the same in both the no-asset group, and those better off. Stunting prevalence in both groups fell by 15 percentage points, equivalent to 1.4 ppts/year. This is good news in that even the children in poorest households have benefited as much as their better-off peers. This leaves, as with education, some challenges in interpretation, but appears to be additional evidence that the poorest are indeed improving. However, the group that moved from poorest to less-poor experienced a greater decrease in stunting (20 percentage points) compared to either group who remained in the same asset level, suggesting an additional benefit of asset gain. Regional analysis gives much the same result. This is particularly important in emergencies and for resilience building as sales of household assets is a major coping mechanism [27, 28].

Figures 10-12 show that stunting levels have improved at the same rate in families without critical assets as those with critical assets, and in families with mothers without any education compared to families with mothers with some education. The figures also show that the proportion of the population in the ‘non-asset’ and ‘non-education’ groups have decreased very significantly in Ethiopia during 2000-2011. This suggests evidence of successful pro-poor and pro-equity policies, and that these policies are key drivers of nutrition improvements in Ethiopia during the last decade, although those that saw an increase in critical assets from having no assets also saw an increased reduction in stunting levels. However, it is important to note that large disparities in stunting continue to be seen between the richest quintile – top 20 per cent of the population – and the rest of the population.

Community effects
One possible reason that the improvement in child nutritional status occurred at similar rates in both the no-asset group, and/or in the children of mothers without education, might be that even the poorest families benefit when others in the community have improved living conditions; or similarly for education. This could be investigated by deriving variables (see the Methodological Report) to indicate the conditions of the cluster, then seeing if households improved when they were in better than average clusters, and vice versa. In general, clusters were determined to be ‘better’ or ‘worse’ by splitting the groups at the mean (average) for each variable. This was done for cluster-level variables indicating poverty (assets), water supply, sanitation, education and housing.
Poverty clusters, at both times (2000, 2011) the conditions where reduced poverty was associated with improved child growth were if BOTH the household AND the cluster (or community) were improved. While it might be hoped that general improvement in the community would benefit even the poorest households, the evidence here seems to be in the opposite direction. In terms of improvement over the 11-year period between surveys, all four groups, (households with assets in the better off cluster, households without assets in the better off cluster, households with assets in the worse off cluster and households without assets in the better off cluster) improved at about the same rates (by 13 - 15 percentage points).

Water supply results show that in 2000, both community and household conditions were associated with improved growth. In 2011, the effect was only from improving household conditions, moreover only in the ‘better’ (higher than average access to surface water for drinking) communities, i.e. the household water supply had to improve before stunting improved. So a household with unimproved water source in a community with better access to improved water source, or a household with improved water source in a community with poor access to improved water source, was not associated with better child growth.

The results for sanitation indicate that there was a big effect of improved household sanitation in 2000, irrespective of the community’s existing sanitation conditions. In 2011 the effect was less, and only in the ‘better’ (i.e. higher than average toilet access) communities. Sanitation improved more than other factors here over 2000-11, and it is possible that the lesser recent impact relates to diminishing returns as the worse-off areas are covered.

Education does show a substantial community effect, although here too the effect at household level is greater in the ‘better’ communities (i.e. communities with a higher than average proportion of mothers with at least some education). The beneficial community effect, in both 2000 and 2011, is seen for uneducated households in ‘better’ communities – about 5 percentage points in 2011 compared to worse clusters – and the interaction of better education in better clusters brings this difference to 11 percentage points in 2011.

Finally, roofing, as an indication of socioeconomic status as well as housing itself, shows no association with growth in 2000, and only in ‘better’ communities with better roofing in 2011. In other words, unfortunately, it looks like improvements at the community level only benefit child growth in better houses in better clusters; better housing in a worse cluster has no benefit, the stunting levels being the same in these as in poor houses in either better or worse clusters.

Reduction in risk factors (poverty, WASH, education) at household level alone is not enough to reduce stunting. Both the household and community as a whole must have reduced risk factors for accelerated reduction in stunting. As such, programmes that reduce risk factors for the community as a whole, combined with individual interventions are more likely to reduce stunting in children.

Estimates from programme data
The Community Based Nutrition (CBN) component of the National Nutrition Programme (which includes the Growth Monitoring Programme, GMP) included regular weighing of participating children since the launch in 2008. The weighing results were summarized by woreda and month, and then aggregated by tranche (new groups of woredas) and by the 3-month period in which reports started coming in. The results provide independent estimates of trends in the prevalence of child malnutrition, estimated now as underweight among programme participants. Note that this is not the population estimate, but taking account of participation rate, can give new insights. See the Methodological Report for detailed explanation of previous analysis. The data recently have been compiled and analysed as part of the FMoH’s nutrition database with UNICEF support.

The trends estimated by the four most populous regions from the CBN weighing programme data by month, for the first programmes started in 2008 (tranche 1), are shown in Figure 11. The consistent pattern is striking – and seen also in later tranches, and in sub-tranches, not shown – whereby the prevalence of underweight among child participants appears to fall from around 30-35% (consistent with EDHS estimates of underweight), more rapidly at first, reaching about 10% after about three years. The credibility of the data is enhanced by small peaks appearing in the hungry seasons, followed by falls in the harvest periods. The participation rate for these data was estimated at about 30%.

Figure 11. Underweight prevalence trends 2008-2012 from Community Based Nutrition data.

The national level estimates up to 2015 from these data are shown in Figure 12. During 2011-2012 the system changed, and the weighing became the responsibility of the HEW rather than the community health/nutrition volunteer. We do not know whether this made a difference to the results, although at this level of aggregation it does not seem to have. The participation rates are similar. But the striking result is that the underweight prevalence has now reached well below 10%. If this is true, it represents an unparalleled impact on nutrition. It is important to assess whether the weighing programme-derived estimates are reasonable. If they are correct, it implies that the CBN/GMP is having a major impact. The first phase of the CBN programme was evaluated and found significant reduction of stunting among CBN participants further details of this evaluation can be found in the assessment of programme and resource section of this report.
The national level estimates up to 2015 from these data are shown in Figure 9. During 2011-2 the system changed, and the weighing became the responsibility of the HEW rather than the community health/nutrition volunteer. We do not know whether this made a difference to the results, although at this level of aggregation it does not seem to have. The participation rates are similar. But the striking result is that the underweight prevalence has now reached well below 10%. If this is true, it represents an unparalleled impact on nutrition. It is important to assess whether the weighing programme-derived estimates are reasonable. If they are correct, it implies that the CBN/GMP is having a major impact. The first phase of the CBN programme was evaluated and found significant reduction of stunting among CBN participants further details of this evaluation can be found in the assessment of programme and resource section of this report.

**Nutritional status of women**

The 2000, 2005 and 2011 EDHS data have been analysed, in terms of trends in thinness (BMI<18.5) and anaemia (Hb<12 g/dl) in non-pregnant women, and their distribution by wealth quintiles.

**Trends**

The national prevalence of BMI <18.5 was estimated as 30% in 2000, and 26% in 2011. The overall improvement was substantially less than for undernutrition in children. The trends by region show that women in the north and northeast – Tigray and Afar – actually worsened slightly in this period (in line with less improvement in children). Somali may have improved substantially, but cell sample sizes are <100 and the trend is thus less reliable. Otherwise most regions improved. However, in the northeast in particular, underweight in women (low BMI) is around 40%, which is high and indicates considerable need for intervention. One consequence is likely to be a lowering of birthweight due to malnutrition in pregnancy, perpetuating malnutrition between generations. This intergenerational effect is a consequence also of the very high prevalence of anaemia, shown in Figures 13A and B, especially in Afar and Somali, as well as Dire Dawa. The highland areas have rather low prevalence for anaemia, around 10-20%. The national estimate is 10%, improved from an estimated 16% in 2005. Attention to anaemia is urgent in the lowland areas, and presumably is worsened as pastoralism becomes less viable and animal product intake declines.
Relation to poverty

Distributions of thinness and anaemia by wealth quintile show some differences to child nutritional status. The slope of improved nutrition with increasing wealth, seen to be developing in child stunting, is only now beginning with respect to women’s thinness. Figures 14A and B show the relation of thinness (A) and anaemia (B) with wealth for 2005 and 2011.

Thinness hardly changes with time, and there is no real slope until the last wealth quintile. Only the top 20% of women in terms of relative household wealth have increased weight over their poorer peers. For the 80%, changes in wealth are not translated into less thinness. Only the top 20% of women in terms of relative household wealth have increased weight over their poorer peers. For the 80%, changes in wealth are not translated into less thinness. Anaemia is interestingly different, with a slope with wealth being seen across the range, although again considerably larger for the top quintile. Further, the improvement over time affects all – this could be interpreted as improved equity, but that is probably too simplistic as we don’t expect a linear response, certainly not at these low prevalences. But in any event, it is good news both that there seems to have been substantial improvement, and all relative wealth levels benefitted, on average.

Disaggregating by region, although stretching the sample in some cases, shows some differences from the average. Most striking perhaps is the considerable variation within quintile by region (Figures 15 A and B) – these quintiles are comparable, as calculated for the country overall – so that location is seen to be more influential than poverty: Tigray and Afar have nearly twice the prevalence of thinness at the same wealth quintiles as other regions. A similar story is seen with anaemia (Figures 16 A and B), for Afar and probably Somali and Dire Dawa: anaemia is much more related to location than to poverty. And the top quintile is always substantially better off.
In contrast to child undernutrition, women’s nutritional status (body mass index, BMI) has improved very little (0.2ppt/yr) from 2000-2014 – with important regional differences. Anaemia among women varies by greatly by geography; it is highest in the north and northeast, and improves only among those with relative greater wealth (richest quintile). Considering the inter-generational transition of undernutrition, maternal nutrition needs stronger emphasis in the further acceleration of nutrition work in Ethiopia.
Estimates of trends in income, expenditure and food consumption, 2000-2014

By region and time
The Central Statistics Agency (CSA) household income and expenditure surveys give regional estimates of food consumption[29-31]. The 2012 analytical report gives food consumption estimates as kcals/capita/day, by region comparing 2000, 2005 and 2011. These results are plotted in Figure 17, for the rural and urban estimates combined.

Figure 17. Food consumption estimates, kcals/capita/day, by region, 2000-2011.

The estimated average consumption increased from 2200 kcals/capita/day in 2000, to over 2400 kcals by 2011. The slope of increase was similar to that calculated by the Food and Agriculture Organization (FAO) for the Food Balance Sheets (FBS), but otherwise the two estimates, from different sources, are substantially different (this is not unusual). The CSA surveys provide household estimate, and therefore are used for this report, and show that the improvement was almost everywhere. However, the levels differ considerably between regions: SNNPR, Gambela, Benishangul-Gumuz, Oromia and Harari are above average, while Amhara, Afar and Somali are lower than average.

The consumption trends are likely to represent one important contributor to the rapid improvement in child nutritional status over 2000-2011. Presumably, as household consumption increases the food provided to children is likely to increase also. Evaluating how far the kcal increases lead to better dietary adequacy is not possible, as the household level kcal data would need to be compared to household food energy requirements, which are subject to much individual variation and are rarely if ever estimated in large scale budget surveys such as these. The increase of around 10% in kcal supply, between 2200 and 2450, could also be estimated with respect to the range in between clear inadequacy, and clear adequacy – say 1,800 to 2,800 – which gives 25% improvement.

By household expenditure quintiles
From the 2011 survey, expenditure and kcal intakes increase substantially by quintile, the latter from less than 2000 kcals/capita/day to around 2900 kcals (Figure 18). The lower quintile level of 2000 kcals is likely to be too low, on average, to support health and moderate activity; almost certainly at this level discretionary activity is curtailed; representing significant deprivation. It is also consistent with high prevalence of child malnutrition. On the other hand, 2900 kcals, for the highest quintile, gives us an estimate of the likely amount of food energy that would be consumed if poverty was not a major constraint.

A different estimate of the adequacy of kcals can be made from the percentage of total expenditure that goes on food; this was nearly 60% in 2005 and 50% in 2011, hardly falling in the first 4 quintiles (Figure 19). This result suggests that food access became easier for all over time, as the percentage of total expenditure on food fell; but not until the richest quintile did it begin to take a lower proportion of expenditure, and by implication, income. Although inflation was significant, the relative price of food increased by 20%, which evidently was not enough to prevent more expenditure on non-food items as well as on food.
Expenditure and income

CSA household survey data confirms large increases in expenditure/income over the 2000-2014 period. The household estimates have been roughly adjusted to better represent real income using the US$:Birr exchange rates, as provided by the 2011 HICE report (Table 24) [29]. They indicate about a doubling – 100% increase – in expenditure 2000-2011, with a greater increase in urban areas (Figure 20).

Figure 19. Expenditure per capita, 2000-2011.

Together, income and expenditure increases, and some lowering of the percentage spent on food, indicate a substantially improving nutritional situation, especially after 2005. The regional distribution of this achievement is indicated by food consumption increases apparent in all regions; there is not much crossover – the ranking of regions is similar in 2000 and 2011. Expenditure per capita by region is estimated in the HICE/CSA surveys. All regions except Harari, Addis Ababa and Dire Dawa (more urbanized) were similar in expenditures in both 2005 and 2011 – range reported as 1,590-1,920 Birr in 2005, and 4,070-5,510 Birr in 2011. The three richest had expenditures ranging from 2,280-2,580 Birr in 2005, and 6375-9050 Birr in 2011. This should explain some differences between the three more urban areas, and the other eight regions; but not within the eight poorer regions. It is important to note that the lower stunting prevalence and increased consumption in urban areas are potential risks for overweight and non-communicable chronic diseases (NCCDs) – this requires future data analysis.

Income, consumption and expenditure grew rapidly – income by 10% or more per year – and this accounted for much of the rapid improvement in child nutritional status over 2000-2011. Lower stunting prevalence and increased consumption in urban areas are risks for overweight and non-communicable chronic diseases (NCCDs) which require further analysis.

Micronutrient deficiencies

Micronutrient deficiencies are, indeed, important aspects of a situation analysis of the nutrition situation. However, the planning and start-up of the present SITAN work it was recognized that existing information on micronutrient deficiencies in Ethiopia was outdated and that a comprehensive, national micronutrient deficiency survey was due to be initiated during the first half of 2015. Hence, it was decided that a comprehensive review of micronutrient deficiencies, including trends and gap and opportunity analysis should be undertaken based on the forthcoming data from this survey.

Nevertheless, it is important to note that Vitamin A Capsule distribution and deworming have been implemented with incrementally higher coverage in Ethiopia since 2005-2006. Based on internationally established evidence and guidelines [11], these interventions are likely to have contributed to the nutritional improvements in Ethiopia during the last decade but it was not possible to statistically assess the impact of these interventions during this SITAN exercise. Both of these interventions are presently in the process of being ‘mainstreamed’ into the enhanced Health Extension Program, HEP. It should be emphasized that ‘blanket’ Vitamin A Capsule distribution is really intended as a stopgap measure in situations of high levels of Vitamin A deficiencies and should be phased as alternative prevention strategies, e.g. Vitamin A fortification of cooking oils, are put in place. A careful review of the Vitamin A deficiency situation and control measures should be carried out as the results of the national micro-nutrient survey become available. The same applies to issues around iron deficiency anaemia and corresponding measures to control (including deworming), although a recent study completed by Emory-Tulane on women’s nutrition concluded that there was no alternative to making the distribution of iron supplements for pregnant work, from central to peripheral levels, the latter through the health and antenatal care systems [32].

Salt iodization needs continuing support as iodine deficiencies carry a significant risk of permanent damage to unborn children. Ethiopia, has seen a significant increase in the supply of iodized salt from 10 per cent in 2011 to >90 per cent in 2014. However, salt iodization techniques are poor and only 43 per cent of the household salt is adequately iodized (>15 Parts per Million (PPM)). A revamping and modernization of iodization methods through the establishment of Centralized Iodization Facility (CIF), coupled with rigorous quality control should be focused on [33].

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RESULTS OF RISK FACTOR (CORRELATIONAL) ANALYSIS

KEY FINDINGS

- Poor water supply and sanitation are risk factors for child stunting – poor sanitation has a greater effect among children less than 24 months of age, while poor water supply has a greater effect among children 24 to 59 months of age.
- Poor water supply and sanitation are modified by maternal education – children of mothers with some education benefit more from improving water supply and sanitation than those without – an equity-negative modifier.
- Improving water supply and sanitation in efforts to improve child nutrition requires an education component (likely behavioural) to counteract equity-negative effect; the exact educational needs requires further research.
- With respect to water supply, child stunting does not improve until public tap or piped water supply is achieved.
- Improving IYCF practices at targeted (appropriate) ages would improve child stunting (i.e. timely and age appropriate messaging), and households with lower socioeconomic status could improve more than those with higher status – an equity-positive effect.
- To improve stunting the following age-specific IYCF practices should be focused on:
  o For new-borns focus on early initiation of exclusive breastfeeding
  o For children 6-8 months focus on timely introduction of solid and semi-solid food (this supposes exclusive breastfeeding from 0-6 months)
  o For children 6-14 months focus on meal frequency
  o For children 14-20 months focus on dietary diversity
- Access to health services, especially facility delivery at birth and antenatal care, are associated with improved child growth. These are modified by sanitation and education, respectively, thus providing health services to communities requires ensuring adequate access to improved sanitation and behavioural education to mothers, to impact child nutrition.
- Expansion of the Health Extension Programme (HEP) to increase access to health services would improve child nutrition, and should be adapted per population needs, especially in pastoral areas.

EVIDENCE

Summary of findings

Four risk areas were analysed, based in part on their connection to important programmes: water supply and sanitation; asset ownership (indicating poverty); infant and young child feeding practices; and access to health services. Indicators of risk were analysed as associated with child nutrition outcome (stunting); see the Methodological Report and Tulane report for further details [4]. The EDHS data was the primary source used for analyses, which does not include indicators of food security and agriculture. Therefore, analyses on an important risk area, food security, could not be performed in a manner similar to the four risk areas highlighted here. This is an area to be analysed in future work.

Poor water supply and sanitation were risks for child stunting, poor sanitation more so in the <24 month age group, and these associations were seen across most regions. Although these were independent effects, they were importantly modified by (i.e. interacted with) socioeconomic status, such as maternal education, in an equity-negative direction, such that the wealthier group would be expected to benefit more from improved water or sanitation. For sanitation, access is particularly low in pastoral areas. For water supply in particular, this suggests that an educational component should be included with water supply improvement interventions so that the growth of children in worse-off households benefits. Further analysis shows that child stunting does not decrease until the quality of water improves to the level of public tap/piped water – those with well water are no better grown; thus water for about 75% of households needs to be improved – this is concerning, but worth knowing.

Within poverty groups no additional risk factors were identified (not very surprising since poverty definitions include many of these likely risk factors). However, the impact of improved socioeconomic status, like education, can be extracted from within the overriding trend of poverty reduction.
Improving infant and young child feeding (IYCF) practices at the appropriate ages provides a major opportunity for enhancing child growth, moreover one that is equity-positive—the children in worse-off households would benefit more. These cover breastfeeding, introduction of (semi-) solid foods, meal frequency and dietary diversity. Of these, dietary diversity is particularly poor throughout Ethiopia, and would benefit from a broad multi-sectoral approach, including agriculture, WASH, education, and other sectors. The directly relevant programme intervention is through the kebele workers of the Health Development Army (HDA) in the CBN agrarian regions and Mother to Mother (M2M) support groups in pastoral and agro-pastoral regions, from whom messages more focused to appropriate ages could be effective; this has implications for training, supervision, etc.

Access to health services was assessed in relation to children above and below 24 months, although only feasible with indirect indicators (home delivery, antenatal care; immunization, treatment of diarrhoea). While there is no doubt that access to health services, and the success of extending the Health Extension Programme (HEP), is of central importance for child growth, development and health, the associations with these factors in the data were limited (although in the expected directions), and seen mostly in the younger children. The policy implications are clear even without this, and this was not pursued further. The associations of child stunting with risk factors were then used to define areas of risk, leading to the maps (combined with assessment of current programmes to address identified risk factors), and to policy and programme recommendations based on gaps and opportunities.

An important note: for all sections below extensive, detailed information may be found in the Tulane report [4].

**Water and sanitation (WASH)**

**National analysis**

Ages less than 24 months. The full analysis of both WASH variables among the younger age group found stronger associations between no toilet and height-for-age-mean (HAZ), while the association with water source diminished with important controlling variables added. An important interaction occurs between no toilet and no education, such that those with education improve more than the uneducated when going from no toilet to any toilet.

Ages 24 months and older. In the older age group, poor water source was much more important than no toilet in its effect on HAZ. Additionally, the effect of water interacted with no education on a similar manner to the interaction found between no toilet and no education in the younger group.

In sum, poor water and sanitation are both associated with a higher stunting prevalence (i.e. lower HAZ), but differences are found across age groups split at the age of two years. Lack of sanitation, represented by no toilet facility, has a greater impact on HAZ of the children less than two years, while poor water source has a bigger effect on HAZ of children two years and older. Overall, the association with water among the older children appears stronger than that with sanitation among the younger children. In addition, education of the respondent interacts with both the water and sanitation variables in their effect on HAZ in the corresponding age groups; only the educated show real improvement across levels of good versus bad water and sanitation, illustrating equity-negative interactions. The interactions with education are such that little improvement in child malnutrition could be expected from improving the WASH environment without including some additional intervention to circumvent the finding that poor education and improved water supply/toilet has little or no effect. This requires further (qualitative) research.

The Ebo clean water project benefits 27,000 people in seven villages including 15,000 school children with clean water in their school and households. Young girls now can attend school regularly without spending more time looking for water.

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Regional analysis
This section builds on the findings of the national-level WASH analysis. Having found the most significant association with HAZ to be with water source among the sample ages 24 months and older, this is the age group and association used here to evaluate WASH regionally. This uses primarily the EDHS 2011 children’s dataset, though some descriptive analysis includes the 2000 and 2005 surveys (where indicated).

Association with child growth. The Source of drinking water was found to be associated with mean HAZ in the national sample when dichotomized into two categories: surface or rainwater (poor water supply), and other sources. This association persisted when controlling for potential confounders. Nearly half of the sample used here (>=24 months) has a poor water supply, among whom nearly half are stunted. There is a significant interactive effect between source of drinking water and education in the total sample, such that only the good education group is expected to benefit from an improved water supply.

The association of child malnutrition with water supply is significant regionally in Afar, Oromia, Benishangul-Gumuz, SNNPR, Gambela and Dire Dawa. The interaction with education persists in Afar, Benishangul-Gumuz and SNNPR; there are clear signs that a similar, but less strong, interactive relationship may exist in other regions. The exception is Amhara, where the association does not appear at all.

Improving the source of drinking water may lead to improvements in child malnutrition, however these improvements may be limited to the more educated due to the interactive effect of education and source of drinking water on HAZ. Therefore, it is advised that programmes incorporate an educational component, based on safe water practices, in areas where the uneducated gain access to an improved water supply.

Descriptive statistics. About one-half of the national sample (>=24 months) use surface or rainwater as their source of drinking water in 2011 (Table 2.21). This category is defined as having a poor water supply in this analysis. Children with a poor water supply have the lowest mean HAZ score at -1.8389 and the highest prevalence of stunting (HAZ<-2), at 48%. Similarly, one-half of these children have poor sanitation facilities, defined as having no toilet, among whom, 46% are stunted. Regional variations of water source and type of toilet facility exist in Ethiopia, along with regional differences in HAZ.

Additional descriptive statistics with all 2000, 2005 and 2011 EDHS data. Trends in type of water source used across survey year were assessed along with regional differences in water source; this analysis used the entire age group of 0
to 59 months, selecting only those measured correctly for height or length based on their age. The results indicate a decline in the percentage of children in households using surface or rainwater as their source of drinking water, from 78% in 2000 to 56% in 2011. The decrease corresponded to a 10 ppt increase in those using a public tap, or piped water source outside of the residence, and a nearly 9 ppt increase in those using well water.

In the 2011 survey, the regions of Afar, Amhara, Oromia, and SNNPR all had more than 50% of children in the poor water category. In most regions, the highest prevalence of stunting was found in the poor water source category. However, using all water source categories showed the well water category to have the highest stunting prevalence in Afar, Amhara, and Benishangul-Gumuz.

At the national level, the prevalence of stunting is very similar between those with well water (40.2%) and those with surface or rainwater (41.2%). This seems to indicate that, despite any associations of surface or rainwater with stunting, it may be necessary to improve the source of drinking water beyond the well water category (i.e. to public tap or better) in order to impact stunting. Regional prevalences of stunting by water category show similar results – surface/rainwater and well water are similarly bad-off in terms of stunting. Children in Tigray with surface/rainwater are the most stunted of all with a prevalence well above 50%.

The effect of interaction between drinking water source and education on HAZ and stunting was explored by region and water-type disaggregation. This revealed the interactive effect; one needs to get to a public tap and get some education before nutrition improves. The interaction is much the same in Tigray, Amhara, Oromia, and SNNPR, and the difference in the level of improvement in the water supply by region is not large. About 55% of the population have no education and unimproved water, and only about 13% have education and access to a public tap or better.

For impact on stunting, these results imply that it is necessary to have at least a public tap, plus some education, before water supply contributes to improved growth. However, in the trends analysis, a number of other factors, some not identified, were found to contribute to stunting reduction. This reinforces the need for qualitative research to identify how water, education and other factors interact to improve nutritional status.

Potential need for an educational component to correspond with programmes aimed at improving water supply as an effort to reduce child malnutrition is indicated. The regional analysis can also be used to specify difference in needs. The revelation of the high use of well water among the malnourished also indicates the need for improvements in water supply beyond the level of well water to impact child stunting in many regions.

Unsurprisingly, poor water supply and sanitation are risk factors for child stunting, but interestingly in Ethiopia, poor sanitation has a greater effect among children less than 24 months of age, while poor water supply has a greater effect among children 24 to 59 months of age. The association between water and stunting is also dependent on the type of water source as child stunting does not improve until public tap or piped water supply is achieved. Furthermore, children of mothers with some education benefit more from improving water supply and sanitation than those without; therefore, an educational/behaviour change component should be included with water supply and sanitation improvement interventions.

Despite good progress in improving access to safe water in Ethiopia almost half of the population is still not covered, therefore this is an area which requires significantly more attention in order to accelerate stunting reduction in Ethiopia. The GoE and partners have recently launched a very ambitious One WASH National Program [34] with the aim to invest a total of US$ 2.41 billion during 2013-2020 to reach the targets of universal access set out by the Government Growth and Transformation Plan, and this will surely contribute to stunting reduction if these are coordinated with nutrition interventions and behaviour change activities.

Poverty: relative and absolute (asset ownership)

The association of poverty with poor child nutritional status is clear from the previous section on trends by poverty groups. Poverty can be quantified either in relative terms, such as by wealth quintiles which are redefined for every survey, or in absolute terms, such as by the ‘no-asset’ definition (no improved housing, or sanitation, or water) which is comparable between surveys. Both these have already been used in estimating trends. In this section we are investigating whether there are important (for policy) correlations over and above poverty, by relative or absolute poverty groups. Since many of the relevant variables are incorporated in the wealth quintile definition, and three in the ‘no-assets’ definition, the variables likely to be important are those unrelated (or with limited correlation) to those in the poverty definitions. Wealth quintiles are calculated by EDHS using principal components analyses, leading to (literally) hundreds of variables selected, but with widely varying weights; water, housing, and sanitation are included, and given high weighting.

A closely related issue is whether there are population groups specifically with worse child nutrition, over and above that expected from the poverty ranking. (The definition of the outlying groups would be the interacting variable.) This is first examined using the relative poverty definitions, which show the relative ranking of households within each survey; the 2000 and 2011 surveys are again the main focus, but 2005 and 2014 are included.

Figure 20. Frequency distribution of height-for-age mean, by wealth quintile, 2011.
From the frequency distribution of height-for-age mean (HAZ) for 2011 by wealth quintile in Figure 21, it can be seen that not only do the means show very little response to increasing relative wealth until the richest quintile, but even the distributions within the quintile show little change. There is a small excess of cases around HAZ -2.5 in the middle and richer quintiles. Comparison of 2000 data shows that there is a shift up in the means, without much change in the distributions.

It may be that certain population groups are worse off than would be expected from their relative poverty rank; however, if this was extensive we would expect to see more non-conformity within the distributions – relative poverty is accounting for a lot of the variation in stunting. Nonetheless, it is worth looking for smaller highly vulnerable groups within poverty definitions. The sort of result that would show this requires testing of potentially interacting variables. If this was found it would suggest that particular priority be given to the vulnerable group (by whatever definition), and conversely that this could be more effective in reducing malnutrition than a less targeted approach.

To this end, variables were tested, including:

- Remoteness: the available variable was distance to water; this was categorized into seven categories, from 0 to >180 minutes
- Livelihood: the three categories (from the ecozone variables, summarized) were agricultural, agro-pastoral, and pastoral
- Ownership of livestock and land
- Urban-rural-migrant
- Access to health services: home or institutional delivery
- Maternal education (although this is incorporated in the wealth quintile definition, and is highly correlated with the ‘no-assets’ poverty definition (p=0.000))

The results using relative poverty, wealth quintiles, as well as absolute definition as ‘no-assets’ showed either that there were no substantial differences within different categories of independent variable, within poverty categories; or that the interaction was in the direction of having a minor effect among the poor, and a significant effect only in the less-poor group.

As discussed earlier, the percentage of the population estimated as poor in absolute (asset) terms was reduced from 65% to 16% between 2000 and 2011, and this is really the larger story. Poverty is highly associated with child malnutrition – and this is not confounded by biological factors, the coefficients remain highly significant controlling for age, gender, mother’s height – and within poverty groups other factors remain important. However, their effect does not appear to be exacerbated by poverty; on the contrary, this effect is sometimes greater in the non-poor groups.

Reducing poverty brings substantial benefit to child nutrition; other factors such as access to health/nutrition service services or maternal education, need to be improved at the same time to accelerate the reduction.

Infant and Young Child Feeding (IYCF)
Exploratory Analysis: Minimum Dietary Diversity and HAZ (2011 data). Minimum dietary diversity was chosen as the first IYCF indicator to explore due to the significant improvements of this indicator found by White and Mason during the evaluation of the Community Based Nutrition programme in Ethiopia [35]. Disha et al. also found this indicator to be associated with HAZ in the 2005 Ethiopia DHS data [36].

The WHO defines adequate dietary diversity as four or more food groups, but due to the low prevalence of this level of consumption (which would limit sample size, especially regionally), this was decreased to three or more food groups.
Minimum dietary diversity, defined as consumption of foods from at least three different food groups, is positively associated with (HAZ) in breastfeeding children ages 6 to 23 months in Ethiopia. This association is strongest in 18 to 20 month old children (7.6 percentage points stunting in bivariate association); moreover, results indicate dietary diversity may be more important for growth in the older age groups of children. There are regional variations of this association. Minimum dietary diversity does not appear to be a strong predictor of HAZ in the regions of Oromia, SNNPR, Benishangul-Gumuz and Gambela. In addition, very few children ages 6 to 23 months receive foods from at least three food groups in Afar, Somali and Addis-Ababa, suggesting that an alternative child-feeding indicator should be assessed in these regions. In Tigray, Amhara, Dire Dawa and Harari, better dietary diversity is significantly associated with higher HAZ, similar to the national level.

In conclusion, improvements in child stunting would be expected from increased dietary diversity in the agrarian regions of Tigray and Amhara, and possibly in urbanized administrations of Harari and Dire Dawa. However, dietary diversity remains a challenge across all regions in Ethiopia, with very low percentages of children consuming even a modestly diverse diet of three or more food groups.

Additional IYCF practices. Additional IYCF practices, as well as changes from 2000-2011 were assessed upon completion of the exploratory analysis of minimum dietary diversity with the 2011 data only. Descriptive statistics, bivariate associations and correlational analyses (using regression techniques where the indicator presents a potential association in the bivariate form, and when sample size allows) were performed. The regression analyses use the 2011 data only. Sample size is an issue for several IYCF indicators due to the narrow age groups to which the practices apply (e.g. timely introduction of complementary foods is measured among 6 to 8 month olds). As a result, regional analysis is often limited to simply descriptive statistics since the samples are too small. Further details for all analyses are provided in the Tulane report, Section 2C.

The WHO IYCF indicators used here include:
1. Early initiation of breastfeeding
2. Exclusive breastfeeding under six months
3. Continued breastfeeding at one year
4. Introduction of solid, semi-solid, and soft foods
5. Minimum meal frequency
6. Minimum dietary diversity
7. Minimum acceptable diet
8. Consumption of iron-rich or iron-fortified foods

Some of the formal definitions of these eight indicators, given by WHO, were slightly altered in order to be useful across the all three datasets (2000, 2005 and 2011). Table 6 in the Methodological Report includes a detailed table of the original definitions, applicable population, and how the definition was altered. Additionally, the Methodological Report includes a table with explanation of IYCF variables used here and their derivations.

To give an overview of how improvements in stunting may result from interventions fostering better IYCF practices, the effects on stunting by 3-month age band (adjusted for potential confounders) of five important practices are summarized; the adjusted effects are then transformed into approximate stunting prevalences, and the results given in Figures 22 and 23. The figures show the expected improvements in percentage points of stunting from correcting the inappropriate practice in the group; thus the improvement in that group is shown in Figure 22 and, taking into account the percentage of the population that would correct this practice, the overall effect on the population prevalence is shown in Figure 23.
then, in the second year of life, improving dietary
ingoal will have an impact from 6-14 months,
ensuring timely introduction of solid foods is needed
practices:
3.4.1. EIBF = Early Initiation of Breastfeeding, CSSSF = Consumption of Solid, Semi-solid and Soft Foods, MMF= Minimum Meal Frequency,
MDD = Minimum Dietary Diversity
Figure 22. Effect of improving Infant and Young Child Feeding practices at different ages, estimated improvement at population level.

The results suggest that the timing of possible interventions is in line with globally recommended practices:
• early initiation of exclusive breastfeeding has a
detectable association with better stunting at 0-2
months, and is important for this and other reasons.
• ensuring timely introduction of solid foods is needed
at 6 months and would have a substantial effect up to
1 year, reducing stunting by up to 6 percentage
points in the total population of 6 to 8 month olds (this
supposes exclusive breastfeeding from 0-6 months)
• increasing meal frequency should have an impact
from 6-14 months, reducing stunting by around 5
percentage points at population level for 6-14
month olds
• then, in the second year of life, improving dietary
diversity becomes the priority, again with potential
for around 6 percentage points improvement in
stunting prevalence in the total population of
14 to 20 month olds

It is important to note that these effect sizes on stunting would not necessarily be cumulative, either across ages
or practices.

Several important interactions are in the direction that the less educated groups would benefit more from
intervention, thus giving likely positive impact on equity.

A summary of results for each indicator assessed is
presented below.

**Early initiation of breastfeeding.** At the national level there has been an increase in early initiation of
breastfeeding, defined as the child being put to the breast
within one hour of birth. The 2011 data shows a higher
mean HAZ (i.e. lower stunting level) among those who
initiated breastfeeding early, for the first 2 months of life.
This was not found in the 2000 data. Further analysis
indicates this practice is associated with better child
growth for the first two months of life and thereafter, it
seems, other factors become more important indicators of stunting.

**Exclusive breastfeeding under six months.**
There has been a slight decrease in children 0 to
5 months who are exclusively breastfed, with the
concerning issue that the largest decrease was found
in the youngest, 0 to 2 month olds. The mean HAZ
by breastfeeding status does not appear to follow any
expected directions, which is likely due to mothers
prolonging exclusive breastfeeding of a smaller or sicker
child, and deciding when to introduce complementary
foods based on the child’s size rather than age. This
phenomenon makes it difficult to assess possible
associations between breastfeeding status and child
malnutrition (this is explained further in the Tulane report).

**Continued breastfeeding at one year.** Continued
breastfeeding at one year has remained very high
throughout all survey years, with 95% or more children
ages 12 to 15 months currently breastfeeding.

**Introduction of solid, semi-solid, and soft foods.**
The percentage of children receiving solid, semi-solid
or soft foods at the recommended age of 6 to 8 months
increased by more than 12 percentage points from 2000
to 2011. However, there is still only 49% of children
between 6-8 months who received complementary food
with 26% of children 9-11 months still not consuming
complementary food and 15% of children 12-17
months are not benefiting from complementary food.
Further, 19% of children 4-5 months of age consumed
complementary foods [37]. There is an interactive
effect on stunting between introduction of solid, semi-
solid or soft foods and education. Those who are
more educated seem to benefit more from achieving the
timely introduction of complementary foods compared
to the educated group. Ensuring timely introduction of
solid foods would have a substantial effect up to 1 year,
reducing stunting by up to 6 percentage points in the total
population of 6 to 8 month olds.

**Minimum meal frequency.** The percentage of children
receiving the minimum number of recommended meal
feedings has increased from 2000 to 2011. The mean
HAZ is higher amongst those meeting the minimum
meal frequency recommendations across nearly all
age groups in both the 2000 and 2011 data, up until the
21 to 23 month age group. Further analysis shows this
indicator to be associated with stunting in the younger 6
to 11 month ages, similar to the association found with
consumption of solid, semi-solid and soft foods indicator.
An interaction with education was found with minimum
meal frequency in 6 to 8 month olds, reaffirming the
interaction found with complementary foods. By 12
months, the importance of meal frequency in relation to
child nutrition seems to diminish as such increasing meal
frequency should have an impact from 6-14 months,
reducing stunting by around 5 percentage points at population level for 6-14 month olds.

**Minimum dietary diversity.** The percentage of children receiving a dietary diversity of either 3 or more, or 4 or more food groups has decreased amongst both breastfed and non-breastfed children from 2000 to 2011. Those with less dietary diversity tend to be stunted, although this varies by age group. This association was analysed in depth in the 2011 data as described above. The importance of dietary diversity as a predictor of stunting seems to come in the older age groups, with potential for around 6 percentage points improvement in stunting prevalence in the total population of children 14 to 20 month olds.

**Minimum acceptable diet.** The percentage of children meeting the recommended minimum acceptable diet for their age and breastfeeding status has decreased from 2000 to 2011 – due to the decrease in dietary diversity – since minimum acceptable diet is a combination of meal frequency and dietary diversity.

**Consumption of iron-rich or iron-fortified foods.** The consumption of iron-rich foods has increased slightly from 2000 to 2011, but this trend varies significantly across regions.

**Cumulative child feeding patterns.** Cumulative child feeding status by age group is presented nationally for each survey year and for regional groups in the 2011 data. These graphs can further elucidate the child-feeding pattern over time. These are included in the supplementary material for the IYCF chapter.

Again, unsurprisingly, improvement in infant and young child practices will improve stunting. However, this report shows that it is the improvement of targeted, age-appropriate IYCF practices that improve child stunting (i.e. timely and age appropriate messaging), and households with lower socioeconomic status could improve more than those with higher status rending this type of intervention very pro-poor.

The findings should lead to more age-aligned and -adapted IYCF messages for children 0-24 months thereby leading to more effective Social and Behavioural Change Communication.

**Access to health services**

Access to health services is analysed here for correlations with child HAZ and stunting. The EDHS data does not have specific information on health services access; therefore, several variables are used as proxies. This topic was explored in 2 general areas revolving around child age: (1) health services access concerning birth is assessed in children less than 2 years; (2) health services access for older children, e.g. measles immunization, is assessed in children two years and older. The proxies used to assess access to health services around birth include: place of delivery, antenatal care personnel (doctor, nurse, midwife, no one, etc.), and number antenatal care visits. The proxy variables used to look at health services access for older children include: possession of a health card, measles immunization, and treatment of diarrhoea. Further details of all analyses may be found in the Tulane report.

A summary of results for each indicator assessed is presented below.

**Access to Health Services around the time of birth: ages< 24 months**

**Place of delivery.** Many births occur outside of health facilities with the large majority of deliveries taking place in the home. Although home deliveries have decreased from 2000 to 2011 across most regions, livelihoods, and urban and rural locations, there remain a significantly high percentage of births taking place outside of health care facilities, illustrating a poor use of health services for delivering mothers.

Additionally, home delivery is associated with lower HAZ scores among children born in the previous two years. There is also an interaction between home delivery and lack of proper sanitation facilities, modifying the effect of home delivery on HAZ. The interaction is such that there is minimal difference in HAZ between those delivering at home versus in a health facility among those with no toilet access. Meanwhile, there is a much greater difference in HAZ among those with toilet facilities, between home deliveries and health facility deliveries.

**Antenatal care.** There have been improvements in access to antenatal care from 2000 to 2011, but still over 50% of mother’s did not receive any form of care during her pregnancy within the 2 years preceding the 2011 survey. Access is worse in rural areas, and for pastoralists, further exemplified by Afar and Somali being the regions with the lowest rates of mother’s receiving antenatal care.

Antenatal care is positively associated with HAZ, but its effect is modified by education level. The interaction is such that only those with some education experience the improved growth outcomes associated with receiving antenatal care during the pregnancy. This demonstrates another unfortunate equity-negative interaction.

**Health card.** The percentage of children with health cards has increased from 2000 to 2011 nationally, but 44% of children greater than 2 years still did not have health cards in 2011. Afar and Somali have much lower percentages of children with health cards, along with
pastoralists in general, compared to the other livelihood groups. Rural areas are worse off compared to urban areas, though the improvements have been greater since 2000 in rural areas, indicating a possibly shrinking of the gap in access to health services between urban and rural areas. There is no clear association between having a health card and improved growth.

Measles immunization. Measles immunizations have increased nationally from 33% to 58% between 2000 and 2011. All regions had improved measles vaccination prevalence except for Somali. Somali and Afar again have the lowest levels, but Afar has experienced a large improvement from 2000 to 2011 (unlike Somali). As seen with the other indicators of health services access, pastoralists have the lowest measles vaccination coverage among the livelihood groups, and rural areas are worse off than urban areas, although pastoralists and rural areas have experienced greater improvements so this is good news for equity. There is no apparent correlative association between measles immunization and HAZ in children 2 years and older.

Treatment of sick children. The treatment of children who recently had diarrhoea was explored in children 2 years of age and older in order to assess a more concrete proxy of access to and use of health services. Within the more limited sample of those children who had diarrhoea in the past 2 weeks, about 10% of the 2011 sample, only 35% received medical treatment, with an additional 3.5% receiving some sort of other, non-medical facility-based treatment. Again there is no clear association between those receiving treatment and HAZ.

Access to health services, especially facility delivery at birth and antenatal care, are associated with improved child growth. These are modified by sanitation and education, thus providing health services to communities requires ensuring adequate access to improved sanitation and behavioural education to mothers, to impact child nutrition. It is important to ensure that all the critical health-based nutrition services and actions are maintained as high priority in the further improvements and expansions of the health services in Ethiopia.
EVIDENCE

Evidence for nutrition-agriculture linkages comes from literature review and qualitative work, as quantitative data (indicator(s) of food security) were not available within the EDHS datasets. Global evidence shows that agriculture programmes that are nutrition-sensitive can increase access to diverse foods, enhance women’s empowerment and support livelihoods [38], all important for improving food security. In Ethiopia, research shows that nutrition-sensitive agriculture interventions can have a positive impact on dietary diversity. In three agrarian regions, with Community Based Nutrition (CBN) programmes in operation, households that reported having a home garden also reported higher dietary diversity; notably the percentage of households consuming vitamin-A rich foods was much greater compared to households without gardens [39]. It would be important to understand if, within households, females and children are receiving more diverse foods. Market access also affects dietary diversity. In households with limited market access, increased household production of diverse foods resulted in increased dietary diversity among children; however, this did not hold for households with market access [40]. Further, household ownership of cows was associated with increased milk consumption and child growth, but this was less important when local markets were accessible [41].

Pastoralist populations in Ethiopia and elsewhere in the world are known to have exceptionally good nutritional status provided that they are able to rely on their traditional livelihoods with high levels of food intake based on animal sources, and when they are able to use their livestock to ‘buffer’ against droughts and other shocks. Their livelihoods in Ethiopia, however, have been under serious stress for many decades due to repeated and very severe droughts (especially Somali, Afar and South Oromia) and floods (especially in South Omo and Gambela areas), coupled with encroachment of their traditional grazing areas and civil strife (often related to control of these grazing areas). These conditions seem to be further exacerbated by effects of climate change during recent years. Additional and sometimes related factors like animal disease and trade barriers for livestock products have been added challenges [5]. For improving nutrition status among pastoral (and agro-pastoral) populations in Ethiopia, initiatives that aim to address factors affecting consumption have been evaluated. “Milk Matters” [42] is one such evaluation highlighting the dependence on animal milk for calorie and protein consumption among children, and the need for interventions aimed at maintaining health and nutritional status of household livestock for maintaining child nutritional status. Due to rapid transition between livelihoods (pastoral, agro-pastoral), interventions will require planning at woreda level, adapted to community needs and acceptable solutions [5].

At local level, implementation of nutrition-sensitive activities has recently gained momentum. The
government, with partner support, has begun relevant nutrition training of agriculture extension workers (AEWs). Observation of activities on the ground shows that AEWs in some areas have specialized roles (e.g. crop, livestock and natural resource management) and receive nutrition training for their respective roles. They are oriented to the role of agriculture in increasing dietary diversity, and the importance for doing so for pregnant, lactating and children less than two years of age. Among pastoral populations, AEWs are relatively less present, and less aware of context-appropriate agriculture/livelihood interventions for improving nutrition among vulnerable populations. It should not be generalized that coverage of and participation in activities is inadequate, due to limited case study visits. However, field observations show that in some cases, less than half of kebeles per woreda are covered, and less than half of households were participating in covered kebeles (see details of woreda case studies in Supplementary Materials).

The suggested adoption of household dietary diversity as an outcome indicator within the Agricultural and Growth Programme (AGP) would be a significant step towards ensuring the agriculture sector will make certain that its activities are nutrition-sensitive. However, a gap in how the sector will evaluate this outcome exists. The EDHS, Welfare Monitoring Survey (WMS) and the Household Income Consumption and Expenditure Survey (HICES) offer opportunities, as large scale surveys to collect data on dietary diversity for households and for children. Additional options that should be explored include the Food Insecurity Experience Scale (FIES) [43], piloted in Ethiopia by FAO, and the Minimum Dietary Diversity-Women [44]; both can be used to indicate dietary diversity. The FIES allows for evaluation at both household and individual level, though is not specific to dietary diversity, instead assessing overall food insecurity. The MDD-W indicator is based on survey evaluation of women’s dietary intake, and could be useful, especially as the trends analysis of this report highlights the need for improvement in the nutritional status of women. However, this indicator is only appropriate if programmes to improve dietary diversity among women are implemented. The indicator chosen for evaluation should be discussed with government health and nutrition and agriculture sectors, and partners that will support implementation of activities. Collecting data for indicator assessment between EDHS surveys would allow for more frequent evaluation of dietary diversity, and enable timely programme response.

The agriculture sector, needs to continue to build understanding and to re-orient itself at all levels to effectively recognize its critical role in establishing sustainable household food security, including dietary diversity, as a necessary condition for nutrition security. Specific activities include: continue current efforts to establish agriculture-based solutions to improved dietary diversity in nutritionally vulnerable households and communities, build an evidence-base from the nutrition sensitive actions within the AGP for potential revision or roll out to other woredas and strengthen institutional capacity for nutrition at federal, regional and woreda levels. At community level, linkages between HEW’s and DA’s must be harmonized and reinforced, in terms of their respective responsibilities for nutrition security (health and food security, respectively).
• Adequate intensity of community-based nutrition interventions is required for effectiveness – dependent on volunteer community workers (the HDA) – nutrition training and skill development should target this cadre – and HEWs should have skills and time necessary for supervision.
• Linking relief and recovery to development is essentials to support short-term nutrition security in emergencies/shocks and support long-term nutrition security in non-emergency situations.
• Assessment of resources (with available data) shows potential adequacy for nutrition interventions IF funds are applied to correct programme design and oriented towards nutrition outcomes (i.e. nutrition relevancy is ensured) in all sectors.

EVIDENCE

Programmes qualitative assessment
Qualitative desk and field work was undertaken to better understand interventions in Ethiopia with the potential to address need (identified in the correlational analyses), and identify gaps and opportunities in current interventions. The results of 1) selected project case studies and 2) selected woreda case studies are summarised below. Note that the terms ‘project’ and ‘programme’ are used for ease (and interchangeably), as all identified support the overarching Government of Ethiopia’s NNP.

Six projects/programmes were identified as relevant to factors associated with undernutrition based in part on the correlational analysis results, and having sufficient scale to address factors either currently, or the potential to do so in the future. Each project is described to the extent information could be obtained, highlighting important aspects of intervention area, coverage and implementation related to nutrition outcomes. – WASH, Alive and Thrive (A&T), CBN and GMP, the Agricultural Growth Program (AGP), ‘ENGINE’ (Empowering New

Generations in Improved Nutrition and Economic opportunities) and PSNP (Productive Safety Net Programme).

Summaries of observations, combining desk and field review, relevant to each project are described in Table A3 of Annex 1. A range of projects are being implemented with potential to address risk factors associated with undernutrition. Those programmes aimed directly at children’s nutrition (A&T, CBN, ENGINE) had shown successful implementation with resources in the range expected to bring significant impact; Nutrition-sensitive projects are increasing in coverage, though interventions must be reviewed for nutrition relevancy, and tailored to more directly target nutrition outcomes. Particularly, as nutrition-sensitive agriculture activities are increasing within the AGP, an evidence base for effective interventions should be built for revision and/or scale-up of actions to additional areas.

Integration of frontline worker activities between sectors (e.g. health/nutrition with agriculture) was seen to be locally viable, and needs sectoral encouragement and resources. The formal mechanism for this exists, under the NNP, with defined roles and responsibilities for sectors within coordination and technical committees. At the kebele level, structures for multi-sectoral work are already in place and should be built upon to ensure interventions are implemented effectively and community needs are addressed. This also emphasises the need for updated and harmonized nutrition education materials shared among sectors and partners. To enhance nutrition improvements, each sector must have defined, nutrition-relevant activities for implementation at local level, as well as outcomes measured by appropriate indicators for verification [5].

A common theme found among all projects assessed and woredas visited was the need for enhanced capacity for implementation of nutrition activities. Partners supporting interventions of the Government’s NNP were instrumental in providing capacity building of workers in health and other sectors.

Existing programmes are in place to provide nutrition-relevant interventions for improving undernutrition – and these interventions can be built upon. However, they require expansion particularly in the developing regional states, resource support and targeting (of both interventions and geographic location). These programs offer important opportunities for capacity development and lessons learnt which should be incorporated into national programming.

Estimates from programme evaluation data
An evaluation of the impact of the CBN component of the NNP on child nutrition was initiated by UNICEF in 2009, to cover tranches 2 and 3 of the CBN, launched in 2009 and 2010. Baseline surveys were conducted in July 2009 (tranche 2) and March 2010 (tranche 3). A midline survey for both tranches was done in September 2011. The design had 60 clusters of around 10 children each, and crucially the midline survey revisited the same clusters, drawing a new sample of children. No ex ante comparison groups were possible, but comparison within the groups surveyed was feasible.

The evaluation analysis determined that considerable and significant changes occurred in a number of maternal and child practices beneficial for child growth, including IYCF – this will be referred to later. For present purposes the child malnutrition results are the most useful.

HEW Binti Mohammed counsels a woman, who is holding her infant, on best nutrition practices, at the health post in the village of Wolaza, in Gomina, a woreda (district) of Oromia Region. Ms. Mohammed is holding a family health card. The card shows the health of a family’s children and also contains educational information about best health practices for the entire family.

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2 Evaluation of ENG and A&T project was not available for analysis at the time.
Stunting was the most significant indicator associated with project implementation; underweight was similar but less robust, and wasting fluctuated which cannot be interpreted at lower prevalences. The long term stunting trend without the programme was -1.3 ppts/yr. Compared with this, the stunting change rates in tranches 2 and 3 were significantly higher, at -4.3 and -5.3 ppts/yr – an additional 3-4 ppts/yr over the long-term trend (which was already improving). Differences in volunteer community health worker (VCHW) activity were also used to assess programme implementation in tranche 2, and a non-implmenting group was defined in tranche 3, allowing comparisons that showed that these changes were plausibly attributable to programme activities.

These results are consistent with the estimated decrease in the underweight indicator, which is highly correlated with stunting, seen in the weighing programme data. Moreover, the evaluation data indicated similar results for the around 30 per cent participation of children in the CBN programme woredas. The improvement rates in stunting discussed above – generally increasing after 2005 – may indeed have included some acceleration due to the Community Based Nutrition programme.

Probably the most encouraging evidence of a successful nutrition specific intervention in Ethiopia is the outcome of reduced underweight in children participating in the CBN, program with growth monitoring and promotion (GMP) as a key component. The results from the pilot phase of the CBN were carefully evaluated but despite the positive results, there was a reluctance to scale-up of the programme in its original design due to the fact that the program had trained and put in place Volunteer Community Health Workers (VCHWs), which created a specialized, ‘extra’, cadre of community workers which was not in line with the basic principles of the Health Extension Program. It is proposed that in order to systematically move towards uniformity and clarity of actions, the option of establishing a National Community Based Nutrition Protocol should be considered.

**Analysis of how far current and planned nutrition interventions link humanitarian with longer-term interventions**

An important aspect of maintaining the rate of reduction, and overall improvement, seen in child stunting is mitigating the risks from shocks that increase vulnerability to poor nutrition (Textbox 3 highlights the impact of drought on stunting reduction), particularly when it comes to protecting household assets which as stated above is linked to reduction in stunting. According to the Ministry of Agriculture (MoA), ‘Ethiopia is exposed to a wide range of hazards associated with the country’s diverse geo-climatic and socio-economic conditions’, requiring resilience-based interventions, i.e. linking relief and recovery to development (LRRD). In recent years, LRRD in Ethiopia has aimed to adopt a resilience concept initiated after the 2011 Horn of African drought emergency. The concept is based on the principle that both emergency and development assistance, as well as the government’s own policies and programmes, should aim to strengthen resilience to shocks. Three levels of resilience are considered to be critical, i.e. individual, community and society. In the context of accelerating nutrition improvements, this is useful because the three levels of resilience-building closely correspond to the three levels of causality in nutrition conceptual framework for causality analysis, i.e. immediate, underlying and basic causes, respectively. The latest government-led initiative to guide the LRRD process is the Strategic Programme and Investment Framework (SPIF) [46]. Since these efforts are just beginning in Ethiopia, current and planned nutrition interventions linking humanitaran with longer-term interventions are limited. Throughout the Ethiopian relief and rehabilitation work over the last four decades nutrition has been seen as an outcome of emergencies, with little attention given to the links between emergencies and chronic undernutrition. Actions needed in the area of LRRD to sustain nutrition improvement in Ethiopia are provided in Table 1.

### Table 1. Findings are recommendations for nutrition in the context of linking relief and recovery to development (LRRD).

<table>
<thead>
<tr>
<th>IDENTIFIED PROBLEM RELATED TO OVERALL GOE POLICY</th>
<th>ACTIONS NEEDED, GENERAL</th>
<th>SPECIFIC ACTIONS NEEDED FOR ACCELERATED NUTRITION IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malnutrition in children and women affected by disasters and shocks recognized as major concern by GoE for very long time - need for LRRD addressed from 2003 onwards.</td>
<td>GoE-led actions towards LRRD are captured in a series of disaster risk management (DRM) policy papers and operational guidelines. The latest, SPIF, provides very good, comprehensive plans for an LRRD approach and needs strong support from all partners to operationalize.</td>
<td>GoE DRM traditionally focuses on food security rather than nutrition. This bias is gradually changing but needs further emphasis. The new SPIF hardly mentions nutrition explicitly, requiring immediate attention.</td>
</tr>
<tr>
<td>Donor/partner support for LRRD verbally strong but restrained by internal operational procedures and lack of capacity among ‘emergency partners’ to undertake development work and ‘development partners’ to undertake emergency work.</td>
<td>Most donors/partners actively addressing the emergency-development dichotomy but major problems still remain in terms of funding and implementation mobilizations.</td>
<td>The emergency-development dichotomy spills over into nutrition work by creating artificial and destructive divides at outcome levels (acute vs. chronic malnutrition, epidemic vs. endemic disease) as well as action levels.</td>
</tr>
<tr>
<td>‘Resilience-building’ launched as a constructive conceptual and operational approach to LRRD from 2011 onwards.</td>
<td>‘Resilience’ is still to be fully operationalized and the ongoing discourse is, in fact, showing signs of fading out in some agencies.</td>
<td>Nutrition sensitive ‘Resilience-building’ offers great opportunity to address nutrition in LRRD and this must not be lost.</td>
</tr>
<tr>
<td>In some programme areas LRRD is already taking place, e.g. PSNP/HABP moving from food security safety nets towards broad based social protection. The same needs to take place across all relevant ‘emergency’ operations but without losing capacity to address recurring shocks and disasters.</td>
<td>LRRD at programme level requires capacity building and transformation. This presents new challenges for donors and partners/NGOs with distinct divides between emergency and development operations.</td>
<td>LRRD at nutrition programme level means transforming emergency nutrition, health, food, WASH, education, etc. into nutrition-sensitive emergency-development programmes. This needs to be systematically pursued also in the other areas (PSNP can provide an example).</td>
</tr>
<tr>
<td>Interestingly, LRRD is going on well in many emergency-prone areas at community/kebele level where HEWs, AEWs and kebele leaders are already accustomed to coordinating emergency and ‘development’ activities.</td>
<td>There are consequently many ‘good practices’ already in place to be learnt from and adopt into the LRRD processes.</td>
<td>Nutrition sensitive LRRD at community level – especially between HEWs and AEWs – needs to be reinforced, improved and translated into relevant implementation guidelines and trainings and promoted in non-emergency-prone areas.</td>
</tr>
<tr>
<td>The emergency/DRM coordinating mechanisms at kebele, woreda, zone and regional/national (including emergency clusters) levels need to be fully integrated/harmonized with corresponding development coordination bodies.</td>
<td>The new DRM policy provides guidelines and institutional arrangements that should support LRRD coordination. This should be rolled-out immediately with the support of partners.</td>
<td>Regarding nutrition coordinating mechanisms, the ongoing roll-out of NNP coordinating bodies to woreda level offers good opportunity to establish strong functional LRRD coordination at operational levels.</td>
</tr>
</tbody>
</table>
One of the major coping mechanisms of households that experience a shock/emergency is the sale of assets. As stated above, acquiring household assets (e.g. improved housing, sanitation, and water supply) improves stunting levels. Linking relief and recovery to development is therefore essential and policies and programmes such as the PSNP that ensure short-term nutrition security in emergencies/adverse shocks must be linked with policies and programmes that support long-term nutrition security in non-emergency situations. Crucially, these policies and programmes must be adapted to the context of the population in need.

Resources
Summary. Quantitative estimates were made with respect to donor resource disbursements for 2012 and 2013, from DAC (Development Assistance Committee of the OECD) data, by sector and sub-sector. This is an integrated reporting of all donor funds, thus approximates to Official Development Assistance (ODA). Complete financial data was unavailable for analysis. A total of 3,065 project in 2013 received donor funds, totalling US$3.67 billion. Health was the largest sector, with about US$650 million; within this nutrition was categorized as a sub-sector, with US$64 million. Projects in other sectors were examined for their relevance to nutrition; less than 10% of agricultural projects were specific to nutrition, and (by different estimates) 10-30% likely to have significant indirect nutrition benefit. WASH and health were similar. Population and reproductive health – mainly for HIV/AIDS – had US$300-400 million disbursed annually, arguably relevant to nutrition but not assessed as such. Agriculture and forestry; water supply and sanitation; population policy and reproductive health (much of this for AIDS funding) and basic nutrition, a sub-sector within health. To give context, the overall distribution of funding, by donor and sector, is first examined, then resources relevant directly to nutrition, and for WASH, CBN, PSNP, and health services are analysed. Finally, we report attempts from these data to assess how far resources in one sector – agriculture – are likely to be of medium-term benefit to nutrition.

Data used from DAC. DAC data is available as a data matrix with project-year as the unit of analysis (or record), with 35 descriptive variables. The variables used for the results reported here were:
- Donor
- Short and long descriptions of project
- Project title
- Purpose code
- Purpose name
- Sector name

Distribution of aid resources by donor and sector.
A total of US$3.67 billion, or US$3,672 million, was reported as disbursed in 2013. A total of 3,065 projects were listed for 2013, with an average value of US$1.2m for each. The distribution is extremely skewed. The two largest sums, for US$143 million and US$136 million (UK) are for ‘sector budget support’ for basic services and basic health. The next three largest are for over US$100 million. At the other end of the scale, the lowest 1,960 projects (64 per cent) are for less than US$200,000 each, it is important to keep this huge range in mind.

The allocation of the 2013 disbursement by sector shows the health sector to be the largest, totalling US$650 million, and reproductive health (mostly AIDS) second with US$443 million, altogether amounting to about US$1 billion in 2013 (about 30 per cent of the total), providing an average of US$10.5 per head. The emergency allocation was about US$400 million, the third highest.

For directly relevant nutrition activities we are particularly concerned with the social sector. The categories ‘general health’ and ‘basic health’ amount to the US$650 million, and ‘basic nutrition’ is a sub-sector within basic health, with US$64 million in 2013. WASH funds amounted to US$175 million; interestingly, education/training for water supply and sanitation is a sub-sector, with five projects totalling US$759,000. Education totalled US$315 million, here broken down into four sub-sectors. The overall total, for all relevant nutrition activities within the social sector was US$1.68 billion, or around US$18 per head. For the funds reported here, the percentage of total social sector funding is found in Figure 24.

Figure 23. Percentage of total distribution by social sector, DAC 2013.
Resources potentially directly relevant to nutrition. Sectors defined as health, reproductive health, WASH, and agriculture were selected for a more detailed analysis. Agricultural projects were analysed in part to understand how far it was feasible to categorize these as nutrition ‘sensitive or-specific’, with the aim of possibly applying this to other sectors. This analysis also includes 2012 data.

The nutrition categories were defined as:
1. Clearly specifically nutrition, or direct nutrition interventions
2. ‘Nutrition-sensitive’ A, meaning assessed as likely to improve nutrition and have a significant impact; referred to as ‘dominant’ in EU terms
3. ‘Nutrition-sensitive’ B, meaning those assessed as possibly having an effect on nutrition but one considered indirect and hard to assess; referred to as ‘partial’ in EU terms
4. An ‘other’ category was used for those with missing data, and those projects clearly irrelevant to nutrition.

Results from 2012 data. For 2012, a random sample was taken from the complete listing of each sector’s projects to give a rough estimate of the distribution of projects by nutrition category. Few of the health sector projects were specific to nutrition (estimated as 13 per cent – this rose to 19 per cent when the nutrition sub-sector projects were included), but half (48 per cent of the sample) were closely related and expected to have a significant impact. For water and sanitation (WASH) projects, only a total of nine projects, 16 per cent of the sample, were categorized as ‘nutrition-sensitive’ A (dominant). The inferences are that (a) there is considerable potential for agricultural projects to impact nutrition, and (b) some assessment and identification of these is possible from the limited DAC data. Resources did not allow this assessment to be applied to further sectors.

Results from 2013 data. In 2013, 3,065 projects were listed in all sectors, with gross disbursements of US$3,672 million. The allocation into the sectors of interest was as follows:
- Health: 302 projects, US$608 million
- Reproductive health: 319 projects, US$443 million
- WASH: 156 projects, US$175 million
- Agriculture: 366 projects, US$270 million
- Nutrition 38

Overall, the 1,112 projects in 2013 within these sectors, worth US$1,538 million, can be compared with the reported 1,210 projects and US$738 million in 2012. The differences in funds do not necessarily mean such large differences by year, since these are annual disbursement figures and thus subject to variations from implementation rates. The numbers of projects are more stable, and here probably do reflect an increase in activity in health, and in nutrition.

To deal with the large number of projects, only those with disbursements above US$1 million were selected for further analysis. This was also applied to 2012 data for comparison. For 2013, this yielded the following numbers of projects with total funds of US$1 million or more for 2013:
- Health: 55 projects, US$608 million (this was 27 per cent of the number of projects, and 94 per cent of the funds)
- Reproductive health, 57 projects, US$397 million (18 per cent and 90 per cent, as above)
- Agriculture, 55 projects, US$223 million (15 per cent and 76 per cent, as above).

Projects were categorised as relevant to nutrition, as shown in Table 2. In health, again about 15 per cent were assessed as nutrition-specific, i.e. direct nutrition projects; however few were considered ‘nutrition-sensitive’ A (dominant), and the majority only indirectly associated, ‘nutrition-sensitive’ B, at 69 per cent. WASH and reproductive health projects were assessed similarly to health, mostly indirect.

Table 2. Categorization of projects (greater than 1 million USD), as relevant to nutrition, DAC 2013.

<table>
<thead>
<tr>
<th>Group</th>
<th>Number Categorized</th>
<th>Specific</th>
<th>Sensitive A</th>
<th>Sensitive B Partial</th>
<th>Not Relevant</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013 PROJECTS &gt; $1M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td>55</td>
<td>8</td>
<td>5</td>
<td>38</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Agriculture</td>
<td>55</td>
<td>1</td>
<td>6</td>
<td>47</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>WASH</td>
<td>25</td>
<td>1</td>
<td>3</td>
<td>17</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Reproductive Health</td>
<td>57</td>
<td>0</td>
<td>7</td>
<td>44</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Nutrition</td>
<td>38</td>
<td>32</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Specific = Clearly specifically nutrition, or direct nutrition interventions, ‘Nutrition-sensitive’ A or Dominant= likely to improve nutrition and have a significant impact; ‘Nutrition-sensitive’ B or Partial = meaning those assessed as possibly having an effect on nutrition but one considered indirect and hard to assess

The criterion for agricultural projects was again whether from their descriptions they seemed likely to alleviate poverty or food insecurity. It should be clear that it is hard to conclude that most of these are likely to have a medium-term impact on the poor, sometimes due to the lack of detail.

Nutrition projects were extracted from both the 2012 and 2013 DAC data. Those that appeared in both years – continuing projects – were identified by matching project title and donor. There were 25 nutrition projects in 2012, of which all but 8 continued into 2013. In 2013 there were 38 projects, thus 21 new ones.

The total funding for nutrition in 2012 was US 31.9 million, and in 2013 US 64.1 million. The issues considered are:
- Distribution of funds, geographically and by population group
• Adequacy of the resources/head, or resource intensity
• How the resources are used, or project content, with reference to relevance to causes of malnutrition and hence likely impact on child malnutrition.

Resource distribution geographically. There is very little information from the DAC data concerning resource distribution, but project distributions and targeting from the mapping exercise are available. This was obtained from a different source (REACH enquiries to donors and government), but was at the same time and should have referred to much the same projects. Roughly, the inferences from the mapping probably apply to the distribution of project resources. Nothing new is brought to this in terms of targeting from the DAC data.

Resource intensity. Adequacy of resource intensity can be approximated by comparing the actual intensity with norms derived from experience. We recently did a meta-analysis of project reports from many countries, using both $/household and community health/nutrition workers/1,000 children (hhds/CHNW), to assess levels of intensity associated with nutrition impact [11]. This, and previous work, suggested that around US$10/household/year (hhdyr) and/or 1 CHNW/20 households (part-time) was associated with impact, approximated as increasing the rate of improvement by 1-2ppts/year (in stunting or underweight). The association was stronger with the CHNW calculation. The relationship is considered likely to be non-linear, meaning that before a certain intensity level little improvement is seen; this level is somewhere below US$10/hhd/yr, and probably above US$5/hhd/yr. The important implication of this is that using too few resources does not simply improve nutrition more slowly, but may not contribute at all, and thus is wasted.

The overall donor funding level for nutrition of US$64m in 2013 amounts to approximately US$4hhdyr. In principle, this would provide nearly the US$10/hhd/yr estimated to be needed for impact, if all were used for community-based programmes, and the funds covered nearly half the country (as the CBN approximately does). Of course, not all the US$64m (in 2013 terms) is used for direct nutrition work at the community level, but this does indicate that the nutrition funds, although not generous, are not way off what would be needed; particularly as government resources would be included (if data were available).

A tentative conclusion would be that the absolute availability of funds for nutrition is probably not the most important constraint in running effective programmes. The use of the funds – the programmes’ content – must also be considered. One element worth noting, yet not fully explored in this report, is the feasibility of a specific funding mechanism for nutrition which could greatly help in the allocation of funds for nutrition particularly in nutrition-sensitive interventions.

Programme content. Based on interpretation of the DAC descriptive data (title, short and long descriptions), a majority of the 2013 funding appears relevant to community nutrition programmes – roughly estimated at US$42 million, which mainly excludes emergency funding.

The projects for which there is evidence of effectiveness (on stunting) are primarily community-based [11]. This needs to be compared with the efficacy evidence, as given for example in the Lancet series [46-48], where it is not translated into evidence for effects in large scale and national programmes. Further, the issue is as much the route or platform by which interventions reach needy mothers and children. For example, as shown earlier, changes in infant and young child feeding are likely to lead to improved child nutrition and reduced stunting; and the efficacy data (e.g. in the Lancet) supports this. The question is: how to best foster the behavioural changes in infant and child feeding practices on a national scale; many attempts (e.g. through traditional nutrition education) have failed; it now seems that supporting a network of community workers, and their supervision through the health system, is effective on a large scale. This impact may indeed not only be due to the child feeding behaviour change – the community worker facilitates referral of sick children, maternal participation in antenatal care, and other activities with direct and indirect benefits to child nutrition.

Programmes/Projects at present should keep the focus at the community level; a number of well recognized projects, like Alive and Thrive and ENGINE as well as UNICEF’s support to CBN, do focus on the community and have established means of doing this.

A far-reaching policy decision would be to ensure that nutrition programmes aimed at improving general child nutrition (as biomarked by stunting) should use the resources primarily at community level.

It seems from this analysis that the budgetary allocations explicitly to nutrition actions are significant but modest. On the other hand, disbursements to ‘nutrition sensitive’ social sectors are very substantial, so if these resources are effectively harnessed into ‘nutrition sensitive’ actions, nutrition improvements are likely to be accelerated. One element worth noting, yet not fully explored in this report, is the feasibility of a specific funding mechanism for nutrition which could greatly help in the allocation of funds for nutrition, particularly nutrition-sensitive interventions.
MAPPING OF NUTRITION INTERVENTIONS

KEY FINDINGS

- Maps can identify priorities for programmes, combining need – prevalence of undernutrition and prevalence of risk factor – with programme presence.
- As part of this report maps were produced to highlight priority zones for the scale up of the following programmes: PSNP, Water access, hygiene promotion and CBN (special emphasis to IYCF).
- These maps are only useful with current information – partners supporting nutrition interventions should be responsible for updating information on a regular basis.
- Many programmes such as nutrition-sensitive agriculture, adolescent and women’s programmes could not be performed with the available data – further research is needed to conduct such analysis.

EVIDENCE

The EDHS database used for trend and risk factor analysis contained geocodes, and this allowed both further merging with nutrition programme data, and with geographical definition at the level of administrative zone (i.e. creation of a single database containing survey and programme data). There are 70+ zones compared to 12 regions, and the zone was considered a reasonable aggregation level, compromising between programme policy needs and stretching the data perhaps a bit further than it should (categories of tertiles were used to mitigate this). Maps were developed combining three dimensions: child malnutrition prevalences (using underweight here to ensure that areas with high wasting were shown as high risk); extent of risk factor (e.g. of poor water supply); and programme presence, derived from the FMOH/REACH database. Detailed explanations of mapping database components, variables used in mapping and presentation of maps are provided in the Methodological Report. Here, a summary of relevant findings are presented, as well as an example of how these maps can be used. In sum, the maps cover the four risk-programme areas, and suggest targeting priorities in geographical terms, as well indicating severity of risk and child nutrition outcomes (stunting, underweight and wasting).

The mapping exercises provide a presentation of need (in terms of child malnutrition), with the extent of selected risk factors for malnutrition and estimates of access to relevant programmes, thus a useful way to understand results of the analyses described in previous sections. The mapping process gets too complex if all three of these factors are overlaid, so the need (malnutrition prevalence) and risk factors are combined as a single dimension, with programme access as the second. The maps are at zone level. The four areas studied, and associated indicators were as follows (child stunting is common to each):

- Water, sanitation, and hygiene programmes; household water supply and toilet facilities;
- Infant and young child feeding practices; community-based nutrition (CBN) activities;
- Poverty; Production-based Safety Net Programme, PSNP
- Health service use indicators; access to health services.

The maps then suggest targeting priorities geographically; other information in the database not shown in the maps, such as organizations working in the areas, can be used when developing interventions. Programme data was not available to indicate extent of health services by zone; mapping of this area could not be performed in a similar manner. Similarly, EDHS data does not have indicators for food security, thus mapping could not be performed for relevant agriculture programmes (e.g. AGP).

Production-based Safety Net Programme (PSNP)
Interpretation of maps: example of PSNP. For an example of how to interpret the map combining need and programme presence, the PSNP section is explained here. Only the final map, combining all components and suggesting targeting is shown below in Figure 24. The complete series of maps can be found in the Tulane report, Section 3A (Tables and Figures).

Figure 25, includes all of the categories of need, overlaid with PSNP presence. Here, the darkest green illustrates the best-targeted areas, or those with the most PSNP presence and in highest need. The mid-green colour illustrates good targeting, or the medium need zones with the most PSNP presence. In addition to the darkest and mid-purples for priorities A and B which were represented in the previous map, the lighter purple colour illustrates priority C, those medium to high need zones in the middle tertile of PSNP presence. Finally, the light blue zones are those in lower need of PSNP. It is easy to see from this map, after digesting the prior maps that Somali and much of Afar are at least well targeted, in that they have a large presence of PSNP and are in the highest tertiles for both underweight and extreme poverty.
Table 3. Summary of need for, and presence of PSNP based on underweight prevalence, percentage of children in zone living in extreme poverty and presence of PSNP.

<table>
<thead>
<tr>
<th>NEED: BASED ON PREVALENCE OF UNDERWEIGHT &amp; PERCENTAGE OF CHILDREN LIVING IN EXTREME POVERTY</th>
<th>PSNP Presence</th>
<th>Fewest</th>
<th>Medium Need</th>
<th>Highest Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSNP Priority A, 1 zone Oromia: North Shewa</td>
<td>7 zones</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSNP Priority B, 7 zone Benishangul-Gumuz: Asosa, Kemashi, Metekel</td>
<td>17 zones</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some Priority C, 12 zones</td>
<td>7 zones</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most Best Targeting, 6 zones Good Targeting, 10 zones</td>
<td>6 zones</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Highest need zones are in the highest tertile for both underweight prevalence and percentage of children living in extreme poverty.
- Medium need zones are in either tertile 2 or 3 for both underweight prevalence and percentage of children living in extreme poverty. This excludes the zones in tertile 3 of both prevalence and extreme poverty as they are captured in the highest need category.
- Low need zones are in tertile 1 of either underweight prevalence or percentage of children living in extreme poverty. Note that some low need zones may be in the highest tertile for one of these, but they are not deemed in need of the programme presented for here (PSNP).

Results from other programme areas. The mapping procedure and presentation described above were applied to the other programme areas: water supply and sanitation/WASH programmes and IYCF/CBN. A summary of results for priority interventions is provided here. An important note: The areas suggested for priority are from the available data. No doubt this information will be updated and the need and prioritization will change. An option is to build the capacity to undertake the mapping processes locally, using the procedures developed (see Methodological Report).

Water sanitation and Hygiene (WASH)
The highest priority is proposed as where malnutrition and lack of improved water or sanitation are both in the highest tertile, plus where the programme presence is least. This suggests top priority areas mainly in the centre-southwest of the country. These zones are:
- Highest priority zones for water programmes were:
  - Priority A zones- Highest Need and fewest presence
    - Amhara: Aw, East Gojam, North Gonder, West Gojam
    - Beneshangul-Gumuz: Kemashi
    - Dire Dawa: Dire Dawa
    - Gambela: Zone 1
    - Oromia: Arsi, Bale, Borena, N Shewa
    - SNNPR: Amaro Special, Guraghe, Hadiya, Sidama, South Omo
    - Tigray: Central Tigray

Highest need areas for hygiene programmes:
- Priority A zones- Highest Need and fewest presence
  - Afar: Zone 5
  - Amhara: Arsi, Bale, Benishangul-Gumuz: Kemashi, Metekel
  - Gambela: Zone 1
  - Oromia: Borena, Ilu Babor
  - Somali: Shinile

The two tables presented below give further information on the groups presented in the maps, specifically, the number of zones per category. Table 3 shows need by programme presence. This is consolidated using definitions of highest, medium, and low need that combines both the zones underweight and extreme poverty tertiles. These are defined in the Methodological Report and in the footnotes of the table. This condensed table illustrates how the groups are combined into priority A, B, C, good targeting, best targeting, and lower need. The footnote also lists which zones are in priority A and B groups. The single priority A zone which is seen as the darkest purple zone in the middle of the map above is North Shewa, in Oromia.
IYCF and Community-Based Nutrition programme

IYCF and Community-Based Nutrition (CBN) programme. The indicator used for IYCF practices for the present purpose is minimum dietary diversity; this is the practice that is most widely problematic, and improving it from non-optimal to optimal is estimated to give a substantial impact – at population level up to about 6 percentage points reduction in stunting. The distribution by zone of the estimated percentage of children (after 12 months of age) getting less than this minimum is mapped. (Note that the percentages are very low even in the better zones – the cut-off point is 16%, so best off is > 16% with this practice optimal). From the dietary diversity map it is clear that Afar and Somali together have the worst practices; some of this may well be from the traditional pastoralist lifestyle, but recall that livelihood (as measured in the EDHS eco-zoning data) itself unexpectedly did not account for much difference in child growth. The northwest of the country also had poor dietary diversity, but in this case is also reported as having the most programmes.

Combining these then by need suggests highest priority to Afar and Somali, and also southern SNNPR (where pastoralism is also common). Areas in Gambela and western Oromia are also of priority. Highest priority zones for CBN programmes were:

- **Priority A zones- Highest Need and fewest presence**
  - Afar: Zone 2, Zone 3, Zone 4, Zone 5
  - Somali: Ader, Liben

- **Priority B Zones - Medium Need and fewest presence**
  - Afar: Zone 1
  - Amhara: Awi
  - Beneshangul-Gumuz: Asosa, Kemashi
  - Gambela: Zone 1
  - Oromia: Ilu Babor, Jimma
  - Somali: Shinile
  - SNNP: Shaka

This information is based on FMoH/REACH data available, and may not reflect the modified CBN programme operating in identified priority zones.

Therefore, it is important to update programme information before interventions are planned. However, the finding that interventions to improve dietary diversity are needed in these areas stands.

There is a limit however to how far targeting is relevant, since throughout the country dietary diversity for young children is a major constraint. Even the supposedly better-off areas in this respect may have less than 20% of children meeting dietary diversity norms. Probably a policy to address this would not focus greatly on targeting, but on ensuring that interventions to improve dietary diversity are prioritized wherever the CBN is operating.

Maps can be particularly useful in identifying priorities for programmes by triangulating information on need, i.e. prevalence of undernutrition and prevalence of a risk factor with programme presence. This exercises was conducted for PSNP, Water access, hygiene promotion and CBN thus highlighting priority zones for scale of these programmes. However the maps are only useful with current information therefore a government-led system for updating the information on a regular basis is necessary.
RECOMMENDATIONS FOR POLICY & PROGRAMME INTERESTS

In the previous sections of this report, policy and programme implications of findings are presented. Here a summary of recommendations for 1) policy and 2) programme interests is provided. These recommendations are taken directly from identified gaps, and opportunities in filling these gaps for improving nutrition among women and children in Ethiopia.

It is worth remembering that there has been rapid improvement in child nutrition in the last 10-15 years, fuelled by economic growth leading to increased food and consumption, accumulation of assets (as an indicator of poverty reduction) and extension of maternal and child health and nutrition services to communities and households through community-based workers. The policies and programmes developed to support these efforts over this time period have been effective, and need expanding in terms of 1) coverage and 2) resources (financial and human). That is, importantly, policies and programmes are moving in the right direction and they require continued support and expansion, especially for furthering nutrition improvement in Ethiopia.

POLICY RECOMMENDATIONS

• Current policies are to be kept and strengthened (equity focus) as they led to reduction of various forms of malnutrition among young children and women in Ethiopia over the past 14 years.
• Reinforce current policies that increase household income and expenditure and support asset acquisition.
• Reinforce policies that aim to improve the situation of women; improve women’s literacy and girls’ education, and access to basic social services (health, nutrition, water, hygiene, sanitation).
• Government is encouraged to continue allocating more resources to improving access to quality health and nutrition services – with an equity focus – and explore the feasibility of a nutrition financial mechanism to better allocate and track nutrition funds within nutrition-sensitive social sectors.
• Revisit exiting agricultural policies to make them nutrition sensitive with a clear result framework.

PROGRAMME RECOMMENDATIONS

• Ensure that all the critical health-based nutrition services and actions are maintained as high priority in the further improvements and expansions of the health services in Ethiopia.
• Increase coverage of nutrition specific programmes, particularly in developing regional states and reaching those with high risk factor especially households with low socio-economic status.
• Increasing participation in Community Based Nutrition programmes within covered programme areas must be prioritised.
• A National Community Based Nutrition Protocol should be considered in order to move towards uniformity and clarity of actions, with improved participation and supervision of the Health Development Army.
• Additional resources for nutrition programmes should be targeted to populations with high prevalence of risk factors and undernutrition, as assessed by the mapping exercise.
• Create capacity for maintaining a comprehensive mapping of stakeholders, their intervention and geographic coverage of their programmes.
• Interventions for improving undernourishment among women should be prioritized – this requires targeting of adolescent girls and well as pregnant and lactating women.
• Enhance women’s access to education and strengthen initiatives to change their health seeking behaviour.
• Water, sanitation and hygiene (WASH) programmes should be prioritized as means to improve child undernutrition. However, WASH programmes must include a behaviour change component with a focus on poorly educated women, to improve behaviours associated with WASH.
• Promote age appropriate and timely feeding counselling for children 0-24 months.
• For nutrition-sensitive agriculture specific activities include:
  o Agriculture based solutions, such as production of nutrient dense crops, livestock/livestock products, agro-processing/storage skills, Increasing on-farm or off-farm income for vulnerable households and
women need to be further established in order to increase the production and access to diverse, safe, and nutrient dense foods.

- Ensure implementation of gender components in nutrition-sensitive programmes like AGP and PSNP.
- Strengthen institutional capacity for nutrition-sensitive agriculture at all levels through development of standardized nutrition-sensitive training manual for policy makers/implmenters and revising existing materials with a nutrition lens as well.
- Harmonize and reinforce synergies between Health and Agriculture Extension Workers regarding food and nutrition security through creating common forums and facilitate experience-sharing sessions.
- Agricultural interventions need to go along with a behavioural education component to avoid potential, unintended negative effects of interventions such as poultry faecal exposure and selling of diverse foods rather than own-consumption.

ANNEXES

ANNEX 1

Figure A1. The UNICEF conceptual framework for causality analysis, 1990.
**Figure A2.** Nutrition actions as related to nutrition causality framework.

### Source:
Adapted from Black, et al., Lancet 2013. Maternal and child undernutrition and overweight in low-income and middle-income countries.

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<table>
<thead>
<tr>
<th>Programme Content - Relevance</th>
<th>Targeting</th>
<th>Resource Intensity</th>
<th>Participation (Local)</th>
<th>Coverage (Local)</th>
<th>Coverage (National)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>One WASH National Programme (OWNP)</strong></td>
<td>Low (pilot programme in eight towns currently)</td>
<td>Not available</td>
<td>Unimproved water supply and sanitation access are associated with poorer child nutritional status</td>
<td>Low</td>
<td>22-24% (150-160/675 woredas in four targeted regions)</td>
</tr>
<tr>
<td><strong>One WASH Plus</strong></td>
<td>Medium-Low</td>
<td>US$12.30/person</td>
<td>Not available</td>
<td>High</td>
<td>4-8% (30-55/675 woredas in 4 regions)</td>
</tr>
<tr>
<td><strong>Water, Sanitation and Hygiene, Multiple Use Services and Community Based Nutrition (WASH/MUS/CBN)</strong></td>
<td>Low (pilot programme in 30 woredas currently; WASH/CBN in 55 woredas)</td>
<td>Not available</td>
<td>Medium-Low</td>
<td>High</td>
<td>30-50% ~US$7 All under-2 children</td>
</tr>
<tr>
<td><strong>Alive and Thrive (A&amp;T)</strong></td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>US$2.22/person All households with pregnant/lactating women or under-2 children. Programme activities targeted to kebele needs. Optimal for meeting nutrition objectives through multipronged approach including SBCC, mass media, capacity building.</td>
</tr>
<tr>
<td><strong>Community Based Nutrition (CBN) / Growth monitoring and promotion (GMP)</strong></td>
<td>High Variable, 30-50% ~US$7 All under-2 children</td>
<td>CBN is the main direct nutrition programme; provides platform for IYCF interventions.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Agricultural Growth Programme (AGP)</strong></td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>US$26.1/person All under-2 children</td>
</tr>
</tbody>
</table>

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*Information based on Phase 1 of project, at time of field study implementation was not ongoing.*

*Specific to nutrition sensitive aspects of the AGP.*
National Nutrition specific and sensitive strategies and programme landscape

Growth and Transformation Plans: The GTPs are five-year development plans which cover multiple sectors, including health, and aim at improving general economic growth and achieving various millennium development goals (MDGs). The GTP 1 (2004/05 - 2009/10) and GTP 2 (2010/11 - 2014/15) called for improvements in health care infrastructure (through the establishment of health posts) and increased capacity of the health care system (through training of more HEWs) [14].

Health Sector Development Programme IV (HSDP IV - 2010 to 2015): Commits to reach all sections of the population with effective health interventions, including nutrition [14]. In the fourth HSDP, nutrition has been considered a “cross-cutting issue,” with stunting included as a key performance indicator in the last 2 HSDPs [14]. HSDP IV’s nutritional objectives are outlined in the NNP and the goal is to ensure all Ethiopians benefit from a secure and adequate nutritional status in a sustainable manner.

National Nutrition Strategy: The first ever National Nutrition Strategy (NNS) was launched in 2008, with the aim of ensuring that all Ethiopians secure an adequate nutritional status. Following this, in 2008, the National Nutrition Programme has been implemented in two phases, from 2008-2013 (NNP-1) and from 2013-2014 (NNP-2), and will continue in a third phase from 2015-2020.

National Nutrition Programme: In June 2013, Ethiopia launched the revised NNP for Ethiopia, which was endorsed by nine line ministries. The NNP aims to improve the coordination of nutrition approaches and programmes through ‘Supporting Service Delivery’ and ‘Institutional Strengthening and Capacity Building’ [51]. The development of the CBN was also a central component of the 2008 NNP as it follows the lifecycle approach with more emphasis on the first 1,000 days, accelerated stunting reduction actions and multi-sectoral engagement in nutrition sensitive actions.

National Food Fortification Action Plan: In July 2014, under the lead of the Ministry of Industry, the National Food Fortification Action Plan was developed with the aim of contributing to the reduction of micronutrient deficiencies in Ethiopia as part of the NNP through the fortification of wheat, salt, edible oil and other food vehicles produced by domestic industries and/or imported into the country.

National Interventions

Established in 2003 the HEP was designed to increase access to a universal set of health services, focusing predominantly on the prevention of illness and disease [52]. The HEP consists of sixteen components activities spread across four thematic areas: (1) disease prevention and control, (2) family health, (3) hygiene and environmental sanitation, and (4) health education (including nutrition) and communication [14]. The HEP is delivered by at least two female HEW at health posts, embedded in the kebele. A year-long training is given to HEW prior to being posted, with refresher trainings on specific topics given on an on-going basis [53].

In an effort to reach each household with key services and facilitate the promotion of healthy behaviours, the GoE has launched a community level Health Development Army (HDA). A so-called “One-to-five” network is established where one person out of every five households (network leader) takes a lead for the neighbourhood as key link with the health and agriculture extension workers. Five leaders of such groups (team leaders) are organized as a development team to look
after the development and wellbeing of the 25 to 30 households. The development army can play a central role in behaviour change communication and social mobilization to enable overall promotion of nutrition interventions.

There has been a steady increase in the coverage of local health services since the year 2000 with the number of health posts constructed—one per kebele—steadily increasing from 1,311 in 2001, 6,191 in 2005, to 14,192 in 2011. It has been estimated that the primary health care coverage increased from 77 per cent in 2005 to 90 per cent in 2010 [54].

Community Management of Acute Malnutrition (CMAM): Ethiopia’s CMAM programme can be categorized in two phases: first, from 2003/04 to 2007, CMAM was initiated in response to a severe drought in Ethiopia in 2003. In 2008, CMAM was incorporated into the HEP and the number of CMAM sites scaled-up from 1,240 in 2008 to 12,000 sites in 2013 [55].

Enhanced Outreach Strategy (EOS) and Targeted supplementary feeding (TSF): The EOS programme began in 2004, and provides bi-annual vitamin A supplementation to children 6-59 months and deworming to children 24-59 months. In addition, children and pregnant or lactating women in drought-prone areas are screened using mid-upper arm circumference on a quarterly basis. Children and women identified with moderate acute malnutrition are referred to the WFP-supported TSF [56] whereas children with severe acute malnutrition are referred to the nearest CMAM programme [57]. Following development of a transition strategy by FMoH, in June 2012, all woredas in agrarian regions transited from EOS to Community Health Days (CHDs). In the CHD model, the EOS activities are incorporated into the workload of the HEW and days are set aside dedicated just for vitamin A, deworming and screening activities. In 2014, a selected number of woredas transitioned from CHD to routine integrating the interventions fully into the HEP routine activities. During 2016, selected woredas in pastoralist regions of Somali, Afar, Gambella and Benishangul will transit from EOS to routine integrating the CHD model. The EOS activities include:

- Monthly Growth Monitoring and Promotion (GMP) of children under-2 for growth-faltering identification and appropriate counselling in agrarian regions;
- Targeted counselling on appropriate IYCF and child care practices; water, sanitation and hygiene practices; and maternal nutrition (individual, group and house-to-house counselling as needed);
- Community mobilization and conversations on nutrition, WASH and health issues;
- Women support groups on nutrition behaviour and IYCF via the HDA structure;
- Micronutrient deficiency control through Vitamin A supplementation and deworming of children under-5, deworming of pregnant women, and supplementation of PLW with iron and folic acid;
- Screening for acute malnutrition in children under-5 and pregnant and lactating women and referral for the treatment of acute malnutrition;
- Referral to health facility based services for treatment of childhood illness (ICCM) and HIV programmes;
- Multi-sectoral linkages to strengthen nutrition sensitive activities with community level education, agriculture, social protection (PSNP), and WASH programmes.

Starting in 2008, the roll out of the CBN programme increased gradually in each region from 39 woredas to 386 Woredas in 2014 covering 55 per cent of all children under 2.

Integrated Community Case Management (ICCM): The ICCM programme focuses on the treatment and management of pneumonia, diarrhoea, malaria, and severe acute malnutrition [58]. In 2008, the ICCM programme was included into the HEP, and was scaled up through the HEP in 2010[58]. By 2013, ICCM was implemented by all the health posts in agrarian regions but remains poor in the developing regional states where implementation is only 69 per cent of health posts in Gambella, 47 per cent in Afar, and 9 per cent in the Somali region [59].

Productive Safety Net Programme (PSNP): PSNP began in 2005 and is the largest food security and social protection programme in Africa. The coverage of the PSNP rose steadily to more than 7 million in 2009 and 2010 covering an estimated 11 per cent of households [60].

Implemented in food insecure woredas, the PSNP provides support to food-insecure households during the hunger gap seasons to prevent the sale of household assets and to stabilize consumption patterns [61]. Specifically, support is provided in the form of a) the provision of food for work via labour-intensive public works projects, and b) direct support to households who cannot participate in public works projects. Since its creation, three separate rounds of the PSNP (2005–2006; 2007–2009; 2010 – 2014) have been implemented. A new phase of PSNP IV is now planned for 2015 onwards and this is more nutrition sensitive.

Household Asset Building Programme (HABP): The HABP is linked to the PSNP and provided productive asset packages on credit in order to build household assets and enable graduation from the PSNP as well as investments in socio-economic infrastructure.

Agricultural Growth Project (AGP): The objective of the Agricultural Growth Project (AGP), a World Bank Funded project (2010-2015) for Ethiopia is to increase agricultural productivity and market access for key crop and livestock
products in targeted woredas with increased participation of women and youth.

Universal Access Programme (UAP): In 2005, the GoE launched the UAP, which defined coverage targets for access to adequate water source and sanitation. Prior to the UAP, Ethiopia’s government established two main policies related to water in 1999 and 2001 [62] conceptualizing how the water-infrastructure projects should be managed and operated.

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