

The Economic Case for Early Humanitarian Response to the Ethiopia 2015/2016 Drought

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Acronyms

CMAM	Community-based Management of Acute Malnutrition
CSB	Corn Soya Blend
HRF	Humanitarian Response Fund
GoE	Government of Ethiopia
HCR	(UN) High Commission for Refugees
HRD	Humanitarian Requirements Document
MAM	Moderate Acute Malnutrition
MT	Metric Ton
MYHF	Multi-Year Humanitarian Financing
NGOs	Non-Governmental Organizations
OCHA	(UN) Office for the Coordination of Humanitarian Affairs
PLW	Pregnant and Lactating Women
PSNP	Productive Safety Net Programme
RUTF	Ready to Use Therapeutic Foods
SAM	Severe Acute Malnutrition
TSF	Targeted Supplementary Feeding
U5	(children) under 5
VfM	Value for Money
WASH	Water, Sanitation and Hygiene
WFP	(UN) World Food Programme

Executive Summary

The Ethiopia Drought

In June of 2015, the Government of Ethiopia (GoE) declared that the spring *Belg* rains had failed. The declared number of people in need of humanitarian assistance rose from 2.9 million in January, to 4.5 million in August 2015. Only a few months later, in October of 2015, this figure was nearly doubled to 8.2 million as a result of the mid-*Meher* harvest assessments. In December 2015, the 2016 Humanitarian Requirements Document (HRD) was released, calling for US\$1.4 billion in humanitarian aid to reach 10.2 million people in need. This was in addition to the 7.9 million chronically food insecure people who are provided with transfers under the Productive Safety Net Programme (PSNP).

Overview of the Analysis

The objective of this analysis is to conduct a Value for Money (VfM) assessment of DFID contingency funding that was provided early in this crisis. The hypothesis is that timely humanitarian funding – funding that is provided early, at the first signs of a crisis - should bring efficiency and effectiveness gains to the overall response. This analysis defines contingency funding as additional early funding triggered in response to the crisis through existing pipelines.

This analysis looks firstly at the overall response to the 2015/2016 drought in Ethiopia to assess the additional cost of the funding shortfall as of March 31, 2016. It estimates the cost required to meet the unfunded part of the HRD, by comparing three scenarios:

1. The cost to procure on time, assumed to be equivalent to the cost of filling the funding gap as outlined in the HRD;
2. The cost of late procurement, measured by evaluating the additional procurement cost required to fill the funding gap late; and
3. The cost of no response, measured by the potential economic losses to households as a result of a lack of response.

The analysis assumes as its starting point that aid provided meets people's needs, either in part or in whole. That is to say that food, nutrition and WASH support at a critical period can help people survive the drought-induced emergency better than without such support. This study forms part of a wider evaluation of DFID multi-year funding and resilience in protracted crises. Qualitative panel interviews in Shinile, Siti Zone that are part of this wider study show clearly how timely food aid helped people cope with livestock and earnings losses.

Importantly, the figures presented here are likely to be a significant underestimate of the true cost of late response, as funding in the first three months of 2016 could very reasonably be considered as a late response. However, because the HRD was only officially released in January

of 2016, the April Periodic Monitoring Report which reports in detail on funding per sector is used as a cut-off point.

Food, Health and Nutrition, and Water, Sanitation and Hygiene (WASH) are the three biggest components of the HRD. They are also the three areas that received early funding from DFID, and are therefore the focus of this analysis.

The Financial Cost of Late Procurement: Assessing the HRD Funding Gap

As of March 31, 2016, only 51 percent of the HRD had been funded. The amount requested for food was US\$1.1 billion, \$500 million had been funded, leaving a funding shortfall of US\$600 million. The supply of internationally procured food has been slow; the congestion at the ports has meant that the food required has not been imported quickly enough to meet demand.

Replacing this food with locally available food stocks (which are more expensive in this crisis than international grains) is estimated to cost an additional US\$111 million as compared with the cost if this food had been procured on time. If this same analysis is conducted to include the caseload under the PSNP, the additional cost of late procurement as compared with early rises to an estimated US\$127 million-US\$271 million for food procurement alone.

Using an estimated cost of \$90 per person for a 9-month food distribution, these findings suggest that the cost savings could have ensured food aid to an additional 1.4 million to 3 million people.

Nutrition and WASH are not included in this portion of the analysis. Nutrition is not included because a) the pipeline for treatment of Severe Acute Malnutrition (SAM) appears to have been fully funded and b) data is not available on any early procurement savings for the treatment of Moderate Acute Malnutrition (MAM). WASH funding is dedicated to a wide variety of measures that are context specific with varying costs, and as a result it is difficult to robustly compare the cost of late and early response.

The Economic Cost of No Response: Assessing the HRD Funding Gap

In reality, it is likely that the funding shortfall will result in households receiving less assistance than they need. Evidence already points to households suffering from severe shortages. Despite a strong pipeline for Ready to Use Therapeutic Foods (RUTF) and supplies of Corn Soya Blend (CSB), there is a shortfall in the number of SAM and MAM cases being treated, and food intake is seriously compromised despite food transfers. Access to clean water continues to be severely compromised.

It should be carefully noted that the figures presented here are based on the best available data, but this data tends to be context specific and therefore could not be applied conclusively. Rather,

these figures are intended to provide a sense of the relative magnitude of impact that could result from no response as compared with timely response, and are indicative only.

- A conservative estimate of the impacts of reduced consumption and asset loss on the long term growth of households suggests that losses could be in the order of US\$136 per person, a 50 percent increase on the cost of responding on time with a 9-month food ration. This would suggest therefore that the food shortage of US\$600 million, if left unmet, could precipitate household losses of US\$900 million, equivalent to an additional economic cost of US\$300 million above the cost of timely response.
- A “Cost of Hunger” in Ethiopia¹ is estimated to result in economic losses of US\$642 per person. The linkages between malnutrition in this drought and longer term undernutrition are unknown. However, if we assume that a conservative 5 percent of the caseload for malnutrition went untreated, and resulted in undernutrition, the economic cost would be on the order of US\$55.9 million, an additional economic cost of US\$51.6 million above the cost of timely treatment for the same caseload (US\$4.3 million).
- The economic impact of a lack of clean water is estimated to cost US\$100 per person in Ethiopia.² This would equate to total losses of US\$320 million for the 3.2 million people without access to clean water under the HRD, an additional cost of US\$295m above the cost of timely response (US\$25.2 million).

Table 1: Summary of Findings, Fulfilling the Funding Gap for the HRD

	The Cost to Procure on Time (HRD Funding Gap)	The Additional Financial Cost of Late Procurement	The Economic Cost of No Response
Food: HRD Caseload, HRD gap	US\$600m	+US\$111m	Net present loss to household growth: US\$900m
Nutrition – Full caseload	SAM: US\$33.6m MAM: Varies month to month	SAM: +US\$0, funded on time MAM: Insufficient data to quantify	N/A
Nutrition – 5% caseload	US\$4.3m	N/A	Economic impact of being underweight (5 percent of total caseload): US\$55.9m
WASH	US\$25.2m	Insufficient data to quantify	Economic losses due to a lack of WASH: US\$320m

¹ WFP, AFD, AfDB (n.d.). “The Social and Economic Impact of Child Undernutrition in Ethiopia.”

² Water Supply, Sanitation and Hygiene (WASH) Programme (One Wash National Programme). UNICEF Business Case, DFID Ethiopia, January 2013

In summary, if the funding gap is not filled and response is compromised, the longer term economic cost to those affected could be on the order of US\$1.3 billion, an order of magnitude that is more than twice the cost of timely response (US\$629.5 million).

The Financial Cost Savings from Early DFID Funding

The analysis drills down to look specifically at how these cost savings translate through to DFID contingency funding provided early for food and for SAM procurement (data was not available to conduct the analysis in sufficient detail for MAM and WASH). DFID provided US\$39.8 million in early funding for food and SAM. **Timely procurement with DFID funding is therefore estimated to avoid an additional US\$6.3 million-US\$7.4 million that would have been incurred by later procurement, an overall saving of approximately 18 percent.**

The Economic Gains from Early DFID Funding

It is also possible that if DFID had not provided early funding, those falling under this funding would be left without adequate food, nutrition and WASH services. It was only possible to analyse the economic cost savings to food and nutrition:

- If DFID funding for food aid of US\$22.5 million is compared with a scenario of no response, the economic losses could be on the order of US\$33.8 million, an additional cost of US\$11.3 million above the cost of timely response.
- If we assume, as above, that 5 percent of the caseload for malnutrition under DFID funding went untreated, and resulted in undernutrition, the economic cost would be on the order of US\$14.1 million, an increase of US\$12.8 million above the cost of timely treatment for the same caseload (US\$1.3 million).

Table 2: Summary of Findings, Cost savings from DFID early funding

DFID contingency	Early Funding Provided by DFID	The Additional Financial Cost of Late Procurement	The Economic Cost of No Response
Food	US\$22.5m	+US\$3.6m	Net present loss to household growth : US\$33.8m
Nutrition – Full Caseload	SAM: US\$17.3m MAM: US\$15m	SAM: +US\$2.7m- US\$3.8m MAM: Cost savings not evident	N/A
Nutrition – 5% caseload	US\$1.3m	N/A	Economic impact of being underweight, 5 percent of malnutrition caseload: US\$14.1m

WASH	US\$19.5m	Insufficient data	Insufficient data
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In summary, if the funding gap had not been filled, the longer term economic cost to those affected could be on the order of US\$47.9 million, an order of magnitude that is more than twice the cost of early response.

Conclusions

While the study findings indicate that DFID contingency funding provided early in the crisis has played a significant role in delivering VfM gains, it also indicates that the costs associated with the remaining deficit could measure in the hundreds of millions of dollars in procurement and economic costs.

This analysis supports DFID’s commitment to greater funding towards early humanitarian action in the Grand Bargain, launched at the 2016 World Humanitarian Summit. It shows the necessity for funding models to respond to the first signs of a crisis. Flexible funding, for example through multi-year humanitarian funding models with built-in contingency mechanisms, can allow shifts in funding depending on need and can help to stimulate more timely response resulting in significant cost savings.

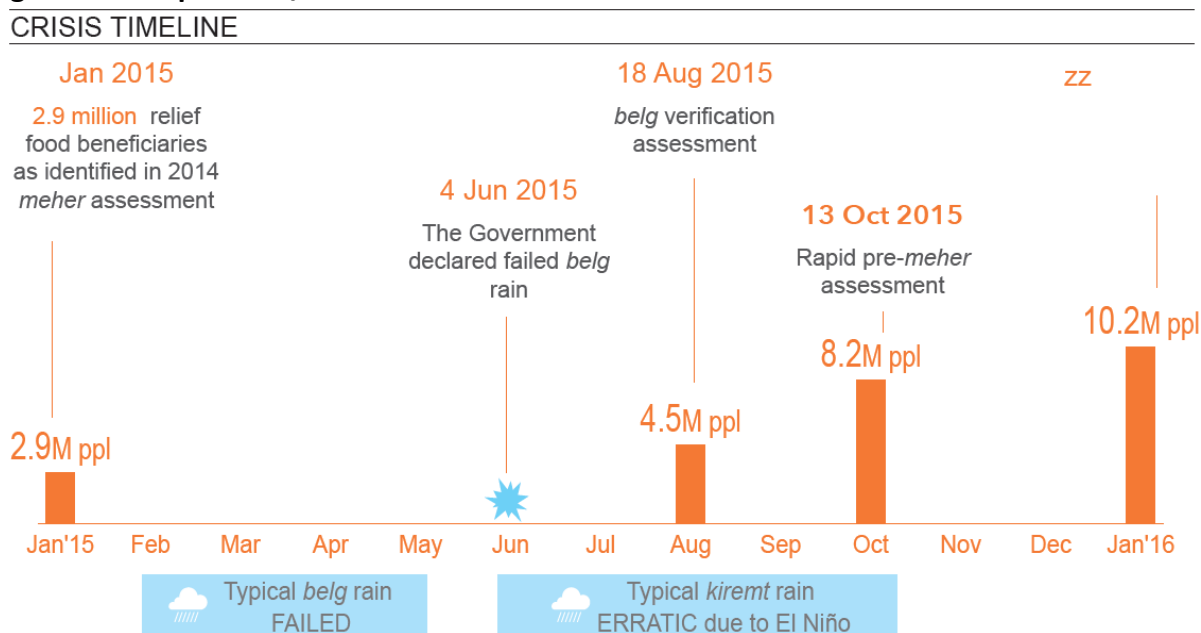
1 Introduction

1.1 The 2015/2016 Ethiopia Drought

1.1.1 Crisis Timeline

In June of 2015, the Government of Ethiopia (GoE) declared that the spring *Belg* rains had failed. The declared number of people in need of humanitarian assistance rose from 2.9m in January, to 4.5m in August 2015. Only a few months later, in October of 2015, this figure was nearly doubled to 8.2m as a result of the mid-Meher harvest assessments. Humanitarian response to the drought in Ethiopia is guided by the country's Humanitarian Requirements Document (HRD)³. In December 2015, the 2016 HRD was released, calling for US\$1.4 billion in humanitarian aid to reach 10.2m people in need. (See Figure 1 for a complete timeline.) In May 2016, a prioritization note issued by GoE and UNOCHA⁴ revised needs upwards from US\$1.40 billion to US\$1.52 billion. This is in addition to the 7.9 million chronically food insecure people who are provided with transfers under the Productive Safety Net Programme (PSNP).

Figure 1: Ethiopia 2015/2016 Crisis Timeline⁵



³ Joint Government and Humanitarian Partners' Document (2016). "Ethiopian Humanitarian Requirements Document"

⁴ GoE/UNOCHA (2016). "Prioritisation Statement, 10 May 2016."

⁵ Joint Government and Humanitarian Partners' Document (2016). "Ethiopian Humanitarian Requirements Document"

1.1.2 Humanitarian Requirements Document

The HRD called for US\$1.4 billion to address the following priority needs:

- 10.2m people targeted;
- 400k severely acute malnourished;
- 1.7m moderately acute malnourished;
- 2.0m without safe drinking water; and
- 0.8m displaced.

Out of the US\$1.4 billion, the three largest sectors are food, health and nutrition, and WASH, with requirements as follows: US\$1.2 billion allocated to food aid (86 percent of the total budget); US\$129.1 million to health and nutrition (9 percent); and US\$73.4 million to WASH (5 percent).

As of March 31, 2016, US\$761m in funding had been committed, equivalent to 51 percent of the HRD.⁶ According to the HRD mid-year review, released in August of 2016, the requirements had been revised to US\$1.52 billion, with an ongoing funding gap of US\$612 million.⁷

1.2 The Value for Money of Early Response

This study evaluates the Value for Money (VfM) of contingency funding provided by DFID towards the 2015/2016 drought in Ethiopia. It specifically assesses “early” contingency funding that facilitated procurement cost savings and a timely response. This analysis defines contingency funding as additional early funding triggered in response to the crisis through existing pipelines.

This study forms one component of the Multi-Year Humanitarian Financing (MYHF) evaluation that has been commissioned by DFID centrally. The evaluation takes place in four countries (Sudan, Ethiopia, the Democratic Republic of Congo and Pakistan) over approximately three-and-a-half years and is composed of three questions.

- Question 1 evaluates whether MYHF makes individuals, households and communities more resilient to shocks.
- Question 2 evaluates contingency funding and whether it enables DFID and its partners to respond earlier and therefore more effectively.
- Question 3 is about Value for Money of MYHF and contingency funding.

⁶ Ibid.

⁷ Joint Government and Humanitarian Partners’ Document (2016). “Ethiopia Humanitarian Requirements Document: Mid-Year Review, August 2016”

This analysis focuses specifically on the VfM of contingency funding, as part of Questions 2 and 3. Qualitative panel interviews in Shinile, Siti Zone that are part of this wider study show clearly how timely food aid helped people cope with livestock and earnings losses.⁸ Ongoing analysis will seek to determine whether aid provided during the 2015 and 2016 drought helped people avoid losses and cope better. The longer time frame of the wider study will allow for updates to this analysis, potentially allowing for a later perspective on how early and not so early response has impacted households.

1.3 Structure of this Report

This report is structured as follows:

- Section 2 describes the overall approach to the analysis, outlining the scenarios considered and providing more detail on the overall analysis.
- Section 3 presents the findings from the analysis, for each of the sectors considered.
- Section 4 summarizes the main conclusions from the analysis.

⁸ Research publication forthcoming.

2 Approach

2.1 Overview of Approach

Timely response to humanitarian crises can result in economic gains, releasing pressure on the overall humanitarian system. It can result in lower procurement and transport costs associated with delivering aid that directly reduces the cost of response to donors. An early response can also have important implications for those affected by the drought, by providing assistance before households have had to resort to negative coping strategies.

This analysis looks firstly at the overall response to the 2015/2016 drought in Ethiopia. As of March 31, 2016, only 51 percent of the HRD had been funded. This analysis estimates the cost required to meet this unfunded part of the HRD, by comparing three scenarios:

1. The cost to procure on time: This is equivalent to the cost of the funding gap in the HRD. In other words, if the funding gap for food is US\$600 million, it is assumed this estimate reflects the estimated cost to donors of early procurement.
2. The financial cost of late procurement: This is measured by evaluating the additional procurement cost required to fill the funding gap in the HRD as of March 31, 2016. This scenario assumes that beneficiaries receive a full humanitarian aid package, but this aid is more expensive to procure. This represents the additional cost that donors would have to pay in order to meet the HRD in full as a result of responding late, as compared with if the HRD had been funded in full at the outset (early response).
3. The economic cost of no response: The evidence suggests that many households are simply going without food or nutrition treatment, or travelling long distances to get water. This scenario is measured by evaluating the economic losses that would be incurred by households as a result of no response, as compared with the cost of responding in full, early, under the HRD.

The analysis is then applied to the portion of DFID contingency funding that was provided early.

Food, Health and Nutrition, and WASH are the three biggest components of the HRD. They are also the three areas that received early funding from DFID, and are therefore the focus of this analysis.

The data for this analysis was largely collected through consultation in Addis Ababa, Ethiopia, during the week of May 9, 2016. A wide range of agencies involved in the response were consulted, including representatives of DFID, the World Food Program (WFP), UNICEF, the UN High Commission on Refugees (HCR), the UN Office for the Coordination of Humanitarian Affairs (OCHA), Save the Children, and Tufts. The aim of the interviews was to understand in greater

depth how the response to the drought had unfolded, what action had been taken and when, and what the implications of late response were for the organizations mobilizing aid on the ground. Extensive follow up with each agency was used to gather data on the cost of late and early response to support the figures presented in this analysis.

2.1.1 Analysis based on the HRD

This analysis looks firstly at the overall response to the 2015/2016 drought in Ethiopia to assess the additional cost of the funding shortfall as of March 31, 2016. Importantly, the figures presented here are likely to be a significant underestimate of the true cost of late response, as funding in the first three months of 2016 could very reasonably be considered as a late response. Early funding could have arrived much earlier than this, in particular in the *Belg* dependent areas where severe drought was already apparent as early as July/August. It is therefore acknowledged that 'early' response could have been much earlier, and likely would have yielded much larger gains. However, because the HRD was only officially released in January of 2016, the April Periodic Monitoring report is used as a cut-off point. The analysis on food includes some discussion of the funding gap and its implications as of January 1, 2016.

2.1.2 DFID Contingency Funding

The Value for Money (VfM) of DFID contingency funding is then analyzed within the context of the overall analysis of the full funding gap under the HRD. For the purposes of this analysis, contingency funding is only considered if it arrives early. While the same cut off point as for the HRD is used to be consistent, DFID contingency funding considered in this analysis was entirely triggered before the end of 2015 (no contingency funding was provided in the first quarter of 2016). The analysis presented here describes procurement gains that could have reasonably been realized with funding that was provided by the end of 2015; the exception to this is the analysis on water, where installation of longer term water solutions requires a much longer lead time.

DFID provided 'early' contingency funding to two of the three agencies being considered under this evaluation, namely WFP and the Humanitarian Response Fund (HRF). DFID also provided a substantial amount of early funding to UNICEF; while they are not technically considered part of this overall evaluation, they are included here because of the significant levels of early funding provided.

In most cases, DFID funding was triggered early in the crisis through existing business cases and therefore was able to be approved relatively quickly and easily, without the design of additional business cases (an estimated value of the time/cost saving of this was requested but not available; though should be noted as an additional benefit). Critically, if these standing

arrangements were not already in place, it would have taken longer to commit the funds. In the case of UNICEF, development spend was pivoted to help scale up response.

DFID also provided contingency funds to UN surge and secondment capacity, Save the Children, the Ministry of Health, and FAO as well as a consortium of Non-Governmental Organizations (NGOs) for agriculture interventions. These are not listed below nor considered in these estimates, because they did not fall within the DFID portfolio of multi-year humanitarian funding and hence were not within the remit of this evaluation.

Table 3: Summary of DFID Contingency Funding to WFP, HRF, and UNICEF

Recipient	Sector	July 15	Oct 15	Nov 15	Dec 15
UNICEF	Nutrition - SAM		£11,540,000		
UNICEF	Nutrition - CMAM ⁹	£5,000,000		£5,000,000	
WFP	Food	£15,000,000			
HRF	Multi-sector		£20,000,000	£3,000,000	£6,333,000
UNICEF	WASH				£13,000,000

⁹ Community-based Management of Acute Malnutrition

3 The Cost of Early Response – Findings

3.1 Introduction

This section presents the findings of the analysis, comparing the cost of a timely response; the cost of late response; and the cost of no response. Each of the sectors – food, nutrition, and WASH – are presented in turn.

For each of these sectors, the following information is presented:

1. **Overview of the funding gap:** this section provides an overview of how much funding was received early, and the size of the funding gap as of March 31 2016. The value of the funding gap equates to the cost estimated of a timely response.
2. **The financial cost of late response:** this section estimates the additional procurement cost to donors of responding late to the funding gap, and compares this with the cost if that funding had been provided on time.
3. **The economic cost of no response:** In reality, many families go without food or nutrition treatment, or have to travel long distances to collect water. This section presents the effectiveness analysis for the full HRD, specifically comparing the cost of timely response with the economic cost to households of no response.
4. **DFID contingency funding:** This section uses the same rules of thumb applied above, and assesses the potential savings that specifically relate to DFID early funding.

3.2 Food

3.2.1 Overview of the Funding Gap

As of March 31, 2016, the food sector had received US\$500m of its requirement of US\$1.1 bn.¹⁰ As a result, US\$600m of the food aid required for this year had not yet been funded as of April. A UNOCHA food pipeline summary as of April 2016 suggests that the funding gap is even higher at US\$652m.¹¹ Food aid typically takes between 3-5 months from funding to distribution, and therefore timely funding for food is critical to protect against pipeline breaks. Further to this, in this particular crisis, local food supplies are more expensive than internationally procured food, specifically due to this drought and the pressure that it has put on food supplies and prices. With limited port capacity for delivering food to the region, timely response has been even more critical to ensure that the ports do not get backed up.

¹⁰ “Periodic Monitoring Report: 2016 Humanitarian Requirements Document, Ethiopia.” Covering 1 Jan to 31 Mar 2016. Prepared by clusters and NDRMC.

¹¹ UNOCHA, Ethiopia: Food Pipeline Summary March – December 2016 (As of April 2016).

Table 4: Food Sector – Funding Gap under the HRD

HRD – Amount requested	HRD – Amount Funded	HRD – Funding Gap as of March 31, 2016.
US\$1.1 billion	US\$500 million	US\$600 million

Food aid is required under both the PSNP as well as the HRD. The scale of the drought has put immense strain on the systems underpinning both PSNP and relief food delivery, leading to inefficiencies and under-performance. Inefficiencies that have caused shortages of food aid have included: congestion at Djibouti port (for example, as of April 1, 2016, there were 19 ships waiting to be offloaded with food and other supplies at the Port in Djibouti, which has two suitable berths); delays in activating the logistics cluster to support the response for political reasons; and, a lack of storage/warehouse space as well as trucking capacity. As a result, food distribution rounds have not been completed in full, leaving households with less food than required. For example, in Somali region, food supply was not available to deliver food beyond Round 2 - a particular and acute example of the effect of inefficiencies and an overwhelmed system on supply.¹²

It is important to note that the HRD only addresses food needs under the 10.2 million relief caseload. PSNP transfers for an additional 7.9 million people were due to end in July of 2016, at which point HRD/relief food is supposed to pick up the PSNP core caseload who are still food insecure. However, due to the scale of this crisis, PSNP rounds will continue for the second half of 2016.¹³

3.2.2 The Financial Cost of Late Response: Food

This analysis evaluates the additional cost of filling the food gap late under the HRD, as compared with the cost of timely procurement. The analysis is constructed using two different scenarios:

- The first analysis uses the costs as reported in the January HRD¹⁴, and evaluates the increase in procurement costs of late response as a result of the portion unfunded as of March 31 2016. This analysis does not include the additional 7.9 million caseload included under the PSNP – these numbers would substantially inflate the costs estimated here.
- The second uses a pipeline analysis from Tufts to evaluate the anticipated full cost of the drought, relevant to both the PSNP and HRD caseloads.

¹² DFID, Head of Office Briefing, April 1, 2016.

¹³ Pers comm, DFID Ethiopia, July 28, 2016

¹⁴ Joint Government and Humanitarian Partners' Document (2016). "Ethiopian Humanitarian Requirements Document"

The cost of providing an equivalent cash transfer for local purchase - HRD

Food procurement in Ethiopia is typically cheaper locally than internationally, with the price of maize typically 50 percent below import parity.¹⁵ However, this year international prices are lower than local prices. According to WFP data¹⁶, the cost of local maize (the majority of the food basket) in April 2016 was around US\$291/Metric Ton (MT), compared to an import parity price of wheat at US\$188/MT.¹⁷ When the full cost of transport and delivery is added in to the total cost (which is higher for international purchase), the cost for local and import are almost identical, equating to approximately US\$536/MT for cereals procured internationally, and US\$523/MT for food procured locally.

As of June 2016, however, the price of local cereals via WFP procurement had risen to US\$400/MT due to the severe shortages of food.¹⁸ Using this estimate, the cost per person per month for the full food basket (cereals, pulses and oil) is US\$10 for international purchase, and US\$11.40 for local purchase. For cereals alone, the full delivered cost works out at US\$536/MT for international, and US\$650/MT for local; in other words, the cost of cereals procured locally is 21 percent more than the cost of cereals procured internationally.

As a result of the shortfall in funding, food has not been arriving in the country fast enough to meet needs. Therefore, the cost of filling the food gap locally by providing people with cash transfers to purchase what they need is used as a proxy for the cost of providing aid due to a shortage of food imports. (In reality, it is entirely possible that this food will not be available, and the cost of no response is addressed in the following sections that quantify the economic impacts of a lack of food).

Cereals comprise 88 percent of the food basket, and therefore cereals are assumed to represent US\$528m of the funding shortfall (88 percent of US\$600m). The other two major components of the food basket are pulses and oil. Data was not available to conduct an analysis of the cost savings on these components. However, for pulses, early/local procurement is typically less expensive, and therefore cost savings are likely. Oils are only procured internationally and therefore are unlikely to reflect substantial changes in cost.

¹⁵ World Food Programme. "Support to WFP Relief Operations in Ethiopia, 2012-2015"

¹⁶ Pers Comm, WFP.

¹⁷ While maize is the local cereal typically procured for the food basket, wheat is procured internationally and used as a substitute for maize.

¹⁸ This price is based on tender results for maize submitted to WFP for maize procurement. It is an average of the prices received via tender for that month. Personal communication, Rebecca Ssamba, WFP Ethiopia, June 06, 2016.

The cost of procuring the US\$528m gap in funding for cereals is therefore inflated by 21 percent to reflect the cost of purchasing these cereals locally. As a result, the US\$528m shortfall in cereals would cost US\$639m procured locally. The remaining US\$72m of funding shortfall for pulses and oils is assumed to cost the same (due to a lack of data). **The full cost of filling the food gap late is therefore estimated at US\$711m, an additional cost of US\$111m compared to the cost of timely response.**

Table 5: Efficiency Analysis: Financial Cost of Late Procurement of Food – HRD

Cost of Funding the Food Gap - HRD		
	Timely Response	Late Response
Funding Gap - Food	US\$600 million	US\$600 million
<i>Cost of cereals</i>		<i>US\$528 million</i>
<i>Cost of pulses/oil</i>		<i>US\$72 million</i>
Additional cost of procuring cereals locally		21 percent
Revised cost of procuring cereals		US\$639 million
Cost of pulses/oil (unchanged)		US\$72 million
Cost of food procurement	US\$600 million	US\$711 million
Additional cost of food funding gap		US\$111 million

This estimate is likely conservative for a number of reasons.

- First, this estimate only accounts for late supply of food under the HRD, and does not include the cost of late procurement of food under the PSNP.
- Second, evidence from the PSNP suggests that the cost of providing food locally may actually be significantly higher than the 21 percent estimated here based on WFP figures. Based on data from the PSNP, to date, one round of PSNP transfers to 8m people has cost about US\$60m. However, an increase in the transfer rates is being considered to reflect higher food prices in Ethiopian markets. If the rate is revised to reflect the purchasing power needed to buy 15kg of the cheapest available wheat (much more expensive than the cheapest available cereal, which is generally maize), then the cost of one round of transfers to 8m people will rise dramatically, to approximately US\$80m, an increase of 33 percent, significantly higher than the 21 percent highlighted above.¹⁹ **If we were to use this figure to estimate the increased cost of late procurement of food, it would suggest that the additional cost of funding the food gap late could be as high as US\$174 million.**
- Third, the assumption that funds received before March 31, 2016 are ‘early’ is generous, particularly given that food supplies require 3-5 months between funding and delivery of

¹⁹ DFID, Head of Office Briefing, April 1, 2016.

food. As of 7 December 2015, US\$158.2 million of funding was available for food²⁰, leaving a food gap of US\$942 million. Using the same rules of thumb applied above, assuming that 88 percent of this is cereals, and assuming that cereals cost 21 percent more to procure as a late response, the total cost of filling the food gap late is revised to US\$1.1 billion, **suggesting that late response resulted in an additional cost of US\$174m for food.**²¹

In addition to local costing more than international procurement, which is the opposite of 'typical' food shortages in Ethiopia, it is worth noting that this analysis only looks at the financial cost of delivery of food aid. The 'real' cost of international food aid would actually be much higher if its cost accounted for the impacts of growing and transporting food, including environmental impact, cost of carbon, as well as the impact of large scale commercial production of cereals in the developed world. Local procurement should be the option of choice where it is feasible.

The cost of providing an equivalent cash transfer for local purchase – Pipeline Analysis

The previous analysis uses requested and funded amounts from the HRD to assess the cost of the funding gap. Another approach is to look at the pipeline analysis for Ethiopia conducted by Tufts²², which assesses the food pipeline, and shortages in production, to determine food shortages. Because this analysis is conducted for the entire food pipeline, it should be noted that it applies to the full caseload of HRD as well as PSNP recipients.

Importation of food into Ethiopia largely comes through the port in Djibouti. Ethiopia normally imports approximately 600k MT of wheat each year on average. In the 2011 drought, approximately 750k MT of wheat were imported, compared with imports of 1.3 million MT in 2015 and a forecast 1.5 million MT for 2016.²³

The MT required to respond to the food deficit are calculated from October 2015. The food availability diagnostic estimates carryover stocks from the previous season, estimated *Meher* and *Belg* production, as well as estimated imports, to calculate the total food supply for each quarter from October 2015. The diagnostic then estimates three scenarios – a best case scenario in which production decreases by 15 percent, a medium case in which production decreases by 20

²⁰ Joint Government and Humanitarian Partners' Document (2016). "Ethiopian Humanitarian Requirements Document"

²¹ It is a coincidence that this figure and the figure above both work out at US\$174 million as they are based on different sets of calculations.

²² Food Availability Diagnostic (2016 – unpublished), USAID Agriculture Knowledge Learning Documentation Policy (AKLDP) project, implemented by Tufts University

²³ <http://www.fao.org/gIEWS/countrybrief/country.jsp?code=ETH>

percent, and a worst case in which production decreases by 25 percent.²⁴ The resulting food gaps are estimated based on these figures, and are reported in Tables 6 and 7 for the best and worst case scenarios. At the time of writing, estimates for Q4 were not yet available. To be conservative, the analysis assumes that the Q4 gap was met in full, though it's likely that there was a shortfall.

Table 6: Pipeline Analysis: Best Case Scenario

	Required (MT '000)	Actual (MT '000)
Q1 (Oct to Dec 2015)	775	540
Q2 (Jan to Mar 2016)	1,163	1,028
Q3 (Apr to June 2016)	1,357	610
Q4 (July to Sept 2016)	582	582
Total	3,877	2,760

Table 7: Pipeline Analysis: Worst Case Scenario

	Required (MT '000)	Actual (MT '000)
Q1 (Oct to Dec 2015)	1,071	540
Q2 (Jan to Mar 2016)	1,606	1,028
Q3 (Apr to June 2016)	1,874	610
Q4 (July to Sept 2016)	803	803
Total	5,353	2,981

Using the best case scenario, if the response had been funded in full from the outset, allowing the ports to run at full capacity according to the pipeline analysis, the total cost using international prices for cereals (US\$536 per MT) would be equivalent to a humanitarian requirement of US\$2.1 billion for the estimated 3.9 million MT of food aid required between October 2015 and September 2016.

Assuming that the pipeline is met in full in Q4, an estimated 2.8 million MT will have actually been delivered on time, which would equate to a cost at international prices of US\$1.5 billion. This leaves a shortage of 1.1 million MT of food aid. If this aid had been procured in a timely manner at a cost of US\$536/MT, it would have cost a total of US\$599m. Using the cost of local procurement as a proxy for the cost of late aid, and assuming that the deficit of 1.1 million MT is procured at local prices (US\$650/MT), this would equate to a cost of US\$726 million for the food shortage. **Timely funding to facilitate procurement that maximized the pipeline capabilities**

²⁴ In previous El Nino events - 1997/98 and 2002/03 - losses were estimated at between 20 percent and 23 percent.

could have avoided additional costs of US\$127 million as compared with late procurement. The same analysis conducted for the worst case scenario suggests that timely funding could have avoided additional costs of US\$271 million.

Using an estimated cost of \$90 per person for a 9-month food distribution, these findings suggest that the cost savings could have ensured food aid to an additional 1.4 million to 3 million people.

Table 8: Cost of Funding the Food Gap – Pipeline Analysis, Best Case Scenario

	Timely Response	Late Response	
	Food Required (MT)	Food Imported	Food Gap
Food Required (MT)	3.9 million	2.8 million	1.1 million
Cost of Intl Procurement @ US\$536/MT	US\$2,078 million	US\$1,479 million	
Cost of Local Procurement @ US\$650/MT			US\$726 million
Total Cost	US\$2,078 million	US\$2,205 million	
Additional Cost of Food Funding Gap	US\$127 million		

3.2.3 The Economic Cost of No Response: Food

In the previous analysis, cash is used as a proxy for the cost of buying food locally. In reality, the evidence is clear that households have been receiving less food than they need, with households sharing food rations. As of February, 76 percent of the affected population were only eating on average 1 meal per day with food rations.²⁵

The economic cost of a lack of food has been documented, though studies tend to be context specific.

For example, a 2005 study found that experiencing a drought at least once in the previous five years (1999-2004 in the study) lowered per capita consumption by 20 percent in Ethiopia.²⁶

²⁵ WFP Ethiopia, “Drought Emergency Food Security Bulletin #1”, February 2016

²⁶ Dercon, S., J. Hoddinott, and T. Woldehanna. 2005. “Shocks and Consumption in 15 Ethiopian Villages, 1999-2004.”. *Journal of African Economics* 37 (1): 47-58.

Receiving food aid within a year of the initial failure of rains has been shown to have long-run benefits. Gilligan and Hoddinott (2007)²⁷ show that households that participated in an emergency relief food-for-work program in Ethiopia within 12 months of food shortages in 2002 saw a 24 percent growth in average real consumption per adult as compared with adults not in receipt of the programme, equivalent to a 4.4 percent higher annual growth rate in the five years following participation. The magnitude of the increase in food consumption was even higher at a 33.5 percent increase in real food consumption. Effects of a similar order of magnitude were observed for those who received emergency food aid rations during this period. Further, these effects were found to be persistent beyond the period of immediate transfers.

Dercon (2004)²⁸ estimates long-run growth effects of the mid-1980s famine in Ethiopia. He finds that households that reduced consumption and sold their most valuable possessions saw a 16 percent lower growth rate in the 1990s versus those only moderately affected (though it should be noted that this analysis is taken from six villages – a very small sample – and follows the 1984 famine – one of the worst events on record). The African Risk Capacity (ARC) Cost Benefit Analysis²⁹ estimates that the present value of this lost growth is equivalent to US\$1,082 per household, assuming four adult equivalents per household, or US\$271 per person.

While the data from these studies provides some insight into the longer term economic impact of a lack of food in Ethiopia, it is difficult to apply these estimates systematically to the full caseload evaluated in this analysis. However, we can provide a sense of the order of magnitude of the economic cost of not responding as compared with providing timely aid.

If we assume that the long term growth effect of drought is only half of that estimated by Dercon/ARC above, this would equate to a net present loss per person of US\$136.

By comparison, the cost per person per month for the full food basket (cereals, pulses and oil) for this crisis is US\$10 for international purchase. Assuming nine rounds of food response (as planned for the 2015/2016 response), this would equate to a cost of US\$90 per person.

This suggests that reduced consumption due to a lack of food could have economic impacts that are 50 percent greater than the cost of ensuring timely food distribution. This would suggest

²⁷ Gilligan, D., and J. Hoddinott. 2007. "Is There Persistence in the Impact of Emergency Food Aid? Evidence on Consumption, Food Security and Assets in Rural Ethiopia." *American Journal of Agricultural Economics*. 89(2): 225-242.

²⁸ Dercon, S (2004). "Growth and Shocks: Evidence from Rural Ethiopia." *Journal of Development Economics* 74 (2): 309-29.

²⁹ Clarke, D and R Vargas Hill (2013). "Cost-Benefit Analysis of the African Risk Capacity Facility." International Food Policy Research Institute (IFPRI), Discussion Paper 01292.

therefore that the food shortage of US\$600 million could precipitate household losses of US\$900 million, equivalent to an additional economic cost of US\$300 million.

3.2.4 DFID Early Funding – Food

DFID provided WFP with early funding for £15 million (US\$22.5 million) of food aid in July 2015. Using the same evidence provided above, we assume that 88 percent of this funding is used for cereals, equivalent to £13.2 million (US\$18.9 million), and the remainder is pulses/oil, equivalent to £1.8 million (US\$2.7 million). If this funding had not been provided, procurement costs for the cereals portion would be 21 percent more delivered late, increasing the cost of cereals from £13.2 million (US\$18.9 million) to £16.0 million (US\$24.0 million). When this is added to the cost of £1.8 million (US\$2.7 million) for pulses/oil, the total cost of late response without DFID early funding would have been **£17.8 million (US\$26.7 million), resulting in savings of £2.8 million, or US\$4.2 million.**

Table 9: Cost Savings from DFID Early Funding, Food

	Timely Response	Late Response
DFID Early Funding - Food	US\$22.5 million	US\$22.5 million
<i>Cost of cereals</i>		<i>US\$19.8 million</i>
<i>Cost of pulses/oil</i>		<i>US\$2.7 million</i>
Additional cost of procuring cereals locally		21%
Revised cost of procuring cereals		US\$24.0 million
Cost of pulses/oil (unchanged)		US\$2.7 million
Cost of food procurement	US\$22.5 million	US\$26.7 million
Savings from DFID early funding		US\$4.2 million

If this funding (US\$22.5 million) is compared with no response, the economic losses to households could be 50 percent greater than the cost of ensuring timely food distribution, suggesting that DFID early funding could have avoided losses on the order of US\$33.8 million, a **savings of US\$11.3 million above the cost of an early response.**

3.3 Nutrition

3.3.1 Overview of the Funding Gap

The HRD called for US\$95.5m to address both Moderate Acute Malnutrition (MAM) and Severe Acute Malnutrition (SAM), including:

- US\$56.3 million for treatment of 1.7 million cases of MAM;
- US\$33.6 million for treatment of 435k cases of SAM;

- US\$3 million for malnutrition screening for 11.8 million children under 5, and 1.4 million Pregnant and Lactating Women (PLWs);
- US\$0.75 million for emergency infant and young child feeding;
- 1.3 million for nutrition surveys; and
- US\$0.3 million for supply warehousing.

The pipeline for Ready to Use Therapeutic Food (RUTF) for SAM treatment has been well stocked and appears to be stocked through to the full amount required for this crisis. However, the Corn Soya Blend (CSB) pipeline for treatment of MAM in this crisis has been very constrained.

Equally, where supplies have been able to get through to beneficiaries, there is concern that beneficiaries are nonetheless not being reached. Many families will not necessarily be aware of health facilities, and therefore will not seek out treatment for a malnourished child. This is normally addressed through outreach screening in communities, and this has been seriously compromised because the capacity of the system is so overstretched. As a result, having supplies in the pipeline is only one factor that affects nutrition outcomes. If these supplies aren't getting to those affected, the outcomes will be unchanged.

Therefore, the analysis below considers the procurement cost savings through timely action, as well as assessing the economic cost of malnutrition as a result of children not receiving the support that they need.

3.3.2 The Financial Cost of Late Response: Nutrition

Severe Acute Malnutrition

SAM treatment typically costs approximately US\$100 per case, half of which is the commodity cost of RUTF. SAM treatment for one child requires 0.9 cartons of RUTF. The HRD calls for funding for a caseload of 435k SAM cases, costing US\$33.6 million, and requiring 391,500 cartons of RUTF. In order to avoid supply pipeline breaks, mainly due to a long lead time for procurement, UNICEF has a strategy to keep a minimum of a four-month buffer stock, equivalent to 130,500 cartons, leading to a total requirement for the drought of 522,000 cartons of RUTF for treatment of SAM.

The freight cost for international procurement of RUTF is approximately US\$7 per carton for sea freight, and US\$20-US\$25 per carton for air freight.

The periodic monitoring review through March highlights the shortages in the RUTF pipeline. More recent data from UNICEF indicates that the gap is only 23,000 cartons and that this is expected to be filled by September. Therefore, no pipeline breaks are anticipated and it is assumed that the funding gap has not been an issue for SAM treatment. However, DFID early

funding played a key role in ensuring this pipeline, and this is addressed in the section on DFID funding below.

Moderate Acute Malnutrition

Moderate acute malnutrition (MAM) is treated using Targeted Supplementary Feeding (TSF) primarily through distribution of Supercereals (CSB+; CSB++), and primarily handled by WFP. Treatment of MAM is designed to prevent children with MAM from falling into SAM. MAM treatment typically targets children under 5 (U5) as well as PLWs.

The HRD called for MAM treatment for 1.7 million people, 1 million of which were children U5. According to the HRD periodic review, this figure was shortly thereafter revised upwards to a total of 2.2 million people targeted for MAM. This would equate to 1.3 million children with MAM applying the same proportions as the original HRD.

MAM costs approximately US\$33 per case (for 3 months of treatment). For the 1.7 million beneficiaries, this equates to a total cost of US\$56.3 million (as listed in the HRD). The main component of this treatment, Corn Soya Blend (CSB), is only procured internationally, and it is not clear that there are immediate cost savings due to early procurement.

However, a lack of MAM treatment results in cases converting to SAM. The CSB pipeline in this crisis has been very constrained, with CSB shortages from October through February such that MAM treatment was compromised. According to WFP, 0 percent of the required funding was received in January 2016, 24 percent in February 2016, 100 percent in March 2016, and only 54 percent in April 2016, resulting in significant shortfalls.³⁰ In May, CSB was stuck in warehouses due to roads being impassable due to flooding.³¹ Treatment of MAM is intended to prevent deterioration to SAM; therefore it is assumed that those cases left untreated convert to SAM, which costs on average US\$100 per case. The conversion rate from MAM to SAM is unknown, and therefore this is not quantified here.

3.3.3 The Economic Cost of No Response: Malnutrition

A “Cost of Hunger” study in Ethiopia³² estimates the cost per person of undernutrition. The study evaluates the economic cost of being undernourished in a specific year in which the effects are measured, based on the age of the child, with impacts arising (and discounted) over the lifetime of that cohort. The study estimates that the economic cost of underweight children was US\$4.7

³⁰ WFP Ethiopia, Drought Emergency Targeted Supplementary Feeding Programme Update #1, 01-15 April 2016.

³¹ Pers Comm UNOCHA

³² WFP, AFD, AfDB (n.d.). “The Social and Economic Impact of Child Undernutrition in Ethiopia.”

billion in 2009, affecting nearly 3 million underweight children and 4.3 million stunted children, equivalent to a cost of approximately US\$642 per person. The economic cost of being underweight includes the documented impacts from additional clinical episodes (diarrhea, fever, respiratory infections), child mortalities, the cost of grade repetition/drop outs, and lost income and earnings.

Undernutrition is influenced by a number of factors and environmental conditions, and is not attributed to lack of food/nutrition alone, though this clearly plays a key role. Further, this analysis is looking at the cost of response to this drought in particular. Therefore, one could argue that attributing the cost of undernutrition in full to this drought is not realistic as the caseload for undernutrition is driven as well by chronic food insecurity year in and year out.

We know that droughts in Ethiopia, particularly one of this magnitude, create a food deficit for households well beyond the year of the drought. The DFID Economics of Early Response Study in Ethiopia³³ found that a drought in year one creates a food deficit for five subsequent years. This in turn suggests that it would not be unreasonable to assume that a lack of adequate response to the crisis now will result in ongoing undernutrition for those affected. However, we don't actually know 1) the degree to which persistent undernutrition will arise as a result of this drought; 2) what the impact of failure to be treated for MAM / SAM has on risk of stunting or underweight; or 3) how long there needs to be a gap in MAM or SAM treatment before the lifetime effects take hold.

The analysis presented here is intended to give a sense of the order of magnitude of the economic cost of a lack of nutrition; for the reasons stated above the findings are not intended as conclusive.

The HRD calls for malnutrition treatment for a total of 1.74 million children U5 (1.3 million MAM; 435k SAM). In the first quarter of 2016, 90 percent of SAM cases were reached, equivalent to 55,996 cases treated. This leaves a gap of 10 percent untreated, equivalent to 6,222 SAM cases. In January-March 2016, 82 percent of the planned MAM caseload had been reached (or 546,257 cases), leaving a gap of 18 percent untreated, equivalent to 119,910 MAM cases. This equates to approximately 126,132 people untreated for malnutrition in the first quarter of 2016 alone.³⁴ These estimates are very high compared to typical programme coverage rates achieved in most countries, which tend to range between 20 and 57 percent, based on estimates of SAM programme coverage across 14 countries in 2014.³⁵

³³ Cabot Venton, C, et al (2012). "The Economics of Early Response and Resilience". DFID, UK.

³⁴ Ethiopia Humanitarian Country Team (EHCT) meeting, 7th May 2016, Pers Comm DFID Ethiopia.

³⁵ Coverage Monitoring Network (2015). "State of SAM Coverage: An Overview from 2013 & 2014." (London, August 2015).

Table 10: SAM and MAM Treatment, Q1 2016

	SAM	MAM
Total number of cases, Q1 2016	62,218	666,167
Percent untreated	10%	18%
Number of cases untreated	6,222	119,910

However, we do not know how many of these cases will result in longer term undernutrition; therefore, it is difficult to robustly apply the economic impact of hunger to these cases. We can nonetheless get a sense of the relative magnitude of the impact of undernutrition. If, for example, we assume that 5 percent³⁶ of the total malnutrition caseload for children U5 in this drought (1.74 million children) does not receive treatment resulting in undernutrition, this would equate to 87,000 cases of undernutrition. Applying the 'Cost of Hunger' in Ethiopia at US\$642 per child to those 87,000 cases the economic impact of late response to this crisis due to undernutrition could be on the order of US\$55.9 million. If this same population received timely treatment for MAM and SAM, the cost would be US\$4.3 million³⁷, resulting in an estimated additional economic cost of US\$51.6 million.

A study on the economic rationale for investing in stunting reduction found that investing in nutrition interventions in Ethiopia yielded returns of US\$10.6 for every US\$1 invested.³⁸ The package of interventions was estimated to cost US\$102.50 per child³⁹, which would result in lifetime discounted benefits of US\$1,087 per child. This is significantly higher than the estimated cost of US\$642 per child used in the analysis, and suggests that the avoided losses from early intervention could be much greater.

³⁶ This figure is used because it is believed to be low enough to be realistic, based on conversations with DFID nutrition advisers. However, it should be noted that it is not based on empirical evidence and rather is selected to give an indication of the potential scale of impact.

³⁷ 5 percent of the MAM caseload of 1.3m U5s, at US\$33 per case, equates to a total cost of treatment of US\$2.1m. 5 percent of the SAM caseload of 435k U5s, at US\$100 per case, equates to a total cost of treatment of US\$2.2m. The two combined result in a total cost of treatment of US\$4.3m.

³⁸ Hoddinott, John, Harold Alderman, Jere R. Behrman, Lawrence Haddad, and Susan Horton. 2013. "The Economic Rationale for Investing in Stunting Reduction." GCC Working Paper Series, GCC 13-08.

³⁹ The package includes salt iodization, iron fortification, iron-folic acid supplementation, community based nutrition programming, provision of complementary foods, community based management of SAM, Vitamin A supplementation, micronutrient powders, zinc supplementation, and deworming.

3.3.4 DFID Early Funding - Malnutrition

Severe Acute Malnutrition

DFID provided funding of £11,540,000 in October 2015 for UNICEF to provide SAM treatment (US\$17.3 million). At a cost of US\$100 per child for SAM treatment, this suggests that this funding was able to reach approximately 173k children with SAM. This funding was largely used to procure 14,000 cartons of RUTF locally, and 213,000 cartons of RUTF from offshore for prepositioning.

The estimated transportation cost for a single carton of RUTF is US\$7 for sea freight and US\$20-\$25 for air freight. At a cost of US\$7 for sea freight, the cost for the 213,000 cartons was around US\$1.5 million. If the orders were submitted late and air freight was needed, UNICEF would have paid between US\$4.2 and US\$5.3 million depending on the location and package of the supply, **saving UNICEF between US\$2.7 and US\$3.8 million.**

Moderate Acute Malnutrition

DFID provided contingency funding of £10,000,000 (US\$15m) for UNICEF to provide CMAM treatment. MAM costs on average US\$33 per case, suggesting that these funds will reach approximately 455k people. Using the same ratios described in the section above, this would be equivalent to 267k children U5, and 187k PLWs.

It was not clear that there are cost savings from early procurement of TSF and therefore procurement cost savings are not included here.

Table 11: Cost Savings from DFID Early Funding, SAM treatment

	Timely Response	Late Response
DFID Early Funding - SAM	US\$17.3 million	US\$17.3 million
Cartons of RUTF procured internationally	213,000	213,000
Transport Cost, RUTF Carton, sea freight	US\$7	
Transport Cost, RUTF Carton, air freight		US\$20-US\$25
Cost of Procurement	US\$1.5 million	US\$4.2 – US\$5.3 million
Savings from DFID early funding		US\$2.7 - US\$3.8 million

Economic Impact

DFID contingency funding for SAM and MAM is estimated to have reached 173k children U5 with SAM, and 267k children U5 with MAM, equating to a total of 400k children U5 requiring

treatment for malnutrition. As described above, the linkages between malnutrition in a crisis and longer term undernutrition are variable, and therefore this estimate is only given to provide a sense of the potential order of magnitude of economic loss as a result of leaving malnutrition untreated. As with the HRD analysis presented above, if we assume that 5 percent of the total malnutrition caseload of 400k for children U5 supported by DFID did not receive treatment resulting in undernutrition, this would equate to 22,000 cases of undernutrition (5 percent of 400k). Applying the 'Cost of Hunger' in Ethiopia at US\$642 per child to those 22,000 cases, the economic cost of no response to this crisis due to undernutrition could be on the order of US\$14.1 million. If this same population received timely treatment for MAM and SAM, the cost would be US\$1.3 million⁴⁰, resulting in an estimated additional economic cost of US\$12.8 million.

3.4 WASH

3.4.1 Overview of the Funding Gap

According to the HRD, 5.8 million people are estimated to be in critical need of WASH as a result of the drought, and US\$73 million in funding was requested. This funding covers a variety of water interventions - including upgrading of existing water schemes, distributing household water treatment chemicals for use in standing bodies of water, water trucking, establishing emergency water treatment systems, emergency drilling of deep boreholes, and optimization of non-functioning water schemes – as well as sanitation and hygiene interventions. The costs of these different interventions vary significantly, and the breakdown of funding dedicated to different types of interventions in this drought was not available.

According to the April Periodic Monitoring Report, of the 5.8 million people targeted, 2.6 million had been reached, and US\$47.8 million, or 65 percent, of the funding requested had been received. This leaves a gap of 3.2 million who had not yet been reached, and a funding gap of US\$25.2 million. The periodic monitoring report cited a significant increase in the need for water trucking. "Due to increasing requests for water trucks to provide communities with potable water, the sector decided to open the costly water trucking intervention to include NGOs. At present, regional authorities are requesting water trucking to support more than 4.1 million people, up from the 500,000 people targeted in the HRD."⁴¹ With the onset of the March/April rains, many traditional open water sources were replenished though contaminated with flood

⁴⁰ 5 percent of the MAM caseload of 267k U5s, at US\$33 per case, equates to a total cost of treatment of US\$8811k. 5 percent of the SAM caseload of 173k U5s, at US\$100 per case, equates to a total cost of treatment of US\$17300k. The two combined result in a total cost of treatment of US\$26111k.

⁴¹ "Periodic Monitoring Report: 2016 Humanitarian Requirements Document, Ethiopia." Covering 1 Jan to 31 Mar 2016. Prepared by clusters and NDRMC.

waters, and hence water trucking had been shifted to the provision of water treatment chemicals.⁴²

3.4.2 The Financial Cost of Late Response: WASH

Water supply is complex – different areas will have different requirements, and cultural or political factors may make some types of permanent water supply unfeasible. Further to this, in a drought of this magnitude, many of these systems were rendered unusable because the shallow water had dried up, making otherwise functional water systems ineffective, and requiring water purification and/or trucking as the only feasible alternative. Finally, in some areas it is possible to repair and rehabilitate existing water schemes to provide longer term water supply. In other areas, water schemes have to be built from scratch and this can take many months. As a result, early funding would have to be very early to ensure that these systems were online and able to displace the need for water trucking by the time the drought hit.

It is therefore very complex to determine the efficiency of early funding for water without very detailed data on the suitability of various water schemes at a local level. On the one hand, in places where existing pumps could be rehabilitated and are still capable of delivering water even with low water tables, early funding in late 2015 could have been less expensive than providing water trucking as a late response. On the other hand, where installation of pumps was required, funding would have to be provided many months in advance to ensure this infrastructure was installed ahead of the drought.

Table 12 provides cost estimates for a number of different types of long term water supply options. For comparison, at an approximate cost of US\$4/month⁴³, providing water trucking as an emergency measure would equate to a cost per person of US\$24 for 6 months. However, water trucking has to be provided every time there is a drought, whereas investment in longer term water solutions can provide water for many years without additional investment. As a result, longer term water schemes may cost more than water trucking, but due to their longer lifespan, will be more cost efficient than emergency response using water trucking in the vast majority of cases.

⁴² Pers Comm, Samuel Godfrey, Head of WASH UNICEF.

⁴³ This cost estimate was provided by UNICEF Ethiopia.

Table 12. Cost efficiency VFM Indicators for rural water supply (2013-2015)⁴⁴

Type of WS facility	Shallow Wells (SW)	Rural Piped System (RPS)	Hand Dug Well (HDW)	On spot spring development (SSP)
Total average per water point cost	US\$11,362.60	US\$278,442.06	US\$3,454.76	US\$3,804.26
Hardware cost	US\$8,842.62	US\$221,514.68	US\$2,664.09	US\$2,972.97
Software cost	US\$189.19	US\$900.90	US\$122.01	US\$94.98
Direct programme support cost	US\$722.55	US\$17,793.25	US\$222.89	US\$245.44
Indirect programme support cost at national level	US\$812.86	US\$20,017.40	US\$250.75	US\$276.12
Indirect programme support cost at international level	US\$795.38	US\$18,215.84	US\$195.03	US\$214.76
Total average per capita cost	US\$32.44	US\$65.04	US\$17.53	US\$12.87
Hardware cost	US\$25.26	US\$51.49	US\$13.32	US\$9.91
Software cost	US\$0.52	US\$0.21	US\$0.61	US\$0.32
Direct programme support cost	US\$2.06	US\$4.14	US\$1.11	US\$0.82
Indirect programme support cost at national level	US\$2.32	US\$4.65	US\$1.25	US\$0.92
Indirect programme support cost at international level	US\$2.27	US\$4.55	US\$1.23	US\$0.90

3.4.3 The Economic Cost of No Response: WASH

As with the food and nutrition analyses, the reality is that many people will simply go without adequate water supply, and/or travel very long distances to get water in a drought.

According to a UNICEF progress report prepared in May of 2016, and based on real-time monitoring results, an alarming 78 percent of the population of Tigray had access to less than 5 liters/capita/day (l/c/d).⁴⁵ A more recent periodic monitoring report from June shows that access to water continued to remain low, averaging at 50 per cent in six regions, and with 42 percent of the target population accessing less than five l/c/d.⁴⁶

⁴⁴ UNICEF, Ethiopia. “Brief Analysis of UNICEF WASH Programme in Amhara region”

⁴⁵ UNICEF Ethiopia (2016). “Emergency WASH Response to El-Nino Induced Drought in Ethiopia: Progress report for the Government of the United Kingdom of Great Britain and Northern Ireland.”

⁴⁶ Ethiopia Dashboard – Sector Response and Contextual Indicators (June 2016)

The total discounted losses due to poor water and sanitation in the UNICEF Business Case submitted to DFID⁴⁷ are estimated at £239 million, or approximately US\$350 million, for a population of 3.6 million. These losses are based on the value of time spent fetching water, the loss of productive days, direct health impacts, and school days lost. This equates to an estimated US\$100 per person in losses.

Based on this evidence, **the economic impact of a lack of response to provide clean water could equate to US\$320 million for the 3.2 million people without access to clean water under the HRD, an additional cost of US\$295 million above the cost of early response.**

3.4.4 DFID Early Funding - WASH

DFID provided early funding of £13,000,000 (US\$19.5 million) in December 2015 for UNICEF by pivoting development spend to provide WASH to affected populations. According to UNICEF, this was used 15 percent for water trucking, and 85 percent to install longer term water solutions such as rehabilitating and installing wells and other infrastructure in areas that were affected, equivalent to approximately US\$16.6 million of the total.⁴⁸

The US\$16.6 million investment by DFID will most likely deliver Value for Money (VfM). As shown above, investment in longer term water solutions is more cost effective than responding with water trucking to repeated droughts, especially in a context like Ethiopia where droughts recur on a very regular basis. When the additional benefits of investing in water are incorporated, longer term solutions consistently yield benefits greater than costs.

However, it should also be noted that it takes 6-8 months on average for works to expand/rehabilitate water infrastructure to come online. Hence it's entirely possible that these populations would have needed water trucking as an interim measure regardless, as DFID funding was not sufficiently early to respond with longer term measures in this event. Therefore, while DFID contingency funding is likely to be high VfM, it is not likely to deliver either financial or economic gains specific to this crisis as a result of early funding.

⁴⁷ Water Supply, Sanitation and Hygiene (WASH) Programme (One Wash National Programme). UNICEF Business Case, DFID Ethiopia, January 2013

⁴⁸ Pers Comm, UNICEF

4 Conclusions

The analysis presented in this report suggests that timely procurement of humanitarian aid in Ethiopia could have avoided costs for the Government of Ethiopia and the international donor community upwards of US\$111 million in cereal procurement for the HRD relief caseload alone. If the full PSNP and HRD food pipeline is taken into account, early procurement could have avoided between US\$127 and US\$271 million in additional costs, funding that could have reached an additional 1.4 to 3 million people in need.

The evidence already suggests that, due to the food shortage, household food consumption, malnutrition treatment, and access to clean water are all constrained. While the evidence on the economic impact of no response has to be interpreted with some caution, the findings presented here suggest that the economic implications for households of no response could be on an order of magnitude that is more than double the cost of a timely response.

Early procurement with DFID funding has played a significant role in the response. Early funding assessed in this report totaled US\$74.3 million out of the total HRD request for US\$1.4 billion. DFID contingency funding considered in this analysis was entirely triggered before the end of 2015, and importantly the use of standing arrangements and existing business cases played a critical role in allowing DFID to pivot funds quickly and easily towards the response. As a result, it is estimated that DFID funding resulted in procurement savings of between US\$6.3 and US\$7.4 million, equivalent to 18 percent of the total funding committed to the sectors assessed. Assuming that this early funding from DFID had not been received, it is likely that significantly higher levels of economic loss to households would have been incurred.

While early funding has been critical for food and nutrition procurement, it has had far less of an impact on water supply. Water investment, particularly for longer term rehabilitation and construction, takes many months to come online. Therefore, in order to ensure that clean water supply came online in the face of this drought, DFID early funding would have had to have been well in advance of the drought to bring about any gains.

Thus, while study findings indicate that DFID contingency funding provided early in the crisis has played a significant role in delivering VfM gains, it also indicates that the costs associated with the remaining deficit could measure in the hundreds of millions of dollars in procurement and economic costs.

Further analysis under the wider multi-year thematic evaluation (of which this is one part) will seek to determine whether aid provided during the 2015 and 2016 drought helped people avoid losses and cope better. The longer time frame of the wider study will allow for updates to this

analysis, potentially allowing for a later perspective on how early and not so early response has impacted households.

The analysis so far however, supports the view that early funding in slow onset crises can both save money and mitigate losses and negative coping. Despite a growing body of evidence generated over many years that this is the case, funding models still struggle to genuinely release funds early at the volume required. This analysis supports DFID's commitment to greater funding towards early humanitarian action in the Grand Bargain, launched at the 2016 World Humanitarian Summit. It shows the necessity for funding models to respond to the first signs of a crisis. Flexible funding, for example through multi-year humanitarian funding models with built-in contingency mechanisms, can allow shifts in funding depending on need and can help to stimulate more timely response resulting in significant cost savings.