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UNICEF/WFP Return on Investment for Emergency Preparedness Study

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About the authors

Dr. Heino Meerkatt is a senior partner and managing director in the Munich office of The Boston Consulting Group. **Dr. Philipp Kolo** is a project leader also in the firm's Munich office. **Quentin Renson** is a consultant in BCG's Brussels office.

2. EXECUTIVE SUMMARY

Although humanitarian actors have long emphasized the benefits of emergency preparedness in high-risk humanitarian contexts, little evidence has been collected to date to demonstrate the impact of early preparedness investments on eventual humanitarian response. This study is one of the first research initiatives to quantify the cost and time benefits of a large and diversified investment “portfolio” of emergency preparedness interventions undertaken by UNICEF and WFP in 2014, with support from the United Kingdom’s Department for International Development (DFID). It builds the evidence-base for a return on investment (ROI) for preparedness to:

- identify opportunities to reduce costs and increase the speed of humanitarian response;
- assess planned and existing preparedness investments in terms of potential cost savings and response time; and
- compare different preparedness interventions along these two dimensions.

The ROI model has been developed and applied based on 49 emergency preparedness investments in three pilot countries: Chad, Pakistan and Madagascar. These investments span across four main operational areas (logistics, procurement, staffing and partnerships/external contracting) and cover UNICEF and WFP activities under DFID Humanitarian Programme funding for emergency preparedness from January 2014 through the end of 2014.

A total of \$5.6 million was invested in interventions covered by this study. In the context of projected risk on the likelihood, timing and scope of future emergencies specific to each country, future emergency response-related costs have been reduced by \$12.0 million, representing \$6.4 million in net savings and an average ROI rate of 2.1. The time savings drawn from these same investments range from 2 to 50 days, or average time savings of more than one week, when comparing the duration of necessary response activities both with and without advance preparedness measures. No preparedness interventions resulted in lost time or slower future response speed. Time-savings are particularly critical in humanitarian action since the speed of programme implementation has direct implications to lives saved during a time of crisis.

KEY FINDINGS

ALL UNICEF and WFP emergency preparedness investments examined in Chad, Madagascar and Pakistan were found to save significant time and/or costs in the event of an emergency.

64% of investments saved both costs *and* time.

COST SAVINGS

\$5.6 MILLION was invested in the 49 preparedness activities examined. These interventions saved a total of **\$12 million** toward future humanitarian response for a net savings of \$6.4 million.

TIME SAVINGS

93% of preparedness investments examined saved time toward humanitarian response – no investment examined slowed down humanitarian response.

Preparedness interventions can speed response time by **2 TO 50**

DAYS or an average more than one week.

Overall findings from the study demonstrate that:

- 100% of all UNICEF and WFP investments in emergency preparedness examined were found to save significant time or costs in the event of an emergency.
- Three quarters of the preparedness investments examined demonstrated cost-savings beyond the amount of the initial investment (ROI>1.0).
- 93% of preparedness investments examined saved time toward humanitarian response. On average, preparedness interventions saved more than one week in humanitarian response time.
- 64% of preparedness investments saved time and cost.

What is an ROI?

The ROI (return on investment) is a financial measure in which an ROI rate of 1 indicates that future costs will be reduced by the same initial investment amount. All rates greater than 1 indicate a higher cost saving than the original investment.

Time savings have been measured in days, indicating the number of humanitarian response days that are saved by preparedness in the event of an emergency.

The research demonstrates that humanitarian preparedness is complex and must be tailored to context. Investments with high returns in one country do not necessarily indicate similarly high returns if implemented in another country. However, trends within the data collected and analysed for this study suggest some first patterns:

- Pre-positioning of internationally-sourced emergency supplies yield ROIs in the magnitude of 1.6 – 2.0 and significant time savings of 14 to 21 days on average across all pilot countries. Analysis based on anticipated future needs suggests that quantities pre-positioned as emergency supplies in the pilot countries could be increased without risk of spoilage or financial loss.
- Large infrastructure investments yield the highest absolute money savings (e.g. the Tissi airstrip investment of \$680,000 in Chad resulted into subsequent cost savings – by avoiding the use of helicopters in the rainy season – of \$5.2 million, with an ROI of 7.7)
- Trainings may yield by far the highest financial ROIs (1.3-18.7) due to their relatively limited initial investments and large potential cost savings, but this type of investment also requires the need to retain the trained staff and to ensure a high quality of training.
- The more dependent a country is on external goods and services, the higher the ROI of an investment ensuring their availability in an emergency situation (primacy of available goods over non-available ones).
- For countries with higher coping capacities, the ROIs for more basic emergency preparedness investments fade, with higher value shifting to those in human capital (e.g., training) and organizational capacity (e.g., additional resources).
- All investments have various additional qualitative benefits (e.g., higher reliability, local expertise development, spillover to the broader humanitarian community or long-term multiplier effects) that were not quantified but further increase the value of the investments.

Given the magnitude of the ROI of most investments, it appears that there is still a large gap between potential savings from preparedness investments and the actual cost of humanitarian response. By contrast, if we were to see an average ROI around 1.0 across investments, this would indicate that the humanitarian community has comprehensively addressed risk with preparedness measures. As such, the research team hypothesizes that there are still significant investments opportunities in high-risk humanitarian contexts to further reduce the emergency response costs.

The favourable returns on investment are an encouraging result for the humanitarian community and the donors already investing in these areas. At a time when global humanitarian needs, costs and complexities have never been higher, the evidence presented in this report makes a strong case for early funding toward emergency preparedness. Up-front resources to invest fully in preparedness opportunities would facilitate swifter and more efficient response, implying more lives saved in future humanitarian action. It must be noted however that donor investment in emergency preparedness does not abdicate against contributing to support to future crises. Instead, the evidence suggests that for both donors and humanitarian agencies a more balanced resource allocation approach between preparedness and response activities in high-risk settings could yield improved long term results. Investments in preparedness should also be diversified across a spread of intervention areas, since the operational preparedness gains examined in this study showed strong inter-dependence in realizing maximum cost- and time-savings. For example, optimally pre-positioned emergency supplies can do little toward a humanitarian response if staff are not sufficiently trained and partnership arrangements are not in place for emergency response activities.

Contextualized analysis is necessary for evaluating the relative merits of investments in different situations. As the model developed through this study can be used for all type of risks and type of activities, it could function more and more as a standard tool in reporting and advocating for emergency preparedness. The research team hopes that in using the model delivered with this project, humanitarian actors will be empowered to make informed long term investment choices for the greatest benefit of aid recipients and be held more accountable to deliver on the investment promises.

3. INTRODUCTION

3.1. Research objectives

This project originates from a larger joint UNICEF/WFP programme funded by DFID and aimed at strengthening humanitarian preparedness in high-risk countries. The objective of the study was to develop a model quantifying the time- and cost-savings derived from emergency preparedness investments in order to advance the evidence-base on the benefits of preparedness.

In order to perform this analysis, an Excel-based model was developed to calculate time and cost factors related to humanitarian response. The creation and refinement of this model served as the second main objective of the project. The tool is meant to be used by country offices and HQ departments alike to structure and analyse their investment opportunities in emergency preparedness.

While a qualitative perspective on preparedness benefits was collected through informal interviews with field staff and community members, this aspect of the project was less rigorous and further in-depth analysis would be needed to validate the preliminary qualitative findings documented in this report.

3.2. Study scope

As defined by the United Nations International Strategy for Disaster Reduction (UNISDR), emergency preparedness refers to the 'knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions'.¹

The research focused on activities that both UNICEF and WFP have previously invested in as prudent interventions towards preparedness (e.g., staff training and emergency supply pre-positioning) but also explored a select number of new or unconventional investments (e.g., infrastructure development). In order to provide robust evidence for the impact of these interventions, some data outside of the DFID-specific investments was used to validate the analysis and to increase data sample sizes to strengthen the accuracy of results.

Any direct economic valuation of human life was deemed to be at odds with UNICEF and WFP's humanitarian principles and mandates and so all methodologies employing this framework were excluded from use. In addition, the quality of any humanitarian action examined was assumed to

¹ Evaluation of UNICEF's Emergency Preparedness Systems, 2013, p. 33

remain constant, since any deterioration in service provision was deemed unacceptable to both UNICEF and WFP. As such, it is assumed that the assistance provided under any scenario remains the same, reaching the same number of beneficiaries and having the same programmatic impact.

A variety of humanitarian risks (human, natural, slow-onset, sudden-onset, etc.) and levels of possible emergency severity were encompassed in the scope. The study takes into account all scenarios that go beyond national response capacities and require an internationally supported response by the UN humanitarian system.

Four core humanitarian operational areas were examined:

- **Logistics** (emergency supply pre-positioning, transportation, infrastructure work, etc.)
- **Procurement** (long-term ordering arrangements, etc.)
- **Staffing** (emergency human resources, staff training, etc.)
- **Partnerships/external contracting** (emergency contingency agreements with cooperating partners, etc.)

Key commodities for the first two operational areas (logistics and procurement) were selected to reflect the scope of the two organizations' work across several sectors (food, nutrition, health, WASH, Logistics and Emergency Telecommunications) and to represent the direct impact these commodities have on beneficiary populations.² Supply chains were analysed up to the last point of handoff between WFP and UNICEF and implementing partners, who then deliver supplies directly to beneficiaries.

The three pilot countries, Chad, Pakistan and Madagascar were specifically selected to represent a broad diversity of country risk profiles, development stages and UNICEF's/WFP's size of operations. While each is a high-risk humanitarian context, the three pilot countries represent varied levels of baseline population vulnerability, coping capacity, infrastructure availability and risk types.

The emergency preparedness activities covered by this study focus on strengthening UNICEF's and WFP's internal preparedness operations to respond to humanitarian emergency situations by making their response faster and more cost-effective in line with the above definition. This research covers the direct impact of emergency preparedness, it does not examine humanitarian strategies aimed at reducing the impact of the disasters on the population itself through other community-based preparedness activities. While important, this would include a different set of activities that were not included in the scope of the study.

² See Appendix for the details of the commodities included

3.3. Limitations of the model

Only preparedness activities under UNICEF's and WFP's direct realm of control were included in the analysis. Since both organizations typically operate by cooperating partners who deliver UNICEF's and WFP's humanitarian supplies and services to beneficiaries, the study does not attempt to assess the impact of preparedness interventions down to the level of the individual recipient of aid. Doing so would require accounting for all influences and activities of cooperating partners. By the same logic, the impact of UNICEF's or WFP's influence, advocacy and capacity-building strategies to encourage preparedness among humanitarian partners, including government partners, was also excluded, as was the humanitarian cluster system.

The model used a sample size of three pilot countries. While some patterns in financial ROIs and time-savings were apparent across these three countries, all results were influenced by context, and caution should be used when extrapolating any generalizations in findings across country contexts. Various external factors were believed to have strongly influenced the outcomes calculated in the model (for example, transport infrastructure, local market capacity, distribution systems, human capital). Further research is however needed to clarify what external factors contribute or detract most from returns on emergency preparedness investments.

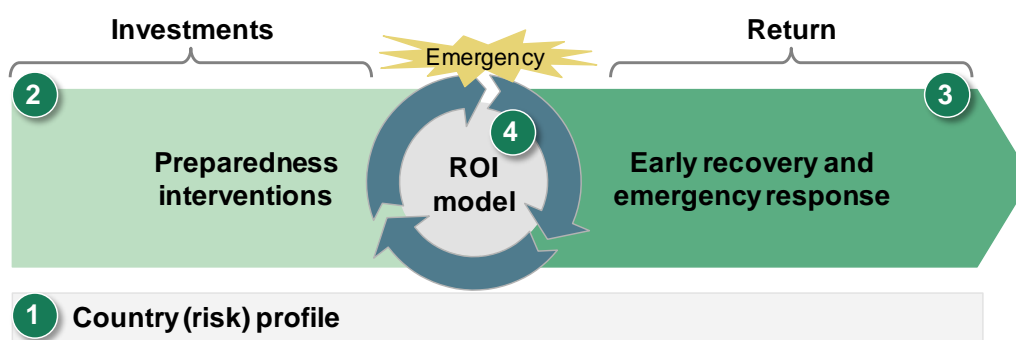
The programmatic appropriateness of the interventions was not evaluated, since this factor cannot be adequately assessed in a quantitative model. Furthermore, the effectiveness of UNICEF's/WFP's cooperating partners at the beneficiary level was not evaluated within the scope of this study.

While acknowledging the limitations in the study scope, the findings presented in this report represent a significant advancement in establishing the foundation of an evidence-based investment case for early and proactive funding towards humanitarian preparedness. The value of these investments, as measured in the pages ahead, is demonstrated for all high-risk country contexts examined in this project.

4. METHODOLOGY

The overall framework, consisting of four major elements used for this study is illustrated in *Figure 1*.

Figure 1 – Overall framework for ROI emergency preparedness study



Each of the four steps is further detailed in the following sections:

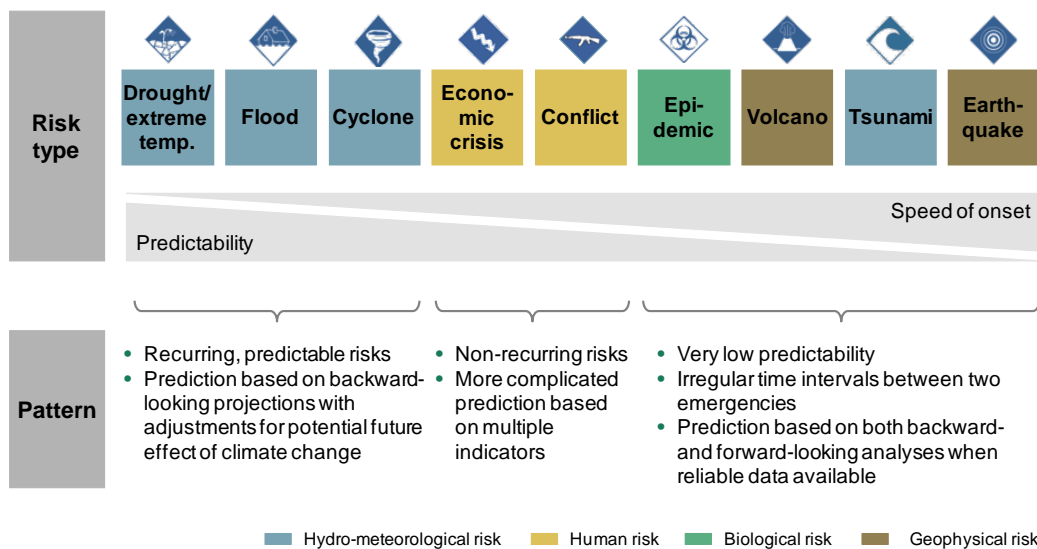
- 1 **Establish emergency scenarios based on existing country risks:** The different humanitarian risks for each country were analysed. Using both historical and predictive data on the possible impact of each scenario, detailed scenarios for each pilot country were elaborated together with UNICEF and WFP country office experts.
- 2 **Define how UNICEF and WFP are preparing for each scenario:** Specific emergency preparedness investments made by UNICEF/WFP country offices to address identified preparedness gaps were analysed. All cost variables and – where feasible – time variables related to each type of preparedness investment were investigated.
- 3 **Measure the impact of preparedness investments:** The savings (in terms of time and costs) of the relevant potential emergency preparedness investments were quantified by comparing the estimated time and costs required for the humanitarian response with and without such advance investments. Anecdotal evidence of additional qualitative benefits that were expected to complement quantitative returns of the specific investments was also documented.
- 4 **Formulation of the ROI model:** Finally, the ROI model calculated the returns on emergency preparedness investments in an Excel-based tool. The ambition is for the model to have continued future use within UNICEF/WFP and potentially other interested humanitarian agencies for all humanitarian contexts.

4.1. Country (risk) profile

The country (risk) profiles are a core input for all model calculations. Given that the focus of the study was on high-risk countries, the model is designed to cover various risks (up to five detailed risk types). It examines various natural (hydro-meteorological, biological and geophysical) as well as human-related risks (see *Figure 2*).

Most seasonal risks have a higher probability (e.g., droughts, floods, cyclones), and the analysis for these risks relied heavily on historical data. The impact and frequency were discussed with the country offices to include dynamics of recent years and the potential future effects of climate change. By trend, both aspects led to slight increase in caseload numbers and frequency compared to the simple historic mean. In the case of conflict, all available forward-looking early warning and inter-agency reports were used to aggregate the most recent developments into scenario planning.³ The risk scenarios with a sudden onset and a low predictability (e.g., earthquakes, tsunamis and volcanoes) are more difficult to translate into expected probability and impact. Historical data should be complemented by reliable expert analyses or other studies in order to be integrated into the model.

Figure 2 – Types of natural and human risks to be considered in country risk profiles⁴



The main impact of the risk scenarios on the ROI calculations is via two channels. The probability of hazard occurrence impacts the average expected time until one hazard strikes a country. This time in turn impacts for example the required storage and warehousing costs for pre-positioning investments. The response duration (number of months during which UNICEF/WFP would provide emergency assistance) and beneficiary caseloads (newly affected populations targeted by UNICEF/WFP assistance) define the volume of needs in an emergency. This has a direct impact on whether the preparedness investments are under- or oversized.

For each risk a yearly probability of hazard occurrence (PHO) was assigned. A probability of 10% characterizes a 10-year recurrence rate, thus the hazard is seen as hitting the country every ten

³ E.g., the WFP bi-monthly early warning reports and the bi-annual IASC Early Warning Report

⁴ IASC Early Warning Report; UN interagency index for Risk Management 2014 (InfoRM); UNISDR Definition of disaster types; Guha-Sapir D. et al. 2012, *Annual Disaster Statistical Review 2012 – The numbers and trends*, CRED/IRSS/UCL

years on average. For the calculation, we assumed that the risk tends to hit in the middle of that period, i.e., after five years. Based on existing research, the probabilities are inversely correlated with the expected hazard impact.⁵

For all modelling, the composite risk scenario (covering all risks of a country) was taken into account. As each individual risk is treated as independent, several risks may strike a country within any given year. Due to their independent nature, their composite risk (the likelihood that at least one of the risks will hit the country) increases as more risks are taken into account in a given country.⁶ The expectation value for this event and caseload always depends on the specific investment and takes only those specific risks into account which the preparedness investment intended to address.

As a baseline for the calculations of the model, the next expected average risk weighted by the assigned probabilities of each risk is used. In example A of *Figure 3*, there is a 10% annual probability of a cyclone hitting the country. Thus, this risk materializes every tenth year on average.⁷ In country B, one finds an additional risk of a drought affecting 80,000 people with a 40% probability. The probability that one of the risks materializes is 46%.⁸ Around every two years, one of the two risks is expected to hit the country, thus it is expected to hit after one year on average. The same logic is applied to the high-risk country in example C. Here, the probability of multiple risks (cyclones, droughts and floods) is very high with a likelihood that at least one will strike over the course of the next 14 months.⁹ This analytical approach is further complemented by probabilistic Monte Carlo simulations to test and verify the calculations and results.¹⁰

⁵ Inverse correlation is also documented in Mechler, R. (2005). *Cost-benefit Analysis of Natural Disaster Risk Management in Developing Countries* or Khan F. (2008) *From Risk to Resilience: Evaluating the Costs and Benefits of Disaster Risk Reduction under Changing Climatic Conditions : A Pakistan Case Study*.

⁶ The exception is the case when two risks are naturally linked to each other and would thus always strike jointly or subsequently. For examples cyclones and the resulting flooding is included as one risk scenario in Madagascar. This is also the approach of the EM-DAT database that was leveraged for all historic risk assessments.

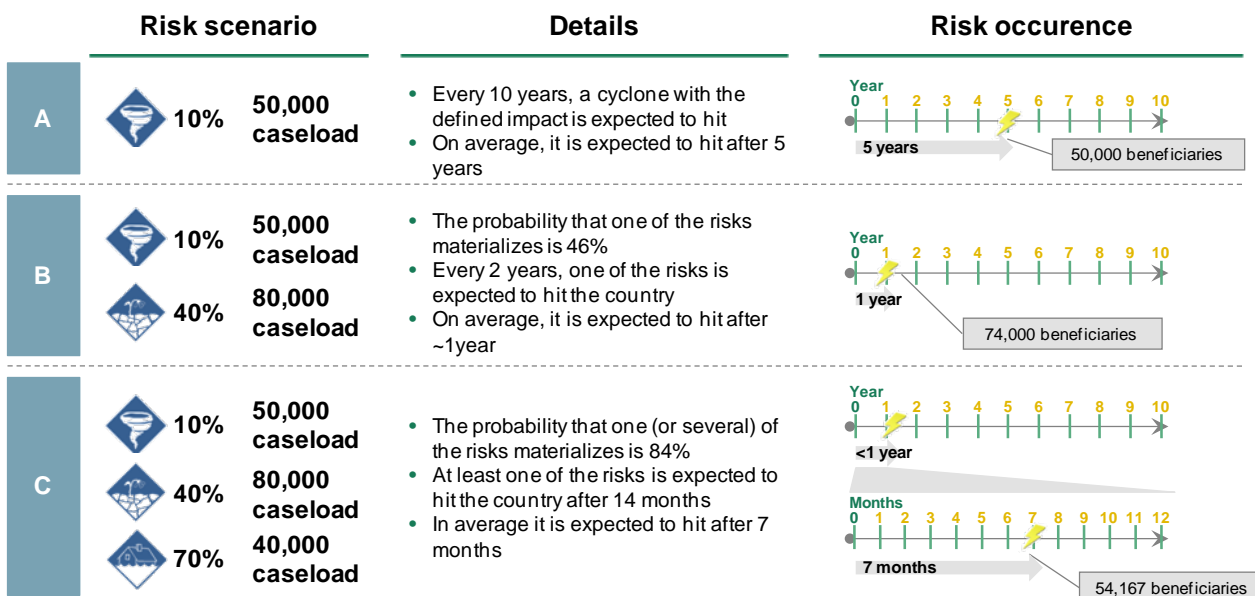
⁷ Scenarios that are assumed to materialize with 100% probability were not included in the risk calculation. Per definition, that would not be a risk because it does not contain any uncertainty and would thwart the calculation approach outlined in this section. However, many countries, including our pilot ones, have these yearly (small) risks that are often addressed through realignment of existing operations.

⁸ The probability that one or both events take place is 1 minus the probability that none of the events take place = $1 - (1-0.1 \times 1-0.4) = 0.46$.

⁹ Equally the overall risk probability = $1 - (1-0.1 \times 1-0.4 \times 1-0.7) = 0.84$.

¹⁰ For further details on these simulations, see Appendix

Figure 3 – Illustration of the details for risk calculations



4.2. Investments

The study acknowledges that UNICEF/WFP have already invested significant resources in emergency preparedness in the pilot countries and globally for several decades. This joint initiative however enabled both agencies to build an evidence-based model that can make a stronger case for sustained investment in preparedness.

As mentioned in section 3.2, the specific investments covered in the study range across four operational areas. Across these four operational areas, emergency preparedness investments were classified into six main types as illustrated in *Figure 4*. Most of the investments are relevant for all risks in a given country. Where this is not the case, detailed assumptions on the relevant risks were incorporated into the model. For example some pre-positioned commodities or trainings were designated to selected risks.

Figure 4 – Types of emergency preparedness investments in scope for the study



These interventions were selected for analysis because of their comparability across UNICEF and WFP operations and their capacity to be quantified within an economic model. For each one, the study undertook a thorough analysis of all related cost variables, i.e., not only the initial set-up costs (e.g., rehabilitation cost of an airstrip) but also the annual maintenance costs (e.g., running cost of the airstrip). Details on these components and the calculation methodology for each single investment type are described in sections 4.3 and 4.4.

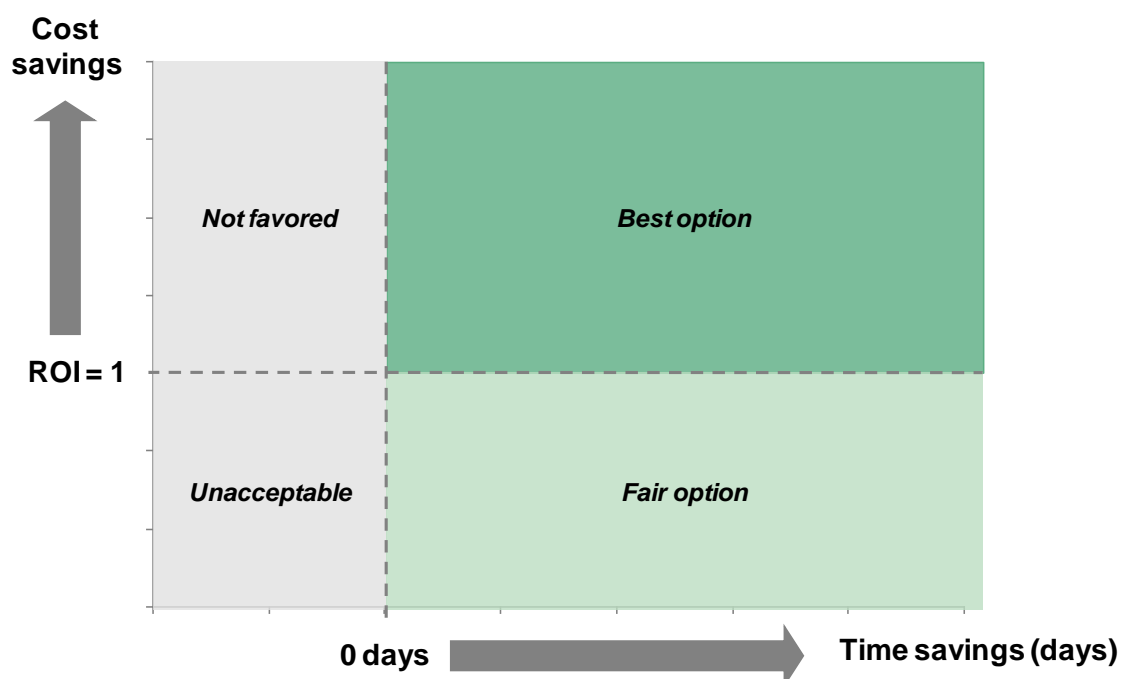
4.3. Returns

Two dimensions of benefits or returns are key to the analysis: cost and speed. Each emergency preparedness investment was assessed by how much cost and time savings it would generate for the delivery of humanitarian commodities and services. The analysis assumed that the targeted population and quality of service provision remained constant, thus the quality of UNICEF's/WFP's response was the same for all analysed scenarios, with or without the preparedness investments. The matrix shown in *Figure 5* was used to compare different types of investments within the same country, but also the same types of investments across different countries.

The cost benefits from emergency preparedness can be very different in nature. They can be direct (costs avoided during an emergency) or indirect (costs avoided following an emergency),

monetary or non-monetary (with or without a market value) and social, economic or environmental.¹¹

Figure 5 – Matrix for assessment of emergency preparedness investments



The approach of this study has been to use conservative values throughout (using the higher end of potential costs and the lower end of potential benefits) to ensure that any changes to the underlying assumptions and estimates only emphasize the overall findings.

The best outcome under the research framework would be to save both money and time simultaneously. Improved speed is of highest priority for WFP and UNICEF since faster implementation of programmes indicates more lives saved during a crisis situation. While preparedness interventions that would save costs while having no impact on time would also be beneficial, any approach that would significantly reduce speed to reduce costs would likely be viewed as unacceptable. Preparedness strategies resulting in no cost savings and slower response speeds would not be considered at all. None of the investments analysed in this study were shown to reduce response speed.

The ROI compares the future positive cash flows in relation to the investments needed to generate them (the detailed formula is summarized in *Figure 6*). The incremental cash flows (C_t) for a given time t are defined by the avoided costs during the emergency response. Depending

¹¹ Mechler, R. 2005. *Cost-benefit Analysis of Natural Disaster Risk Management in Developing Countries*. Sector Project 'Disaster Risk Management in Development Cooperation', German Federal Ministry for Economic Cooperation and Development, pp. 16–19

on relevant risk scenarios, these gross savings are realized either in the first investment year and/or in consecutive investment years. The emergency preparedness investments (I_t) are the upfront investments that are normally taken at $t = 0$, i.e., the time of investment. It may, however, also include recurring investments (e.g., maintenance costs), as a maximum time frame of 10 years ($t = 10$) is used. All future investments or cash flows are discounted at a discount rate of $i = 10\%$.¹² The discount rate is the interest rate used to determine the present value of the future cash flows. It can also be understood as the minimum rate of return required by the investor to make an investment decision.

Figure 6 – Formula used for the ROI calculation in the model

$$\text{ROI} = \frac{\sum_{t=0}^{10} \frac{C_t}{(1+i)^t}}{\sum_{t=0}^{10} \frac{I_t}{(1+i)^t}}$$

An investment per se should be taken if the sum of discounted cash flows is higher than the sum of discounted investments, thus the $\text{ROI} \geq 1$. In such cases, the sum of the future benefits (or saved costs) is higher than the initial investment. On the other hand, an $\text{ROI} < 1$ means that costs outweigh returns. For example, an ROI of 7 indicates that if \$100,000 have been invested in a particular preparedness initiative, \$700,000 could potentially be saved during the response.

The time savings were measured in days, indicating the number of days that UNICEF or WFP would gain in response speed in the event of an emergency. Time savings were calculated in the model by comparing the time for UNICEF or WFP to reach their last point of control between an emergency situation with and without the preparedness investment.

4.4. ROI model

For each type of investment, the quantitative benefits are calculated in the model by comparing the emergency situation with and without the preparedness investment in place. In the following sections, these two scenarios are referred to as the 'with scenario' and the 'without scenario'. The description of cost and time savings as well as other qualitative benefits is based on the specific design of the investment types found in the pilot countries.

¹² A 10% discount rate has been selected to match with the rate employed by DFID

4.4.1. Emergency supply pre-positioning

Cost savings

Pre-positioning includes any circumstance where a contingency stock has been established. In the three pilot countries, pre-positioning was analysed for the key commodities in scope (food, nutrition and WASH commodities) as well as operational support equipment – ICT equipment and Mobile Storage Units (MSUs). Cost savings from pre-positioning investments were mainly realized from lower transport costs. Indeed, stock pre-positioning implies a certain storage cost that would not be incurred in the case of immediate procurement during an emergency, but allows for the use of a more cost-effective transport type. For commodities sourced internationally, the 'with scenario' usually implies lower costs through shipping by sea while the 'without scenario' requires more costly air transport in order to minimize the delivery time.¹³ For commodities purchased locally, land transport is assumed for both scenarios leading to more limited cost savings. However, de-stabilizing post-emergency effects on local transport systems can typically lead to higher transport prices and a positive ROI can therefore be realized for local commodities under certain circumstances. The model has assumed procurement prices of both internationally and locally sourced commodities to be static in both 'with' and 'without scenarios'. This represents a conservative assumption as procurement prices are likely to increase during an emergency due to sudden surge in demand, leading to even higher ROI figures.

For the procurement and transport costs of the pre-positioned commodities, exact costs incurred by the COs were used. The storage costs until the first emergency related to the specific quantities pre-positioned were calculated based on the rental and maintenance costs of the respective UNICEF/WFP warehouses. The average shelf life of commodities and stock rotation¹⁴ to prevent losses from expired commodities was also taken into account. For the 'without scenario', the higher transport costs were calculated based on current and past airfreight costs incurred by the COs¹⁵ and observed price premium in local transport costs during past emergencies.

Time savings

Time savings from pre-positioning were derived by comparing the delivery time of the pre-positioned commodities from the local centralized warehouse where stocks were pre-positioned

¹³ Assuming zero pre-positioned stock in this scenario. To ensure cost efficiency during an emergency response, UNICEF and WFP typically employ dual transport methods to transport international supplies to the site of the crisis. While air transport is primarily used at the start of a response, international delivery mode usually shifts to less expensive overseas shipping as soon as a continuous overseas pipeline of supplies can be established.

¹⁴ If the expiry date of the commodities approaches, a stock rotation system normally replenishes emergency stocks while older commodities are re-directed to regular programmes (such as school feeding) for consumption before they expire.

¹⁵ When data was not available for the analysed commodities, airfreight costs during past emergencies for the transport of other types of commodities were used as proxy.

to the last point of delivery prior to handover to UNICEF/WFP¹⁶ cooperating partners while also taking the lead times for ordering, airlifting and delivery of these commodities from suppliers into account. In the 'without scenario', the model assumed the availability of the products internationally. This is again a conservative approach as the unavailability of the commodities at the time of the emergency procurement would even increase the lead time before final delivery.

When available, historical data from the COs was leveraged and further refined with cost estimations from the respective UNICEF/WFP HQ departments based on the most realistic operational scenario in case of an emergency. In the absence of sufficient historical data, the time savings calculations for selected internationally procured emergency supplies was estimated based on the assumption that international supply orders, procurement and delivery by air to the country's port of entry would take a maximum of 14 days; this is according to minimum organizational standards for emergency supply and logistic modalities. Although delivery within 72 hours is possible and sometimes necessary, this speed requires very high transport costs that could inflate the related cost savings results in the model disproportionately. A 14-day timeframe for international delivery was assumed as a moderate balance between a realistic response time and costs variations for different humanitarian responses.

Qualitative benefits

Better reliability is the main additional qualitative benefits from pre-positioning activities as it ensures that the required quantity and quality of commodities are immediately available on-site. UNICEF/WFP therefore minimizes the reputational risk associated with a delayed emergency response due to: limited emergency stocks within central warehouses, limited cost-effective transport options to bring in additional emergency supplies in a timely manner and local supply chains that are unable to meet increased demand.

4.4.2. Infrastructure projects

Cost savings

By their very nature, infrastructure projects are characterized by a heavy initial investment followed by smaller recurring maintenance and operating costs. They are also contextually based and therefore associated benefits are contextually unique. In each pilot country, the exact budget estimates and a projection of the maintenance costs were used. However, cost savings differ significantly in nature and in magnitude from one infrastructure project to the other. For instance, large cost savings from the rehabilitation of the Tissi airstrip in Chad were realized from the use of a more cost-effective transport type (fixed-wing aircraft vs. helicopter), while cost savings from the rehabilitation of the Nasir Bagh warehouse in Pakistan that aimed to enhance covered capacity by constructing concrete platforms and installing mobile storage units was mainly generated from lower food losses/waste due to reduced exposure to floods and other adverse

¹⁶ Area of the emergency and point where it is handed-over to cooperating partners

weather conditions. In Madagascar, the possible future use of unmanned aerial vehicles (UAVs) – often referred to as "drones" – for the post-disaster needs assessment would allow savings from the reduced need of helicopter time.

Time savings

Like cost savings, the time savings greatly vary from one infrastructure project to the other, and a case-by-case approach was therefore adopted. For the rehabilitation of the Tissi airstrip, time savings were difficult to quantify as they mainly accrue to other humanitarian partners. The time savings achieved by WFP through one additional rotation per day by fixed-wing aircraft as opposed to helicopter trips is negligible compared to the multiplier effect to other humanitarian partners. Increased access to affected populations in Tissi during the rainy season could potentially translate to faster response times for their respective emergency operations.

The same logic applies for the Nasir Bagh investment because it was primarily intended to boost the capacity of the Logistics Cluster in meeting increased demand from humanitarian partners during emergencies with the added on benefit of increased internal storage capacity. The time savings accrued by other humanitarian partners due to the reduced need to transport emergency supplies over much longer distances would however be difficult to quantify from all the different possible transport routes across the country. Similarly, the time savings from the UAV investment in Madagascar were also negligible as this new technology does not fully replace the necessity for initial aerial assessments via helicopter that can be followed up by more detailed emergency assessments using drones

On the other hand, the Bol investment in Chad that involved the pre-positioning pre-fabricated offices and ICT equipment for an operational humanitarian hub generated large time savings due to the reduced time needed to start up humanitarian operations on the ground. These savings were computed by consolidating the time needed to identify a suitable site, process rental contracts, conduct necessary renovations to meet minimum safety and security standards (MOSS) and obtain the ICT equipment in a region with no existing operational presence.

Qualitative benefits

In addition to cost and time savings, infrastructural investments can enhance the reliability, cost efficiency, and safety and security standards to the broader humanitarian system. The rehabilitation of the Tissi airstrip allows for expanded capacity for a wider range of fixed-wing aircraft with a higher number of rotations than was possible with helicopters resulting in increased passenger and cargo capacity for humanitarian operations in the area. This has, in turn, resulted in an uninterrupted supply of essential supplies such as vaccines, essential medicines, nutrition and WASH supplies to humanitarian partners operating in Tissi. It has also facilitated life-saving interventions such as medical evacuations for critically sick patients requiring urgent referral to secondary facilities for further management.

The infrastructure investment in Bol that involved setting up an operational hub as a base for humanitarian operations on the other hand reduces the reputational risk associated with a

delayed response to a potentially high-profile crisis while minimizing the safety and security risks posed to humanitarian personnel in a highly volatile security environment.

The rehabilitation of the Nasir Bagh warehouse that enhanced its covered storage capacity has significant spillover benefits to other humanitarian partners utilizing the facility to pre-position emergency supplies while ensuring a better commodity tracking/warehousing system due to more secure, enclosed storage facilities.

Finally, the investments in UAVs for post-disaster needs assessments after a cyclone can greatly improve the depth, quality and reliability of aerial assessments providing more accurate data on the extent of casualties, damages and other existing/potential hazards to better inform planned emergency responses by all humanitarian stakeholders.

4.4.3. Long Term Agreements

Cost savings

Long Term Agreements covered various types of commodities or services. The primary objective for signing local LTAs was to save time and ensure the availability of the specific commodities and services (particularly transport services from different suppliers). Cost savings were more unpredictable and varied from one country to the next. In some cases, prices negotiated in the LTAs were lower than market prices, while elsewhere suppliers requested a price premium to hedge against high price fluctuations during the duration of the LTA. Due to the lack of clear evidence based on strong and reliable historical data, no quantitative ROIs were calculated for this type of preparedness interventions – except for the third party monitoring LTAs in Pakistan where sufficient historical data was collected.

Time savings

LTAs often allow for significant time savings due to shorter procurement procedures and delivery time by the suppliers. For the 'with scenario', delivery times were derived from the conditions negotiated in the LTAs with the suppliers. For the 'without scenario', historical procurement timelines were used to estimate the required time needed to identify the right supplier, negotiate the contract and get the commodities delivered.

Qualitative benefits

LTAs also have various qualitative benefits including better reliability for UNICEF/WFP responses since specifications are agreed upfront and suppliers are contractually bound to deliver goods and services at pre-determined cost rates and time frames.¹⁷ In addition local LTAs can potentially stimulate local economies through increased local procurement as local suppliers

¹⁷ Some LTAs only fix specifications of products and services without specifying prices or quantities, but these were not observed in the three pilot countries.

have increased capacity to bring in larger quantities of goods/services if they are assured of future demand from UNICEF/WFP.

4.4.4. Trainings

Cost savings

It was assumed that the different types of trainings analysed¹⁸ resulted in enhanced in-country staff capacity (both nationally and internationally) with a reduced dependence on additional staff deployments in the event of an emergency.¹⁹ On this basis, emergency preparedness trainings represented a small initial investment with the potential to generate high cost savings. The cost of the trainings was estimated based on the respective training budgets of the country offices, including costs of training facilitators, transport and daily subsistence allowance (DSA), travel allowances for training participants where travel was required, costs for conference facilities, food and other contingencies. To assess the cost savings, the same methodology was used for all trainings across the three pilot countries. A hypothetical scenario informed by past experience was developed based on additional external staffing needs (international and national) to ensure the same quality of service provision if the requisite skills and competencies provided by the trainings were not available amongst existing staff in the event of an emergency. In all analysis, the future impact of trainings was defined by experienced country office colleagues and complemented where possible with historical evidence from past emergencies. The specific roles, functions and length of staff deployments or staff re-assignments from the country office to emergency locations with the relevant salaries, DSA, transport and other related costs were summed up to calculate the total cost savings.

Time savings

The same logic was used to calculate the time savings of the respective trainings by taking into account the anticipated deployment times for additional staff resources during an emergency. Based on past human resource experience, this typically consists of the time needed to identify people with the required skills, processing of travel authorizations and deployment times to the emergency location.

¹⁸ Related to emergency preparedness and response planning (EPRP), humanitarian performance monitoring (HPM), rapid needs assessment, ICT emergency response management and specific sectorial trainings (for Health, WASH and Nutrition) on Community-Based Disaster Risk Management (CBDRM)

¹⁹ This assumption was based on the intensive nature of some of the trainings that often required international training facilitators with higher-level competencies beyond those currently available at the country level. However, the study team recognizes that further qualitative analysis which was beyond the scope of this study might be necessary to confirm this assumption.

Qualitative benefits

The direct benefits of emergency trainings are enhanced staff capacities thus reducing dependence on external staff support during emergencies. However, as the quality of trainings can vary considerably, qualitative benefits would need to be further analysed. The majority of trainings examined within the scope of this study included external partners (both NGO workers as well as government employees) in addition to UNICEF or WFP staff members, meaning that local capacity was augmented in these contexts, although the scope of analysis excludes precise quantification of any associated cost and time savings derived from better-equipped partners. Trainings on joint emergency assessments, vulnerability analysis and mapping, ICT emergency management also enhance inter-agency coordination, information management and accurate targeting of affected populations to minimize duplication/overlap of humanitarian efforts and resources.

4.4.5. Additional resources

Cost savings

The amount that was considered as the initial investment for additional resources was the annual salary of the new staff members up until the first emergency. This means that the total annual salaries were included in the calculations and not just their salaries for the duration of the emergency. While it was ascertained that the new staff members fulfilled other functions during non-emergency periods, this methodology reflects the fact that they were primarily hired as an 'emergency preparedness' investment.²⁰ Savings from additional resources come from the reduced need for much higher additional staff resources during an emergency. With the reinforced staff capacity, there is no need to re-assign additional staff from other offices to the emergency. The cost savings were estimated based on costs of staff re-assignment during an emergency. Similar to the training investments, the relevant costs considered included salaries of re-assigned staff and DSA and transport to/from the emergency location.

Time savings

Time savings also followed the same approach and were calculated by taking into account the time required for staff re-assignment and deployment to emergency locations if additional staffing reinforcement was needed based on historical HR experience within the respective country offices.

²⁰ Alternatively, the other departments or programmes leveraging the additional capacity would need to re-finance the emergency preparedness budget. In the case of the pilot countries, this has not been the case.

Qualitative benefits

Additional resources also enhance the reliability of UNICEF/WFP responses due to enhanced staff capacity to effectively implement appropriate emergency programming with greater knowledge of the local context as compared to new staff deployments. As the additional staff mainly fulfil technical functions and conduct in-house trainings (as needed) for other staff members, they enhance knowledge transfer and in-house technical expertise within both organizations. They also have other functions during non-emergency periods and thus contribute to the overall effectiveness of other existing programmes. Furthermore, additional resources reduce the number of staff reassignment required during an emergency. This allows existing staff to better focus on their primary functions, which also increases the quality of UNICEF/WFP regular programmes. Finally, when the investment targets nationals, it facilitates a wider development of national expertise.

4.4.6. Programme Cooperation Agreements/Field Level Agreements

Cost savings

Emergency contingency PCAs/FLAs were signed with third parties to support UNICEF/WFP emergency operations by cooperating partners during emergencies. The initial emergency preparedness investment considered was the staff time invested in negotiating the agreements. Historical data was used to determine the time required to sign an emergency contingency PCA/FLA, the number of people assigned to complete the task and their respective functions. The relevant staff salaries pro-rated against staff time allocation per PCA/FLA was then used to come up with the initial investment. This investment recurs after the duration of each PCA/FLA expires. Cost savings from emergency contingency PCAs/FLAs were from additional funding that cooperating partners may request during emergencies in the 'without scenario' in order to cover additional support costs. Past historical data of additional emergency funding through existing PCAs/FLAs during emergencies were used as proxies wherever possible.

Time savings

If no PCA/FLAs with emergency clauses were in place, new agreements would need to be negotiated and signed after an emergency has been reported before commencing any emergency operations with cooperating partners. The time needed to negotiate and sign new PCA/FLAs during emergencies was assessed based on past historical data from the respective country offices.

Qualitative benefits

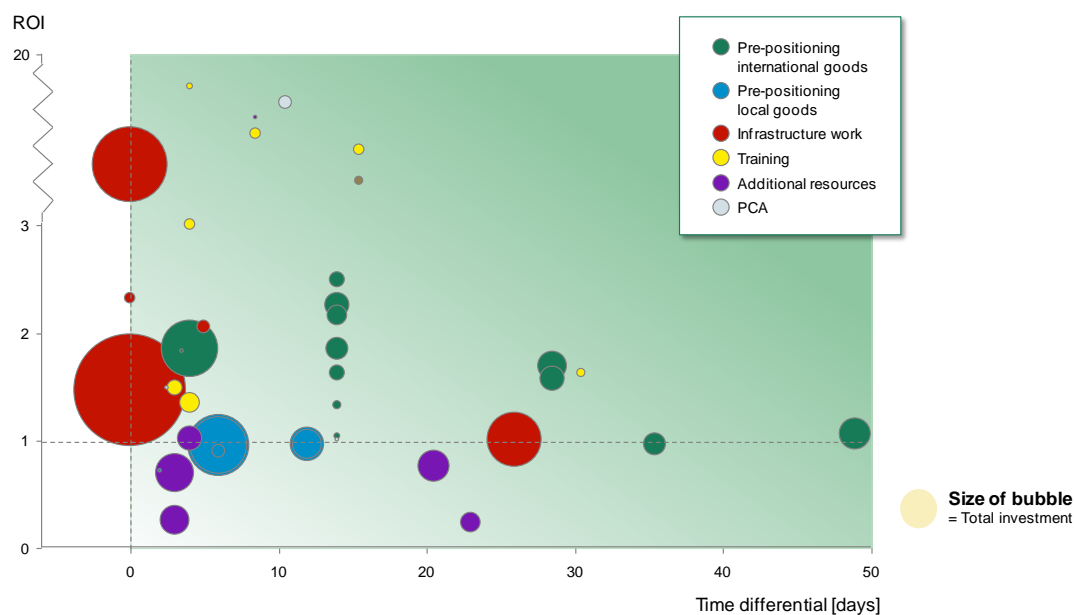
PCAs/FLAs improve the reliability of UNICEF/WFP responses as they can significantly extend their geographic coverage through existing networks of cooperating partners. They also have strong expertise spillovers for local knowledge development since most partners are staffed entirely by nationals.

5. MAIN RESULTS AND GENERAL TRENDS OF EMERGENCY PREPAREDNESS ROIS

Nearly 50 different preparedness investments in the three pilot countries were investigated.²¹ These broad data sets allowed for the testing and refining of a robust ROI model, while highlighting some general patterns between the different types of investments.

These preparedness investments required a total initial investment of \$5.6 million but yielded potential savings of \$12 million in future emergency operations. This corresponds to an average ROI across all investments greater than two.²² Considering that this research examines a very broad collection of preparedness investments implemented in highly variable settings, this average is good proxy for advocating for greater emergency preparedness investments.²³ Thus, the study shows that for every invested dollar you would save two dollars in the future on average. The investments also save an average of more than one week in emergency response. These days may translate differently into actual lives saved depending on the scale of the emergency, baseline situation of beneficiaries and the specific investment, but will undoubtedly have a positive impact on the effectiveness of emergency responses and general humanitarian outcomes.

Figure 7 – ROI and time savings of all analysed investments across countries²⁴



²¹ The detailed analysis of each respective investment is described in the Appendix.

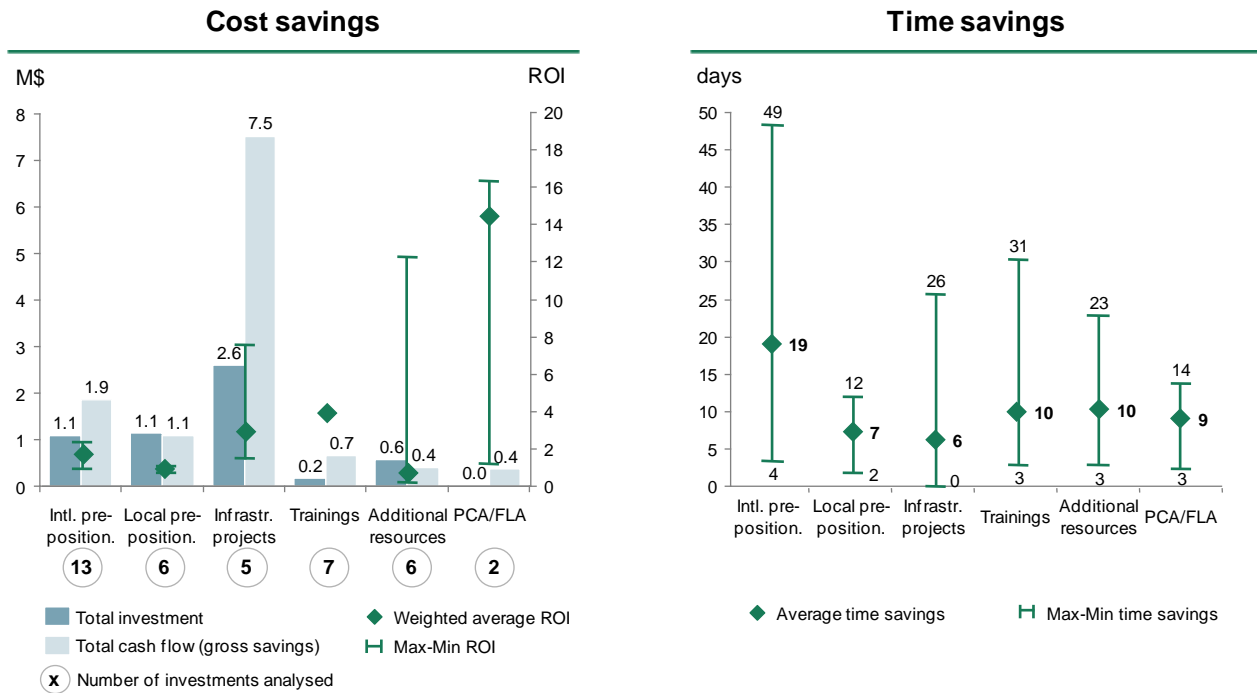
²² The average was weighted by the investment size. So, the larger investments (mainly infrastructure work) have the highest weight in this calculation.

²³ This average even includes investments primarily made not to reduce costs but to save time

²⁴ Long Term Agreements and other investments for which cost savings were not evaluated were excluded from the figure

Figure 7 depicts the results from all countries while Figure 8 – ROI and time savings per investment type highlights the differences per investment type.

Figure 8 – ROI and time savings per investment type²⁵



Overall, investments in human capital (trainings and national rosters) showed the highest relative ROIs. Because the initial investments in trainings are comparably low (less than \$200,000 for the seven trainings analysed), an increased focus in training and developing staff capacities is highly encouraged assuming the quality, performance evaluation and staff retention considerations are effectively covered. Extending knowledge transfer to cooperating partners and government counterparts would further add to a country's national capacity (and resilience) with low investment amounts.

The infrastructure investments included in the study were very diverse and thus only give a high-level indication of general patterns. Since they mainly served dual purposes for both regular and emergency operations, the time savings generated were negligible or difficult to quantify. Nevertheless, all infrastructure investments were financially sound and yielded ROIs of greater than one. In stark contrast to trainings, the infrastructure projects require large upfront investments (total of \$2.6 million for five investments). While some ROI values attained are lower, the absolute money saved is significant: \$7.5 million in total. Thus, infrastructure project investments need to be critically assessed for their financial viability; in addition, they can also

²⁵ Long Term Agreements and other investments for which cost savings were not evaluated were excluded from the figure

bring about long-term developmental gains over and above their direct impact on emergency operations.

For pre-positioned goods, a distinction between nationally and internationally procured commodities needs to be made. Depending on the capacity of the national supply chain, pre-positioning goods that are readily available within local markets usually results in financial ROIs lower than one. Such investments make sense from a preparedness perspective if the pre-positioned supplies bridge critical gaps in the initial phase of an emergency before local supply chains recover from post-disaster shocks. Most of the internationally sourced goods have a positive ROI stemming from the increased transportation costs during emergency operations. Even more striking are the significant time savings. As these goods are not available within the countries in need, they have to be procured from global pre-positioning hubs, international suppliers or the major UN Humanitarian Response Depot (UNHRD) Network in the case of WFP. The long custom and clearance processes often lead to significant time delays. The time savings were specifically high for ICT equipment in some cases due to government restrictions placed on the importation of those ICT commodities. Thus, for nationally procured goods the COs should pre-position only a minimal amount of goods for immediate reaction when sudden-onset emergencies hit to bridge urgent supply gaps in the early days of an emergency. Internationally procured commodities generate both cost and time savings. A more detailed statistical analysis was also conducted to derive the optimal quantities to be pre-positioned for each of the respective commodities.²⁶ In most cases, the quantities pre-positioned as part of this project fell considerably short of the optimal levels, therefore making a strong case for greater investment in pre-positioning such commodities (see *Figure 11 – Smoothed ROI for different pre-positioned quantities*²⁷

Additional resources investments aim to increase the staff capacities within high-risk countries/regions. Boosting staff numbers in order to effectively respond in the event of emergencies generates an ROI of less than 1, but can save substantial time. The low financial ROI stems from the fact that the full salary of the additional resources was considered as the emergency preparedness investment.²⁸ This is generally more costly than periodically increasing staff capacity during emergencies. This type of investment has higher returns for countries that are highly risk-prone with a high frequency of emergencies as the additional staff resources more often leveraged for emergency response. Evidence supports the need to ensure that high-risk country offices are sufficiently staffed well before crises escalate into full-blown emergencies.

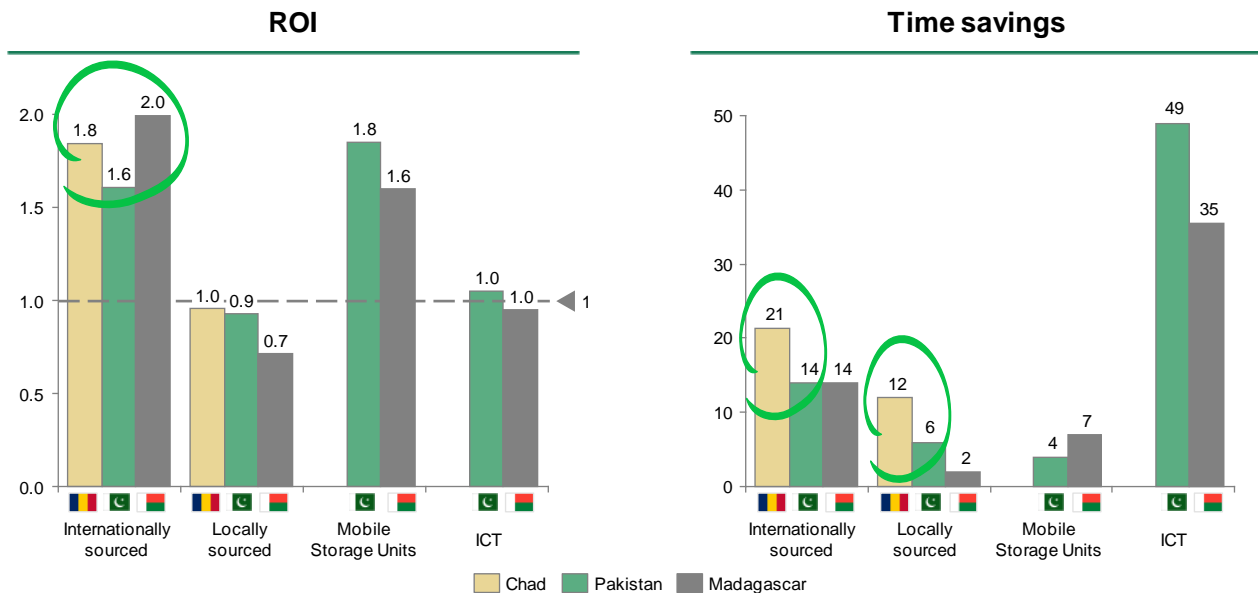
²⁶ More details and sensitivity analysis on the optimal amount of pre-positioning are found in section 6

²⁷ It should be noted however that this analysis does not account for possible capacity limitations among partners to absorb and distribute significantly larger quantities of supplies during an emergency. Further research on the maximum speed of supply through-put to partners is needed here.

²⁸ Although acknowledging that the additional resources may perform other functions during non-emergency times

The Programme Cooperation Agreements (PCAs) and Long Term Agreements (LTAs) examined in this study did not reveal a clear trend in cost and time savings but heavily depended on the operational area (procurement, logistics, services) and context-specific conditions.

Figure 9 – Cost and time savings for selected commodities across countries



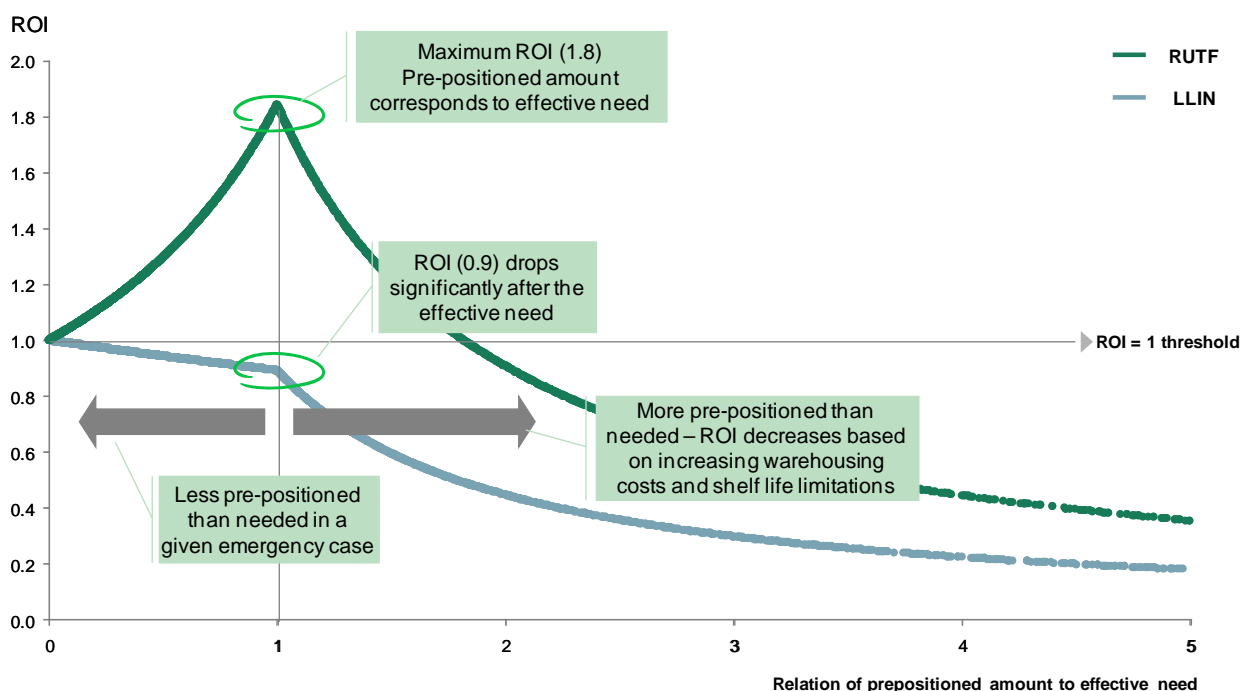
Finally, country-specific circumstances had an important effect on the resulting ROIs meaning comparing the same investment between countries would most probably lead to different values. Particularly striking was the contrast between Pakistan and Chad (see Figure 9 – Cost and time savings for selected commodities across countries). The former has a relatively well-established transport and supply infrastructure throughout the country facilitating faster movement of commodities and personnel compared to landlocked Chad. The local market capacity is also much more reliable in Pakistan.²⁹ As a result, pre-positioning activities in Pakistan attained lower ROI and time savings as compared to Chad. The same applied for Madagascar: being a remote island, returns from pre-positioning internationally sourced commodities were also more substantial. When commodities are more abundant in a country, pre-positioning large quantities of emergency stocks is not necessarily the optimal strategy, since many of these commodities can be quickly procured locally and, if markets are functioning, cash and voucher programmes can be used as an alternative approach to support beneficiaries.

²⁹ Different suppliers available not jointly affected by emergency situations

6. SENSITIVITY ANALYSES

Pre-positioned commodities are one of the most important preparedness investments for any given emergency and represent a large proportion of the investments in scope of this study. Therefore, the question of the optimal quantity of the pre-positioned goods becomes apparent. The cost savings from pre-positioning stems mainly from lower transportation costs prior to the emergency than after it occurs. However, warehousing costs are incurred for that duration until a risk strikes the country. In subsequent Monte Carlo simulations, the pre-positioned quantities and the actual emergency needs based on the different scenarios defined in the country risk profiles and relevant for each commodity were simulated simultaneously. The ROI for the overall emergency response was calculated by combining these two results. In the case of insufficient pre-positioning for an emergency, the remaining needs would be covered by international emergency procurements and airlifting the commodities at prohibitive costs and under high time pressure. Whenever the pre-positioned quantities match the actual need the overall ROI of the emergency is maximized. *Figure 10* summarizes the simulation results for RUTF and LLIN in Pakistan. In this case, the former was procured internationally, whereas the LLINs are sourced in the country.

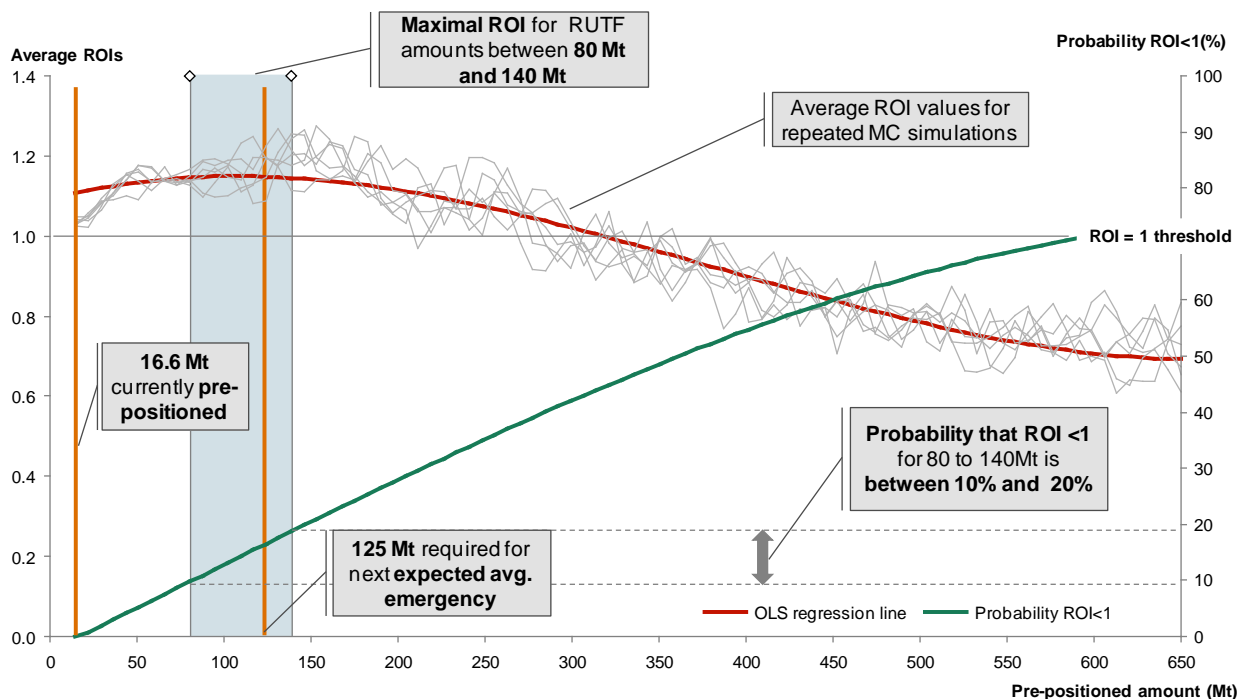
Figure 10 – ROI observation for internationally and nationally procured goods



For the RUTF it implies that, if the relation of the pre-positioned amount to the effective need is equal to one, the maximum ROI of 1.8 is realized. If fewer quantities are pre-positioned than needed in a given emergency, the overall ROI decreases as the balance is airlifted incurring high costs. The same is true when too much is pre-positioned – the ROI constantly decreases as the warehousing costs increase significantly. The picture is interestingly different for locally procured

goods where the commodities are readily available and can all be procured within the country. Hence, in an emergency situation no costly airlifting costs would be incurred, but instead as the pre-positioned quantities increased the higher the warehousing costs would climb. Therefore, from a purely financial perspective, pre-positioning locally procured commodities is not desirable, but limited pre-positioning bridges immediate supply gaps after an emergency strikes until the local supply chain recovers and kicks in. This saves significant time and thus still makes the investment reasonable.

Figure 11 – Smoothed ROI for different pre-positioned quantities



To derive the optimal amount for a given commodity, the simulation results (ROI) are depicted against the absolute pre-positioned amount in *Figure 11*. The combination of a certain pre-positioned amount and the simulated emergency need delivers different ROI values.³⁰ The red line represents the average of all ROI values and increases for low quantities while decreasing when the pre-positioned amounts are too large compared to what would be needed.³¹ The grey area gives an optimal amount of pre-positioned RUTF in Pakistan for the range between 80 and 140 Mt. The currently pre-positioned amount of 16.6 Mt is significantly below projected needs for future emergencies.³² The green line draws the probability of an ROI value below 1 depending

³⁰ Details of the simulation and the results are found in Appendix

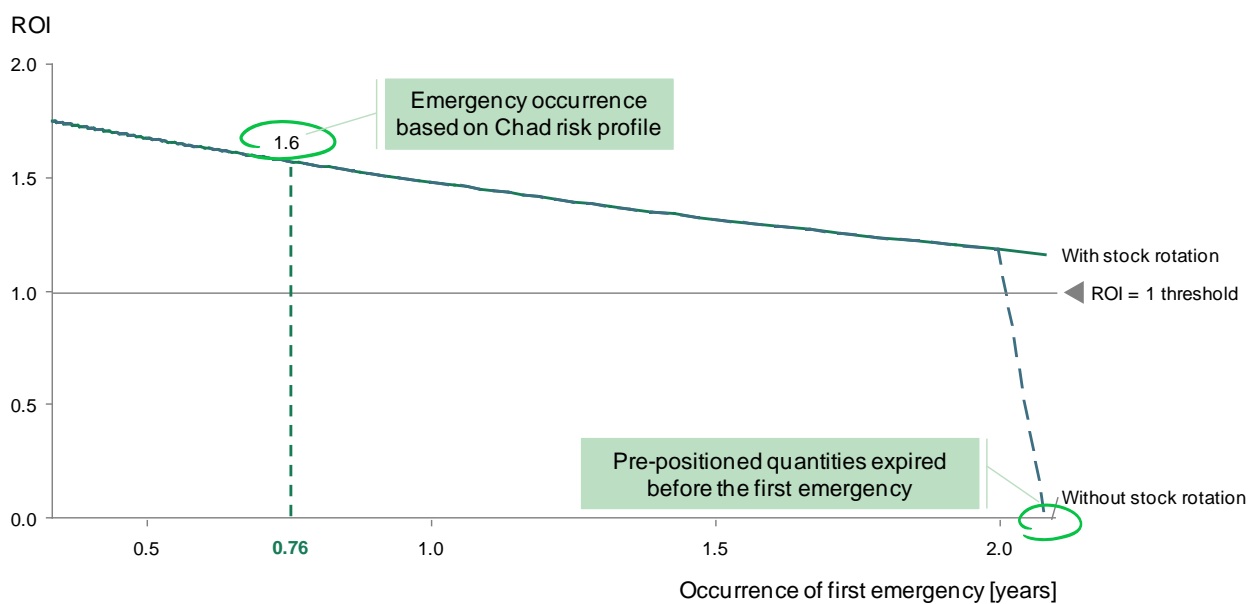
³¹ Two period moving average with a degree of two is used here

³² It should be noted that the sensitivity analyses in this report assume that implementing partners have sufficient capacity to absorb distribution of all emergency supplies without delays or operational bottlenecks. Further research is needed to clarify the likely rate of partner absorption of emergency goods in different contexts.

on the prepositioned amount. Naturally, the higher the prepositioned amount the higher is the probability that too much was prepositioned and the resulting ROI is below 1. For the values between 80 and 140 Mt this probability is in the case of Pakistan only between 10% and 20%.³³

The declining ROI for larger amounts of the pre-positioned good is mainly driven by the warehousing costs incurred. The time frame until the next emergency impacts the duration of warehousing the goods. Therefore, stocking for an emergency that does not actually materialize may be costly. To test the sensitivity of the results to this input factor, *Figure 12* sketches the ROI against the expected time until the next emergency.

Figure 12 – ROI of HEB pre-positioning in function of country risk profile



In the example of HEB pre-positioning in Chad, the next relevant emergency is expected to hit the country in less than a year based on the defined country risk profile. The ROI for this time frame is 1.6. As the probability of the next emergency declines, the ROI also decreases. However, it does not drop below the threshold of 1.0. Thus, even if the risk does not materialize as expected, pre-positioning is still a reasonable investment. Only when the shelf life is reached and no stock rotation is possible, would the ROI dramatically drop, turning the investment negative. This analysis only applies to goods that generally have a positive ROI, i.e., internationally procured goods.

The key findings of the sensitivity analysis with regards to the model are:

³³ This probability highly depends on the assumed risk scenarios and will be higher for the two other pilot countries, Chad and Madagascar.

- For each given country risk profile and specific assumptions regarding the procurement of the pre-positioned goods, an optimal range of quantity may be derived
- For internationally procured goods the results show:
 - Pre-positioned quantity is mostly lower than what is required for the next emergency.
 - In these cases, increasing the pre-positioned quantities would increase the ROI, thus reducing operational costs in the event of an emergency.
 - The results are stable and are not too sensitive to changes in the assumptions. Although some risks may not materialize, the prolonged storage time does not turn the investments negative.
- For nationally procured goods, pre-positioning to bridge immediate supply gaps until the local supply chain can react is reasonable, as time is saved by this investment. Further stocking, however, consistently decreases the financial ROI.

7. LESSONS LEARNT AND AREAS FOR FURTHER RESEARCH

The main objective of the study was to develop an ROI model to be used by UNICEF/WFP country offices and HQ departments alike to structure and analyse their investment opportunities in emergency preparedness. The pilots in three very diverse countries, together with the development of more complex sensitivity analyses, have demonstrated the robustness of this model and have sharpened the expertise of the UNICEF/WFP team in the systematic analysis of the broad range of preparedness investment options available to them. The cost and time savings identified by the model in Chad, Pakistan and Madagascar are powerful advocates for investments in emergency preparedness and shed light on preparedness perspectives where only limited research is currently available. We are therefore highly confident that the ROI model will be a crucial tool in assisting UNICEF and WFP in calibrating their future preparedness investments. It will enable the COs to plan and share the ROIs of investment proposals with donors.

The next important step of this study will be to steer the implementation of the ROI calculation approach in relevant UNICEF/WFP HQ departments, interested country offices and partners. The model's methodology should be expanded to other existing emergency preparedness investments, but should also be used to identify new investments opportunities.

While advancing a strong evidence base for time and cost returns on specific emergency preparedness investments done at the country level, the ROI model also showed interesting complementary research areas that have emerged from this study:

- Cash and Voucher and Early Warning system investments investigated in this study were at the early stages of implementation, and it was therefore not feasible to derive any financial calculations. Further research at a later stage or in other countries should however be able to demonstrate the cost savings from these interventions.
- Similar ROI calculations could be developed for preparedness interventions at the regional or global level, such as market-shaping initiatives and regional rosters.
- Some humanitarian and development organizations are becoming more interested in increasing the resilience of governments and communities and developing national capacities. They cover a much broader scope than pure emergency preparedness. Investigating the financial, time and human savings from UNICEF/WFP activities in increasing resilience and national capacity development investment would therefore require more data-intensive research, but it could yield crucial findings on their benefits. As stressed recently in the press, '[our] success [as global relief organizations] should be measured not just by the number of people we provide with water, food and shelter – but

by how effectively we empower local actors to take the lead, so that more people won't need our help in the first place'.³⁴

- Similarly, additional research at the household level could identify how time savings in emergency response can translate into life and economic savings (e.g., lower caseload of children affected with SAM or reduced risk of epidemic outbreak after an emergency).
- Of special interest should be how such approaches correlate with the methodology and findings of this study since resilience focuses on decreasing the beneficiaries' need, while this study shows how to best increase speed and cost returns to satisfy those needs.
- Finally, the differentiation between slow-onset emergencies (e.g., drought) and sudden onset (e.g., earthquake) and the relevant impact on preparedness approaches requires further exploration.

³⁴ Offenheiser, R. 2014. *Time for an alternative humanitarian response funding model*. Devex, 17 December. <https://www.devex.com/news/time-for-an-alternative-humanitarian-response-funding-model-85129>