

Improving food security in humanitarian settings: an evidence gap map protocol

Cem Yavuz
International Initiative for Impact Evaluation (3ie)

Paul Fenton Villar
3ie

Miriam Berretta
3ie

Etienne Lwamba
3ie

Ashiqun Nabi
3ie

Chris Cooper
University of Bristol, University College London

Shannon Shisler
3ie

EGM Protocol

July 2022



About 3ie

The International Initiative for Impact Evaluation (3ie) promotes evidence-informed, equitable, inclusive, and sustainable development. We support the generation and effective use of high-quality evidence to inform decision-making and improve the lives of people living in poverty in low- and middle-income countries. We provide guidance and support to produce, synthesize and quality assured evidence of what works, for whom, how, why, and at what cost.

3ie evidence gap maps

3ie [evidence gap maps](#) (EGMs) are thematic collections of information about impact evaluations and systematic reviews that measure the effects of international development policies and programs. The maps provide a visual display of completed and ongoing systematic reviews and impact evaluations in a sector or sub-sector, structured around a framework of interventions and outcomes.

The EGM protocol provides all the supporting documentation for the map, including the background information for the theme of the map, and the methods that will be applied to systematically search and screen the evidence base, extract and analyze data and develop the EGM report.

About this evidence gap map protocol

This report presents the protocol for a systematic search to identify impact evaluations and systematic reviews of the effects of interventions in humanitarian settings on food security outcomes in low- and middle-income countries (L&MICs). The EGM will be developed by 3ie with generous support from the United States Agency for International Development (USAID), through the Bureau for Humanitarian Assistance (BHA). The content of this report is the sole responsibility of the authors and does not represent the opinions of 3ie, its donors, or its Board of Commissioners. Any errors and omissions are also the sole responsibility of the authors. Please direct any comments or queries to the corresponding author, Cem Yavuz, cyavuz@3ieimpact.org.

Suggested citation: Yavuz, C., Fenton Villar, P., Berretta, M., Lwamba, E., Nabi, A., Cooper, C., Shisler, S. 2022. Improving food security in humanitarian settings: an evidence gap map Protocol. New Delhi: International Initiative for Impact Evaluation (3ie).

© International Initiative for Impact Evaluation (3ie), 2022

Table of Contents

List of Tables.....	v
1. Introduction	6
2. Background: Humanitarian emergencies and food security	9
3. Interventions in humanitarian settings	10
3.1. Early warning systems	11
3.2. Interventions pre-arranging household finance for disasters	12
3.3. Food, cash and other in-kind transfer interventions	13
3.4. Agriculture and livestock interventions	14
3.5. Nutrition interventions.....	15
3.6. Market-based recovery interventions	16
3.7. Water security interventions	17
4. Criteria for considering studies for this review	18
4.1. Population	18
4.2. Interventions.....	19
4.3. Outcomes	21
4.4. Study design.....	22
4.5 Other inclusion and exclusion criteria.....	23
5. Search methods and data.....	24
5.1. Search methods	24
5.2. Data.....	26
6. Analysis.....	27
6.1. Evidence Gap Map.....	27
6.2. Descriptive analysis.....	28
7. Review information	29
7.1 Acknowledgements	29
7.2 Contributions of authors	29
7.3. Declarations of interest.....	29
7.4. Sources of support	29
8. References.....	30
9 Appendix	45

Acronyms

3ie	International Initiative for Impact Evaluation
DEP	Development Evidence Portal
DFID/FCDO	Department for International Development
EGM	Evidence gap map
EU	European Union
FAD	International Fund for Agricultural Development
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross domestic production
HIC	High-income country
IDP	Internally displaced people
IEs	Impact evaluations
IFRC	International Federation of Red Cross and Red Crescent Societies
L&MIC	Low- and middle-income country
NFIs	Non-food items
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OECD DAC	Development Assistance Committee (DAC) - OECD
PICOS	Population (or types of participants), Interventions, Comparison groups, Outcomes, and Study designs
SRs	Systematic reviews
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development
USAID BHA	Bureau for Humanitarian Assistance - USAID
WFP	World Food Programme
WHO	World Health Organization

List of Tables

Table 1. Included intervention types.....	19
Table 2. Included outcome groups	21

1. Introduction

Today, the world stands on the brink of unprecedented famines, with an estimated 49 million people experiencing alarming levels of hunger and nearly 193 million people living in a situation defined as a food crisis (FSIN 2022; Humanitarian Coalition 2022). Catastrophic events and natural disasters are key factors threatening people's access to food and their food security. Severe weather, including the worst drought in 40 years in East Africa, has decimated crops, livestock, and water supplies. Economic crises, made worse by the COVID-19 pandemic, are pushing more and more households into poverty, and conflicts in places such as Ukraine, Ethiopia, and South Sudan are also affecting agricultural production and food prices. These events are exacerbating the demand for humanitarian assistance, with international donors now spending more than USD 30 billion per year on humanitarian support and protection (OCHA 2021). Furthermore, in 2022, it is estimated more than 274 million people will require humanitarian assistance, a significant increase from the 235 million people in 2021 (which was already the highest figure recorded for several decades) (OCHA 2021).¹

Amidst the food crisis and rising demand for humanitarian assistance, stakeholder reviews indicate interest is increasing in high-quality evidence of the effects of interventions in humanitarian settings for the purposes of informing program implementation and decision-making (Bakrania et al. 2021; Carden, Hanley, and Paterson 2021). Operational and methodological issues have historically challenged the implementation of rigorous impact evaluations of humanitarian interventions (e.g., even preparation for evaluations can be challenging when the timing and details of humanitarian emergencies are unpredictable) (Puri et al. 2017). However, the number of impact evaluations in humanitarian settings is now gradually increasing, demonstrating that these challenges can be overcome, and reviews of evidence are

¹ It is estimated that the United Nations and partner organizations will require more than USD 40 billion to assist approximately two thirds of people requiring humanitarian assistance in 2022 (OCHA 2021).

also beginning to emerge with policy-relevant findings (Hill, Peredo, and Tarazona 2021; Weingärtner, Pforr, and Wilkinson 2020).²

The purpose of this research is to compile an Evidence Gap Map (EGM) identifying ongoing and existing impact evaluations and systematic reviews of the effects of interventions in humanitarian settings on food security outcomes in low- and middle-income countries (L&MICs). EGMs are thematic collections of information about impact evaluations and systematic reviews that help to make research more accessible and easily identifiable for policymakers, practitioners, researchers, and funders of research. Our research objectives are to:

- 1) Identify impact evaluations and systematic reviews on the effects of humanitarian interventions on food security outcomes, indicating areas where clusters of evidence exist.
- 2) Categorize and describe impact evaluation and systematic review characteristics and study designs.
- 3) Identify potential primary evidence gaps, defined as areas where there is a lack of impact evaluations.
- 4) Identify synthesis gaps, defined as areas where there is either no medium or high confidence systematic reviews, or where a review is outdated by five years, and relevant evaluations have since been published.

To address these objectives, we will conduct a comprehensive literature search for evidence on seven types of humanitarian interventions including: early warning systems; interventions pre-arranging household finance for disasters; food, cash and other in-kind transfers; agriculture and livestock interventions; nutrition interventions; market-based recovery interventions; and water security interventions. We will map the identified studies on an intervention-outcome

² For example, see Doocy and Tappis (2017) on cash transfers and Trako and Jeong (2022) on cash and in-kind transfers; Juillard (2017) on market support interventions; Balhara and colleagues (2017) on nutrition interventions; Prudhon and colleagues (2017) on child feeding interventions; Weingärtner and colleagues (2020) on anticipatory action interventions; Hill and colleagues (2021) on pre-arranging finance for disaster response; Marshall and colleagues (2021) on child nutrition in emergencies; and Catley and colleagues (2021) on emergency agriculture interventions.

matrix, providing an interactive visual display of the volume of impact evaluations and systematic reviews in each thematic area (Saran and White 2018; Snilstveit et al. 2016; 2017; White et al. 2020).³ This visualization allows for easy identification of clusters of evidence related to specific interventions and outcomes, as well as absolute research gaps (i.e. a lack of impact evaluations) and synthesis gaps (i.e. a lack of medium or high confidence SRs). We will also examine frequencies and patterns in studies' key characteristics (e.g., examining the geographic distribution of evidence, study designs, and the types of emergencies and interventions featured in the literature).

This EGM will fill a significant gap in current humanitarian research, with there being no extant comprehensive mapping of evidence of the effects of humanitarian interventions to improve food security. It also builds on some existing efforts to map evidence of the effects of interventions on food security and nutritional outcomes. Moore and colleagues (2021) mapped evidence on food systems interventions on food security and nutritional outcomes, with a recent update to the map showing 2,647 relevant studies in total (impact evaluations and systematic reviews) (Lane et al. 2022). However, while some relevant literature is captured by Moore and colleagues, they do not focus specifically on interventions conducted in emergencies. As a result, this EGM will encompass a broader range of interventions, which are also more relevant to the humanitarian sector.

In this protocol, we outline details of our approach and methods for compiling an EGM of evidence on the effects of interventions in humanitarian settings on food security outcomes. Section 2 provides background information on the links between humanitarian emergencies and food security. Section 3 summarizes each of the included intervention types and how they might affect food security. Section 4, provide details of the criteria for determining the inclusion of studies in the map. Finally, Section 5 and 6 outline our literature search strategy and methods of data management and analysis.

³ For an example of the online visualization of a 3ie EGM see Kozakiewicz and colleagues (2022): <https://developmentevidence.3ieimpact.org/egm/human-rights>

2. Background: Humanitarian emergencies and food security

Food security has been a subject of much debate, with discussions exchanged over many decades about its meaning and definition. Today, the most widely cited definition of Food security originates from the 1996 World Food Summit Plan of Action:

“Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.”

– (FAO 1996)

Based on this definition, eradicating hunger is recognized as an issue that requires more than simply the provision of food supply. It highlights four interrelated dimensions to achieving food security that international development agencies and organizations (e.g., FAO, WFP, USAID, DFID/FCDO) have also structured their own work on this issue around. The first dimension is **food availability**, which reflects the availability of sufficient quantities of food supplied through domestic production or imports (including food aid). The second is **food accessibility**, which is concerned with whether individuals have the resources they need to purchase or grow enough nutritious food. The third dimension, **food utilization**, reflects whether an individual has an adequate diet and clean water to reach a state of nutritional well-being. The fourth dimension of food security is **stability**, whether food availability, access, and utilization are adequate and sustainable over time (Fahy 2021; FAO 2006; Gibson 2012; USAID BHA 2022).

Although food security issues can arise outside of a humanitarian setting, humanitarian emergencies can perpetuate the challenges or the conditions that cause food insecurity and present major obstacles to food availability. Humanitarian emergencies are defined as serious disruptions to the functioning of a community or society that exceed its capacity to cope using its own resources (Humanitarian Coalition 2022; IFRC 2022; UNICEF 2022). Also often referred to as ‘covariate shocks’ (Holzmann and Jørgensen 2001), they are catastrophic events that can cause human, material, economic and environmental losses. They encompass different types of emergencies, including both natural disasters and man-made emergencies. Natural disasters are emergencies due to a natural event or environment-related event. This includes sudden

impact (e.g., earthquakes) and slow-onset events (e.g., drought), as well as epidemic diseases (e.g., water-borne). Man-made emergencies are events caused because of human behavior. This includes events caused by industrial and/or technological issues (e.g., pollution and environmental degradation), as well as complex emergencies (such as war) (Anderson and Gerber 2018; Bang and Balgah 2022; Garber et al. 2020; Sivaraman and Varadharajan 2021).

There are several reasons why households' food security may decline during humanitarian emergencies. Such emergencies can affect infrastructure and transport networks, food supplies and livelihoods. For example, food production can be compromised when a conflict or natural disaster prevents farmers from accessing land or receiving the agricultural inputs they require (Bora et al. 2010; Pietzsch, Talley, and Navarro-Colorado 2018). Emergencies can also affect the production of food when labor becomes in short supply due to restrictions on travel or forced displacement (FAO et al. 2021; Stephens et al. 2020). More broadly, disasters may affect food availability when conditions or damage to transport infrastructure mean that food cannot be transported to local markets (or they reduce supply) (Pietzsch, Talley, and Navarro-Colorado 2018; Stephens et al. 2020). Furthermore, staple foods can become unaffordable (limiting food access) when food prices increase because of disasters' impact on supply (Aday and Aday 2020; Davis, Downs, and Gephart 2021; Weil and Zachmann 2022). Disasters can also affect the broader functioning of markets, which can harm both economic activity and household incomes, as well as food access and food utilization (Maxwell et al. 2008; European Commission 2013; Pietzsch, Talley, and Navarro-Colorado 2018).

3. Interventions in humanitarian settings

The scope and framework for this EGM have been developed in consultation with USAID's Bureau for Humanitarian Assistance (BHA), as well as other relevant practitioners and experts on humanitarian emergencies and food security. In this EGM, we focus on a selection of seven key types of interventions identified and prioritized for the EGM through a consultation process where we invited sectoral experts to make suggestions and comment on the framework. Below

we summarize key arguments about how each of the included intervention types might address the challenges and constraints caused by humanitarian disasters on food security.

3.1. Early warning systems

An early warning system is an integrated system for monitoring, collecting data, analyzing, interpreting, and communicating information about the likelihood and risk of meteorological and other events (Quansah et al. 2010). Such systems are in place in many parts of the world, to monitor, forecast, and warn people about tropical cyclones, floods, storms, tsunamis, avalanches, tornadoes, severe thunderstorms, volcanic eruptions, extreme heat and cold, forest fires, droughts, etc. They can help people to anticipate and prepare for extreme events (Hallegatte 2012). For example, they can be used to help make decisions early enough to protect people and enable them to secure possessions, evacuate farm animals, and move agricultural equipment, other agricultural inputs (such as seeds), and harvested crops (Carsell, Pingel, and Ford 2004; Subbiah, Bildan, and Narasimhan 2008; Williams 2002). They can also determine the choice of coping strategies available, such as evacuation or stocking up on food supplies (Hallegatte et al. 2017).

Overall, it is estimated that providing access to early warning systems could reduce losses from disasters by USD 3-16 billion per year in L&MICs (Global Commission on Adaptation 2019). Additionally, damages and losses from disasters are thought to have 'scarring effects' (e.g., due to lower child consumption and costly borrowing) (Pople et al. 2021). Economists' endogenous growth models similarly predict that damage to a part of an economy's physical or human capital stock can result in a lower growth path and, consequently, a permanent deviation from its pre-disaster long-run growth trajectory (Cavallo et al. 2010). Therefore, at least in theory, there may be significant benefits from earlier action enabled by early warning systems. For example, Hill and colleagues (2019) estimate that, in eastern and southern Africa, not getting a response in place in time to meet the consumption needs of those suffering from a drought decreases long-run income (GDP) per capita by 3.9 per cent.

3.2. Interventions pre-arranging household finance for disasters

Households can require financial coping strategies to manage the effects of a disaster on their livelihoods, to address costs of damage or losses caused by a disaster and because of rising costs of living (potentially due to limited supply and operating markets). It is thought that, by helping households supplement their incomes during a disaster and ensuring finance is available when it is needed, interventions that pre-arrange finance for households can improve food access and alleviate the need for shock changes to food consumption (Barnett, Barrett, and Skees 2008; Janzen and Carter 2019). They may also negate the need to access informal loans with unfavorable terms, mitigating some of the possible longer-term effects of these emergencies, and can help households maintain or increase investments in agricultural production. For example, they may help households preserve their capital for cultivation (e.g., prevent them from selling equipment and other agricultural inputs) (Carter and Chiu 2020; Stoeffler et al. 2022).

Research on 'poverty traps' has also evolved over the last few decades, emphasizing shocks can persist and potentially push households onto a downward spiral into destitution (a low-level equilibrium) from which they do not fully recover (Carter and Barrett 2006; Hallegatte et al. 2017; Kovacevic and Pflug 2011). This increases the risk of long-term food insecurity, as well as households' vulnerability to future shocks (Barrett 2010). It is anticipated that pre-arranged financing can prevent households from reaching critical thresholds (an unstable dynamic equilibrium in more precise, formal terms) that escalate conditions conducive to poverty traps (Barnett, Barrett, and Skees 2008).

There are various interventions that can help households pre-arrange financial coping strategies. Interventions that promote personal savings are one example (Demont 2022; Jahns 2014; Karlan et al. 2017; Manyumwa et al. 2018; Rayamajhee and Bohara 2019). However, it is uncertain whether savings schemes are a sufficient strategy for helping households respond to large-scale disasters (Hill et al., 2021). Contingent credit schemes are another approach that provides guaranteed credit access after a disaster, but they do also increase households' financial risk (increasing debt during a time of insecurity) (Lane, 2018). Alternatively, forecast-based financing schemes use weather forecast and disaster risk data to trigger cash transfers, grants and other in-kind transfers for action before the acute effects on an event are

experienced by a population at risk. Interventions providing or promoting the uptake of insurance (Hazell and Hess 2010; Jensen, Barrett, and Mude 2017; Kousky 2019; Mechler, Linnerooth-Bayer, and Peppiatt 2006) and other risk-sharing products (such as index-based risk transfers, see Barnett et al. 2008) are also examples of strategies used to help protect their finances following a disaster.

3.3. Food, cash and other in-kind transfer interventions

Interventions providing food, cash and other in-kind transfers of food and non-food items are also used to help absorb the effects of the shocks and devastation caused by many humanitarian disasters. Similar to the discussion above, they intend to alleviate human suffering (Fernald, Gertler, and Neufeld 2008; Ndlovu and Ndlovu 2019) and elevate households' capacity to cope with these challenging circumstances: reducing the need to (among other things) decrease food consumption, perform fire-sales of productive assets, or increase existing lines of credit (Fisher et al. 2017; Lehmann and Masterson 2014). This, again, also relates to the discussion concerning helping households mitigate their susceptibility to falling into poverty traps (Lawlor et al. 2017), which can increase the risk of long-term food insecurity (Barrett 2010). Furthermore, they can create positive 'resource shocks' which, when applied at scale, could affect local demand for goods. This may create positive spillovers in the local economy, affecting local labor demand and livelihoods (including those of non-recipient households and firms) (see Egger et al. 2021).

The most direct approach to addressing food insecurity simply involves the provision of required foods, for example, when it becomes scarce in local markets or food prices threaten food access (Adelman et al. 2019; Jamaluddine et al. 2020; WFP 2021). As an alternative strategy, interventions may also provide non-food items (NFIs), which allows households to increase their assets (or reduce costs of other aspects of their living). Assuming these additional resources are fungible, meaning they enable households to spend more of their income on food, this can promote food access and utilization (Quattrochi et al. 2020). However, distributing food and non-food items come with the added logistical challenges and costs of transporting and distributing bulky items (Jiang and Yuan 2019; Okumura 2012; Sheu 2007), which can be particularly challenging if they perish quickly (Eisenhandler and Tzur 2018). Voucher and food stamp

schemes provide another option, where beneficiaries can retrieve goods from local suppliers who are instead remunerated (Hidrobo et al. 2014).

Cash transfers intend to smooth a negative income shock created by disruptions to income generation activities or damage/destruction of private assets. They can also help to supplement incomes during periods of heightened food prices (e.g., due to limited supply or market disruption) (Doocy et al. 2020; Gairdner, Mandelik, and Moberg 2011). Cash (like some voucher schemes) has been highlighted for its ability to provide households with the flexibility to purchase the items or goods they require. This reduces the need for humanitarian operatives to make assumptions about either households' current requirements or preferences for food items and other goods (Schwab 2020; Venton, Bailey, and Pongracz 2015). Moreover, it is argued that less stigma is attached to cash transfers, which, compared with vouchers or food stamps, are less visible to non-beneficiaries (Grosh et al. 2008; Hidrobo et al. 2014). However, these interventions require functioning markets and that local traders can supply the desired goods and commodities at an affordable rate (Doocy and Tappis 2017; Gentilini 2007; Ivaschenko et al. 2020).

3.4. Agriculture and livestock interventions

Disasters can cause a loss of human and animal life, crops, stored seeds, agricultural equipment/materials and disrupt supply systems (Chapagain and Raizada 2017). There are also significant disruptions being caused by ongoing conflicts, which can prevent access to agricultural land, trade routes and markets (Fan and Rue 2020; FAO 2021). Agriculture and livestock interventions target both farmers and households growing their own food. These interventions aim to assist the cultivation and production of food during an emergency. Food production can affect all aspects of food insecurity, as well as the livelihoods of many people who are dependent on the sector (Fan and Rue 2020; World Bank 2020; 2022).

Common interventions in this area can include the direct provision of cash, vouchers and subsidies for agricultural inputs, technologies and infrastructure (such as irrigation). These interventions are intended to help increase agricultural production and the supply of food to populations affected by the disaster (Cunguara and Darnhofer 2011; Longley et al. 2001; Stewart et al. 2015). Other interventions that have been gaining currency help with the

management of livestock. In particular, commercial and slaughter destocking interventions help to facilitate the sale and trade of livestock to alleviate the pressures caused by their resource consumption (Abebe et al. 2008; Watson and van Binsbergen 2008). These strategies are very relevant during droughts, when feed and grain prices rise and grazing risks irreversible land degradation in arid zones (Morton and Barton 2002). Another common type of intervention involves capacity building, which provides farmers with information and training to improve the efficient production of agriculture and livestock (Stewart et al. 2015; Waddington et al. 2014).

3.5. Nutrition interventions

When humanitarian emergencies damage or cause a loss of livelihoods, households are forced to buy food using the remaining income or savings they have. In many cases, disasters may cause consumption changes, with consumers choosing cheaper, less nutritious alternatives that are most convenient to identify (Hunter, Gerritsen, and Egli 2022; Laborde et al. 2021; Leddy et al. 2020; Xu et al. 2018). Nutrition interventions provide or promote nutritious foods. In some instances, they may also treat people with malnutrition.

An example of a nutrition intervention is the direct provision of nutritious food, this food is either specifically nutritious or the volume of assistance provides extra food beyond a normal ration (Adelman et al. 2019; Visser et al. 2018). It is important to recognize that nutrition interventions go beyond the basic provision of food assistance (Young, 1999). Nutrition interventions ensure that there is a component dedicated to the promotion of nutritional status. Two examples highlight how food assistance can often neglect the importance of a nutrition component. Following a large tropical cyclone in Vanuatu in 2015, much of the food assistance provided to communities included less perishable, cheap, and easy-to-transport food, such as tinned meat and instant noodles. These are not uncommon food items in these emergency circumstances but are labeled unhealthy in nutrition programs (Wentworth 2020). A more severe instance of these issues was seen following the large earthquake in Nepal in 2015. Food assistance provided in this context consisted of snacks and instant noodles, foods that were not regularly consumed in these communities before the disaster. As a result of the increased consumption of highly processed snacks, local businesses began stocking these products, promoting food behavioral changes in local communities (Schreinemachers et al. 2021).

These instances highlight the need for nutrition education and promoting healthy behaviors during emergencies (Islam and Ahmed 2017). Correspondingly, nutrition education interventions that aim to change the way households think about food, educating them on what nutritious food is and why it is beneficial are another type of intervention in this area (Lamstein et al. 2014; Warren et al. 2020). They seek to raise awareness about dietary choices and, if possible, change the behaviors of those affected by humanitarian disasters. Education and information interventions during emergencies can also focus on issues such as the promotion of breastfeeding, which is considered a cost-effective approach for ensuring infants receive vital dietary needs (Black et al. 2013; Hwang, Iellamo, and Ververs 2021). Supplementary feeding programs and food supplement schemes are examples of other common nutrition interventions that can also be differentiated from general food assistance as the specific goal is to rehabilitate moderately malnourished individuals (UNHCR 2011).

3.6. Market-based recovery interventions

Market-based recovery interventions help people recover their livelihoods, as well as the local supply of goods and services. It is increasingly argued that markets should be an essential component of humanitarian programming and that ensuring market systems function properly is an important aspect of mitigating the effects of humanitarian emergencies on societies' outcomes (Albu 2010; Sloane 2018). Estimates show that when societies can rebuild stronger and more inclusively after disasters, they can reduce the overall impact of disasters on wellbeing by as much as 31 percent (Hallegatte, Rentschler, and Walsh 2018).

Market-based recovery interventions include interventions that provide cash, or in-kind transfers, as well as training or credit to help individuals specifically establish or re-establish their livelihoods. It is argued that interventions that promote livelihood or market restoration, as well as the creation of new ones, strengthen people's own capacities to cope with an emergency (some argue in a more sustainable manner than through the regular provision of food assistance, or short-term cash transfers) (Hemberger, Muench, and Algoso 2018; UNHCR 2020). For example, when a market-based solution becomes commercially viable, the private sector has a financial incentive to continue to operate, which increases the legacy of the intervention beyond the immediate program of assistance.

Market-based recovery interventions can also include the rehabilitation of infrastructure to connect markets. This includes, for example, roads leading from rural communities to central markets, as well as community structures in marketplaces. Disasters and conflicts can cause physical damage and destruction to marketplaces and transport infrastructure. Limited or no access to this infrastructure can affect food security by severely affecting the sale and distribution of agricultural goods, as well as non-agricultural ones (which are important for people's livelihoods) (Ward, Hemberger, and Muench 2017). Furthermore, the reconstruction of transport infrastructure has been shown to relate to broader reconstruction efforts (Gajanayake et al. 2018; Hayat, Amaratunga, and Haigh 2013), though factors such as a lack of funding, administrative problems, and the increased risk of corruption incentivized by public rent-seeking may moderate these potential broader effects (Hayat, Amaratunga, and Haigh 2013).

Functioning markets may also enable humanitarian assistance to be delivered in a more efficient way (Development Initiatives 2021; Donovan et al. 2006; Mude et al. 2012). Market interventions are regularly implemented to ensure the market system continues to operate. This can support humanitarian efforts because local businesses are often better placed to provide essential goods to individuals than humanitarian organizations (Hemberger, Muench, and Algozo 2018). For example, financially supporting vendors to restock food items helped to distribute food assistance in remote and rural communities in Sierra Leone during the Ebola outbreak (Juillard 2017) and cash grants to blacksmiths after a typhoon in the Philippines were used to help ensure they could continue to create agricultural tools needed by local farmers to meet efforts to increase agricultural production. Local organizations were operationally better placed to provide goods and services than international organizations in both these instances (CRS 2014).

3.7. Water security interventions

Water security interventions target several issues, including making water physically available and accessible, economically accessible and ensuring it is safe for consumption and as a resource for production (Miller et al. 2021). For food security and nutrition, water is used for food production and processing. It is also fundamental for nutrition, health and well-being because it allows people to maintain homeostasis. Water access enables hydration, nutrient adequacy, reduces pollutant and germs exposure and reduces risk of epidemic outbreaks (Miller et al.

2021). Furthermore, it is an essential resource for ecosystems, and it contributes to energy production, industry and economy (HLPE 2015).

However, access to water, both in terms of quality and quantity, is under increasing stress (Young et al. 2021). Water insecurity is a major cause of humanitarian crises (e.g., drought, water scarcity, water contamination, flooding, water shortage etc.) and represented 74 per cent of all natural disasters between 2001 and 2018 (UNICEF 2021; Young et al. 2021). It also accounted for 70 per cent of all deaths related to such disasters (UN-Water 2021). Common water security interventions that seek to address these issues can include extending or maintaining improved water supply services, increasing water storage capacity, and improving water monitoring systems of water availability, demand and quality (WaterAid 2012).

4. Criteria for considering studies for this review

Next, we outline the inclusion and exclusion criteria, which define the factors determining whether a particular study will ultimately be included in the EGM.

4.1. Population

In this EGM, we will include studies of the effects of interventions consisting of participants residing in L&MICs, as defined by the World Bank, at the time the intervention began.⁴

Reflecting that humanitarian emergencies can cause displacement, we will also include studies on participants residing in high-income countries (HIC), if the intervention is implemented in a refugee camp. To inform our search for literature, using UNHCR data, a list of HICs that will be included in the EGM has been selected based on whether the country has a large refugee camp

⁴ We will also include studies from countries that have had a high-income status for only one year before reverting to L&MIC status. At the time of writing this protocol, this exception only applies to Argentina (2014, 2017), Venezuela (2014), Mauritius (2019), and Romania (2019).

(UNHCR 2022). Examples of included countries are Greece, Italy and Germany (Appendix 1 provides full details of countries included in this map).⁵

Some studies will include evidence of the effects of interventions implemented in more than one country. Studies will be included in this EGM if they include at least one estimate of the effect of an intervention on participants residing in an L&MIC. A study including interventions from multiple countries will be included if results are provided for L&MIC and HIC countries separately, or if the average effect across interventions in different countries is identified and data from L&MICs comprises at least 50 per cent of the study sample.

Interventions targeting specific vulnerable populations (e.g., women, persons with disabilities, etc.) will be included but interventions that seek to enhance the performance of specific niche populations, such as athletes, the military, astronauts or actors/models will be excluded.

4.2. Interventions

As described above, we will include the following seven types of interventions in the Evidence Gap Map (Table 1). There are variations in the way these types of interventions may appear in practice and Appendix 2 characterizes further the different ways these intervention types will be sub-categorized.

Table 1. Included intervention types

Intervention type	Description
Early warning systems	Early warning systems are integrated systems for monitoring, collecting data, analyzing, interpreting, and communicating information about the likelihood and risk of meteorological and other events.
Interventions pre-arranging household finance for disasters	Interventions that create financing arrangements that trigger or can be used during a humanitarian emergency or disaster.

⁵ The criteria used to define a large camp is whether its population exceeded 1000 people.

Food, cash, and other in-kind transfers	Interventions directly providing households with food, cash or other in-kind, non-food transfers. This includes the provision of vouchers and non-food items (NFIs).
Agriculture and livestock interventions	Provision of inputs and support to agricultural and livestock sectors, this excludes the aquaculture sector. These interventions assist the cultivation and production of food during an emergency, as well as the management of livestock (e.g., through commercial and slaughter destocking).
Nutrition interventions	Direct provision of nutritious foods and supplements or interventions disseminating information or educating people about nutrition, as well as the provision of treatment for malnutrition.
Market-based recovery interventions	The provision of cash, training and inputs to traders, and suppliers working outside of the agriculture and livestock sectors.
Water security interventions	Interventions which directly provide water for human consumption as well as water management interventions.

Interventions implemented in an emergency, or protracted crises will be included in this EGM. This includes interventions implemented in rapid or sudden onset emergencies, slow onset emergencies, man-made and technological disasters and so on (Appendix 3 provides definitions of each of the different types of emergencies which will be recorded in this map). Four phases of humanitarian programming have also been identified for this EGM, these are anticipatory action, emergency response, early-recovery and long-term recovery (detailed definitions of each phase are available in Appendix 4). For a study to be included in this map it must be implemented in one of the first three phases, meaning interventions implemented as long-term recovery will be excluded. In practice, when the intervention is responding to a singular event, such as an earthquake, a cut-off of three years will be used to decide whether the intervention constitutes early, or long-term recovery. This cut-off will act as a guide for screening.⁶

⁶ However, when there is reason to believe an intervention implemented within three years constitutes long-term recovery the study will be excluded and if there is reason to believe an intervention implemented three years after an emergency constitutes early recovery, it will be included. These decisions will be recorded to ensure consistent criteria are being applied across the map and to enable expert consultations, if necessary.

4.3. Outcomes

We have developed an outcome framework based on the four common dimensions (or pillars) of food security: availability, accessibility, utilization and stability. Given the focus on emergency interventions, though sustainability is an important aspect of all programming, it is not anticipated it will be a priority outcome within included interventions, therefore we will capture these outcomes, but not provide an outcome group solely dedicated to stability. We will also include composite measures of food security, whether they are at the household, individual or community level. The following four outcome groups are included (Table 2). Appendix 5 provides a detailed description of all included outcomes and examples of measures and indicators.

Table 2. Included outcome groups

Outcome group	Description
Food availability	Production and productivity outcomes: Measures of agriculture and livestock production and the use of improved technologies and skills. Food trade and supply: Whether food is being stocked by traders and whether it is being imported into the community. Markets: Outcomes which measure the ability of markets to supply consumers.
Food access	Food behavior and insecurity: Measures of food security, coping strategies, and decision making around food consumption. Purchasing power and income generation: Economic indicators related to household wealth, income and employment.
Food utilization	Food safety: Measures of whether food is being prepared safely. Nutrition: Prevalence and incidence of malnutrition, micronutrient status, anthropometric measures and nutritional knowledge and behaviors. Food intake: Measures of food consumption, dietary diversity and food expenditure.

Composite measures of food security	Composite food security measures combine different aspects of food security (availability, accessibility, utilization stability) into a single indicator.
Social and human development	Social and human development encompasses outcomes closely linked to food security, but which fall outside of the availability, accessibility and utilization pillar. This includes: Health: Morbidity, mortality and health knowledge and behavior. Sustainability of food security: Poverty and inequality and whether food production practices follow best practices for land use sustainability.

4.4. Study design

In this EGM, we will include both impact evaluations and systematic reviews of the effects of the included interventions in humanitarian settings. We define the requirements for the study designs drawing on commonly accepted standards for impact evaluations (Gertler et al. 2016) and systematic reviews (Waddington et al. 2012).

4.4.1 Impact evaluation

We will include studies using experimental and quasi-experimental study designs to measure a change in food security outcomes that is attributable to an intervention. This includes studies that may apply a wide range of potential designs, such as randomized controlled trials, regression discontinuity designs, instrumental variables, fixed-effect regressions, interrupted time series models, matching methods and the synthetic control method (see Appendix 6 for a comprehensive list of included study designs). We will only include studies if they evaluate the effects of interventions (Appendix 7 provides screening criteria we use to determine this).

We will not exclude studies based on the comparison condition of a control group. A study's control group may consist of observations subject to no intervention, on a waitlist, or a member of an alternative intervention or condition. However, we will exclude studies that only use simulation or forecast models, ex-ante impact assessments or scenario analyses, as well as evaluations and case studies that do not satisfy the methodological conditions described above. We will also exclude feasibility studies, acceptability studies, and studies that examine willingness-to-pay for goods, services, and process and business models.

4.4.2 Systematic review

A systematic review is a synthesis of the research evidence on a particular topic obtained through an exhaustive literature search for all relevant studies using widely accepted scientific strategies to minimize errors associated with appraising the design and results of studies. We will include systematic reviews of the effects of interventions if they describe the search, data collection and synthesis methods according to the 3ie database of systematic reviews protocols (Snijlsteit et al. 2016). Any evidence reviews, such as literature reviews, that do not adopt these methods will be excluded.

Where reviews include a mixture of evidence from both HICs and L&MICs, we will include them if they present disaggregated evidence for L&MICs, or if more than 50 per cent of the evidence of non-disaggregated results is from L&MICs. Where there are no disaggregated results for L&MICs and more than 50 per cent of the evidence for consolidated findings in a systematic review comes from high-income countries, or where it is impossible to ascertain the composition of evidence by income level, the studies are excluded. If reviews include study designs or methods that are not included in this map), we will include these if it includes at least one included impact evaluation design described above.

4.5 Other inclusion and exclusion criteria

Language: Studies published in any language will be included, although the search terms used will be in English only.

Publication date: Studies will be included if they were published in 2000 or after. From our experience from developing other EGMs, a very small proportion (less than one per cent) of impact evaluations and systematic reviews on interventions implemented L&MICs predate the year 2000. In view of this, considering the small likelihood of missing eligible studies, we will search, and screen studies published after 2000. This will limit the overall breadth of the evidence mapping project and ensures the exercise remains manageable and within our available resource constraints.

Status of studies: We will include ongoing and completed impact evaluations and systematic reviews, both peer-reviewed studies and ‘grey’ literature. For ongoing studies, we will include prospective study records, protocols and trial registrations. Providing an indication of the prevalence and characteristics of ongoing evaluation evidence is expected to enrich the analysis of current evidence gaps and support decision-making in relation to evidence generation.

5. Search methods and data

5.1. Search methods

To identify relevant literature, we will conduct a comprehensive search for eligible studies using the standards and methods developed by Snilstveit and colleagues (2016; 2017) for compiling an Evidence Gap Map. We are working in collaboration with an information specialist and referring to the guidance by Kugley and colleagues (2017) on searching for literature to inform these activities. We have developed a set of English search terms that we will apply to a wide array of electronic academic and institutional databases and repositories. We will also complement our online electronic database searches with citation tracking, by publishing a blog presenting a public call for papers and we will contact key experts and organizations to identify additional studies.

5.1.1. Electronic database searches

To identify relevant studies for our EGM, we have created a set of search terms and we are developing a search strategy in collaboration with an information specialist to identify relevant literature. Our search terms combine Boolean terms with a list of keywords related to the review's inclusion criteria (see Appendix 8). We will use these terms to search electronic databases, repositories, and institutional websites with sufficient search functionality. We also provide a list of the range of databases, repositories and websites we will search in Appendix 9. To reduce the risk of publication bias, these sources have been selected to cover a range of publication types, including journal articles, working and discussion papers, conference proceedings, thesis and dissertations, and institutional reports. We have identified relevant sources by consulting an information specialist and other known related systematic reviews and evidence gap maps (e.g., Moore et al. 2021).

While some websites and databases have reasonably well-developed search functions, some do not support complex search strings or allow for the direct export of materials and others must be browsed by keywords or even browsed in their entirety. We will customize our search strategy according to the functionality of each database and website we search (using the website's thesaurus or keyword index if necessary to identify the most appropriate vocabulary). We will consult with an information specialist who will help troubleshoot problematic sources, as well as advise on the best ways of conducting targeted searches. We will document the literature search process and any necessary changes to the search strategy for each source.

5.1.2. Citation tracking

For the studies included in the review, we will also perform backward and forward citation tracking (Greenhalgh and Peacock 2005). Backward citation tracking consists of screening the reference lists or bibliography of included studies for other eligible studies cited in the text. Forward citation tracking involves searching for eligible studies that cite the original included study. For forward citation tracking, we will utilize Google Scholar.

5.1.3. Searching other resources

We will supplement these searches by publishing an online blog presenting our review and calling for includable studies from academic and other evidence communities. We will also contact key researchers and organizations working on issues related to this map. Finally, we will search the included studies of other related evidence maps and reviews.

5.1.4. Selection of studies

After collating and de-duplicating records from our literature search, we will perform a two-stage selection process where trained reviewers will assess studies against the inclusion and exclusion criteria described above. In the first stage, reviewers will independently screen studies title and abstracts using a 'safety first' approach where, if a reviewer is uncertain about whether a study should be included or excluded, they can request a second opinion from another reviewer. Alternatively, if a study's title and abstract do not provide sufficient information to determine its relevance to the criteria, we will review its full text.

In the second stage of the study selection process, using two independent reviewers we will double screen the full text of each study that was not excluded from the review during the first stage of the screening process. Studies that satisfy the inclusion criteria will be included in the EGM. We will resolve any disagreements between the reviewers concerning a study's inclusion through a discussion with a third core review team member and the input of an additional core reviewer if necessary. To expedite the screening process, we will utilize the machine learning capabilities in EPPI-Reviewer 4 and screening from 3ie's other evidence synthesis projects to exclude irrelevant studies (Appendix 10 provides a detailed description of the screening and selection process).

5.2. Data

5.2.1. Data extraction and management

We will extract descriptive and methodological data from each study using a standardized data extraction form (a provisional codebook is available in Appendix 11). We will convert a Microsoft Excel version of the form to the DEP platform, which is used to manage the data extraction process. The types of data we will extract include:

1. Descriptive data including authors, publication date and status, as well as other information to characterize the study (such as country, type of intervention and outcome, population, context, intervention design, etc.).
2. Methodological information on study design, analysis method, type of comparison group, consideration of equity-sensitive analysis.
3. Critical appraisal results: All included systematic reviews will be critically appraised following the practices adopted by the 3ie systematic review database protocol, which draws on Lewin and colleagues (2009). This appraisal assesses systematic reviews according to criteria relating to the search, screening, data extraction, and synthesis activities conducted and covers the most common areas where biases are introduced. Each systematic review will be rated as low, medium, or high confidence drawing on guidance provided by Snilstveit and colleagues (2017). We will not critically appraise impact evaluations, as this is typically beyond the scope of EGMs. The tool used for this purpose is presented in Appendix 12.

Data will be single coded by a trained reviewer and will be reviewed by another. Any disagreement will be resolved through discussion with a third reviewer (who must be a core team member). All critical appraisals will be coded by two reviewers with disagreements being reconciled with the help of a third core team member.

5.2.2. Dealing with multicomponent interventions

Depending on the number and nature of multi-component interventions included, the project team will adopt one approach to coding these in the map so that we are consistent. This approach may be to determine the main intervention of focus in the study and grouping the study with others that focus on that main component, grouping all multicomponent studies together or a combination of those approaches. The approach adopted and the associated limitations will be clearly stated in the final report.

5.2.3. Dealing with missing data

In instances where there is missing or incomplete data, we will make every effort to contact study authors to obtain the required information. In line with recommendations on collating data from study authors (see Mullan et al. 2009), we will report the number of studies for which authors were contacted, the information requested, any important details of the method of eliciting information and the response of authors to the request.

6. Analysis

6.1. Evidence Gap Map

We will create an interactive evidence gap map that visually presents the current evidence base. Studies that meet the EGM's inclusion criteria are mapped onto the framework of interventions and outcomes and presented on an interactive platform that provides a graphical display of the evidence in a grid-like framework. This provides a visual display of the volume of evidence for intervention-outcome combinations, the type of evidence (impact evaluation, systematic reviews, completed or ongoing) and a confidence rating of the quality for systematic reviews.

Evidence Gap Maps highlight both absolute gaps, which should be filled with new primary studies, and synthesis gaps, which are ready for new systematic reviews and meta-analyses. They are envisioned as a global public good and this allows them to be used as a tool that facilitates access to high-quality research. The final map will be published on 3ie's online interactive platform that provides additional filters so users can further explore the available evidence, for example by global regions, income levels or population.

6.2. Descriptive analysis

The interactive map will be accompanied by a report that provides a summary of the findings from the EGM and an analysis of the characteristics of the available evidence and key trends (i.e., number of impact evaluation published over the time, geography, focus on interventions and outcomes, targeted audiences). We will conduct a range of descriptive analyses to provide an overview of included studies across the following dimensions:

1. Publication year
2. Publication type
3. Geography
4. Study participants
5. Interventions
6. Outcomes
7. Study type characteristics
8. Results of the systematic review critical appraisal
9. Equity and cross cutting themes considerations (e.g., democratic/autocratic context and gender).
10. Implementation funder
11. Emergency type (inc. slow-onset and rapid onset emergency)
12. Phase of humanitarian programming

Where appropriate, we will also cross-tabulate information to provide a more nuanced overview of the evidence identified.

7. Review information

7.1 Acknowledgements

The authors are grateful for the support provided by Lloyd Owen Banwart and Christy Lazicky who were able to provide feedback on the protocol and organize feedback from relevant practitioners and sectoral experts.

7.2 Contributions of authors

- **Framework development:** Framework development was led by Cem Yavuz (CY) with support from Etienne Lwamba (EL), Paul Fenton Villar (PFV) and Shannon Shisler (SS)
- **Protocol Development:** Protocol development was led by CY, Miriam Berretta (MB), PFV with support from EL, Ashiqun Nabi (AN) and Shannon Shisler (SS).
- **Search Strategy:** The search strategy was developed by Chris Cooper (CC) and supported by CY.
- **Screening, data extraction, analysis and reporting:** Screening, data extraction and reporting will be led by CY with support from MB, PFV, SS and AN.

7.3. Declarations of interest

No conflict of interests to declare.

7.4. Sources of support

This EGM was commissioned by the United States Agency for International Development (USAID) under the Bureau for Humanitarian Assistance (BHA). This work is part of the Humanitarian Assistance Evidence Cycle (HAEC) Associate Award.

8. References

- Abebe, Dawit, Adrian Cullis, Andy Catley, Yacob Aklilu, Gedlu Mekonnen, and Yodit Ghebrechirstos. 2008. "Impact of a Commercial Destocking Relief Intervention in Moyale District, Southern Ethiopia." *Disasters* 32 (2): 167–89. <https://doi.org/10.1111/j.1467-7717.2007.01034.x>.
- Aday, Serpil, and Mehmet Seckin Aday. 2020. "Impact of COVID-19 on the Food Supply Chain." *Food Quality and Safety* 4 (4): 167–80. <https://doi.org/10.1093/fqsafe/fyaa024>.
- Adelman, Sarah, Daniel O Gilligan, Joseph Konde-Lule, and Harold Alderman. 2019. "School Feeding Reduces Anemia Prevalence in Adolescent Girls and Other Vulnerable Household Members in a Cluster Randomized Controlled Trial in Uganda." *The Journal of Nutrition* 149 (4): 659–66. <https://doi.org/10.1093/jn/nxy305>.
- Albu, Mike. 2010. *Emergency Market Mapping and Analysis Toolkit*. Warwickshire, UK: Practical Action Publishing.
- Anderson, Mark, and Michael Gerber. 2018. "Introduction to Humanitarian Emergencies." In *Health in Humanitarian Emergencies*, edited by David Townes, 1st ed., 1–8. Cambridge: Cambridge University Press. <https://doi.org/10.1017/9781107477261.002>.
- Bakrania, Shivit, Nikola Balvin, Silvio Daidone, and Jacobus De Hoop. 2021. "Impact Evaluation in Settings of Fragility and Humanitarian Emergency." Office of Research – Innocenti Discussion Paper DP-2021-02. Florence: UNICEF Office of Research – Innocenti.
- Balhara, Kamna S., David M. Silvestri, W. Tyler Winders, Anand Selvam, Sean M. Kivlehan, Torben K. Becker, Adam C. Levine, and the Global Emergency Medicine Literature Review Group (GEMLR). 2017. "Impact of Nutrition Interventions on Pediatric Mortality and Nutrition Outcomes in Humanitarian Emergencies: A Systematic Review." *Tropical Medicine & International Health* 22 (12): 1464–92. <https://doi.org/10.1111/tmi.12986>.
- Bang, Henry Ngenyam, and Roland Azibo Balgah. 2022. "The Ramification of Cameroon's Anglophone Crisis: Conceptual Analysis of a Looming 'Complex Disaster Emergency.'" *Journal of International Humanitarian Action* 7 (1): 6. <https://doi.org/10.1186/s41018-022-00114-1>.
- Barnett, Barry J., Christopher B. Barrett, and Jerry R. Skees. 2008. "Poverty Traps and Index-Based Risk Transfer Products." *World Development* 36 (10): 1766–85. <https://doi.org/10.1016/j.worlddev.2007.10.016>.
- Barrett, Christopher B. 2010. "Measuring Food Insecurity." *Science (New York, N.Y.)* 327 (5967): 825–28. <https://doi.org/10.1126/science.1182768>.

Black, Robert E, Cesar G Victora, Susan P Walker, Zulfiqar A Bhutta, Parul Christian, Mercedes de Onis, Majid Ezzati, et al. 2013. "Maternal and Child Undernutrition and Overweight in Low-Income and Middle-Income Countries." *The Lancet* 382 (9890): 427–51. [https://doi.org/10.1016/S0140-6736\(13\)60937-X](https://doi.org/10.1016/S0140-6736(13)60937-X).

Bora, Saswati, Iride Ceccacci, Christopher Delgado, and Robert Townsend. 2010. "Food Security and Conflict." World Development Report 2011 Background Paper. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/9107>.

Carden, F, T Hanley, and A Paterson. 2021. "From Knowing to Doing: Evidence Use in the Humanitarian Sector." Elrha Learning Paper. London: Elrha. <https://www.elrha.org/wp-content/uploads/2021/06/Elrha-R2HC-From-knowing-to-doing-Learning-Paper.pdf>.

Carsell, Kim M., Nathan D. Pingel, and David T. Ford. 2004. "Quantifying the Benefit of a Flood Warning System." *Natural Hazards Review* 5 (3): 131–40. [https://doi.org/10.1061/\(ASCE\)1527-6988\(2004\)5:3\(131\)](https://doi.org/10.1061/(ASCE)1527-6988(2004)5:3(131)).

Carter, Michael R., and Christopher B. Barrett. 2006. "The Economics of Poverty Traps and Persistent Poverty: An Asset-Based Approach." *Journal of Development Studies* 42 (2): 178–99. <https://doi.org/10.1080/00220380500405261>.

Carter, Michael R, and Tara Chiu. 2020. "Microinsurance & Disaster Risk Finance." Evidence Brief 1. Washington, DC: United States Agency for International Development (USAID), Feed the Future, UC Davis. https://basis.ucdavis.edu/sites/g/files/dgvnsk466/files/2020-09/MRR%20Discussion%20Paper%20-%20Microinsurance%20Evidence%20Review%20-%20Sept%202020_0.pdf.

Catley, Andy, Racey Henderson, and Anne Radday. 2021. "Emergency Agriculture Interventions: Reviewing Evidence on the Impacts on Livelihoods, Food Security, and Nutrition." Standards for Supporting Agricultural Livelihoods in Emergencies (SEADS). https://seads-standards.org/wp-content/uploads/2021/04/SEADS_brief1_4.26.21.pdf.

Cavallo, Eduardo, Sebastian Galiani, Ilan Noy, and Juan Pantano. 2010. "Catastrophic Natural Disasters and Economic Growth." IDB Working Paper Series IDB-WP-183. Washington, DC: Inter-American Development Bank. <https://publications.iadb.org/publications/english/document/Catastrophic-Natural-Disasters-and-Economic-Growth.pdf>.

Chapagain, Tejendra, and Manish N. Raizada. 2017. "Impacts of Natural Disasters on Smallholder Farmers: Gaps and Recommendations." *Agriculture & Food Security* 6 (1): 39. <https://doi.org/10.1186/s40066-017-0116-6>.

CRS. 2014. "Support to the Local Tool Market Post-Typhoon Haiyan." Study Brief. Maryland: Catholic Relief Services (CRS). <https://www.calpnetwork.org/publication/support-to-the-local-tool-market-post-typhoon-haiyan/>.

Cunguara, Benedito, and Ika Darnhofer. 2011. "Assessing the Impact of Improved Agricultural Technologies on Household Income in Rural Mozambique." *Food Policy* 36 (3): 378–90. <https://doi.org/10.1016/j.foodpol.2011.03.002>.

Davis, Kyle Frankel, Shauna Downs, and Jessica A. Gephart. 2021. "Towards Food Supply Chain Resilience to Environmental Shocks." *Nature Food* 2 (1): 54–65. <https://doi.org/10.1038/s43016-020-00196-3>.

Demont, Timothée. 2022. "Coping with Shocks: How Self-Help Groups Impact Food Security and Seasonal Migration." *World Development* 155 (July): 105892. <https://doi.org/10.1016/j.worlddev.2022.105892>.

Development Initiatives. 2021. "Global Humanitarian Assistance Report 2021." Bristol: Development Initiatives. <https://devinit.org/documents/1008/Global-Humanitarian-Assistance-Report-2021.pdf>.

Donovan, Cynthia, Megan McGlinchy, John M. Staatz, and David L. Tschirley. 2006. "Emergency Needs Assessments and the Impact of Food Aid on Local Markets." MSU International Development Working Paper 87. East Lansing, Michigan: Department of Agricultural Economics and the Department of Economics, Michigan State University (MSU). <https://doi.org/10.22004/ag.econ.54566>

Doocy, Shannon, Martin Busingye, Emily Lyles, Elizabeth Colantouni, Bridget Aidam, George Ebulu, and Kevin Savage. 2020. "Cash-Based Assistance and the Nutrition Status of Pregnant and Lactating Women in the Somalia Food Crisis: A Comparison of Two Transfer Modalities." Edited by Tilman Brück. *PLOS ONE* 15 (4): e0230989. <https://doi.org/10.1371/journal.pone.0230989>.

Doocy, Shannon, and Hannah Tappis. 2017. "Cash-based Approaches in Humanitarian Emergencies: A Systematic Review." *Campbell Systematic Reviews* 13 (1): 1–200. <https://doi.org/10.4073/csr.2017.17>.

Egger, Dennis, Johannes Haushofer, Edward Miguel, Paul Niehaus, and Michael W. Walker. 2021. "General Equilibrium Effects of Cash Transfers: Experimental Evidence from Kenya." Working Paper 26600. National Bureau of Economic Research. <https://doi.org/10.3386/w26600>.

Eisenhandler, Ohad, and Michal Tzur. 2018. "The Humanitarian Pickup and Distribution Problem." *Operations Research*, October. <https://doi.org/10.1287/opre.2018.1751>.

European Commission. 2013. "Humanitarian Food Assistance from Food Aid to Food Assistance." https://ec.europa.eu/echo/files/policies/food_assistance/them_policy_doc_foodassistance_en.pdf.

Fahy, Austin. 2021. "What Is Food Security?" *Concern Worldwide* (blog). May 26, 2021. <https://www.concern.net/news/what-food-security>.

Fan, Shenggen, and Christopher Rue. 2020. "The Role of Smallholder Farms in a Changing World." In *The Role of Smallholder Farms in Food and Nutrition Security*, edited by Sergio Gomez y Paloma, Laura Riesgo, and Kamel Louhichi, 13–28. Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-42148-9_2.

FAO. 1996. "World Food Summit: Rome Declaration on World Food Security and World Food Summit Plan of Action." Food and Agriculture Organization of the United Nations (FAO). <https://www.fao.org/3/w3613e/w3613e00.htm>.

FAO. 2006. "Policy Brief: Food Security." Rome: Food and Agriculture Organization of the United Nations (FAO). https://www.fao.org/fileadmin/templates/faoitally/documents/pdf/pdf_Food_Security_Cocept_Note.pdf.

FAO. 2021. *The Impact of Disasters and Crises on Agriculture and Food Security, 2021*. Rome: Food and Agriculture Organization of the United Nations.

FAO, IFAD, UNICEF, WFP, and WHO. 2021. *In Brief to The State of Food Security and Nutrition in the World 2021*. Rome: Food and Agriculture Organization of the United Nations (FAO). <https://doi.org/10.4060/cb5409en>.

Fernald, Lia CH, Paul J Gertler, and Lynnette M Neufeld. 2008. "Role of Cash in Conditional Cash Transfer Programmes for Child Health, Growth, and Development: An Analysis of Mexico's Oportunidades." *The Lancet* 371 (9615): 828–37. [https://doi.org/10.1016/S0140-6736\(08\)60382-7](https://doi.org/10.1016/S0140-6736(08)60382-7).

Fisher, Eleanor, Ramlatu Attah, Valentina Barca, Clare O'Brien, Simon Brook, Jeremy Holland, Andrew Kardan, Sara Pavanello, and Pamela Pozarny. 2017. "The Livelihood Impacts of Cash Transfers in Sub-Saharan Africa: Beneficiary Perspectives from Six Countries." *World Development* 99 (November): 299–319. <https://doi.org/10.1016/j.worlddev.2017.05.020>.

FSIN. 2022. "2022 Global Report on Food Crises." Rome: Food Security Information Network (FSIN). http://www.fightfoodcrises.net/fileadmin/user_upload/fightfoodcrises/doc/resources/GRFC_2022_FINAL_REPORT.pdf.

Gairdner, David, Florence Mandelik, and Liv Moberg. 2011. "We Accept Cash: Mapping Study on the Use of Cash Transfers in Humanitarian, Recovery and Transitional Response." Oslo: Norwegian Agency for Development Cooperation (Norad). <https://www.alnap.org/help-library/we-accept-cash>.

Gajanayake, Akvan, Hessam Mohseni, Guomin Zhang, Jane Mullett, and Sujeeva Setunge. 2018. "Community Adaptation to Cope with Disaster Related Road Structure Failure." *Procedia Engineering* 212: 1355–62. <https://doi.org/10.1016/j.proeng.2018.01.175>.

Garber, Kent, Charles Fox, Moustafa Abdalla, Andrew Tatem, Naseeb Qirbi, Laura Lloyd-Braff, Kahtan Al-Shabi, Kennedy Ongwae, Meredith Dyson, and Kebir Hassen. 2020. "Estimating Access to Health Care in Yemen, a Complex Humanitarian Emergency Setting: A Descriptive Applied Geospatial Analysis." *The Lancet Global Health* 8 (11): e1435–43. [https://doi.org/10.1016/S2214-109X\(20\)30359-4](https://doi.org/10.1016/S2214-109X(20)30359-4).

Gentilini, Ugo. 2007. "Cash and Food Transfers: A Primer." Occasional Paper 18. Rome: World Food Programme (WFP). <https://www.wfp.org/publications/cash-and-food-transfers-primer-ugo-gentilini-2007>.

Gertler, PJ, S Martinez, P Premand, LB Rawlings, and CM Vermeersch. 2016. *Impact Evaluation in Practice*. 2nd ed. Washington, DC: Inter-American Development Bank and World Bank. <https://openknowledge.worldbank.org/handle/10986/25030>.

Gibson, Mark. 2012. "Food Security—A Commentary: What Is It and Why Is It So Complicated?" *Foods* 1 (1): 18–27. <https://doi.org/10.3390/foods1010018>.

Global Commission on Adaptation. 2019. *Adapt Now: A Global Call for Leadership on Climate Resilience*. Rotterdam: Global Commission on Adaptation, World Resources Institute. <https://gca.org/reports/adapt-now-a-global-call-for-leadership-on-climate-resilience/>.

Greenhalgh, Trisha, and Richard Peacock. 2005. "Effectiveness and Efficiency of Search Methods in Systematic Reviews of Complex Evidence: Audit of Primary Sources." *BMJ* 331 (7524): 1064–65. <https://doi.org/10.1136/bmj.38636.593461.68>.

Grosh, Margaret E., Carlo del Ninno, Emil Tesliuc, and Azedine Ouerghi. 2008. *For Protection and Promotion: The Design and Implementation of Effective Safety Nets*. Washington, D.C: World Bank.

Hallegatte, Stéphane. 2012. "A Cost-Effective Solution to Reduce Disaster Losses in Developing Countries: Hydro-Meteorological Services, Early Warning, and Evacuation." Policy Research Working Paper 6058. Washington, DC: World Bank. <https://doi.org/10.1596/1813-9450-6058>.

Hallegatte, Stephane, Jun Rentschler, and Brian Walsh. 2018. "Building Back Better: Achieving Resilience through Stronger, Faster, and More Inclusive Post-Disaster Reconstruction," 47. <https://doi.org/10.1596/29867>.

Hallegatte, Stephane, Adrien Vogt-Schilb, Mook Bangalore, and Julie Rozenberg. 2017. *Unbreakable: Building the Resilience of the Poor in the Face of Natural Disasters*. Washington, DC: World Bank. <https://doi.org/10.1596/978-1-4648-1003-9>.

Hayat, Ezri, Dilanthi Amaratunga, and Richard Haigh. 2013. "Research Approach to Evaluate Post-Disaster Road Reconstruction in Indonesia." In *2013 International Post Graduate Research Conference*. Salford.

Hazell, Peter B. R., and Ulrich Hess. 2010. "Drought Insurance for Agricultural Development and Food Security in Dryland Areas." *Food Security* 2 (4): 395–405. <https://doi.org/10.1007/s12571-010-0087-y>.

Hemberger, A, S Muench, and D Algoso. 2018. "Beyond Cash: Making Markets Work in Crisis." London: Mercy Corps. <https://www.mercycorps.org/research-resources/beyond-cash-markets-crisis>.

Hidrobo, Melissa, John Hoddinott, Amber Peterman, Amy Margolies, and Vanessa Moreira. 2014. "Cash, Food, or Vouchers? Evidence from a Randomized Experiment in Northern Ecuador." *Journal of Development Economics* 107 (March): 144–56. <https://doi.org/10.1016/j.jdeveco.2013.11.009>.

Hill, Ruth, Emmanuel Skoufias, and Barry Maher. 2019. "The Chronology of a Disaster: A Review and Assessment of the Value of Acting Early on Household Welfare." Washington, DC: World Bank. <https://www.preventionweb.net/publication/chronology-disaster-review-and-assessment-value-acting-early-household-welfare>.

Hill, Ruth Vargas, Alejandra Campero Peredo, and Marcela Tarazona. 2021. "The Impact of Pre-Arranged Disaster Finance: Evidence Gap Assessment." Working paper 7. London: Centre for Disaster Protection. <https://www.disasterprotection.org/publications-centre/the-impact-of-pre-arranged-disaster-finance-evidence-gap-assessment>.

HLPE. 2015. "Water for Food Security and Nutrition. A Report by the High-Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security." Rome: High Level Panel of Experts on Food Security and Nutrition (HLPE).

Holzmann, Robert, and Steen Jørgensen. 2001. "Social Risk Management: A New Conceptual Framework for Social Protection, and Beyond." *International Tax and Public Finance* 8: 529–56. <https://doi.org/10.1023/A:1011247814590>.

Humanitarian Coalition. 2022. "What Is a Humanitarian Emergency?" 2022. <https://www.humanitariancoalition.ca/what-is-a-humanitarian-emergency>.

Hunter, Lauren, Sarah Gerritsen, and Victoria Egli. 2022. "Changes in Eating Behaviours Due to Crises, Disasters and Pandemics: A Scoping Review." *Nutrition & Food Science* ahead-of-print (ahead-of-print). <https://doi.org/10.1108/NFS-12-2021-0385>.

Hwang, Cindy H., Alessandro Iellamo, and Mija Ververs. 2021. "Barriers and Challenges of Infant Feeding in Disasters in Middle- and High-Income Countries." *International Breastfeeding Journal* 16 (1). <https://doi.org/10.1186/s13006-021-00398-w>.

IFRC. 2022. "Climate-Smart Disaster Risk Reduction." 2022. <https://www.ifrc.org/climate-smart-disaster-risk-reduction>.

Islam, M Manjurul, and Selina Ahmed. 2017. "Effects of Natural Disaster on Food Availability, Accessibility and Consumption in Household Level of Coastal Villages." *Journal of Geography & Natural Disasters* 7 (3). <https://doi.org/10.4172/2167-0587.1000209>.

Ivaschenko, Oleksiy, Jesse Doyle, Jaekyun Kim, Jonathan Sibley, and Zaineb Majoka. 2020. "Does 'Manna from Heaven' Help? The Role of Cash Transfers in Disaster Recovery—Lessons from Fiji after Tropical Cyclone Winston." *Disasters* 44 (3): 455–76. <https://doi.org/10.1111/disa.12411>.

Jahns, Elke. 2014. "Savings Groups, Shocks and Coping Strategies: The Case of Poor Rural Households in El Salvador." *ProQuest Dissertations and Theses*. Ph.D., Massachusetts: Fletcher School of Law and Diplomacy (Tufts University). <https://www.proquest.com/docview/1562016652/abstract/473D3895110F4920PQ/1>.

Jamaluddine, Zeina, Jowel Choufani, Amelia Reese Masterson, Reem Hoteit, Nadine R Sahyoun, and Hala Ghattas. 2020. "A Community-Based School Nutrition Intervention Improves Diet Diversity and School Attendance in Palestinian Refugee Schoolchildren in Lebanon." *Current Developments in Nutrition* 4 (11): nzaa164. <https://doi.org/10.1093/cdn/nzaa164>.

Janzen, Sarah A., and Michael R. Carter. 2019. "After the Drought: The Impact of Microinsurance on Consumption Smoothing and Asset Protection." *American Journal of Agricultural Economics* 101 (3): 651–71. <https://doi.org/10.1093/ajae/aay061>.

Jensen, Nathaniel D., Christopher B. Barrett, and Andrew G. Mude. 2017. "Cash Transfers and Index Insurance: A Comparative Impact Analysis from Northern Kenya." *Journal of Development Economics* 129 (November): 14–28. <https://doi.org/10.1016/j.jdeveco.2017.08.002>.

Jiang, Yiping, and Yufei Yuan. 2019. "Emergency Logistics in a Large-Scale Disaster Context: Achievements and Challenges." *International Journal of Environmental Research and Public Health* 16 (5): 779. <https://doi.org/10.3390/ijerph16050779>.

Juillard, Helene. 2017. "Supporting Markets in Emergencies. Scoping Study." Maryland: Catholic Relief Services (CRS) and Oxfam GB. <https://www.calpnetwork.org/publication/supporting-markets-in-emergencies-scoping-study/>.

Karlan, D, B Savonitto, B Thuysbaert, and C Udry. 2017. "Impact of Savings Groups on the Lives of the Poor." *Proceedings of the National Academy of Sciences of the United States of America* 114 (12): 3079–84. <https://doi.org/10.1073/pnas.1611520114>.

Kousky, Carolyn. 2019. "The Role of Natural Disaster Insurance in Recovery and Risk Reduction." *Annual Review of Resource Economics* 11 (1): 399–418. <https://doi.org/10.1146/annurev-resource-100518-094028>.

Kovacevic, Raimund M., and Georg Ch. Pflug. 2011. "Does Insurance Help to Escape the Poverty Trap? -A Ruin Theoretic Approach." *Journal of Risk and Insurance* 78 (4): 1003–28. <https://doi.org/10.1111/j.1539-6975.2010.01396.x>.

Kozakiewicz, T, H van Buskirk, A Franich, J Hammaker, S Prasad, L Adams, and D Glandon. 2022. "The Effects of Human Rights Interventions on Rights-Related Outcomes: An Evidence Gap Map." New Delhi: International Initiative for Impact Evaluation (3ie). <https://developmentevidence.3ieimpact.org/egm/human-rights>.

Kugley, Shannon, Anne Wade, James Thomas, Quenby Mahood, Anne-Marie Klint Jørgensen, Karianne Hammerstrøm, and Nila Sathe. 2017. "Searching for Studies: A Guide to Information Retrieval for Campbell Systematic Reviews." *Campbell Systematic Reviews* 13 (1): 1–73. <https://doi.org/10.4073/cm.2016.1>.

Laborde, David, Anna Herforth, Derek Headey, and Saskia de Pee. 2021. "COVID-19 Pandemic Leads to Greater Depth of Unaffordability of Healthy and Nutrient-Adequate Diets in Low- and Middle-Income Countries." *Nature Food* 2 (7): 473–75. <https://doi.org/10.1038/s43016-021-00323-8>.

Lamstein, S, T Stillman, P Koniz-Booher, A Aakesson, B Collaiezzi, T Williams, K Beall, and M Anson. 2014. "Evidence of Effective Approaches to Social and Behavior Change Communication for Preventing and Reducing Stunting and Anemia: Findings from a Systematic Literature Review." Anson: USAID/ Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) Project. https://www.spring-nutrition.org/sites/default/files/publications/reports/spring_sbcc_lit_review.pdf.

Lane, Charlotte, Veronika Tree, Ingunn Storhaug, and Mark Engelbert. 2022. "Food Systems and Nutrition Evidence Gap Map." EGM in Brief (Update #2). New Delhi: International Initiative for Impact Evaluation (3ie). <https://www.3ieimpact.org/sites/default/files/2022-05/FSN-EGM-brief-update2022.pdf>.

Lane, Gregory. 2018. "Credit Lines as Insurance: Evidence from Bangladesh." Working paper. <https://basis.ucdavis.edu/publication/paper-credit-lines-insurance-evidence-bangladesh>.

Lawlor, Kathleen, Sudhanshu Handa, David Seidenfeld, and THE ZAMBIA CASH TRANSFER EVALUATION TEAM. 2017. "Cash Transfers Enable Households to Cope with Agricultural Production and Price Shocks: Evidence from Zambia." *The Journal of Development Studies* 55 (2): 209–26.

Leddy, Anna M, Sheri D Weiser, Kartika Palar, and Hilary Seligman. 2020. "A Conceptual Model for Understanding the Rapid COVID-19–Related Increase in Food Insecurity and Its Impact on Health and Healthcare." *The American Journal of Clinical Nutrition* 112 (5): 1162–69. <https://doi.org/10.1093/ajcn/nqaa226>.

Lehmann, Christian, and Daniel Masterson. 2014. "Emergency Economies: The Impact of Cash Assistance in Lebanon." London: International Rescue Committee (IRC). <https://www.rescue.org/sites/default/files/document/631/emergencyeconomiesevaluationreport-lebanon2014.pdf>.

Lewin, Simon, Andrew D Oxman, John N Lavis, and Atle Fretheim. 2009. "SUPPORT Tools for Evidence-Informed Health Policymaking (STP) 8: Deciding How Much Confidence to Place in a Systematic Review." *Health Research Policy and Systems* 7 (S1): S8. <https://doi.org/10.1186/1478-4505-7-S1-S8>.

Longley, Catherine, Richard Jones, Mohamed Hussein Ahmed, and Patrick Audi. 2001. "Supporting Local Seed Systems in Southern Somalia: 106 Developmental Approach to Agricultural Rehabilitation in Emergency Situations." AgREN Network paper 115. The Agricultural Research and Extension Network. <https://cdn.odi.org/media/documents/8262.pdf>.

Manyumwa, Harrison Danai, Shephard Siziba, Leonard Unganai, Paul Mapfumo, and Florence Mtambanengwe. 2018. "The Impacts of Community-Based Cash Management Tools on Smallholder Rural Farmers' Access to Livelihood Assets." *African Journal of Agricultural and Resource Economics* 13 (311-2018–3123): 182–92.

Marshall, Aniqah Islam, Gideon Lasco, Mathudara Phaiyaram, Nattanicha Pangkariya, Phetdavanh Leuangvilay, Pigunkaew Sinam, Rapeepong Suphanchaimat, Sataporn Julchoo, Watinee Kunpeuk, and Yunting Zhang. 2021. "Evidence on Child Nutrition Recommendations and Challenges in Crisis Settings: A Scoping Review." *International Journal of Environmental Research and Public Health* 18 (12): 6637. <https://doi.org/10.3390/ijerph18126637>.

Maxwell, Daniel, Patrick Webb, Jennifer Coates, and James Wirth. 2008. "Rethinking Food Security in Humanitarian Response." In *Food Security Forum*. Rome.

Mechler, Reinhard, Joanne Linnerooth-Bayer, and David Peppiatt. 2006. "Disaster Insurance for the Poor? A Review of Microinsurance for Natural Disaster Risks in Developing Countries." Geneva: ProVention Consortium, IIASA. https://www.preventionweb.net/files/2059_VL108400.pdf.

Miller, Joshua D., Cassandra L. Workman, Sarita V. Panchang, Gretchen Sneegas, Ellis A. Adams, Sera L. Young, and Amanda L. Thompson. 2021. "Water Security and Nutrition: Current Knowledge and Research Opportunities." *Advances in Nutrition (Bethesda, Md.)* 12 (6): 2525–39. <https://doi.org/10.1093/advances/nmab075>.

Moore, Nick, Charlotte Lane, Ingunn Storhaug, Amber Franich, Heike Rolker, Josh Furgeson, Thalia Sparling, and Birte Snilstveit. 2021. "The Effects of Food Systems Interventions on Food Security and Nutrition Outcomes in Low- and Middle-Income Countries." 3ie Evidence Gap Map Report 16. 2021st ed. New Delhi: International Initiative for Impact Evaluation (3ie). <https://doi.org/10.23846/EGM016>.

Morton, John, and David Barton. 2002. "Destocking as a Drought–Mitigation Strategy: Clarifying Rationales and Answering Critiques." *Disasters* 26 (3): 213–28. <https://doi.org/10.1111/1467-7717.00201>.

Mude, Andrew, Robert Ouma, and Erin Lentz. 2012. "Responding to Food Insecurity: Employing the Market Information and Food Insecurity Response Analysis Framework in Rural Northern Kenya." *Journal of Development Studies* 48 (12): 1731–49. <https://doi.org/10.1080/00220388.2012.685719>.

Mullan, Rebecca J., David N. Flynn, Bo Carlberg, Imad M. Tleyjeh, Celia C. Kamath, Matthew L. LaBella, Patricia J. Erwin, Gordon H. Guyatt, and Victor M. Montori. 2009. "Systematic Reviewers Commonly Contact Study Authors but Do so with Limited Rigor." *Journal of Clinical Epidemiology* 62 (2): 138–42. <https://doi.org/10.1016/j.jclinepi.2008.08.002>.

Ndlovu, Thabo, and Siphathisiwe Ndlovu. 2019. "Are Cash Transfers the Panacea to Local Involvement in Humanitarian Decision-Making? Evidence from World Vision Projects in Umzingwane." *Jamba: Journal of Disaster Risk Studies* 11 (1): 1–8. <https://doi.org/10.4102/jamba.v11i1.486>.

OCHA. 2021. "Global Humanitarian Overview 2022." Geneva: United Nations Office for the Coordination of Humanitarian Affairs. <https://reliefweb.int/report/world/global-humanitarian-overview-2022>.

Okumura, Makoto. 2012. *Logistics Chain Management for Emergency Supplies*. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/16153>.

Pettersson, Therese. 2021. "UCDP/PRIO Armed Conflict Dataset Codebook v 21.1." UCDP/PRIO Armed Conflict Dataset Codebook v 21.1.

Pietzsch, Silke, Leisel E. Talley, and Carlos Navarro-Colorado. 2018. "Food Security." In *Health in Humanitarian Emergencies: Principles and Practice for Public Health and Healthcare Practitioners*, edited by David Townes, 181–97. Cambridge: Cambridge University Press. <https://doi.org/10.1017/9781107477261.014>.

Pople, A, Ruth Vargas Hill, S Dercon, and B Brunckhorst. 2021. "The Impact of Pre-Arranged Disaster Finance: Evidence Gap Assessment." Working paper 6. London: Centre for Disaster Protection. <https://www.disasterprotection.org/publications-centre/anticipatory-cash-transfers-in-climate-disaster-response>.

Prudhon, Claudine, Prisca Benelli, Ali Maclaine, Paige Harrigan, and Jacqueline Frize. 2017. "Informing Infant and Young Child Feeding Programming in Humanitarian Emergencies: An Evidence Map of Reviews Including Low- and Middle-Income Countries." *Maternal & Child Nutrition* 14 (1): e12457. <https://doi.org/10.1111/mcn.12457>.

Puri, Jyotsna, Anastasia Aladysheva, Vegard Iversen, Yashodhan Ghorpade, and Tilman Brück. 2017. "Can Rigorous Impact Evaluations Improve Humanitarian Assistance?" *Journal of Development Effectiveness* 9 (4): 519–42. <https://doi.org/10.1080/19439342.2017.1388267>.

Quansah, Joseph E., Bernard Engel, Gilbert L. Rochon, Joseph E. Quansah, Bernard Engel, and Gilbert L. Rochon. 2010. "Early Warning Systems: A Review." *Journal of Terrestrial Observation* 2 (2): 24–44.

Quattrochi, John, Ghislain Bisimwa, Tyler Thompson, Peter Van der Windt, and Maarten Voors. 2020. "The Effects of Vouchers for Essential Household Items on Child Health, Mental Health, Resilience and Social Cohesion Among Internally Displaced Persons in the Democratic Republic of Congo." Impact Evaluation Report 107. 2020th ed. 3ie Impact Evaluation Report. New Delhi: International Initiative for Impact Evaluation (3ie). <https://doi.org/10.23846/TW6IE107>.

Rayamajhee, Veeshan, and Alok K. Bohara. 2019. "Natural Disaster Damages and Their Link to Coping Strategy Choices: Field Survey Findings from Post-Earthquake Nepal." *Journal of International Development* 31 (4): 336–43. <https://doi.org/10.1002/jid.3406>.

Sandieson, Robert. 2006. "Pathfinding in the Research Forest: The Pearl Harvesting Method for Effective Information Retrieval." *Education and Training in Developmental Disabilities* 41 (4): 401–9.

Saran, Ashrita, and Howard White. 2018. "Evidence and Gap Maps: A Comparison of Different Approaches." *Campbell Systematic Reviews* 14 (1): 1–38. <https://doi.org/10.4073/cmdp.2018.2>.

Schreinemachers, Pepijn, Rachana Manandhar Shrestha, Bishal Gole, Dhruva Raj Bhattarai, Puspa Lal Ghimire, Bhishma P. Subedi, Tilman Brück, Ghassan Baliki, Ishwori P. Gautam, and Christine E. Blake. 2021. "Drivers of Food Choice among Children and Caregivers in Post-Earthquake Nepal." *Ecology of Food and Nutrition* 60 (6): 826–46. <https://doi.org/10.1080/03670244.2021.1969925>.

Schwab, Benjamin. 2020. "In the Form of Bread? A Randomized Comparison of Cash and Food Transfers in Yemen." *American Journal of Agricultural Economics* 102 (1): 91–113. <https://doi.org/10.1093/ajae/aaz048>.

Sheu, Jiuh-Biing. 2007. "Challenges of Emergency Logistics Management." *Transportation Research Part E: Logistics and Transportation Review* 43 (November): 655–59. <https://doi.org/10.1016/j.tre.2007.01.001>.

Sivaraman, Srinivas, and Surendar Varadharajan. 2021. "Investigative Consequence Analysis: A Case Study Research of Beirut Explosion Accident." *Journal of Loss Prevention in the Process Industries* 69 (March): 104387. <https://doi.org/10.1016/j.jlp.2020.104387>.

Sloane, E. 2018. "Taking Market Analysis Beyond Theory: Practices That Facilitate the Use of Market Information in Humanitarian Programming." United States Agency for International Development (USAID), Catholic Relief Services, Mercy Corps. <https://www.calpnetwork.org/publication/taking-market-analysis-beyond-theory-practices-that-facilitate-the-use-of-market-information-in-humanitarian-programming/>.

Snilstveit, Birte, Raag Bhatia, Kristen Rankin, and Beryl Leach. 2017. "3ie Evidence Gap Maps: A Starting Point for Strategic Evidence Production and Use." 3ie Working Paper 28. New Delhi: International Initiative for Impact Evaluation (3ie). <https://www.3ieimpact.org/sites/default/files/2019-01/wp28-egm.pdf>.

Snilstveit, Birte, Martina Vojtkova, Ami Bhavsar, Jennifer Stevenson, and Marie Gaarder. 2016. "Evidence & Gap Maps: A Tool for Promoting Evidence Informed Policy and Strategic Research Agendas." *Journal of Clinical Epidemiology* 79 (November): 120–29. <https://doi.org/10.1016/j.jclinepi.2016.05.015>.

Stephens, Emma C., Guillaume Martin, Mark van Wijk, Jagadish Timsina, and Val Snow. 2020. "Editorial: Impacts of COVID-19 on Agricultural and Food Systems Worldwide and on Progress to the Sustainable Development Goals." *Agricultural Systems* 183 (August): 102873. <https://doi.org/10.1016/j.agsy.2020.102873>.

Stewart, Ruth, Laurenz Langer, Natalie Rebelo Da Silva, Evans Muchiri, Hazel Zaranyika, Yvonne Erasmus, Nicola Randall, et al. 2015. "The Effects of Training, Innovation and New Technology on African Smallholder Farmers' Economic Outcomes and Food Security: A Systematic Review." *Campbell Systematic Reviews* 11 (1): 1–224. <https://doi.org/10.4073/csr.2015.16>.

Stoeffler, Quentin, Michael Carter, Catherine Guirkingier, and Wouter Gelade. 2022. "The Spillover Impact of Index Insurance on Agricultural Investment by Cotton Farmers in Burkina Faso." *The World Bank Economic Review* 36 (1): 114–40. <https://doi.org/10.1093/wber/lhab011>.

Subbiah, A R, L Bildan, and R Narasimhan. 2008. "Background Paper on Assessment of the Economics of Early Warning Systems for Disaster Risk Reduction." World Bank Group, Global Facility for Disaster Reduction and Recovery.

Trako, Iva, and Dahyeon Jeong. 2022. "Cash and In-Kind Transfers in Humanitarian Settings A Review of Evidence and Knowledge Gaps." Washington, DC: World Bank - Development

Impact Evaluation (DIME), United States Agency for International Development (USAID) and World Food Programme (WFP). <https://www.wfp.org/publications/cash-and-kind-transfers-humanitarian-settings-review-evidence-and-knowledge-gaps>.

UNHCR. 2011. *Guidelines for Selective Feeding: The Management of Malnutrition in Emergencies*. Geneva: United Nations High Commissioner for Refugees (UNHCR) - Public Health and HIV Section. <https://www.unhcr.org/uk/publications/operations/4b7421fd20/guidelines-selective-feeding-management-malnutrition-emergencies.html>.

UNHCR. 2020. "Multi-Sector Market Assessment Guidance and Toolkit." Geneva: United Nations High Commissioner for Refugees. <https://www.calpnetwork.org/wp-content/uploads/ninja-forms/2/2020-UNHCR-NRC-multi-sector-market-assessment-guidance-and-toolkit.pdf>.

UNHCR. 2022. "UNHCR - Refugee Statistics." UNHCR. 2022. <https://www.unhcr.org/refugee-statistics/>.

UNICEF. 2021. "Reimagining WASH: Water Security for All." New York: United Nations Children's Fund (UNICEF). <https://www.unicef.org/media/95241/file/water-security-for-all.pdf>.

UNICEF. 2022. "UNICEF - Humanitarian Practice: Glossary." UNICEF. 2022. <https://www.corecommitments.unicef.org/ccc-glossary>.

UN-Water. 2021. "Water, Sanitation and Hygiene." *UN-Water* (blog). 2021. <https://www.unwater.org/water-facts/water-sanitation-and-hygiene/>.

USAID BHA. 2022. "Emergency Application Guidelines: Applicable to Fiscal Years 2021 and 2022." Washington, DC: Bureau for Humanitarian Assistance (BHA), United States Agency for International Development (USAID). https://www.usaid.gov/sites/default/files/documents/USAID-BHA_Emergency_Application_Guidelines_April_2022.pdf.

Venton, Courtenay Cabot, Sarah Bailey, and Sophie Pongracz. 2015. "Value for Money of Cash Transfers in Emergencies." Calp Network. <https://www.calpnetwork.org/publication/value-for-money-of-cash-transfers-in-emergencies/>.

Visser, Janicke, Milla H. McLachlan, Nicola Maayan, and Paul Garner. 2018. "Community-based Supplementary Feeding for Food Insecure, Vulnerable and Malnourished Populations – an Overview of Systematic Reviews." *Cochrane Database of Systematic Reviews*, no. 11. <https://doi.org/10.1002/14651858.CD010578.pub2>.

Waddington, Hugh, Birte Snilstveit, Jorge Hombrados, Martina Vojtkova, Daniel Phillips, Philip Davies, and Howard White. 2014. "Farmer Field Schools for Improving Farming Practices and

Farmer Outcomes: A Systematic Review.” *Campbell Systematic Reviews* 10 (1): i–335. <https://doi.org/10.4073/CSR.2014.6>.

Waddington, Hugh, Howard White, Birte Snilstveit, Jorge Garcia Hombrados, Martina Vojtkova, Philip Davies, Ami Bhavsar, et al. 2012. “How to Do a Good Systematic Review of Effects in International Development: A Tool Kit.” *Journal of Development Effectiveness* 4 (3): 359–87. <https://doi.org/10.1080/19439342.2012.711765>.

Ward, S, A Hemberger, and S Muench. 2017. “Driving Resilience. Market Approaches to Disaster Recovery.” London: Mercy Corps. <https://resources.peopleinneed.net/documents/169-market-approaches-disaster-recovery-september-2017-mercy-corps-jpmorgan.pdf>.

Warren, Andrea M, Edward A Frongillo, Phuong H Nguyen, and Purnima Menon. 2020. “Nutrition Intervention Using Behavioral Change Communication without Additional Material Inputs Increased Expenditures on Key Food Groups in Bangladesh.” *The Journal of Nutrition* 150 (5): 1284–90. <https://doi.org/10.1093/jn/nxz339>.

WaterAid. 2012. “Water Security Framework,” 64.

Watson, David J, and Joep van Binsbergen. 2008. “Review of VSF-Belgium’s ‘Turkana Emergency Livestock Off-Take’ Intervention 2005.” Research Report 4. ILRI Research Report. Nairobi (Kenya): International Livestock Research Institute (ILRI). <http://rgdoi.net/10.13140/RG.2.2.24942.02887>.

Weil, Pauline, and Georg Zachmann. 2022. “The Impact of the War in Ukraine on Food Security.” *Bruegel-Blogs* (blog). Bruegel. March 21, 2022. <https://go.gale.com/ps/i.do?p=AONE&sw=w&issn=&v=2.1&it=r&id=GALE%7CA697951850&sid=googleScholar&linkaccess=abs>.

Weingärtner, Lena, Tobias Pforr, and Emily Wilkinson. 2020. “The Evidence Base on Anticipatory Action.” Rome: World Food Programme (WFP). <https://www.wfp.org/publications/evidence-base-anticipatory-action>.

Wentworth, Chelsea. 2020. “Unhealthy Aid: Food Security Programming and Disaster Responses to Cyclone Pam in Vanuatu.” *Anthropological Forum* 30 (1–2): 73–90. <https://doi.org/10.1080/00664677.2019.1647830>.

WFP. 2021. “WFP Strategic Plan 2022-25: Turning the Tide Against Hunger.” Rome: World Food Programme (WFP). <https://www.wfp.org/publications/wfp-strategic-plan-2022-25>.

White, Howard, Bianca Albers, Marie Gaarder, Hege Kornør, Julia Littell, Zack Marshall, Christine Mathew, et al. 2020. “Guidance for Producing a Campbell Evidence and Gap Map.” *Campbell Systematic Reviews* 16 (4). <https://doi.org/10.1002/cl2.1125>.

Williams, B. A. 2002. *Fran, Floyd and Mitigation Policy*. Collinsville, IL: Berry A. Williams and Associates, Inc.

World Bank. 2020. *Poverty and Shared Prosperity 2020: Reversals of Fortune*. Washington, D.C: World Bank. <https://doi.org/10.1596/978-1-4648-1602-4>.

World Bank. 2022. "Agriculture and Food." Text/HTML. World Bank. 2022. <https://www.worldbank.org/en/topic/agriculture/overview>.

Xu, Xianglong, Bing Li, Ruixue Bai, Yunshuang Rao, Lingli Liu, Cesar Reis, Manoj Sharma, and Yong Zhao. 2018. "Food Guide Pagoda and the Food Safety of Women: One-Year Follow-up Study on the Effects of the 2008 Sichuan Earthquake." *Asia Pacific Journal of Clinical Nutrition* 27 (3): 662–70. <https://doi.org/10.6133/apjcn.092017.08>.

Young, Helen. 1999. "Public Nutrition in Emergencies: An Overview of Debates, Dilemmas and Decision-Making." *Disasters* 23 (4): 277–91. <https://doi.org/10.1111/1467-7717.00118>.

Young, Sera L., Edward A. Frongillo, Zeina Jamaluddine, Hugo Melgar-Quiñonez, Rafael Pérez-Escamilla, Claudia Ringler, and Asher Y. Rosinger. 2021. "Perspective: The Importance of Water Security for Ensuring Food Security, Good Nutrition, and Well-Being." *Advances in Nutrition (Bethesda, Md.)* 12 (4): 1058–73. <https://doi.org/10.1093/advances/nmab003>.

9 Appendix

<https://www.3ieimpact.org/sites/default/files/2022-08/HAEC-EGM-protocol-appendices.pdf>