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Forecast-based Financing: Transformation or a faster way to transfer funds?

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<p>Ennusteeseen perustuvan katastrofirahoituksen (forecast-based financing) mallissa katastrofeja ennustetaan ja niihin vastataan jo etukäteen. Tällä pyritään niin vahinkojen ja ihmishenkien menetysten minimoiseen kuin humanitaarisen avustustoiminnan kustannusten pienentämiseen. Ennusteeseen perustuvan katastrofirahoituksen pääkomponentit ovat etukäteen sovitut toiminnan laukaisijat ja toimintamallit, joilla reagoidaan ennusteeseen ennen kuin katastrofi tapahtuu.</p> <p>Keskeinen hypoteesi on, että ennusteeseen perustuvalla rahoitusmallilla on parhaat edellytykset saada aikaan pitkäkestoisia ja kohderyhmän katastrofikestävyttä edistäviä vaikutuksia silloin kun mallia käytetään hitaasti kehittyviin katastrofeihin, kuten kuivuuteen. Tällöin on aikaa kohdentaa toimia parantamaan ruokaturvaa ja elinkeinojen harjoittamista muuttuvissa sääolosuhteissa. Tutkielmassa pyrin kriittisesti arvioimaan tätä ennusteeseen perustuvan katastrofirahoituksen potentiaalia tapaustutkimuksen keinoin. Valitsin kolme erilaista tapausta, joissa mallia on hyödynnetty hitaasti kehittyvissä kriiseissä (Mongolia, Kenia ja Zimbabwe). Ne on valittu keskeisten toimijoiden (Punaisen Ristin liike, Maailman ruokaohjelma (WFP), elintarvike- ja maatalousjärjestö (FAO) ja Start Network) operaatioista.</p> <p>Hyödynnän laadullisessa tapaustutkimuksessani arvioivaa (evaluatiivinen) ja heuristista menetelmää. Pyrin niiden avulla vastaamaan tutkimuskysymyksiin: 1) Onnistuuko ennusteeseen perustava rahoitusmalli priorisoimaan toimia siten että se parhaiten vastaa avunsaajien tarpeita ja resursseja? 2) Ovatko toimet kestäviä ja tuovatko ne kohteilleen pitkäkestoisia sosioekonomisia hyötyjä? Tutkimukseni aineistona käytän tapauksista kirjoitettuja raportteja ja tehtyjä arvioiteja (sekundaaridataa) joita trianguloin tekemiini yhteentoista (11) asiantuntijahaastatteluun (primääridata). Haastateltavat ovat toimijoiden edustajia, jotka työskentelivät tapausten parissa. Puolistrukturoiduissa haastatteluissa hyödynnän toimijanäkökulmaa.</p> <p>Aineistoni perusteella mekanismissa on pitkäkestoisten kehitysvaikeuksien potentiaalia mutta se ei toteudu tällä hetkellä ja toimijat tulkitsevat sitä hyvin eri tavoin. Pääosin operaatioiden toimet näyttävät onnistuvan tehokkaassa ja hyvin kohdennetussa avustustoiminnassa. Tutkittujen tapausten perusteella voin kuitenkin todeta, että ennusteeseen perustuvan rahoituksen malli ei tällä hetkellä juuri vaikuta avustettavien henkilöiden tilanteeseen muuten kuin esimerkiksi auttamalla heitä selviämään seuraavaan sato-kauteen ja vähentämällä haitallisten selviytymiskeinojen (omaisuuden myynti yms.) käyttöä kriisin aikana. Ennusteeseen perustuvan rahoituksen kestävyys on kyseenalaista eikä nykyiset rahoitusmekanismit varsinaisesti tuo vaihtoehtoja kansainvälisille hätäapurahankeille, joita annetaan tapauskohtaisesti.</p> <p>Useimmat haastatteluista näkivät järkevänä linkittää ennusteeseen perustuva rahoitus jollain tavalla pitkäkestoisiiin ohjelmiin, kuten pidentämällä toiminta-aikaa huomattavasti tai lisäämällä operaatioihin positiivista vastetta (esimerkiksi sopivien siementen jako, kun ennustetaan sateita). Aineistosta on pääteltävissä, että tämä vaatisi ajattelutavan ja mallin kehystämisen muutosta (humanitaarisesta katastrofikestävyteen) sekä rahoituslähteiden uudelleen harkitsemista. Jotta toimet olisivat vaikuttavia, pitäisi toiminnan laukaisijan tapahtua riittävän aikaisin ennen kuin kuivuuden vaikutukset alkavat näkyä. Toisaalta toimet kannattaisi jakaa kahteen kategoriaan: ennakoiva ja vaikutuksia vähentävä (tai ennusteista hyötyvä) sekä varsinainen aikaistettu avustustoiminta. Avunsaajien näkökulmasta toimia kannattaisi laventaa suorasta avusta erilaisiin koulutus- ja muihin tukitoimiin, jotka parantavat perheiden sosioekonomista tilannetta katastrofista riippumatta.</p>		
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<p>In this thesis I focus on a novel disaster response and preparedness mechanism called forecast-based financing. The mechanism is linked to the changing paradigm of humanitarian response that calls for more localized and more resilience building solutions to addressing and preventing humanitarian crisis. It is also in the core of the anticipation agenda which argues that waiting for disasters to happen is not a sustainable option and that forecast data and pre-agreed triggers and actions should be used in order to prevent both loss of lives and mitigate the cost and impact of disasters.</p> <p>Main hypothesis is that climate related hazards to livelihoods and food security seems to be the sector where forecast-based financing could have most potential for increasing resilience and sustainability. Slow onset crises with long lead-time allow for better targeting and more variety of actions. As the lifetime of the action is longer, there is less chance of action which is in vain. Furthermore, the actions which are more localized, for example direct support to farmers, can decrease their vulnerabilities. I aim at taking a critical approach to assessing this potentiality associated with the forecast-based financing mechanism through case study. The three cases (Mongolia, Kenya, Zimbabwe) were selected from pilots implemented by the main actors: the Red Cross, World Food Programme (WFP) and Food and Agriculture Organization (FAO) and Start Network.</p> <p>This thesis uses a combination of evaluative and heuristic approach to qualitative case study analysis. To answer the first research question, 1) is the forecast-based financing mechanism successful in prioritization of actions in a way that best address the needs and resources of vulnerable populations, I aim at finding out if mechanism is effective (or potentially effective) in delivering impact. For the second research question, 2) are the actions sustainable and do they bring socio-economic benefits that go beyond meeting acute humanitarian needs, I will see if new pathways are found for confirming the defined hypothesis. I am using heuristic approach in terms of finding new links e.g. between actions and needs of either donors, actors or beneficiaries. I assess and analyse available reports and evaluations (secondary data) of the selected operations. I conducted eleven (11) semi-structured key informant interviews (primary data) using practitioner's perspective for retrieving qualitative data, for further understanding and for triangulation. All key informants were affiliated to the cases.</p> <p>My analysis show that the potentiality for development impacts and long-term transformation of the forecast-based financing is there but it is not utilized in the cases reviewed nor is it perceived in a same way across practitioners of different backgrounds. Currently the mechanism is used more for effective response, not for addressing the root causes of vulnerability. In general, the entitlement or empowering of a person who is affected by disaster currently does not go beyond securing bridge over lean season, avoiding negative coping mechanisms or e.g. better yield or survival of livestock. Sustainability potential of the forecast-based financing seems to be currently underutilized and international funding envelopes do not offer an alternative to the humanitarian funding launched case-by-case.</p> <p>Most of the practitioners interviewed were clearly in favour of linking and using forecast-based financing in some way to long-term programming, thinking outside of the framework of humanitarian response, extending lead time significantly and adding positive reinforcement inputs. I argue that with a lead time that goes long in advance, towards development actions, the mechanism needs to be reframed for the donors and the sources of funding might need to be reconsidered. To implement meaningful resilience actions in slow onset cases, triggers need to be early enough and actions in two phases: 1) anticipatory and benefiting from forecast and 2) early response. At beneficiary level the actions should be geared up to better address underlying socio-economic vulnerabilities and take advantage of the long lead time.</p>		
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Abbreviations

BRC	British Red Cross
CERF	Central Emergency Response Fund
CSA	Climate-smart Agriculture
DFF	Drought Financing Facility
DFID	Department for International Development
DREF	Disaster Relief Emergency Fund
DRR	Disaster Risk Reduction
EAP	Early Action Protocol
ECHO	European Civil Protection and Humanitarian Aid Operations
EU	European Union
EWEA	Early Warning Early Action
EWS	Early Warning System
FAO	Food and Agricultural Organization
FBA/F	Forecast-based Action/Financing
FEWS	Famine Early Warning Systems
FRC	Finnish Red Cross
FSIN	Food Security Information Network
GloFAS	Global Flood Awareness System
GRC	German Red Cross
HES	Household Economy Security
HFA	Hyogo Framework for Action
H-ROI	Humanitarian Return on Investment
IFRC	International Federation of Red Cross and Red Crescent Societies
KRCS	Kenya Red Cross Society
MEAL	Monitoring, Evaluation, Accountability and Learning
MRCS	Mongolian Red Cross Society
NAMEM	National Agency for Meteorology and Environmental Monitoring
NEMA	National Emergency Management Agency
NGO	Non-Governmental Organization
ODI	Overseas Development Institute
PER	Preparedness for Effective Response
RIMA	Resilience Index Measurement and Analysis
SDG	Sustainable Development Goal
SFDRR	Sendai Framework for Disaster Risk Reduction
SFERA	Special Fund for Emergency and Rehabilitation Activities
SOP	Standard Operating Procedure
SPEI	Standardized Precipitation-Evapotranspiration Index
UN	United Nations
UNDP	United Nations Development Programme
UN OCHA	United Nations Office for the Coordination of Humanitarian Affairs
USAID	United States Agency for International Development
WFP	World Food Programme
WHS	World Humanitarian Summit
ZRBF	Zimbabwe Resilience Building Fund

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1 Introduction

In this thesis I will focus on climate change adaptation under a broader resilience framework with a specific focus on forecast-based financing, a novel disaster response and preparedness mechanism originally developed by the Red Cross Red Crescent Movement. It is linked to the changing paradigm of humanitarian response that calls for more localized and more resilience-building actions in addressing and preventing humanitarian crisis. It is also at the core of the anticipation agenda which argues that waiting for disasters to happen is not a sustainable option and that forecast data and pre-agreed actions should be used to prevent loss of lives and mitigate the cost and impact of disasters.

The focus of the thesis is in slow onset disasters, which have limited predictability and which impact food security and livelihoods in agrarian or pastoralist-based societies. The main hypothesis, as derived from research and grey literature, is that climate related hazards to livelihoods and food security seems to be the sector where forecast-based financing could have most potential for increasing resilience and sustainability due to long lead time that allows better targeting and more variety of actions. I will take a critical look at this potential, and through cases, assess whether the mechanism is successful in prioritization of actions, are they sustainable, and do they bring benefits that go beyond meeting acute humanitarian needs.

1.1 Forecast-based financing - from finance to action

The Red Cross Red Crescent Movement has developed a framework called forecast-based financing (FbF). It addresses interdisciplinary challenges in disaster preparedness and mitigation of disaster risks by developing Standard Operating Procedures (SOPs) for preventative actions which reduce risks, enhance preparedness and response and mitigate impact of disasters. These SOPs are to be activated when a forecast is exceeding a pre-specified threshold. (Stephens et al., 2015) Humanitarian organizations and stakeholders like government departments, meteorological services and communities at risk agree on selected actions that are worth carrying out once a forecast reaches the pre-defined threshold of probability. Each action is allocated a budget to be activated when the forecast is received. Recently the mechanism has more often been named forecast-based action (FbA), like throughout Wilkinson et al. (2018) report on the current operationalizations of the mechanism. The Red Cross Movement financing mechanism, launched in May 2018, is also called FbA by DREF (Disaster Relief Emergency Fund) (IFRC, 2018). Various organizations have differing names for mechanisms with a similar basic idea of basing actions on weather or seasonal forecast information, such as the Food Security Climate Resilience (FoodSECuRE) facility (WFP, 2018a) or Early Warning Early Action (EWEA) System (FAO, 2019).

The forecast-based financing mechanism is contributing to the changing paradigm of humanitarian financing. Financing has mainly been available when a disaster strikes, but the forecast-based financing argues that waiting for disasters to happen is not a sustainable option. The forecast-based financing mechanism includes key components of adaptation as defined by Becker (2014) and is based on acting before disaster hits. The approach has links to both Sendai Framework for Disaster Risk Reduction 2015–2030 (SFDRR) and International Federation of Red Cross and Red Crescent Societies' (IFRC) resilience framework. When based on scientific models and accurate weather data combined to pre-agreed and modelled actions, response before disaster can increase resilience to hazards (Coughlan de

Perez et al. 2015) and reduce financial implications of an event (Rüth et al., 2017). The key argument of the Red Cross' forecast-based financing approach is that pre-agreed, evidence-based allocation of resources in advance contributes to reducing costs of response, as well as reduced human suffering and financial losses, all in all decreasing the costs of disasters (Rüth et al., 2017). The Red Cross' resilience approach also aims at increasing local response capacities and thus contribute to the agenda of localization of aid and Sustainable Development Goals (SDG) adopted in September 2015 at UN Summit.

The forecast-based financing mechanism can be seen as both a case of localization of aid and of aid delivered directly by large, international humanitarian agencies. The starting point for the approach is donor-driven. In 2014 the German Government Federal Foreign Office announced an Action Plan for Humanitarian Adaptation to Climate Change (PreventionWeb, 2015). The action plan was the launch of the forecast-based financing mechanism and it was divided in two phases: from 2014 to 2016 and 2017 to 2019. The forecast-based financing mechanism was to be tested in eight pilot projects by the three organizations included in the action plan. These organizations are the German Red Cross (GRC), World Food Programme (WFP) and Food and Agriculture Organization (FAO) of the UN. The forecast-based financing mechanism has been operationalized in different contexts through these pilot projects.

A GRC project in Uganda was focusing on flood preparedness. It was also one of the contexts where the forecast-based financing thresholds were crossed during the project, and action plans were operationalized in mid-2015 in flood response. This case was studied and discussed in detail by Coughlan de Perez et al. (2016). In combination with GloFAS (Global Flood Awareness System) model and albeit scarce local data, some worthwhile and well-aimed actions were taken in pre-response to floods. Actions were simple: from water storage and purification (distribution of chlorine tablets, jerry cans etc.), to water drainage (e.g. trenches around homes). The case in Uganda showed that the accuracy of early action was relatively high when the scarce data was referenced to the false alarm ratio of the GloFAS forecast in the area. Probability of triggering an unacceptable level of false alarms was less than 25%. One key factor in this success was that the selected response actions had long lifetimes, i.e. they are not in vain even if the forecast is early and the flood comes late. The longer the lead time (from alert to action), the less likely the action will be in vain and humanitarians will have more actions to choose from. (Coughlan de Perez et al., 2016)

One of the most notable, non-Red Cross operationalizations of the forecast-based financing is the WFP Food Security Climate Resilience (FoodSECuRE) facility, a multilateral, multi-year, replenishable fund to financially and programmatically support community-centred actions to reinforce and build climate resilience. It is or has been operational in five countries (Guatemala, Niger, Philippines, Sudan and Zimbabwe) and is based on three window triggers that are aiming to allow the mentioned long lead time and variety and targeting of actions to different scales. (WFP, 2018a) The instrument is aiming at providing funding based on seasonal and hazard forecasting, to scale-up food and nutrition responses. Since 2019 WFP is launching new forecast-based financing pilots especially for conducting anticipatory actions to address and mitigate food insecurity in Africa. (WFP, 2019) FAO, in its Early Warning Early Action approach works with national governments and humanitarian, development and scientific partners conducting regular monitoring, producing quarterly reports on food security and translating warnings into anticipatory actions. (FAO, 2019) Unlike WFP, FAO has also a Special Fund for Emergency and Rehabilitation Activities (SFERA) which can be released to anticipatory actions and operations.

Another pioneer for the anticipatory financing is the Start Network, which since early 2010s has been building a network of non-governmental humanitarian organizations that manage and access pooled humanitarian funding based on internal alert mechanisms, aiming to act before disasters turn into a crisis. (Start Network, 2017). Although it's not called forecast-based financing, the Start Network's influence is recognized by practitioners also in the interviews of this thesis.

1.2 Potentiality beyond response

There are many sources of information and mechanisms in place for addressing food security, such as the USAID founded, multi-sectoral Famine Early Warning System (FEWS, 2018b) for defining triggers and the SOPs for the early action. Combining historical data (on impacts of events) and meteorological capacity building (accuracy of forecasts) likely increases accuracy and relevance of actions. Furthermore, combined with good local context knowledge and technological or agricultural solutions, people's needs could be met with sustainable, and development-enhancing ways, prior to disaster happening. According to existing literature (most notably Coughlan de Perez, 2018 and Wilkinson et al., 2018,), climate related hazards to livelihoods and food security seems to be the sector where forecast-based financing could have most potential for increasing resilience and sustainability. Slow onset crises with long lead time allow for better targeting and more variety of actions. As the lifetime of the action is longer, there is less chance of action which is in vain. Actions which are more localized, for example support to farmers, can decrease their vulnerabilities.

Altieri and Nicholls (2017) look at climate change adaptation and mitigation potentials of traditional, small-scale farming and its vulnerability to changing climate. As they note, quoting ETC Group (Action Group on Erosion, Technology and Concentration), small-scale farmers are contributing with 50% of the global agricultural output for domestic consumption using mostly locally adapted plant varieties grown without agrochemicals. According to, among others, Altieri and Nicholls (2017), the paradigm of climate-smart agriculture (CSA) with agrotechnological inputs tend to forget to focus on the core vulnerability of farming communities which depends essentially on their natural and social capital. This means that it is not only important to have the right tools and crops in place, it is also important to look at the community and society level strategies and capacities for coping. Taylor (2018) takes his criticism on vertical, climate-smart agriculture solutions a step further: "*It (the World Bank with CSA) thereby proposes a paradigm shift in agriculture without acknowledging the vast inequalities of access to land, inputs, water and food that stratify contemporary patterns of food production, distribution and consumption* (Taylor, 2018, p. 103)". Going in depth in Taylor's resilience and development criticism is not in the core of this thesis but it is important to note that if we are to address food insecurity in a sustainable and transformative way, mere input of humanitarian aid to cope for the lean season is hardly enough. Combination of food and cash aid, support to agroecological solutions (including planting drought resistant crops and other climate smart agricultural practices) coupled with alternative livelihoods, coping mechanisms and supporting of social security networks, can increase a local population's resilience in the face of climate-driven disasters.

Social capital stands out as relevant asset also in Jiri et al. (2016) article on the use of indigenous knowledge in prediction and adaptation. They conclude with two main points that are relevant to forecast-based financing as well: first that the impacts of climate change are strongly dependent on socio-economic disposition and therefore the adaptation strategies

need to be considerate of local conditions, including of culture and environment; and secondly the mainstreaming of use of scientific forecasts has to some extent failed due to both access issues (available technology) but also due to failing to utilize and combine it with indigenous indicators. (Jiri et al., 2016, p. 167)

The delivery of forecast-based financing operates on three main pillars: humanitarian, disaster management and social protection. The link between disaster management and social protection systems adaptability to vulnerability scenarios is interesting in terms of looking at slow-onset disaster and actions that go beyond response. Costella et al. (2017) see both opportunity and challenge in the increasing weather extremes' impacts to vulnerability and recommend integrating forecast-based financing mechanisms into social protection systems.

1.3 Criticism

While the forecast-based financing mechanism has a lot of global potential, the solutions and actions, SOPs, triggers and climate data have to be very context specific. Criticism to the forecast-based financing mechanism varies from the accuracy and reliability of forecast data to difficulty in agreeing acceptable risks and triggers for action and allocation of resources. Practitioners and donors are faced with questions like can the action taken be justifiable even if the risk doesn't materialize. Is it sustainable to act?

Coughlan de Perez et al. (2015) introduce a model for calculating cost of acting in vain and consequently, assessing acceptable probabilities. The forecast-based financing practitioners and theorist focus a lot on the so called acting in vain challenge and its mitigation. The importance of ensuring sound justification of release of resources (high enough losses if not acting and risk materializing or high enough probability of risk materializing) is imperative. However, this is difficult to assess. As Coughlan de Perez (2018) conclude, the key challenge of assessing the efficiency and effectiveness of the forecast-based financing mechanism is that we often lack benchmark data i.e. what would have happened if the early action had not been triggered. The calculation of potential loss remains difficult, especially as some level of response (post-event) would have surely taken place regardless of forecast-based financing mechanism. This would require more research.

WFP did attempt to do the so-called Humanitarian Return on Investment (H-ROI) analysis of their forecast-based financing project in Nepal. As per the H-ROI model, the crude simplification was that in the so called WITH scenario (with the investment in place) cost for preparation was ca. USD 110,000 per 10,000 affected people with an added USD 6,000 per 10,000 affected people for response, totalling USD 116,000. In without (the investment) scenario the response cost was one million USD per 10,000 affected people, assuming quite staggering savings per investment. (WFP, 2018b) The model further considers that for every hundred floods, the probability that the alarm is given reaches 80%. In the remaining 20% of cases, the flood is not detected, and no preparation is done, although response starts after flooding occurs. For every hundred alarms, thirty are false and unnecessary preparation is done, i.e. the USD 110,000 per 10,000 people is invested in vain.

FAO has done similar analyses on the impact of early action through models in four different operations: Mongolia dzud (harsh winter) early action 2017 - 2018, Kenya drought early actions 2017, Sudan drought early actions 2017 - 2018 and Madagascar drought early actions 2017 - 2018. In their analyses they considered return on investment through direct benefits

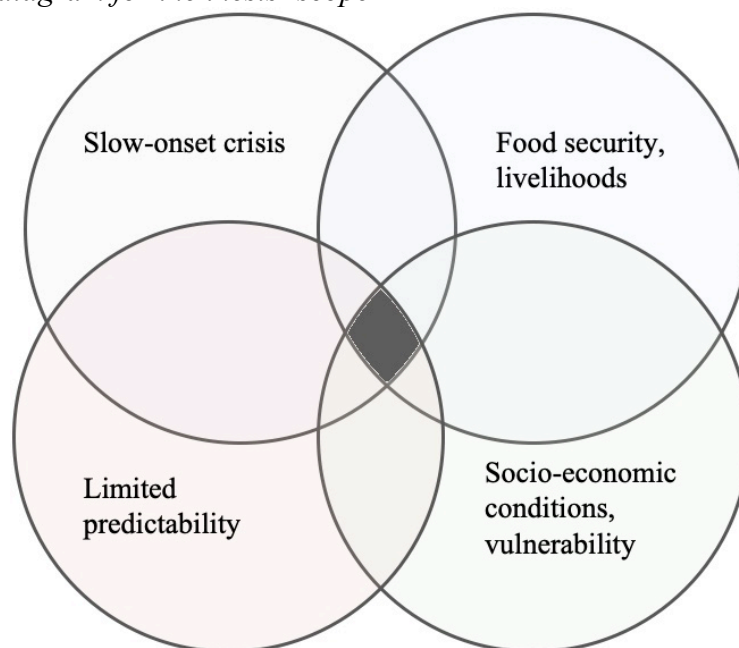
for household i.e. not through realized losses. In addition, they considered avoided costs of the emergency response and finally, the food security and nutrition benefits. (FAO, 2018a)

The potentiality of the forecast-based financing mechanism in improving cost-efficiency, better targeting of response actions and ensuring sustainability of the actions is documented in many case studies and articles but it also remains under debate both with response actors and donors. (Coughlan de Perez, 2018 and Wilkinson et al., 2018) It is important to ask what added value the approach brings to the current localization of aid agenda in humanitarian response. Will it allow to do response better, differently or more sustainably than in the past? How does the mechanism impact the root vulnerabilities and societal issues or increase resilience? It is also critical to consider the mechanism's scalability potential and limitations.

1.4 Research questions

This thesis will focus on slow onset disasters, which have limited predictability (in general, the longer the lead time, the less predictable is the forecast) and which impact food security and thus livelihoods in agrarian or pastoralist-based societies. Food security is also impacted by underlying socio-economic conditions and vulnerability (including environmental conditions). The study focus is in the intersection of all four focus areas, as presented in figure 1.

Figure 1. Venn diagram for the thesis' scope



The forecast-based mechanism has potential: while forecast-based financing can be adapted to disasters occurring on different time scales (sudden, mid-onset, slow-onset) and to variety of hazards, it seems to have most value added when lead time is long and the lifetime of response is long. I will take a critical approach to assessing this potentiality and aim at answering the following research questions:

1. *Is the forecast-based financing mechanism successful in prioritization of actions in a way that best address the needs and resources of vulnerable populations?*
2. *Are the actions sustainable and do they bring socio-economic benefits that go beyond meeting acute humanitarian needs?*

2 Framework for forecast-based financing

In this chapter I will briefly introduce the overall framework, including the humanitarian discourse and key concepts (resilience, localization, vulnerability and sustainability) that the forecast-based financing mechanism and this thesis' take on the mechanism are anchored to.

2.1 Resilience

The IFRC defines resilience as, “*the ability of individuals, communities, organizations or countries exposed to disasters, crises and underlying vulnerabilities to anticipate, prepare for, reduce the impact of, cope with and recover from the effects of shocks and stresses without compromising their long-term prospects.*” (IFRC, 2014). Resilience and ability to bounce back or bounce forward are key concepts of the IFRC approach to resilience and community-based work. The resilience framework also contributes to the sustainability of response that the Red Cross Movement is engaging in. When communities and organizations are better prepared and more resilient, less investments are likely needed in case of disaster to prevent impacts of disasters.

Becker (2014) looks at resilience in the human-environment system, considering four overall functions that can be also applied to preparing for extreme weather events; 1) anticipating, 2) recognizing, 3) adapting, and 4) learning. Adaptation is further divided in preparing (e.g. pre-stocking of relief materials, evacuation plans, early warning), preventing (flood walls etc.), mitigating (e.g. retrofitting or building new infrastructure and urban planning sensitive to the changing weather events and scenarios), responding (evacuation, provision of relief and shelter etc.) and recovering (e.g. insurance schemes, rebuilding, livelihood support). It is interesting to look at how forecast-based financing adds to the mitigation of disaster risks, preparation, and response to disaster events and whether the forecast-based financing model adds to the sustainability of these adaptation measures.

This thesis aims to anchor the mechanism it studies to wider development questions and more specifically to the development critique. It aims at taking a critical look at the current resilience approach in development and considers the socio-economic aspects in reducing vulnerability. In order to do that, we need to understand the current development discourse and the framework where the practitioners, implementing the mechanisms are operating.

2.2 Localization of aid

Barnett (2011, p. 30) has described various ages of humanitarianism from imperial to liberal by looking at driving forces behind humanitarianism (from colonial commerce to globalization) and its focuses in different eras (civilizing to human rights-based approach). Localization is very much a trend in the era of post-World Humanitarian Summit (WHS) of 2016. Financially the so-called Grand Bargain aims at bringing 25% of global humanitarian funding to local and national responders by 2020 (IASC, 2017).

It is widely understood that using local knowledge and resources and diverting financial support directly to the increasing of local capacities, results to sustainable approach to tackling advert humanitarian impacts. But are new policies bringing change in the discourse and practice? Are they transforming the sector itself? Or is nothing fundamentally changing and are we (as Global North) still implementing based on our moral obligations and seeing that we can (only) make a difference with the global financing tools and technology? Can the

localization of aid challenge the development curbing impacts of top-down posed humanitarian international that already de Waal (1997) discussed?

2.3 Vulnerability

Ribot (2014) states that assessing and understanding vulnerabilities is essential for climate change adaptation, but also argues that emancipation of the vulnerable is under-researched. His critique is that disaster mitigation efforts focus too much on who is vulnerable, not why they are vulnerable. Ribot finds that decreasing vulnerabilities should be rooted in rights based, democracy focused approach. Ribot also discusses the ontology of natural disasters, where their interlinkages to environmental and social aspects which are at the core of resilience discourse and practice, are sometimes missed when framing disasters natural. Another critique, Fassin (2011) talks about framing root socio-economic causes as something stemming from individual, where inequality is seen as social exclusion, oppression as bad luck and injustice as suffering.

It is crucial to understand that vulnerabilities for food insecurity are diverse (e.g. security, infrastructure, availability of resources and services) and so are the indicators for household distress. Different vulnerabilities require different actions and different indicators for triggers, not limited to e.g. precipitation indexes; Standardized Precipitation Index (SPI) or Standardized Precipitation-Evapotranspiration Index (SPEI) (Coughlan de Perez et al., 2019). Food insecurity can also be man-made. The Food Security Information Network (FSIN) report estimates that “*Some 74 million people – two thirds of those facing acute hunger – were located in 21 countries and territories affected by conflict or insecurity*” (FSIN, 2019, p. 2). The list of worst food crises (Yemen, the Democratic Republic of the Congo, Afghanistan, Ethiopia, the Syrian Arab Republic, the Sudan, South Sudan and northern Nigeria) confirm this assumption. In many cases protracted or chronic crises takes away possibility or to some extent responsibility for providing basic services as they drive countries, governments and organizations in mode of continuous lifesaving operations.

From a practitioner’s perspective, the understanding of socio-economic nexus in risk and vulnerabilities is high on the agenda. The guiding policies of the development field are very rights-based, aiming at broader diminishing socio-economic vulnerabilities (individual, community and national level) and enforcing civil-societies, including the Finnish Government’s Development Policy (MFA, 2016) and the EU level policies and funding instruments such as the Cotonou Agreement (EC, 2014). It is widely discussed in development sector that regulations as well as political and economic environment should be transformed so that they would help to improve the communities’ resilience sustainably. The social capital has a significant impact on a community’s resilience. For example, possibilities to participate in decision-making may result in better strategies and encourage people to engage more in the process of improving their community’s resilience. It is important to strengthen trust and cooperation among all the stakeholders. (Adger, 2003)

2.4 Sustainability

Before diving into the analyses of sustainability of the forecast-based financing approach, it is important to consider two of the key concepts in sustainability science raised by Becker (2014) that are relevant to analysing sustainability of response: 1) what is sustainable by definition? “*Able to be maintained at a certain rate or level*” (Oxford Dictionaries, 2018). In the field of response this should be looked from perspective of economic, social and environmental potentiality of sustaining the impact of selected mean of responding to a disaster

or risk; 2) What is a risk? While Becker (2014) introduces different definitions, it boils down to the fact that something is uncertain (likelihood) and also has an impact (negative) to the object, financial or otherwise. This brings us also to the key criticism of the forecast-based financing mechanism. What is high enough risk to allocate resources and what is the threshold of response in order to keep the action sustainable?

Closely linked to localization, targeting and sustainability, is the social protection aspect of forecast-based financing; functioning social protection mechanisms in general reduce people's vulnerabilities and with simple tweaking, better anticipation, coordination etc., the social protection systems can be made more shock responsive and reduce need for separate humanitarian responses. (O'Brien et al., 2018) There are a number of Sustainable Development Goals (SDG) linked to social protection (ILO, 2019) most notably of course target 1.3 *"Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable"* (UN, 2019). 1.5 is also relevant, *"By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters"* (UN, 2019).

Sustainability in humanitarian response is a widely discussed topic from financial, social and environmental perspectives. The focus is both on technical solutions as well as paradigm change. On the discourse level, the key driving policies and frameworks for response and relief are the Hyogo and Sendai frameworks for Action. These both put more and more effort to prevention and increasing of resilience. The Sendai Framework for Disaster Risk Reduction 2015–2030 (SFDRR), that is succeeding the Hyogo Framework for Action (HFA), understands the complexity of disaster risks and calls for closer collaboration among various sectors in order to prevent, prepare for, respond to, and recover from disasters caused by interlinked, increasing, and volatile risks. SFDRR also emphasizes the role of science in evidence-based approach to relief and response, including mitigating, preparing, and recovering. (Aitsi-Selmi et al., 2015)

In the World Humanitarian Summit in 2016 participants committed to the so-called Agenda for Humanity, which is a five-point plan that aim for alleviating suffering, reducing risk and lessening vulnerability. The agenda is managed by the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA). Especially the so-called core responsibility five, Invest in Humanity, talks about local capacities, need for investments and transformation. (Agenda for Humanity, 2016) In her address on UN OCHA event, UN Deputy Secretary-General Amina Mohammed encouraged participants to come up with innovative solutions and partnerships to challenges *"that hinder our ability to prevent and exit existing crises while we continue to save lives and to do this at scale."* (UN News, 2018).

The trend that the need of humanitarian financing seems to increase disaster after disaster, doesn't support that the financial sustainability behind the global humanitarian community has been hugely successful. Prior to WHS, Carbonnier (2015) noted that the increase in aid dollars does not correlate necessarily to needs, partly due to lacking information in times of crises to accurately assess forecasted needs but also to "operational ambitions and capacities" of large humanitarian agencies in relation to potential donors. It is interesting to look if the interventions made will have an impact on how target communities and populations can address similar situations in the future? Can they do this with less outside resources, or do they need continued support that is not embedded in their local societal structures?

2.5 Summary of key concepts

Table 1 below summarizes the key concepts used in this thesis and definitions as deemed applicable for the purpose of this thesis.

Table 1: Summary of key concepts

Concept	Definition
Resilience	Ability to anticipate, prepare for, reduce the impact of, cope with and recover from the effects of shocks and stresses without compromising long-term prospects.
Localization	Using local knowledge and resources and diverting financial support directly to the increasing of local capacities.
Vulnerability	Socio-economic or environmental conditions that make individual or community vulnerable to risks, shocks and adverse events.
Sustainability	Ability to maintain an intervention or its impact without continued external financial resources.

3 Methodology

This thesis aims at taking a critical approach to assessing the potentiality, localization and sustainability associated with the forecast-based financing mechanism, especially for slow onset disasters through case study. Selected cases focus on the scenarios for disasters that enable long lead time and lifetime of response, namely climate related hazards to livelihoods and food security (e.g. drought). The case studies were selected from many pilots implemented since 2014 by three major humanitarian organizations; the Red Cross, World Food Programme (WFP) and Food and Agriculture Organization (FAO) and supplemented from the non-governmental organization (NGO) sector pilots.

The thesis' research strategy is based on qualitative case study analysis with triangulation of data from secondary materials and interviews. It uses a combination of evaluative and heuristic case study. Research questions are aimed to be answered through assessing and analysing available reports and evaluations (secondary data) done of the selected projects. Semi-structured key informant interviews were conducted for retrieving qualitative data, for further understanding and for triangulation (primary data).

3.1 Qualitative case study research

The qualitative case study approach in this thesis is based on analysing secondary data which includes materials from the actors (implementers of the case operations), mostly project reports and available evaluations. This is complemented with other secondary data, such as available articles (non-scientific) and grey papers. All of the reviewed materials are listed and introduced in annex 7.1. Analyses of secondary data is complemented with semi-structured interviews (primary data) with identified practitioners involved to the case operations.

I use qualitative content analysis in which the wealth of materials, reports and interview transcripts are loosely categorized around key concepts: resilience, localization, vulnerability and sustainability. Flick (2002, p. 190-192) introduces Mayring's (1983) procedural model for text analysis. In my thesis I reduce, structuralize and explicate the materials for understanding how and why practitioners operate the way they operate under circumstances surrounding the mechanism. This also allows to confirm the presence of the transformation potential of the mechanism in the materials.

I consider typology of heuristic and evaluative as according to Thomas (2011) relevant. To answer the first research question, I aim at finding out if mechanism is effective (or potentially effective) in delivering impact. For the second research question I will see if new pathways are found for confirming the defined hypothesis (sustainability and localization or even transformation). I am especially using heuristic approach in terms of finding new links between actions and needs of either donors or beneficiaries, as according to informants.

Like George and Bennett (2005) I propose that case study has strength in conceptual validity by seeking to identify relevant conceptual variables and see how they fit into the framework of forecast-based financing that was described earlier. With qualitative heuristic approach according to Kleining and Witt (2000) I aim at finding new concepts, discovering similarities in cases and new perspectives to forecast-based financing. New ideas are not necessarily derived from secondary data but through reframing questions based on interviewee's response and leading the discussion to paths that are raised by or picked up from the interviewee's response. Conceptual analysis of the interview transcripts is essential for testing the hypothesis on potentiality of the mechanism that is the basis of research questions. It can also lead to new inferences of the mechanism's potentiality, or lack of, especially from the practitioner's perspective. The key limitation is the relatively low amount of data and similarity of cases to fulfil the so called third rule "*Data should be collected under the paradigm of maximum structural variation of perspectives*" (Kleining and Witt, 2000). I compensate this by taking a broader approach to actors with different mandates and modi operandi.

During triangulation, I aim at doing process-tracing, which "*attempts to trace links between possible causes and observed outcomes through body of documents and archives [in this case evaluations, reports, interview transcripts etc.], to see whether the causal process a theory hypothesizes or implies in a case is in fact evident in sequence and values of the intervening variables in that (or those) case(s)*" (George and Bennett., 2005, p. 6). In accordance with George and Bennett (2005) I especially aim at exploring causal mechanisms (e.g. is the hype of the forecast-based financing derived from donor needs for efficient spending of funds or from the need to do more localized and more relevant interventions) and identify relevant variables that carry across the case examples from different actors. Summaries of conceptual analyses of both type of data are annexed to this thesis: of secondary materials as annex 7.2 and of transcripts of key informant interviews as annex 7.4.

3.2 Semi-structured interviews

In this thesis I am applying a practitioner's perspective. One pioneer of using practitioner's perspective in organizational learning was Donald Schön, whose ideas can be well used also in the development sector. "*The practitioner allows himself to experience surprise, puzzlement, or confusion in a situation which he finds uncertain or unique. He reflects on the phenomenon before him, and on the prior understandings which have been implicit in his behaviour. He carries out an experiment which serves to generate both a new understanding*

of the phenomenon and a change in the situation.” (Schön 1983, p. 68) The aim is not to assess the mechanism (forecast-based financing) directly from what it means from the perspective of end user or beneficiary but more from what it means to, how it is interpreted and how are the potentials verbalized by people who are working with the tool, typically under pressures from both the needs on the ground and from donors. The fact that I am a practitioner myself, adds to the practitioner perspective of the research.

The purpose of the interviews of practitioners is to increase understanding of the pilot operations, to ask questions stemming from secondary data or to add information needed to analyse impact and potentiality for long term benefits of the mechanism. Interviews also aim at understanding the rationale behind choosing the mechanism and ask respondents’ own interpretations and recommendations based on their experiences. This thesis cannot do generalizations but aims to find new perspectives: finding expectations among practitioners and looking at framing in regards of the wider development discourse. I have an ambition to derive new theories in heuristic manner. Asking questions like “do you think it is relevant to or feasible” can reaffirm existing hypothesis or it can derive to other paths. This is especially relevant for understanding how and for what purposes the interventions are framed.

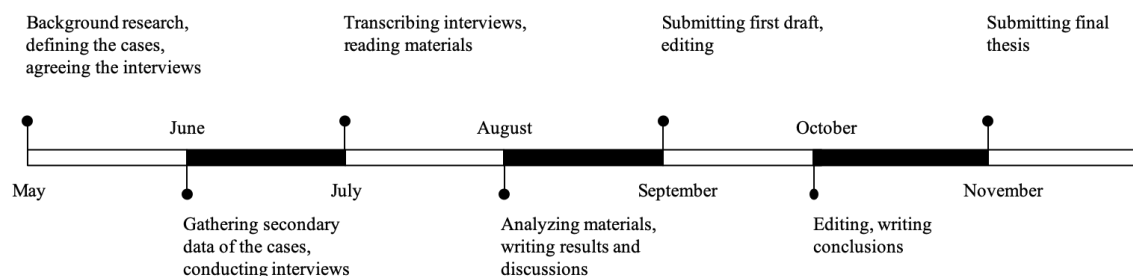
For the thesis I conducted a total of eleven (11) key informant interviews, all of which were practitioners. All main forecast-based financing actors (Red Cross, UN and Start Network) were contacted and the practitioners were selected by their affiliation to the cases and through recommendations by people contacted. The interviews were done in June 2019. List of key informants is included in annex 7.2. The key informants represented two major UN organizations involved in the forecast-based financing or early action, three national Red Cross societies, IFRC, Start Network, one non-governmental organization, researcher from a meteorological institution and Red Cross and Red Crescent Climate Centre. Two planned interviews were cancelled due to schedule conflicts: one was UN organization (a representative of that organization is included in the interviewed eleven) and one non-governmental organization (this organization is not included in the interviewed eleven practitioners). In this thesis I code the quotes from key informants with consecutive numbers i.e. Key Informant 1 becomes K1 and so forth.

Interviews were done mostly over Skype with only one face-to-face interview. Interviews were done in English and transcribed verbatimly. Transcripts were used as primary data. Interviews were done in the form of semi-structured interviews where the questions were grouped based on the focus areas defined in the research plan (predictability, socio-economic vulnerability, slow-onset crisis and impact to food security/livelihoods). Interviews were done in discussive manner, not all questions were used or read as written down and as an interviewer I also allowed discussions around the questions and asked follow-up questions based on the answers of interviewee. The list of guiding semi-structured interview questions are annexed as 7.3. The interviews were done partly in the style of expert interviews. Meuser and Nagel (1991) (as cited in Flick 2002, p. 89) consider expert informant to represent a group i.e. their affiliate organization rather than individual. However, in this thesis the skills and experiences of informants were abundant and highly useful in providing context to the concepts discussed. I was also aiming to find meaning through their personal perspectives and experiences as active practitioners.

3.3 Timeline of the thesis

Figure 2 presents the timeline for the phases of preparation and writing this thesis.

Figure 2. *Timeline of the thesis' process*



3.4 Selected cases

The thesis' cases focus on the more rarely piloted, less studied and at the same time more complex phenomena of drought, its impacts, its forecasting and preparedness to it. Regardless of the complexity of adapting the mechanism to it, the forecast-based financing seems to have significant potential given the long lead time for and lifetime of response. It can also be linked to long term development and underlying vulnerabilities perhaps more easily than response to sudden onset disasters. To date most of the examples from the Red Cross movement seem to be focusing on the more acute and effective, life and money saving response such as the Uganda project. Thus, it makes sense to look at the FAO and WFP lead operations with a focus on addressing climate related hazards' impacts to livelihoods and food security. Wilkinson et al. (2018) report maps the current state of the action in forecast-based financing, with an extensive list of initiatives reviewed. They also present a typology of which the two localized delivery channels are interesting for this thesis: community-based emergency preparedness and social protection systems.

At the planning phase of the thesis, the potential cases were grouped in three country baskets.

- 1) Zimbabwe with WFP FoodSECuRE project: El Niño induced drought and FoodSECuRE mechanism (2015 – 2016); Danish Red Cross and Finnish Red Cross forecast-based financing initiative in Zimbabwe (in planning, feasibility study available); and Start Network Drought Financing Facility, Zimbabwe alerts and responses.
- 2) Mongolia with FAO Early Action to safeguard lives and livestock-based livelihoods against potential dzud (impact report available); Red Cross Dzud Forecast Response in 2017 – 2018 winter (evaluation available); and Start Fund alert 284 Mongolia anticipation of dzud by Save the Children and World Vision.
- 3) Kenya with several actors and projects on early action to drought including FAO, National Drought Management Authority (NDMA) but especially 2016 – 2017 El Niño preparedness and response project by Kenya Red Cross Society (KRCS) with a component on forecast-based intervention in Kitui county.

As the cases are not clearly defined units nor comparable as such, to understand the differences and to build a case study approach one needs to consider classic dichotomy as introduced by Ragin in Ragin and Becker (1992), “(1) whether they (cases) are seen as involving empirical units or theoretical constructs and (2) whether these, in turn, are understood as

general or specific” (p.8). Both Mongolia and Kenya are cases of relatively small-scale forecast-based financing interventions to a specific slow onset scenario. It is later reflected in discussions that such pilot cases of forecast-based financing are applicable for analysing and building evidence as the mechanism is not yet ready to be scaled to large scale disasters.

After consideration and background research, the scope of the thesis was defined primarily to Mongolia as it was an excellent specific, spatially and temporally limited empirical case that could be observed from many angles: suitability for analysing responding to slow onset disaster; wealth of past experience on response; and recent forecast-based financing operations with three different actors, four if Start Fund alert counts both recipients, Save the Children and World Vision, (Start Network, 2019a). I am also personally experienced with the work of Mongolian Red Cross Society (MRCS).

Zimbabwe used as a more complex and constructed theoretical case as I was not looking at one specific operation but rather looked at the future potentials based on reports and key informants’ perspectives. Zimbabwe case became a sort of modelling scenario to which the real-life experiences from Mongolia could be reflected to. Kitui case in Kenya was included as another empirical case: an example of responding to positive forecast pre-agreed action.

3.5 Limitations

Thesis did not include a field visit to any of the case countries mostly due to time limitations and to the scope of the thesis in terms of credits and inputs. Choosing not to do a field study is also a climate choice as in relation to the scope of the study: the field visit would probably not bring anything that the interviews or secondary data would not bring. However, choosing not to do a field visit limits the possibility to verify data or deepen the thesis with empirical research. Conclusions need to be fully based on interviews and secondary data.

Quality of secondary data from the practitioners and actors can be very varied: technical project reports, sub-standard or biased reviews, publicly available evaluations, grey papers etc. Robust source criticism needs to be utilized when looking at the credibility of data and they need to be supplemented with interviews.

The development literature and development criticism are extremely wide areas of discipline, references are abundant, and it is difficult to narrow down to most relevant theories and discourse. On the other hand, articles on the forecast-based financing mechanism are limited due to the novelty of the mechanism which affects the availability of directly relevant, peer-reviewed literature.

3.6 Ethical considerations

As I will not include any beneficiary interviews or such discussions with people subject to the mechanism and operations, there is no ethical consideration in terms of how people are addressed in interviews. At the same time, this limits their representation and is challenging in regards of understanding the localization of the approach.

I have a background with the Red Cross. That makes me biased and I needed to consider how much I am impacted by my employers’ views. While Red Cross staff are included as interviewees, I am not doing this thesis as an assignment for Red Cross but as an individual study. Case study bias was addressed consciously along the way by opening floor to new cases, interviewees etc. as well as distancing me from the background affiliate.

4 Results and discussions

The main hypothesis, as derived from literature (Coughlan de Perez, 2018 and Wilkinson et al., 2018), was that climate related hazards to livelihoods and food security seems to be the sector where forecast-based financing could have most potential for increasing resilience and sustainability. Slow onset crises with long lead-time allow for better targeting and more variety of actions. As the lifetime of the action is longer, there is less chance of action which is in vain. The actions which are more localized, e.g. direct support to farmers, can decrease their vulnerabilities. Combination of food and cash aid and alternative livelihoods including planting drought resistant crops and other climate smart agricultural practices (Chandra et al., 2018) can increase local population's resilience in the face of climate driven disasters.

As the Wilkinson et al. (2018) report describes out, early action is often a combination of actions at different times (including before hazard from months to hours, during and immediately after) to mitigate the impact of hazard. Aiming to avoid regrets, acting in vain and spending of financial resources, low cost, low regret activities are prioritized rather than e.g. large-scale evacuations and distributions of aid materials. In slow onset cases, there is a potentiality to insert low-regret, long-term development benefiting actions such as in East Africa where FAO "*organises training and awareness-raising activities, scales up existing disaster risk reduction projects and provides livestock fodder and supplements to protect pastoralist livelihoods*" (Wilkinson et al., 2018, p. 16). Longer lead time however reduces accuracy of forecast and long-term focused actions can be challenged on if they are early action in sense of disaster preparedness and if they can be justified with this sort of funding?

To address the thesis' research questions, I was asking from the practitioners and the materials, if the prioritization is right in terms of reaching the most at need but also in terms of timing of actions that specifically benefit the needs of target groups, as opposed to so called blanket solutions. Secondly, I was asking if the action and financing are likely sustainable after the imminent and operational phase which is anything from few days to three months for the so-called early actions and interventions. According to methodology, I was trying to identify potentialities and proved successes and challenges from the secondary data and further derive the practitioners' perspectives from primary data. I was not aiming to evaluate the cases but through triangulation, identify mutually framed impacts and challenges, and further through heuristic approach either confirm hypothesis or arrive to other inferences. Tracing the quotes and responses of practitioners I further aimed to understand how different actors perceive the potentiality of the mechanism.

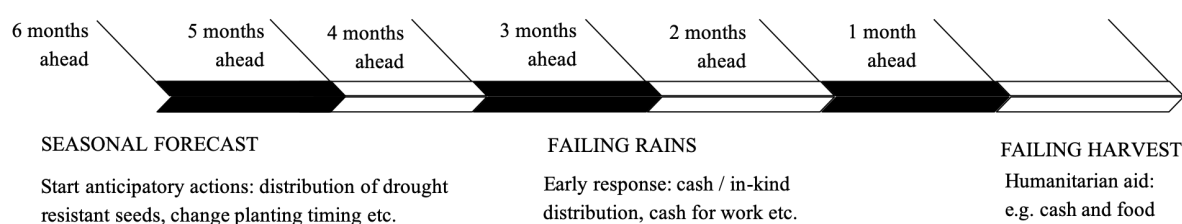
In the following sub-chapters I will discuss the results and findings from the cases within the framework introduced in chapter 2. I will aim at responding to research questions by dividing the discussions in to five constructs that aim to logically narrate the elements contributing to the assumed potentiality of the mechanism. I will start by looking at the transformation potential on general level as opposed to traditional responding and from the perspective of how forecast-based financing is framed. This is followed by a look at the example of forecast-based positive reinforcement action which is then linked to the case of Mongolia and the operation's scope and impact in terms of long-term resilience. Finally, I will introduce the two major elements that the success of the mechanism is dependant of: coordination and financial sustainability.

4.1 Response or transformation?

Coughlan de Perez et al. (2019) look at usability and accuracy of rainfall observations and seasonal forecast in estimating potential food insecurity to both pastoral and non-pastoral groups in East Africa. Simplified summary is that combination of both of the above forecast data sources and understanding of socio-economic factors of the target groups, can be used as reliable justification of triggering action. The paper also notes the higher vulnerability and dependence on rainfall for pastoralist. The paper continues to note that investments to the chronically food insecure regions “*should address long-term food insecurity as well as periods of increased food stress*” (Coughlan de Perez, 2019, p. 63). To address the long-term food insecurity the paper also claims that properly planned activities can be triggered to benefit from upcoming weather patterns with a lead time of plus six months. This claim both in terms of ensuring best possible mitigation of impacts that slow-onset disaster might have and the possible benefiting from understanding and reacting to forecast to improve yields or livelihoods of target populations, is in the core of this thesis when looking at resilience and transformation potentials. The Mongolia case is focusing on pastoralist population whose socio-economic status is crucial for their vulnerability which is further aggravated by both environmental, cultural and meteorological phenomena.

When looking at forecast-based financing potentials to longer term impact, one needs to first look at the fundamental question on when to act which seems to differ to some extent between interviewed actors. In figure 3 is a timeline for forecast, early action and response for drought amended from Wilkinson et al. (2018) report which marks the earliest action point to six months before disaster. This has some level of consensus among practitioners, albeit also Coughlan de Perez et al. (2019) claims that one can act even before that. In case of drought, the six-month window is allowing actions based on the seasonal forecasts before we are starting to see low precipitation or other signs of impending drought which typically are within three months timeframe (Key informant 2 i.e. K2, FEWS, 2018a, FMI, 2019).

Figure 3. Forecast, early action and response timeline for drought (Amended from Wilkinson et al., 2018)



In the Red Cross slow onset forecast-based financing case in Mongolia, the trigger in the operation and in the following Early Action Protocol (EAP) for Forecast-Based Action (FbA) by DREF is set one month prior to action and it's based on the release of the so-called dzud risk map which is a combination of both observation-based (of summer conditions i.e. growth of hay) and forecast-based (winter snow conditions) trigger (MRCS, 2019 and K6). This is the longest lead time of all five FbA by DREF EAPs to date (IFRC, 2019a). This responsive type of triggering is common with response orientated actors such as with Red Cross FbA by DREF EAPs. According to K11 this is mostly due to the funding ceiling of CHF 250,000 for FbA by DREF EAP. “*If you really want to do FbF project for slow onset that would have different interventions and different lead times and you would really want*

to have meaningful actions, I would imagine that it would be tough to do anything with that ceiling” (K11).

The allowed use of funding within and FbA by DREF EAP is divided into three categories: early action for the identified hazard based on the trigger; readiness i.e. capacity building to be able to deliver early action; and possible prepositioning (K3). The Mongolia case makes perfect sense from this perspective: it has relatively long lead time to prepare and target actions, it has clear trigger and it aims at reducing loss of livestock. As discussed with K6, the dzud risk map is using observations of the summer conditions, combining them to forecast of winter to assess risk of lack of feed due to poor grazing potential of poor conditions for hay to be prepared in advance. If the summer environmental observation information would be used, the lead time for mitigating activities could grow up to e.g. five months before the end of December when actions typically start.

The dzud risk map in its current form has been released since 2015 and it is aiming to better predict risks and act accordingly in pre-disaster phase ahead of impending dzud (Nandintsetseg et al., 2018a). The informants are quite clear that in the past, all actions related to dzud were entirely in response (K6) and that the risk map had not been used as a trigger before the forecast-based financing operation by Red Cross and FAO in 2017 – 2018 (K7). I can confirm that there has been criticism within the Humanitarian Country Team in Mongolia for the lack of anticipation actions for at least eight years ago (time of previous major dzud).

K7 notes that the dzud risk map is currently lacking socio-economic indicators. Adding and analysing that information could support planning of early action several months before dzud is occurring with better targeting and better planned activities that would be culturally and traditionally acceptable and building on the social capital of Mongolian herders. What K6 also confirms, while addressing issues related to interpretation of the dzud risk map and level of emergency (later discussed more under coordination), is that the dzud risk map’s environmental information could indeed be used by herders in making decisions related to traditional adaptation strategies including the otor, a traditional practice with different versions of breaking the four season pattern of migration to more irregular, condition based, including splitting herds, joining with other herds etc. (Murphy, 2011 p. 405 – 413).

DRR (Disaster Risk Reduction) in Action case study of Mongolia cite another study on comparison of the role of climate-driven or man-made causes for high dzud mortality but narrow it down to very technical and vertical cause: “*Livestock overpopulation and inadequate preparedness (e.g. reserve hay/forage) were the main vulnerability factors*” (Nandintsetseg et al., 2018a, p. 3). In essence the Nandintsetseg et al. (2018b) paper in Scientific Reports more broadly and very much in line with Murphy (2011) looks at the socio-economic conditions in post-Soviet era Mongolia (poverty but also weak state risk management) and weaker herding practices including hay and forage preparation but also small herd sizes, inexperienced herders and reduced capacities and/or willingness to otor. In addition, there are significant geographical variations within country including climatic but also e.g. adjacency to cities that affect vulnerability. As the article concludes: “*the dzud risk model presented in this study should be incorporated into a future dzud-EWS (Early Warning System) to include the quantitative contributions of natural and socioeconomic factors in the warning system* (Nandintsetseg et al., 2018b, p.7).”

Considering the above, the one-month trigger window is not very ambitious. In addition, while saying that hay or feed preparation and distribution could start early on in summer or

autumn, K7 notes also that *“What will contribute more to dzud, more than the weather conditions, is the social and economic factors. And we are missing that. That is also challenging, when we target the beneficiaries, we need to address who’s the most vulnerable in dzud. The dzud risk map only uses indicators (like) the number of grazers, grass growth, rainfall situation, all like precipitation or natural, not socio-economic indicators.”* This can be confirmed from the IFRC (2019a) EAP summary for Mongolia: *“NAMEM (National Agency for Meteorology and Environmental Monitoring) developed dzud risk map using 11 different parameters including summer condition, pasture carrying capacity, number of grazers, biomass/1,500 site, anomalous precipitation, anomalous temperature, drought index, snow depth, snow cover, air temperature forecast and precipitation forecast (IFRC, 2019a, p. 2)”*.

What the approach with relatively short lead time in Mongolia EAP misses is addressing the core vulnerabilities or the transitioning perspectives, which both K6 and K7 identify as challenges among the herders. Both informants acknowledge the need for wider social support schemes. At the moment this is not too much linked to dzud risk map or forecast-based actions. Murphy (2011) in his extensive dissertation looks at the political ecology of dzud disaster in Mongolia, putting it in the context of transition from socialism to free market and the struggling of local governments and traditional herding lifestyles including land use issues which are to large extent vague and somewhat based on *“mastery of the use or resources”* (p. 506). He also concludes: *“Other households, because of the lack of positive social connections, political empowerment, economic and other assets, are relegated to confronting disaster (Murphy, 2011, p.504)*. Thus, the vulnerability of Mongolian herders is very much a question of social capital, resources, land-use issues etc. which tend not to be included in the hegemony of framing the vulnerability in relation to changing environmental conditions. Those vulnerabilities are not even included in the family based socio-economic indicators (single headed households, disabled family members etc.) that tend to refer to families’ internal conditions. When discussing about pastoralists and agro-pastoralists in East Africa Coughlan de Perez et al. (2019) come to the same conclusion. *“Advances in impact forecasting can help estimate possible outcomes for different groups of people and provide tailored forecasts for particularly vulnerable populations. Because different livelihood zones have dramatically different relationships to rainfall, further understanding of differential vulnerability across livelihood zones and socio-economic groups can allow for tailored support to those who are most likely to be impacted by a particular hazard”* (Coughlan de Perez et al., 2019, p. 66).

Hegemony among donors and practitioners seem to be that cash-based assistance is most cost-effective, efficient and localized mean of delivering humanitarian aid. This is stemming from, among others the UN Secretary-General Ban Ki-moon report to World Humanitarian Summit in 2016, *“Where markets and operational contexts permit, cash-based programming should be the preferred and default method of support (ReliefWeb, 2016)* and is widely endorsed by humanitarian community (CaLP, 2016). Cash-based assistance is seen to have notable benefits of allowing the recipient to decide what to do with the cash aid and directly contributing to the local markets, or even better, not disturbing the local markets with internationally procured goods. Also, the aid critique Moyo (2009, p. 44) makes a reference to this benefit with the example of mosquito net surplus destroying local small businesses. Same hegemony for cash was evidenced in my key informants in general. K1 rationalized it namely for logistics, overheads, and targeting purposes. This was echoed in the case of Mongolia (K6 and K7) when discussing whether to provide cash, of which nearly everything was used by beneficiaries to buy feed for the animals or to provide hay directly to the beneficiar-

ies. For Mongolia, neither of them however were capable of producing any actual calculations of cash being more cost-efficient and Red Cross impact survey recommends “*It may be worth exploring whether a bulk procurement and distribution of hay and feed may have been more cost-efficient for the FbF intervention, and for beneficiaries in accessing these goods, than going via cash distributions.* (Red Cross impact survey, 2019, p. 16)”

Costella et al. (2017) have made an overview of the conducted forecast-based financing initiatives in terms of potential for using cash-based intervention to promote resilience. They state that “*Cash transfers in advance of the flood would help households avoid negative coping strategies when a disaster materialises*” (Costella et al., 2017, p. 35). This claim is also strongly evident among the key informants when talking about drought or slow onset disasters in general. They list various harmful coping mechanisms (from early marriages and taking children away from schools to selling property) that the cash intervention can mitigate during crisis (K1, K2, K8). The purchasing power that comes with cash is seen highly relevant e.g. by K1 who refer to post-distribution monitoring studies, that say “*if the cash assistance is targeted correctly, to the person responsible of the food security at the household level, basically the women who are preparing food for the children, over 90% of the cash that goes to the area is used for food*”. While cash-based intervention can yield direct improved coping mechanisms in short term perspective with relatively fast return to normal life or bridging over lean season, in terms of longer-term coping and increased means of surviving, the impact to resilience is far more challenging and not so evident at the moment, according to informants.

Jumping from pastoralist to agricultural communities, we go back to how much of variety of activities there might be available for acting early to mitigate possible disaster’s impact. As K5 frames it “*Those activities would be then much different than giving out food, they would be more associated with changing the way you are approaching the cropping season in general, that might mean different type of seeds, resistant seeds, alternative seeds, seeds and food of course that people would be willing to eat and sell. That takes time*”. K5 continues in painting picture of how when we start seeing the drought impact, we are already too late with any meaningful mitigation activities and resort to giving out cash or food calling it “*point of no return where people either didn’t plant or if they did plant (wrong kind of seeds), the plants are dead.*”

The next crucial point raised by several key informants, especially K2 and K5, in relation to long term actions, is the no-regret approach to activities. As you push the window for decision to act way early in your timeline, the certainty of knowing what will happen in terms of weather is close to mere guessing. The Red Cross Roadmap for FbEA (2019) report notes that in general long lead time and low spatial resolution creates a challenge for accurate forecasting and consequently planning of actions. Thus, focus should be on no-regret actions, e.g. “*cash transfers or school feeding as food insecurity actions benefit marginalised communities and vulnerable households in all circumstances and, in the best case, prevent the use of harmful coping strategies*” (Red Cross Roadmap, 2019 p. 7). The proposed cash transfer in this sense is very close to linking with existing or substituting non-existing social security system which is controversial in typical humanitarian response. The same Roadmap (2019) goes into reminding that low-cost actions such as dissemination and early warning should be part of the available interventions. Furthermore, the report reminds that with long-lead time both “*the ZRCS (Zimbabwe Red Cross Society) and donors should accept some risk of acting in vain*” (Red Cross Roadmap, 2019 p. 19). In summary, the activities conducted should in general reduce vulnerabilities and increase positive coping mechanisms.

This could be looking at core socio-economic factors or conducting actions that aim to e.g. improve yields even when the drought is not realizing, as was done in the Kitui case in Kenya (see next chapter) which is a case of positive reinforcement based on forecast information.

More than half of the informants are clearly in favour of linking and using forecast-based financing in some way to long-term programming, extending lead time significantly and adding positive reinforcement inputs. K5 discussed the extra-long lead time in reference to El Niño in a way of merging both the obvious benefit of investing a year on and the apparent challenge in convincing donors to pay. *“If we want to start FbF at scale we’re in this funny position (in) places like Mozambique and others (which) are suffering from drought and even past cyclone and I want to take some of the money that (the organization) has and divert it to a disaster that has not yet occurred.”* (K5) At the same time for K5 it is clear that as actors we should be able to use the knowledge, triggers and forecast of impending, albeit slow-onset disaster to prioritize where development agencies are working and even scale up e.g. their water infrastructure projects. Red Cross in general seems most focused on trigger based early response action from preparedness for response (K3) to months ahead distribution of cash to prevent negative coping mechanisms (K1). K6 concludes *“Any money that is spent from the FbA pot of the DREF is spent after the trigger before the peak impact. Which is different from the other programmes which have money that is spent before trigger.”*

The quotes above hit the core of the questions and doubts some actors have on the stretch of the financing, even if they see forecast-based financing in principle applicable to long-term interventions. The available funding remains a challenge (discussed more under donor drivenness) as does the more philosophical question of how we are framing the mechanism. Of the major actors WFP aims at more combined approach as they state in their brochure, *“WFP believes that Forecast-based Financing is more effective when implemented as part of a comprehensive and well-integrated risk management strategy that combines different disaster risk financing tools to anticipate, absorb and prepare for the impacts of climate-related disasters. Thus, through FbF, WFP seeks to complement rather than replace other disaster risk reduction, seasonal preparedness and resilience-building activities”* (WFP, 2019, p. 16). WFP also aims for longer lead time in their forecast-based financing for drought by starting anticipatory actions well before the planting season (Ibid, p. 14).

Albeit one of the Red Cross informants (K11) was acknowledging the limitations of FbA by DREF in time frame, funding level and so forth, the informant was at the same time hopeful that maybe eventually the FbA by DREF EAPs go beyond responding earlier to more innovative ways of including development and resilience aspects. However as both K5 and K11 state, it is a difficult path to change people’s perception on the mechanism that is currently geared towards humanitarian aid and mostly applied by humanitarian actors.

4.2 Forecast-based Action in Kitui, Kenya: positive reinforcement

The forecast based action intervention in Kitui, Kenya in 2015 – 2016 brings an interesting exception to the Red Cross approach. As the case study report states *“Most forecast based financing seeks to mitigate the negative impact of an unusual climate event, while the Kitui intervention aimed to take advantage of a potentially positive impact. As such, it could be seen as livelihoods enhancement intervention rather than a disaster management action, as it aimed to increase the food security among a population vulnerable due to climate variability and poverty”* (KRCS, 2016, p. 5). The intervention included positive reinforcement actions (delivery of hybrid maize seeds and training, including post-harvest management

training) based on a forecast (in this case above average rainfall predictions). Albeit, as the case study report confirms, the intervention is one-off, vertical and not aiming for long-term impact, it is a prime example of action that goes beyond the mitigation of impact of future disaster and conducting traditional relief earlier.

The case study makes a point that it is crucial to do proper dissemination of forecast information for ensuring buy-in and acceptance in communities (Ibid, p. 11). In regards of the action, the case study report points that *“There will always be a short time lapse between localized climate forecasts and the need for action, more thought is needed as to how to manage this going forward.”* (Ibid. p. 12). This narrows down the fact that, if and when positive reinforcement is to be done, it needs to rely on agreed triggers and well drafted SOPs and understanding of target group demographics like in any other forecast-based action. Otherwise, either the window of opportunity is lost, or the actions might become regret actions (wrong seeds, wrong timing, wrong cultural approach, wrong target group). Intervention selection is also crucial as learning point shows, *“This strategy (diversified seeds with nutritious and potentially profitable crops) is shown in a longer-term livelihoods programme currently under way in Tseikuro, Kitui. This begs the question of whether it would have been better to offer seeds of different crop varieties. Had this been done, it would have supported the broader aim of diversifying the crops grown in the area and been in keeping with approaches KRCS is actively trying to promote in other programmes. Equally, farmers in Kitui frequently recycle their harvests for the following season and hybrid seeds cannot be recycled.”* (Ibid, p. 14)

In the interviews K11 raises Kitui case as relevant example for long-term approach and also notes the issue of communication and dissemination. One needs to be really careful not to make generalization based on a single case. If you plant the same seeds with different forecast, or if the forecast fails, results could be catastrophic. Two other points raised by informants on the dissemination of forecast information relate to proper understanding and use of the forecast data (K11) and on the timeliness of forecast data in terms of action (K5, K8 and K11). On the first point, K11 talks about the difficulty of explaining the probabilistic nature of forecasting and thresholds to audience not trained in such concepts. The language is difficult and it's not only an issue of education and level of literature etc. as the same applies to university students in Europe as demonstrated by K11 in their recent exercise. The forecast information needs to be both case relevant and readable in the given context, as was also reflected in Jiri et al. (2016) for mainstreaming of use of scientific forecasts in Southern Africa among subsistence farmers. According to K11 it is also relevant to acknowledge that people have very different levels of risk averseness.

On the second point of the timeliness of information and its link to actions' success, K8 says that *“if there's more information at the local level that could help the farmers to really understand what the rain forecast is going to be then of course it's going to help the farmers. At the same time, what we've really observed for the past few years and it's definitely linked to the climate change, is the complete unpredictability of the rains and the dry spells are literally a killer.”* This is meaning to say that if you plant based on information that turns out false, you lose crops because of the intervention. Staggering or spreading your planting over a period of time is one proposed mitigation measure by the same informant when talking about Southern Africa. *“There's no model currently that can accurately anticipate a dry spell in mid-January or beginning of February”* (K8). Furthermore, while discussing the so-called high frequency monitoring for UNDP in Zimbabwe (ZRBF, 2019), K8 notes the need to have good quality data fast enough (real-time) and have capacity to act with agricultural

inputs timely. *“If the dry spell continues to February, the problem is going to start to be reported in March and it’s far too late and you missed all your options of quickly acting and quickly distributing agricultural inputs to the farmers.”* (K8) This is echoed by K11 noting the same issue of long time required for collecting data from community level to district level and combining and analysing it. What K11 is putting as one option is the use of community volunteers in collecting data at community level in cost-effective, simple and sustainable way: so-called community-based surveillance mechanism. Similar mechanism is recommended in Roadmap for a FbEA system in Zimbabwe. The probabilistic forecasting for seasonal disasters is low and thus the report recommends combined monitoring of societal, environmental, community and market conditions and constant monitoring. Also Red Cross Livelihoods Centre’s Household Economy Security (HES) is recommended. (Red Cross Roadmap, 2019, p. 20) K11 acknowledges however that it is not an easy task: how smartly and quickly is it possible to assess data and not lose time in compilation and analysing?

There are similar discussions on target group selection criteria in Kitui as is in the case of Mongolia on herders’ resilience; who is capable enough for the resilience actions and how do you frame the actions to different interventions (humanitarian, lifesaving, resilience, positive reinforcement). *“Key criteria for selection were that participants must be capable farmers with two acres of land available.”* (KRCS, 2016, p. 15). The MRCS EAP (2019) defines vulnerable target herder to having 50 – 200 livestock. Relevance of this to impact of actions for Mongolia is discussed in next chapter.

In general, the Kitui case study report is cautious on the impact but at the same time indicates general increase in yields. This is similar, albeit not in so many details as the WFP report on their so-called Small Grains project under the FoodSECuRE initiative in which’s projection the food security and economic stability was slightly less impacted in communities applying more diversified cropping. (WFP, 2017) Thus there is some evidence base on straight forward agro-input interventions linked to rainfall forecasting that could be included as a component to forecast-based action for no-drought scenario. As Kitui project was first of its kind intervention, the report notes a lot of communication issues related to both explaining to target groups and framing the intervention as forecast-based financing. Both are noted as learnings and needs further investments and research.

4.3 Scope and impact of forecast-based actions in Mongolia

The case of Mongolia is a textbook example of forecast-based financing that aims at earlier, more targeted pre-disaster actions to mitigate impact of impending disaster and building resilience of target groups. The lack of holism and sustainability of actions from the target groups’ perspective becomes evident when you look at the ways different actors responded to the crisis. None are really targeting the underlining issues nor adding to skills or resilience of herders. The humanitarian practitioners, in their attempt for nexus, could identify better who they will target and with what actions. While they successfully target most vulnerable, all likelihood is that the same target groups are vulnerable again next winter and definitely during next dzud. What makes Mongolia case different from traditional disaster response is that it is not so much about life saving than livestock saving. The activities are targeted to ensure resilience of the livelihoods. The herders, in all likelihood will not die of hunger. They will eat or sell whatever livestock left and migrate to urban or peri-urban settlements after losing too many livestock which eventually breaks the camel’s back. (IOM, 2018)

The forecast-based financing operation of the Red Cross in short was that “*MRCS (Mongolian Red Cross Society) targeted the 40 most-at-risk soums (districts) in twelve provinces, based on the risk map. The intervention assisted 2,000 herder households with unrestricted cash grants of USD 100 (equivalent the monthly minimum wage in Mongolia at that time) in December 2017 and with animal care kits delivered to the pastoralists in January 2018. The kits included mineral blocks, hoof ointment and fish oil – supplies that do not require veterinary training to administer and are well-known and used by herders. The intention was to provide this essential resources in time before winter conditions would reach their most extreme and animals would become weak (Red Cross impact survey, 2019 p. 4)*”.

FAO had more diversity in their actions with in-kind support (feed, nutritional supplement) and conditional cash (through destocking). FAO reached 504 rural households and 504 urban households. Their intervention to herders i.e. the rural households was pelleted concentrate feed, animal health kits and cash through destocking. The amount of animal feed depended on the amount of livestock the household had but was an average 670 kg which equals ca. USD 190 in value. FAO did also divert destocked meat to vulnerable urban households, thus spreading the impact of the operation to wider range of target groups. (FAO, 2018b and Jones, C. and Lombardi, N., personal communication, October 1, 2019). Table 2 below summarizes key specifications of both operations. Quick overview of the Start Fund operation in Mongolia in early 2019 shows the same objective of just bridging over the harsh season with financial aid and animal feed support Start Network, 2019b). The evaluation report of the operation was not available by the time of writing this thesis.

Table 2: specifications of the Mongolia harsh winter operations (FAO, 2018b, Red Cross impact survey, 2019)

Actor	Total budget	Targeted rural hhs	Cash per hh	Feed per hh	Animal care kits
Red Cross	USD 337,000	2,000	USD 100	NA	Yes
FAO	USD 290,000	504	USD 56*	670 kg**	Yes
* Via destocking of two animals					
** Equallent of USD 190 in value					

In case of Mongolia, different actors had slightly different target groups, albeit the intervention was similar (cash/feed, animal care supplies). Red Cross by definition targets the most vulnerable and this is reflected in their language, “*traditional Red Cross vulnerability criteria, poorest of the poor*” (K1, K6). The Red Cross impact survey (2019) notes that the operation targeted most vulnerable as demonstrated by survey: “*FbF beneficiary households in the sample had a significantly higher proportion of family members with a disability than the comparison group.*” FAO targeting criteria is not evident from their impact report, but the targeting was conducted in collaboration with the Mongolian Ministry of Social Development who provided the list of vulnerable herders. (FAO, 2018b and Jones, C. and Lombardi, N., personal communication, October 1, 2019)

The target group for Red Cross operation had low average monthly non-herding income (USD 59 i.e. 59% of the cash grant given, (mostly) consisting of child and disability benefits). Practically all bought hay and fodder with the cash they received. The Red Cross impact survey notes that “*The absence of FbF cash assistance does not appear to have impacted the comparison group’s ability to buy animal fodder in preparation for the Dzud.* (Red Cross impact survey, 2019, p.8). Both targeted and comparison households took loans (43% and 37% of households respectively) and the median loan was from 2 mio to 2.5 mio MNT, or

10 times more than the grant. Survey was not able to properly measure payback status of loans. Loans were largely spent on hay but also on items in category other with diversity like fuel, generators and repairs etc., all things that are needed to operate herding.

What is important to note here that the cash intervention amount, albeit relatively high as a one-off distribution, was low compared to the needs of households. It is relatively tempting to infer that either giving larger grants to less families or linking disadvantaged households more with low- or no-interest loans could yield more impact to the individual families. As K6 puts it, *“If we are giving people 10% of what they would be taking out in a loan anyhow, can we really expect to see large differences. But then the money we do spend, we do see it’s per households very small, but we still do see statistically significant differences. And that’s even though the impact is less than we might have thought, it’s still something. And I’m sure it’s valued by the people who received this support.”* K6 continues to consider that as loan is already existing as private sector driven coping mechanism, scaling up this with low interest schemes etc. would also have potential impact. Then the risk would be carried by herders themselves which could also be seen as a way of increasing ownership.

When discussing impact of disasters K6 says that vulnerability and reasons for migration are somewhat poorly understood. The IOM study that surveyed 1,000 migrant and non-migrant households conclude that *“internal migration in Mongolia is largely driven by unequal economic and social development between areas of origin and destination, that is urban as against rural”* (IOM, 2018, p. 45). In line with Murphy (2011), the reasons are not so much to do with events or harsh conditions but are part of wider societal change and the IOM study goes into recommending a number of social-policy actions to mitigate the trend. It is safe to assume that simple means as small cash distribution is not sufficient for increasing the resilience of herders, as also the Red Cross impact survey (2019) show and informants confirm (K6, K7). The target herders need far more money to suffice, and fundamental support to lifestyles, bigger livestock units or transition support (via destocking for example) and proper social-benefits schemes etc. What the beneficiaries acutely need during harsh winter is to ensure that their livestock has hay and feed and for this there are options, otor, hay reserves etc. which are not part of the interventions of humanitarians at the moment. At the same time, especially the families with smaller livestock headcounts, need wider employment and socio-economic possibilities.

Another informant (K8) made a notion for Zimbabwe that challenges the blanket solution targeting also used in Mongolia by comparing the droughts of 2001 and 2016 saying that the latter was much worse in impact because *“the country has really gone down the past fifteen twenty years now and people’s capacity to, people’s resilience capacities are very minimum now and they can’t absorb any tiny little shock.”* (K8) This is recurring and fundamental notion that reducing vulnerability requires deep socio-economic understanding and targeted actions. It is reflected both in literature and by informants, but it is not nearly as often as needed addressed in planning the actions. This is understandable as K8 later puts it while discussing about Zimbabwe and NGOs potential to address complex socio-economic vulnerability. *“It’s so far beyond our sphere of control because it’s a lot to do with critically unstable political situation and corruption and macro-finance issues.”* (K8)

Zimbabwe is indeed very complex setting, and it is quite evident from many of the informants (K2, K4, K5, K8) that one should be cautious in taking up too big of a task with forecast-based actions and on the other hand be ready to assess what really is feasible (K2 and K8 especially). K8 describes a resilience building programme in Zimbabwe that for the past

three years has focused on diversification of means of production and means of livelihood in the agricultural sector but is missing the aspect of general macroeconomic situation. K8 continues to suspect that the economic crisis is actually reversing the impact of the programme so far.

Red Cross Roadmap (2019) for Zimbabwe emphasises in general a focus on shifting from disaster response to disaster risk reduction at a government level. There is a recent comment e.g. on News Day (2019) for the same call for localization, assessment and understanding of risks, increasing preparedness and creating mitigation fund. Red Cross conclude in the report that *“Even if DRR is not the focus in FbEA (Forecast-based Early Action), its crucial role in reducing the risk of natural hazards cannot be neglected. In many cases, the socio-economic benefits of implementing actual DRR and general development measures substantially outweigh the cost of disaster response, and most likely also early actions. This applies both to food security and cholera outbreaks, as human and infrastructure vulnerability are the main reasons behind large-scale disaster impacts.”* (Red Cross Roadmap, 2019 p. 6) This is a strong call for transformation of culture of operating and focus on vulnerability reduction. K5 talks about supporting and diversifying available livelihood means in making agricultural communities less vulnerable and prioritization of development agencies projects and interventions based on forecasts i.e. tailored and scalable solutions. This is a case of framing of vulnerability in general and a matter of how you justify your actions and it underlines the need to really understand socio-economic situations and in essence shows the limitations of purely climate change adaptation focus.

Coming back to Mongolia and Murphy (2011) the question is if some families are indeed too vulnerable to be able to sustain this kind of recurring cycles of harsh conditions? What K6 raises at one point of the interview is a crucial and elsewhere unmentioned issue of *“true herders”*. K6 wonders if 200 heads of livestock criteria is artificial and is relying only on *“information you have which is how many animals do you have, (without knowing) who’s doing what in this family”*. According to K6 this is not sufficient as *“(it is difficult to know) who is really subsisting of their herd and who has already started to make this transition out of herding, the small number of animals reflects that they are transitioning out rather than they are on the sort of brink of holding on”*. This goes back to questions on the relevance of understanding socio-economic conditions both at community and society level but also at the level of target households (including if the family has other means of livelihoods, relatives migrated etc.) in order to plan for meaningful interventions.

In their impact assessment for Mongolia operation FAO make a couple of relevant points on the wider socio-economic and environmental reasons for vulnerability. *“In the transition to a free market system, the abolition of controlled herd sizes fuelled overgrazing. Exports declined and the meat processing industry all but collapsed. Many herders narrowed their income base to focus on raising goats for cashmere. But when prices fell, herders bought more animals to stabilize their incomes, leading in turn to more overgrazing”* (FAO, 2018b, p. 5). They claim to consider wide socio-economic vulnerabilities in their targeting, coupled with forecast information (Ibid, p. 9). FAO informant sees livestock as both social and hard capital of herders and does make a point on the potentiality of destocking. *“In the case of especially of sizable herds, you are diminishing the weight that the household needs to deal with in terms of the number of animals that they have to support throughout the drought or throughout the winter. You are preserving the core breeding herd and maybe they sell some other animals, a number of other animals that they don’t necessarily need to re-establish the herd after the disaster has passed.”* While this is definitely a resilience mean, non-negative

or even positive coping mechanism, it does require the mentioned sizable herd in the first place and the impact of just destocking two heads of livestock is questionable.

Looking at the Red Cross operation, the question remains on whether long-term outcomes were achieved, especially since survey data was collected already in May 2018 and thus only capable of responding to the status of short-term outcomes as set out in the theory of change for the Mongolia forecast-based financing early action protocol (Red Cross impact survey, 2019, p. 4). Of the short-term impact, the reduced animal mortality and morbidity were achieved but no significant change in stress and psychosocial trauma was evidenced nor was greater economic well-being achieved directly as the target groups resorted to loans (Ibid and K6). Looking at the key findings of evaluation of the Red Cross operation, K6 says “*I think the results are definitely less of an impact than we had expected. And if you compare to the results that FAO has produced, the impact is much weaker*”. Informant continues to discuss that in many cases, when looking at the impact of forecast-based financing, we are disappointed of the results but we are also cognitively biased to compare them to the potential value that the humanitarian response operation would bring to target group, or what we assume it to bring. And this assumption is less likely very accurate, or evidence based. It is also difficult to compare because as K7 puts it, “*In the previous experiences we would respond after the household lost their livestock, we would give them humanitarian aid. For the FbF approach, we are providing assistance before they lose their livestock, we are actually preventing them from losing their livestock. I am not sure, if both cases could be compared.*”

What the Red Cross intervention did manage to do was to reduce the mortality of animals and improve offspring survivals (Red Cross impact survey, 2019, p.13). There is huge importance in timeliness of assistance (ibid., p.15). Effectiveness of animal care kits is assumed but not conclusively verified. Scalability of intervention could and should be explored. The Red Cross impact survey (2019) noted that no herder family had to completely abandon and move to urban areas which is perhaps more telling of the less severity of the winter itself than of the effectiveness of action.

What makes FAO approach more efficient? It is difficult to say because as K11 also states, the methodologies were different between the two assessment. This relates also to coordination as it is important to understand the results of different actors’ operations in a same way. The FAO’s Mongolia impact assessment does not use their Resilience Index Measurement and Analysis (RIMA) which is an index that aims to measure if the resilience changed, stayed or was being reinforced through anticipatory approach to crisis (FAO key informant). But the report does use anecdotes of increased resilience (FAO, 2018b). The impact assessment uses a lot of words like dignity or self-esteem when talking about resilience and empowering of the herders. What is interesting and conflicting to what most of the Red Cross’ target families did with their cash is what one FAO beneficiary said of the use of the USD 50 from destocking-for-cash programme. “*With the money, we were able to buy pain and high blood pressure medications for my mother, replenish the stocks for heating our home and pay the school fees for my daughter* (Ibid, p. 15)”. Related to this, only 1/3 of both Red Cross evaluation groups reported difficulties in necessities (Red Cross impact survey, 2019, p 11). It would be extremely interesting to see similar statistics on use of the FAO money as Red Cross impact survey had, as the main difference between the operations was that FAO recipients did receive feed for the animals directly, thus to some extent lessening the need to buy.

FAO assessment (FAO, 2018b) claims that there has been an increase in number of animals by almost third since 2005 and states that the current amount (22 animals per capita) is nearly double the land capability. Furthermore, they note that *“For the poorest herders, these animals are the key base from which to build recovery and resilience. However, a longer-term perspective must be taken into account. The sustainability of herder livelihoods depends on more efficient livestock management and a reduction in the environmental and economic impacts of over-grazing.”* (ibid., p. 27 – 28) K7 was also talking about the need for reduction in total number of animals: *“our government is taking some actions. They are trying to reduce the number of livestock and improve the quality. Quality better than quantity, we don’t want 60 million animals, we really need highly productive, say 30 million animals, that would still be equal to 60 million animals. I think the government is trying to put a tax on herders. If you have more livestock, you pay more taxes. Because our Mongolian pasture capacity over national country is decreasing. It’s very critical and desertification you know, there are problems.”* This can’t be ignored when planning interventions in Mongolia for herder resilience if we aim for interventions and livelihoods to be sustainable. Red Cross has a perfect opportunity here, as also identified by K7, to link their interventions to their social care work, support to alternative livelihoods, small enterprises, vocational trainings etc. or the so-called sustainable livelihood projects (K7). The identified vulnerable beneficiaries could be linked to additional support forms if not directly supported with the forecast-based initiative. In general, the MRCS informant seems to be slightly more in favour of linking forecast-based financing to long term programming than other Red Cross representatives.

K9 talks about the long term aspect, *“Short term anticipatory interventions are very important component of humanitarian programming that we are trying to promote but not as a solution to all, as an important complement so that you are not accumulating all these humanitarian needs to the point where you need to do very costly humanitarian assistance and recovery, but you were doing something beforehand, so it’s an important component of humanitarian programming but of course need to go hand-in-hand with things like disaster risk reduction measures and development measures that address the structural issues of why these communities are so exposed to these hazards and why they’re so vulnerable because in most of these cases obviously we are talking about chronic issues that have to be resolved through longer term investments, longer term planning and that are not going to go away through with four to five month or less of early action interventions.”*

The above is an important quote. What all humanitarian actors should consider is what are the structural actions the organization can take in order to truly impact the vulnerability in the long term. What is the transformation potential from humanitarian response to development and how can we break the cycle of dependence instead of just responding to a crisis after a crisis? The problem is two level: 1) you are acting on too low of a trigger or without triggers yet being met and thus undermining the forecast-based financing model; or 2) focusing on the large scale impact of disaster and missing the nexus potential i.e. acting when it is already too late to do meaningful anticipatory interventions.

So, the key question remains: is there potential for real transformation? While resilience can be broken down to adaptation, anticipation and absorption, real transformation is not mere capacity building or vertical fix to an impending issue but rather *“an approach to holistically and fundamentally build, reshape and enhance people’s capacity to adapt to, anticipate and absorb shocks and stresses”* (Bahadur et al. 2015, p. 48). In very complex scenarios like Zimbabwe, this could be anything from free and un-oppressed democracy to rights of land ownership, access to schools, social-policy reforms etc. In Mongolia the case with herders

is in a way slightly more straightforward but would potentially need reshaping of actions (from early response to increasing skills and capacities) and societal change on how herding lifestyle is maintained and supported by society to provide right environment for small-scale herders to continue practicing.

4.4 Need for coordination

As in the case of Mongolia, when there are number of forecast-based financing initiatives active or planned in a given context, the need for coordination between actors becomes imperative and this is reflected in responses of all informants. At the same time, the actors are in competition because sources of the humanitarian funding are basically the same (states, UN, EU, private foundations, public donations etc.). K5 justifies working together, *“If we work together not only are we going to get better, bigger results for these projects (...) if we really are looking to change the way humanitarian world is structured and response to disasters, then we’re going to have to work together in order to get the types of evidence and the types of impact that we want to see. In any of these countries that we are going into, (if others) have already developed (e.g.) triggers for drought, that’s excellent.”*

Coordination is deemed important when discussing with informants on cases like Mongolia and Zimbabwe. Mongolia’s potential is perhaps greater; there is one major disaster which functions according to same pattern time and again. Although the country is vast and that creates logistic challenges, the target population sizes are limited. The humanitarian community is tight, the government is leading the national level disaster management and the structure is functioning at least on a national level. At the same time, Mongolia witnessed issues in coordination, although some of that could be due to novelty of the mechanism in Mongolia.

In winter 2017 – 2018 Red Cross and FAO considered that the triggers for dzud surpassed and launched an operation. Start Network affiliates did not raise an alert. The following winter (2018 – 2019) Start affiliates Save the Children and World Vision raised an alert and received a grant. FAO and Red Cross did not react because they considered and forecasted the winter to be quite mild (K6). Why was this perceived differently?

In this particular case the main issue is in interpretation of the base modelling, the dzud risk map. As K6 puts it, *“the dzud risk map is confusing. Every year it has been produced it shows some level of having very high risk but what that very high risk means is not what maybe a practitioner would consider very high risk. It is very high risk of livestock mortality going above 10%, and the natural die-off rate is 6%, so the difference is not huge, it’s not what most humanitarian actors would consider any kind of an emergency. But when you see on a dzud map, large areas covered in red, it feels very alarming.”* In short, this signals that the potential impact of impending disaster should go beyond a threshold that if the forecast realized, it would prompt response afterwards (i.e. when animals start dying). On the other hand, the Start Network rationalized that although the geographic scale was not that of the previous winter, there might be localized pockets of very harsh winter prompting more localized early action. When discussing the case and rationale for launching operation in 2018 – 2019, K6 was quite neutral, K9 was critical but cautious in wording, K7 was indifferent and K10 was clearly not satisfied with the outcome. The informants are quite unanimous that the main issue is in that there ought to be consensus on the triggers and thresholds for acting (K6, K7, K9, K10).

The lack of consensus is a problematic issue especially when there is otherwise functioning coordination mechanism for humanitarian response. In 2017-18 there was a dzud operation by number of actors and then the following year it's two different international NGOs responding while the main national humanitarian organization, the MRCS, was not reacting. That can potentially create confusion among partners and recipients of aid and perhaps even undermine the action. MRCS informant said, *“There is a humanitarian country team, it consists of all international and national humanitarian organizations and also national emergency management and UN agencies. And if we are implementing a project, then all humanitarian country team members have to know that we are doing this project in this province for this purpose to avoid duplications. ... we only provide humanitarian assistance if it's requested by the government. If the government or local people can handle it themselves, there is no need for us for assistance, so that's why we did not provide any assistance.”*

K6 sees the Red Cross and FAO alignment in general very well operating. K9 also notes this but the Start Network case keeps coming up as in K9's quote on alignment *“so therefore we were not in accordance and we were trying to configure the country process dialogue where they could agree all together between Mongolia Start Network, Mongolia FAO, Mongolia Red Cross that they should not activate, because you know if you activate for whatever risk level it obviously renders the whole approach questionable because any of you can activate every year. So, there needs to be a sort of an understanding at which point that should consider potential humanitarian emergency.”*

Maybe the best would be to have same triggers but at different levels: allowing local level actions to be financed in milder conditions, including socio-economic interventions, all the way to the full blown dzud forecast with large scale response. Another crucial issue in coordination is the targeting criteria for beneficiary selection. We already discussed that the actions need to be aligned to the different needs of different groups. But using very different criteria in choosing who gets support, potentially causes confusion and coordination issues. *“I think probably the more significant besides the action is, that they used different targeting criteria. So, their household they distributed to were relatively better off than the ones we distributed to. And, so I think if anything, it would be the targeting criteria that would be a bigger, will be more challenging.”* (K6) Beneficiary targeting criteria could be depended on action. You could target more well off, more capable herders with different actions. In this operation, the actions between FAO and Red Cross were, as mentioned similar; both distributed veterinary supplies, both distributed cash (unconditional and in exchange for animals), there were some differences between the number of items distributed in kits (due to budget reason) but the contents were streamlined by FAO livestock experts. Main difference was the direct distribution of hay by FAO. (K6, K9)

4.5 Financial sustainability, donor drivenness

The anticipation agenda in the humanitarian sector is gaining a lot of momentum. In his article for the World Economic Forum Annual Meeting of 2019, UN OCHA Secretary General Mark Lowcock claims that first step to fix the humanitarian funding gaps is to shift from responding to *“a default position of anticipatory prevention”* (World Economic Forum, 2019). The same trend is reflected with the informants who mention this being a topic in most of the fora and platforms of practitioners. The interest and funding willingness are to some extent evident in the donors' languages. K3 notes that the government and institutional donor base for their forecast-based action envelope has increased significantly in a year. K3 continues, *“There are lots of donors approaching but we have said (...) let's be careful and*

let's think this through, so we better don't take more than we can (absorb) at the moment". That quote concludes the concern of the informant that this needs to be well planned and effective mechanism. If not, then the funding trend or hype can bring about the obvious threat of donor drivenness.

The list of humanitarian organizations who have funding envelopes especially for anticipatory action is growing. German Federal Foreign Office has fund for partners using an SOP that includes a forecast-based finance trigger (Wilkinson et al., 2018). IFRC has Fb Abu DREF, FAO has Special Fund for Emergency and Rehabilitation (SFERA), Start Network has an Anticipation Fund and World Bank Pandemic Emergency Financing Facility. (Coughlan de Perez, 2018) One of the major humanitarian funding mechanisms, the UN CERF (Central Emergency Response Fund) is also under paradigm change. Recent paper from Overseas Development Institute (ODI) suggests that CERF could and should be used to fund early actions to humanitarian crises in a formalized and pre-agreed manner (Pichon, 2019). This view is echoed e.g. by informant K5 who likens CERF to DREF in its potential to create a specific window for anticipatory actions.

While Start anticipation fund is one of the most long-standing types of anticipation funding, it has its limitations. Start informant raised the fact that *"Start Fund (is best suited) at small and medium emergencies, so it's quite good for flash flood but for drought which is very big in terms of time and space, it's not really a suitable mechanism, the interventions (with Start Fund) are 45 days so it's just a bit too small for drought"*. This is why Start Fund is also working on concepts like Drought Financing Facility (DFF) to better respond to slow-onset crisis. The quote also summarizes quite well the fact that the traditional response and even early action mechanisms have different modus operandi than what is required for long lead time, slow building, forecast-based action, let alone for true resilience building approach that is not evident in fast interventions.

FAO informant says on their funding mechanism, *"We are talking about exactly the same kind of an approach; combination of trigger based country system and financial modality that allows rapid disbursement of emergency funds in an early timeframe triggered by forecast, not waiting for the declaration of emergency and not waiting for the assessment of emergency needs."* The main differences between Red Cross, FAO and Start Network are in the release mechanisms: Red Cross uses more rigid, scientific triggers; Start uses discussion process; and FAO is somewhere in between with qualitative thresholds and human judgment.

Another modality, where existing fund is changed or geared to respond to crisis is the so called crisis modifier which for the past twenty years has been incorporated to larger programmes of donors like DFID, ECHO and USAID to allow implementing organizations to swiftly respond to crisis within their operational area and budget (Peters and Pichon, 2017). Albeit this is not without its challenges and limitations as Peters and Pichon (2017) conclude, it is a mechanism that at best can address localized crisis with the efforts, resources and knowledge already in place by humanitarian or development actors. According to one informant, same mechanism is in place e.g. in the Zimbabwe's ZRBF (Zimbabwe Resilience Building Fund) programme, *"There is a crisis modifier so basically every time there's something that's starting to become serious, they release a bit of money to address the emergent effects so were are not reversing the gains from the long term development work."*

Increasingly government funds in drought-stricken countries for various preparedness funds such as Ethiopia's Productive Safety Net Programme or Kenya Hunger Safety Net Programme, are aimed for scaling up social protection. In Mongolia, biggest potential money-wise comes from the government who, as according to the disaster law of 2017 must allocate 1.5% of the total budget at local and national level for disaster risk reduction albeit this is not being enforced yet (K7, Wilkinson et al., 2018). That fund could be used in support of herders in form of money and hay, coupled with training and support with herding practices. The approach of combining monetary or material support to skills training could definitely be part of slow onset early action as K2 also highlighted. The problem might be that while K7 explains there are a lot of discussion at the moment on the socio-economic issues, the NEMA's (National Emergency Management Agency) DRR department responsible for early action might miss that in their contingency planning. On the other hand, this would be a great place for advocacy and cross-sectoral work from the local Red Cross.

Using government funding would create even more pressure on the accuracy of actions (justifying the use of resources) but would also create needed mandate to address root causes. Likewise, use of local organizations' own fundraising instead of international donor fund would create perhaps more ownership. As K2 notes when talking about sources of funding for local actors, *"If it's your own money, you take things more seriously."* K3 also confirms that at the moment their forecast-based actions have been driven and planned by mostly European based partners in the driving seat. This is a wider issue in the field of humanitarian response and discussed among donors, practitioners and researchers. From global perspective, it's addressed in the localization agenda. Informants acknowledge this pressure (donor driven, top-down) that in worst case leaves the non-national partner de facto to obtain the responsibility for fundraising and eligibility of actions. However, K3 is also hopeful and realizes that *"sometimes it's necessary that it starts like this (as partner driven process), but hopefully (as) you have (more) to show that it works and how it works. Someone has to take the risk until there are others who are seeing the added value and saying I'll embark on it."*

The Mongolia case is an interesting example as for the Red Cross there was first a bilateral operation between the British Red Cross and Mongolian Red Cross Society which then in a way resulted to the first FbA by DREF EAP for slow onset disaster. The EAP was launched in August 16, 2019 (it was in the making during interviews). Based on the interviews (K3, K6 and K7) and reading the MRCS Early Action Protocol for dzud (MRCS, 2019), the drafting seemed to have been quite localized and nationally lead process (using the MRCS knowledge and experience, including a good diversity of local partners and based on understanding of the vulnerability scenario). However, as noted in the EAP, *"Climate Centre is to provide MRCS with assistance for developing the EAP in which CC will be mainly focusing on the trigger mechanism and activation where valid scientific evidence is required (MRCS, 2019, p. 7)"*. The role of Climate Centre was raised in general discussions about the Red Cross funding tool and K3 did note being aware of the potential transparency issue of having the same people helping preparing triggers when drafting the EAPs and later validating them as part of the validation committee. Namely this means the staff of Climate Centre. This is a practicality issue (small circles and low availability of specialized experts to commit time) that can easily become a biased issue when talking about allocation of financial resources. The same criticism can be directed to other actors. Start Network justify their localized and information gathering process by saying that *"using operational humanitarian experts and people who are working and living in that context, making the decisions on how to use funds, I think that type of process is the best that you can get for complex situation"*. The concern I have is biased decision making and internal competition within the network but also, is it

really then improving the forecasting or analysing skills of the local actors? Or is it a way for external partners to make the international processes of allocating funds more efficient?

Looking at the MRCS (2019) EAP for dzud we come across the main sustainability issue of the DREF mechanism and in general of these international funding envelopes. It is notable from the EAP budget that they go up to the maximum of CHF 250,000. Only less than CHF 40,000 (15.5%) of the budget goes to readiness, 0 for pre-positioning (because cash is the chosen intervention) and the rest is allocated for early action of which CHF 187,000 is for two main interventions towards beneficiaries; Procurement and transportation of livestock nutrition kits and Unconditional cash assistance, targeting 1,000 households. The issue of funding sufficiency becomes evident. The British Red Cross supported action in 2017 – 2018 targeted 2,000 households with USD 337,000 budget, direct cash grants alone were USD 200,000 (Nyamkhuu Ch, personal communication, October 4, 2019 and Red Cross impact survey 2019). In addition to British Red Cross bilateral forecast-based financing project, there was a post-disaster DREF operation in 2018 for ca. CHF 250,000. In the previous two years, early 2017 and early 2016 there have been DREF allocations of ca. CHF 150,000 which renders sustainability of this EAP questionable. (IFRC, 2019b) The IFRC EAP summary reads, “*The conditions for trigger have been calculated by the Climate Centre to ensure it’s only activated for extreme event.*” (IFRC, 2019a, p. 2) In the EAP, there is only money for one-off intervention during the five-year period, and if we assume harsh winter (actual dzud) happening within that five years, then the budget is not enough for response and needs to be topped up. In the last major dzud of 2010 the emergency appeal budget was just over 1 million CHF. In addition, Finnish Red Cross diverted ECHO funds of ca. EUR 600,000.

The logic above fits to the chain explained by IFRC informant that EAP can lead to launch of imminent DREF and possibly Emergency Appeal (in case of large scale dzud) and it demonstrates how IFRC sees this as a way of making humanitarian action earlier in the timeline. As the IFRC informant puts it, “*of course we hope that by implementing early action protocol we will see some mitigation or reduction of impact because that’s the whole idea behind it but in some cases, we know still there might be a need for response operation*”. At the same time, the Mongolia case in general, with yearly DREF allocations, challenges the eligibility criteria of DREF. As same informant notes, “*if it’s recurring drought every year and the DREF team has already seen that every year that country is requesting funding for imminent DREF, you know of their requirement of DREF is that it is not a recurring disaster.*” Maybe MRCS could benefit more from some kind of annual allocation for early action to mitigate any impeding impacts of poor animal feed situation (poor summer), coupled with awareness and training activities towards the vulnerable herders instead of preparing for a small-scale response once in the five-year timeframe of the EAP.

What IFRC says is that they want to see institutionalization of anticipation work, but the tools are limited at the moment, namely re-applying to the five-year EAP or diversifying and creating multiple EAPs (as they are per hazard). As was noted, there are cases where the EAPs are pushed by partners and are quite stand-alone but IFRC informant is also highlighting opposite examples. “*In the case of Ecuador, we have seen that the (Red Cross) national society (...) have clearly outlined in their (early action) protocol how this becomes integrated into their response and preparedness mechanisms*”. Informant continues that IFRC is trying to ensure that all EAPs contribute toward their Preparedness for Effective Response (PER) mechanism and hopes that forecast-based financing’s advantage might be seen in the improving of risk analysis, preparation and in contingency and anticipation planning with actual concrete actions, not just earlier launching of DREFs and emergency appeals.

It needs to be noted that FbA by DREF mechanism is extremely new (launched in May 2018). Informants note it needs more learning and understanding of impact and effectiveness, proper MEAL (monitoring, evaluation, accountability and learning) processes etc. IFRC informant reminds that *“Forecast-based financing has been around for like eight years, but I think only now we are seeing this systematic evaluation and how, there is still not even an agreement how we are going to evaluate (and) what we want to evaluate”* But there is practitioners’ group across organizations who deal with this, including in the global fora. IFRC informant calls for patience in making conclusions for such a new approach, which is a good reminder for me as well as practitioner and researcher.

5 Conclusions

The main hypothesis was that forecast-based financing could have most potential for increasing resilience and sustainability in slow onset, climate driven hazards to livelihoods and food security. The forecast-based financing mechanism seems to be currently geared, and proved by evidence, for mitigating impacts of fast onset disasters, but the trend is more towards addressing slow onset disasters and gaining long-term development benefits. This is evident to some extent in all of the organizations included in this study albeit there is discrepancy between the focus on humanitarian aid and early action (response) and on anticipatory actions and development potentials. The interviews and materials show that the potentiality for the development impacts and long-term transformation is there, but it is not perceived in the same way across practitioners of different backgrounds. There is a lot of variation among practitioners on how to approach the dichotomy between response and development. Some informants even rule out the longer-term impact seeking approach. However, the majority of the informants do see some potential in linking the forecast-based financing mechanisms to the nexus from humanitarian to development.

The research question was two-part. First, I was asking, is the forecast-based financing mechanism successful in prioritization of actions in a way that best address the needs and resources of vulnerable populations? It is evident that long lead-time increases the possibility for better targeting of actions. At the same time forecasting accuracy and spatial resolution in planning for actions is lower. Informants stressed that increasing uncertainty emphasizes the need for robust, no-regret early actions. This mitigates the risk of acting in vain.

I conclude that currently the actions’ successes are very much measured in response terms which is reflected then into the funding framework. Operations are justified by their direct impacts to yields, livestock and money saved from response. There is some level of hegemony among informants that the mechanism can and should be used for slow onset scenarios with positive reinforcement actions. But the transformation potential that is evident in the literature, is not evident in the cases I reviewed. Forecast-based financing is still used more for effective response, not for addressing the root causes of vulnerability. The entitlement or empowering of a person affected by disaster does not go beyond securing bridge over lean season, avoiding negative coping mechanisms or e.g. better yield or survival of livestock. Localization remains a question mark as some processes are locally led but the nature of funding drives top-down approach.

In second research question I was asking are the actions sustainable and do they bring socio-economic benefits that go beyond meeting acute humanitarian needs? The socio-economic

benefits to target groups are clearly not materializing in the cases reviewed. There is potential, but it is not integrated to actions at the moment. Mongolia is a good example of this. It can be criticized for actions being too narrow in scope, lacking transition impact and not taking advantage of the potential from long lead time. The destocking approach used by FAO in Mongolia was not identified as transition by the informant, but as a mean to help herders to save their main breeding stock, earn some cash and not having to resort to negative coping mechanisms. I would argue that controlled destocking with scale might also have potential in transition if it's done in coordination with government social protection services and include also e.g. skills training.

As few informants noted, it is crucial to plan interventions considering socio-economic context and not only from climate perspective. Framing resilience mostly as climate change adaptation issue is a larger problem within the sector. I find it also evident in the forecast-based financing mechanism and this was raised by informants. Vertical solutions to predicting and safeguarding from extreme weather is not enough to transform target populations out of vulnerability. In case of Zimbabwe, informants strongly emphasize the complex socio-and macro-economic situation as the main source of overall deterioration of development gains. They emphasize that understanding the localized pockets of vulnerability within a country is crucial for understanding risks and consequently for designing relevant actions.

With this limited dataset I can conclude that forecast-based financing at scale is still too early to be launched. Red Cross FbA by DREF's financing instrument's funding ceiling curbs its potential for scale. Start Fund Anticipation Window has temporal and spatial limitations to address large scale, slow onset disaster. However, Start Network has other financing facilities, such as the DFF, in the pipeline. WFP has the most comprehensive and holistic action plan, but it is also in the piloting phase. Straight forward response under forecast-based financing or early action works with all actors that were included in the study but responding with long term and scalable actions to slow onset disaster is not institutionalized yet and is not made easier by different perspectives of actors.

My analysis indicate that sustainability potential of the forecast-based financing is currently underutilized and dependent on institutional donors. Pilots and operations are still very much project based. The international funding envelopes do not offer an alternative to the humanitarian funding mechanisms launched case-by-case. With FbA by DREF, the funding ceilings also limits the sustainability potential that comes from a long action plan (of up to five years).

Coordination among actors and commitment from government to enforce, fund and support the mechanism is the strongest enabler of the scalability of forecast-based financing, as echoed by informants. Coordination between various (non-governmental) actors is deemed crucial by all. New kind of partnerships are needed locally with e.g. government agencies and universities. In both cases, Mongolia and Zimbabwe, there is great potential for coordination but different challenges in implementing it including competition of funding, different mandates and lack of coherence in risk modelling and interpretation of it as well as with triggers and actions. The lack of consensus is a problematic especially when there is otherwise functioning coordination mechanism for humanitarian response. It can create confusion among partners and recipients of aid and even undermine the action.

There is a consensus on the need for being evidence based. As one informant puts it, we need a repository of evidences and cases which is akin to building a puzzle where we figure out

what works and what does not before trying to insert forecast-based mechanism in to a disaster affecting hundreds of thousands of people and costing hundreds of millions USD in response. I would emphasize that for paradigm change we should look beyond shock prevention and response and have more focus on the long term, socio-economic impact. For studying the impact and effectiveness of actions we should ask are the livelihoods really made resilient or do same people need assistance during next drought? Can we support people in transition to more sustainable livelihood when seasonal forecasts continue to show harsh times for the traditional agricultural or pastoralist practices in the region? Can we support transition to climate smart agriculture mindful of forecasts? Can we engage with local government to enforce social protection schemes and support people in transition between livelihoods as the weather conditions are changing?

This thesis could be followed up with field evaluations and further analysis (including quantitative) on the body of documents for looking at these direct results of operations and long-term potentials. To ensure scalability, one could challenge the issues of donor drivenness and availability of humanitarian funding through framing the forecast-based financing more clearly beyond the scope of better and more effective humanitarian response. One should aim for as wide as possible commitment from actors with diverse expertise and mandates to address complex development challenges before they turn into humanitarian crisis.

I end the conclusions with few practical and policy recommendations

- We need pilots and cases that test and justify e.g. cash based early action linked to social protection or use of seasonal forecasting in livelihood resilience to build repository of evidences and cases;
- We need to plan interventions considering wide socio-economic context and not only from perspective of climate driven or external hazards;
- At beneficiary level the actions could be geared up to address underlying socio-economic vulnerabilities and take advantage of the long lead time (skills training, social protection schemes, livelihood support, transitioning through destocking etc.);
- To include meaningful actions to slow onset scenarios, the triggers need to be early enough before seeing impact of disaster (seasonal forecast or based on previous cycles). Actions should be in two phases: 1) anticipatory and mitigating of or benefiting from weather impact and 2) early response;
- With a lead time that goes really long in advance, towards development actions, the forecast-based financing mechanism needs to be reframed for the donors and the sources of funding might need to be reconsidered;
- Coordination and cooperation among actors bring forward benefits of accessing specific, mandate-based expertise, such as the veterinarian and agropastoral expertise of FAO. When mandates are close, like WFP and Red Cross with their humanitarian, response orientated and resilience building *modi operandi*, benefits in scale and e.g. diversifying cash-based interventions to forecast-based financing are clear and should be utilized;
- We could eventually aim for even more holistic approach for scaling up of forecast-based actions, including prioritising large-scale development projects based on forecasts and needs stemming from changing environmental and climatic conditions.

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7 Annexes

7.1 List of materials reviewed

Organization	Title of publication	Author	Date	Description	Source
FAO	Mongolia - Impact of Early Warning Early Action	FAO	October 2018	Internal impact assessment of winter operation of 2017 – 2018	FAO, 2018b
Red Cross	Effects of providing forecast-based cash and animal care kits to vulnerable herder households during the 2017-2018 dzud season in Mongolia	Climate Centre	June 2019	Evaluation of harsh winter operation of 2017 – 2018	BRC, Zastiral
WFP	Forecast-based Financing (FbF) - Anticipatory actions for food security	Mason, J.	April 2019	Brochure on WFP's forecast-based financing initiative	WFP, 2019
Mongolian Red Cross Society	Mongolia dzud Early Action Protocol summary	MRCS, IFRC	August 2019	Full Early Action Protocol for the FbA by DREF	IFRC, 2019
Red Cross	Mongolia dzud Early Action Protocol	MRCS	May 2019	Summary Early Action Protocol for the FbA by DREF	Ibid.
Red Cross	Roadmap for a Forecast-based Early Action system in Zimbabwe and in the Zimbabwe Red Cross Society	Pilli-Sihvola K., Mabumbo, D.	March 2019	Feasibility study for setting up forecast-based financing for Zimbabwe Red Cross Society	FRC, Hatakka
WFP	Exploring projected outcomes of the Food-SECURE small grains project: evidence from Zimbabwe	Giuffrida V.	April 2017	Analyses report on the Food-SECURE project's results in Zimbabwe	WFP, 2017
Red Cross	Forecast-based action in Kitui, Kenya: a case study report	KRCS, BRC, Barr S. (ed.)	May – June 2016	Report on the impact of forecast-based action in Kitui, Kenya	KRCS, 2016

7.2 Summary of conceptual analysis – secondary materials

Concepts	FAO – Impact of EWEA in Mongolia (2018)	Red Cross – Impact survey Mongolia (2019)	Red Cross – EAP for dzud Mongolia (2019)	Red Cross – FbA in Kitui, Kenya. Case study (2016)	Red Cross – Roadmap for FbA in Zimbabwe (2019)	WFP – Evidence from FoodSECURE Zimbabwe (2017)	WFP – FbF for food security (2019)
Lead time	NA	NA	Trigger is set one month ahead of the crisis	Calls for longer lead time	El Niño induced drought has the highest feasibility due to long lead time	Actions need to happen during planting season	Seasonal forecasting, triggers prior to seeing impacts of disasters
Interventions	Destocking, feed for animals and animal care kits	Cash and animal care kits	Cash only	Hybrid maize seeds and skills training	Focus on robust, no-regret early actions e.g. cash transfers or school feeding to prevent harmful coping activities	Planting of drought resistant small grains (incl. sorghum and millet)	Anticipatory actions e.g. soil and water conservation, drought resistant seeds and training on agroforestry and water management
Food security	Focus on ensuring survival of livestock	Focus on ensuring survival of livestock	Focused on ensuring survival of livestock	Forecast data and pre-agreed actions can be used to increase yields and improve food security regardless of disaster	Sees food security as priority for developing a forecast-based financing mechanism	Forecast data and pre-agreed actions can be used to increase yields regardless of disaster not happening	Food security is a key priority for the anticipatory actions under WFP approach
Resilience	Not using actual measuring but a lot of anecdotes and language for resilience building of target groups	Resilience mentioned under long-term outcomes but not met with the operation	Resilience not included in the early action protocols	Potential in such interventions to be used as resilience building activities in long term programming	Recommends linking forecast-based financing into community resilience programmes	Diversified cropping increases resilience to drought	Sees potential in complementing variety of disaster risk reduction and seasonal and climate resilience building programmes
Localization	Coordination with local authorities in targeting (beneficiaries and locations) and in selection of e.g. veterinary interventions	Good coordination with local authorities in planning the response and key role for community level branch offices	Nationally lead process for capacities, understanding of vulnerabilities etc. Triggers defined by Climate Centre	Kenya Red Cross involved in local level. Calls for more dialogue with local administration and localized interventions	Recommends increasing capacity of the local Red Cross as priority and to start with small-scale hazards and low-cost actions	Data is sourced from very local level and interventions are indigenous and are aiming at household level food security in face of shock	Emphasises the importance of local partners and government bodies and includes a focus on their capacity building

Concepts	FAO – Impact of EWEA in Mongolia (2018)	Red Cross – Impact survey Mongolia (2019)	Red Cross – EAP for dzud Mongolia (2019)	Red Cross – FbA in Kitui, Kenya. Case study (2016)	Red Cross – Roadmap for FbA in Zimbabwe (2019)	WFP – Evidence from FoodSECuRE Zimbabwe (2017)	WFP – FbF for food security (2019)
Vulnerability	Vulnerable herders identified with Ministry of Social Development. Actions also targeted vulnerable urban dwellers	Targets most vulnerable herders that are owning less than 200 heads of livestock and meets vulnerability criteria (such as family members with a disability)	Based on vulnerability assessment, criteria set as herder household with 50 – 200 livestock and one of following: single headed, include elderly or disabled person or more than 5 children	In order for interventions to work, beneficiary must be capable farmers and have minimum two acres of land available	Sees vulnerability in Zimbabwe consisting of a complex web of factors and calls for more capacity and emphasis in analysing the vulnerability data	Uses extensively the Comprehensive Approach for Reporting Indicators of Food Security (CARI) in defining the food insecurity level of target communities.	Focuses more on actions and increasing resilience of target groups instead of defining vulnerabilities
Sustainability	Sustainability of interventions is not ensured with specific plans	Sustainability of interventions is not ensured with specific plans	Sustainability of interventions is not ensured with specific plans	Sustainability of interventions is not ensured with specific plans	Collaboration with government, national organizations and major UN actors seen as essential for sustainability and scale	Sustainability not discussed in the report	Sees capacity building of and coordination with national, district and community level partners essential. Also see benefits in linking e.g. to existing social protection programmes
Socio-economic indicators	Considers socio-economic indicators in targeting but not in defining interventions	Considers socio-economic indicators in targeting but not in defining interventions	Considers socio-economic indicators in targeting but not in defining interventions	There are a number of learnings recommending linking intervention to social programmes.	Considers socio-economic factors' role in cause for vulnerability and food insecurity	Socio-economic indicators understood in food insecurity context	Doesn't focus much on socio-economic factors specifically but does emphasise the link to social protection entities and programmes

7.3 List of key informants

Name	Title	Organization
Caroline Zastiral	DRR Adviser	British Red Cross
Dunja Dujanovic	Technical Officer, EWEA	FAO
Karoliina Pilli-Sihvola	Researcher	Finnish Meteorological Institute
Jouko Ala-Outinen	Regional DM Adviser	Finnish Red Cross
Stephane Petitprez	Head of Resilience Building Project	Welthungerhilfe
Nazira Lacayo	Forecast based Action Senior Officer	IFRC
Nyamkhuu Ch	Disaster Management Programme Officer	Mongolian Red Cross
Meghan Bailey	Technical Advisor	Red Cross Climate Centre
Sarah Barr	Technical Advisor - Learning	Start Network
Lorenzo Bosi	Programme Policy Officer - Rural Resilience Coordinator	WFP
Jesse Mason	Senior Project Manager (FbF)	WFP

Not presented in order of interviews or key informant quotes in the thesis

7.4 Summary of conceptual analysis – key informant interviews

Claims, findings	Key Informant #										
	1	2	3	4	5	6	7	8	9	10	11
In favour of long (several months) lead time	Yes	Yes	Yes	NA	Yes	No	Yes	Yes	Yes	Yes	Yes
Emphasises need to include socio-economic indicators to hazard mapping	No	Yes	NA	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
In favour of cash interventions over in-kind as default	Yes	No	NA	NA	No	Yes	Yes	No	No	NA	NA
Preventing negative coping mechanisms as priority	Yes	Yes	Yes	NA	Yes	NA	NA	Yes	Yes	Yes	Yes
In favour of forecast-based positive reinforcement	No	Yes	Yes	NA	Yes	No	NA	Yes	NA	Yes	Yes
Sees nexus to development as a strong potential for the mechanism	No	Yes	No	Yes	Yes	No	NA	Yes	Yes	Yes	Yes
Sees communication and advocacy crucial for mechanism's success, incl. use of forecast data	NA	Yes	Yes	NA	Yes	NA	NA	Yes	NA	NA	Yes
Sees coordination on triggers and thresholds essential	NA	Yes	NA	Yes	Yes	Yes	Yes	NA	Yes	Yes	NA
Calls for caution before scaling	No	Yes	Yes	Yes	Yes	NA	NA	Yes	NA	Yes	Yes
Challenges climate framing	NA	NA	NA	NA	NA	NA	Yes	Yes	Yes	NA	NA
NA = Not applicable as in not discussed or highlighted in interview											

7.5 Semi-structured interview questions

1) Questions on predictability and forecasting

- How do you define short, medium and long term in the sense of forecasting?
- What type of forecasting methods are used in your case (*probabilistic, real-time monitoring, surveillance or hybrid*¹)? Why?
- Which forecasting methods you think would be most usable for slow-onset disasters?
- What are the main sources of forecast information (*national meteorological institutions, global mechanisms such as FEWS NET etc.*) used in your case?
- What are the main challenges in retrieving forecast information?
- What are the main challenges in analysing forecast information?
- What level of accuracy you are expecting in the forecasts?
- What kind of lead time is optimal for forecast-based action?

2) Questions on socio-economic vulnerability and risks

- What kind of vulnerability assessments are used in your case for planning of the forecast-based action?
- How has the target population participated to the vulnerability assessments?
- In your view, how should they be participating?
- What kind of data (*statistics, reports, traditional knowledge etc.*) was or could be used in assessing food security? What about complex socio-economic issues (*inflation, population movement, political unrest, violence and clashes etc.*)?
- How are the vulnerabilities differing per male and female headed household in your case? How are the vulnerabilities differing between occupational or livelihood status (*pastoralist, non-pastoralist, subsistence farmers, labour etc.*)? What other social groups that have specific socio-economic vulnerabilities have you identified?
- How have you defined the risks in your case? How are the triggers for action defined? Are there differences between geographical areas (*locations*) and if so, how are they addressed?
- Can some target groups in your case be identified as chronically food insecure? If so which groups?
- Are some groups especially vulnerable to periodical food insecurity stress? If so which groups?
- Are there function social service and protections mechanisms? Can you please describe how they work?

3) Questions on slow-onset crisis

¹ examples in brackets and italics are not to be read out

- What kind of challenges there are in merging forecast and vulnerability data in terms of slow-onset crisis?
- When looking at slow-onset disasters, at what level you think the focus of forecast-based action should be (*community, local, district or similar, national, regional*)?
- What kind of analysis on impact of identified disasters has been done in your case?
- What do you see as the main benefit in applying forecast-based action in slow-onset crisis?
- What would be the biggest challenge in applying forecast-based action in slow-onset crisis?

4) Questions on actions targeting food security and livelihoods

- How do you see the role of Field Assessment Coordination Teams (FACT) and similar assessment teams, which are typically deployed right after disaster, in case of forecast-based action i.e. before disaster strikes? When should they be deployed? With what focus or terms of reference?
- What kind of early actions were defined in your case? How were the prioritized actions decided? Who were consulted in planning the actions?
- Are the actions especially addressing food security and livelihoods? Are they dependant on the type of expected risk or disaster impact?
- What kind of interventions you think would be most applicable in addressing food insecure families (*cash based, food, mitigating impact to livelihood, positive coping strategies etc.*)?
- Have you done efficiency evaluation of the actions applied based on forecast? Were the actions implemented cost-efficiently? Were the objectives achieved accurately and timely?
- What do you see as an alternative to the forecast-based early action taken?
- How do you justify implementing the forecast-based early action?
- If forecast indicates favorable season (*e.g. precipitation*) would it be justifiable to conduct forecast-based action to support vulnerable groups (*e.g. subsistence farmers*)? Why/Why not?
- Can the forecast-based actions have implications on socio-economic vulnerability? How?
- Are the forecast-based actions identified in your case linked to long term programming (*disaster risk reduction, resilience, community development activities, policy, advocacy*)?
- Do the actions need maintenance, follow-up etc. after implementation? How is it ensured?

5) Questions on financing

- What is the main source of financing in your case? Who is paying? Is suitable funding available for forecast-based actions?

- To whom the funds are allocated to? Who is implementing the forecast-based actions?
 - Is local government involved in either actions or financing and if so, how?
 - Are the financing or actions in your case linked to local social service and protection mechanisms?
 - Are private sector partners (*e.g. insurance companies*) involved in either actions or financing and if so, how?
 - Are there other NGOs, local community groups or actors etc. involved in either actions or financing and if so, how?
 - Have you done calculation on return on investment or similar in your case?
 - What is the tolerance for acting in vain for your organization? Have you defined monetary values? What is a high enough risk (*losses*) and probability (*forecast*) to accept allocating resources? When is the action taken justifiable even if the risk doesn't materialize?
- 6) Feedback, recommendations, open criticism from respondent
- Open feedback ...