Box 1: Activities performed by the Agriculture and Food Security Clusters in 2016

The Agriculture Cluster is co-chaired by the MoAIWD and FAO. Its members mainly come from various implementing NGOs, civil society organizations (CSOs), and development partner representatives. In 2016, the cluster:

- Developed a response plan for the Agriculture Cluster (focused on distribution of seeds, fertilizers, irrigation, livestock, and private sector maize production). A total of 1.85 million people were targeted, with a response cost of US$30.8 million.
- Harmonized approaches for package for beneficiaries, and targeting criteria.
- Coordinated support of various players, and mobilized resources based on financial gaps.
- Coordinated implementation actions –e.g., distribution of seeds, fertilizer, roots/tubers, irrigation.
- Developed a database of who is doing what with respect to response activities.
- Coordinated a program on intensified maize production by the private sector.
- Monitored implementation of response activities and ensured reporting on progress.

The Food Security Cluster is co-chaired by DODMA and the World Food Programme (WFP). Its members are drawn from NGOs, Ministry of Finance, Economic Planning and Development, development partners, and the private sector. This is the biggest cluster in terms of need. It is tasked to provide direct support to food insecure households (through WFP) and a cash based-based response through the International NGO (INGO) Consortium (led by Save the Children). In 2016, the cluster:

- Developed a response plan for the Food Security Cluster. A total of 6.7 million people were affected and targeted (28 percent were supported under a cash-based response, the rest under food-based transfers), with an overall cost of US$307.8 million.
- Coordinated food- and cash-based responses.
- Discussed implementation updates, approaches, and challenges.
- Discussed any request for drawdowns to support the humanitarian response.
- Coordinated food security assessments as related to cluster activity (e.g., dry spell response).
- Monitored implementation of response activities and ensured reporting on progress.

Both clusters report to the National Disaster Preparedness and Relief Committee, with matrix reporting to the Humanitarian Country Team (HCT).

Source: GoM 2017c.

The key gaps associated with Malawi's institutional architecture for disaster management are as follows:

- Lack of finances, particularly at district level, impede the structure's functioning, leaving support at the mercy of the various NGOs that support the districts. This is due to the lack of a national budget line for DRM.
- DODMA representation is weak, which impacts effective coordination among various sectors. In most cases, disaster officers are junior staff members, with little power and limited resources to effectively perform their roles; the position even remains vacant in some districts. Coordination and reporting mechanisms are lacking between such officers and various sectors at district level.

- Civil Protection Committee (CPC) structures are mostly active in districts where NGO project activities serve as the Malawi Vulnerability Response Committee (MVAC) humanitarian response programs. Area Civil Protection Committees (ACPCs) were established in most disaster-prone Traditional Authorities (TAs). Chairpersons of ACPCs are elected by the committee members. Village Civil Protection Committees (VCPs) operate at village level.

2.6 Institutional Capacity Assessment

2.6.1 National-Level Human Resource Capacity Assessment[3]

The increased frequency of disasters and their subsequent impacts places DODMA in a critical position, such that coordination is a paramount task. A functional review of DODMA undertaken in 2012 eventually led to the Disaster Risk Management Policy developed in 2015. The functional review outlined job descriptions for the approved positions in the structure but did not provide corresponding personnel specifications. Hence some expertise is missing in DODMA (for example, specialists for geographical information system (GIS), engineering, water resources management, public health, etc.). DODMA's in-house capacity is inadequate to effectively carry out its coordination mandate, as elaborated in the NDRMP (GoM 2017c). Table 2 presents the results of a SWOT analysis of DODMA and the DRM architecture in Malawi.

Although the agriculture sector is the hardest hit sector and its policies recognize climate change issues, the capacity to translate policy into action is low. Food security risk management was one of the key priority areas of the agriculture sector wide approach (investment plan), the focus of which was mostly maize-based initiatives. A review of the agriculture sector revealed that approximately 50 percent of the national agriculture budget is spent on maize (through the Farm Inputs Subsidy Programme (FISP), maize purchases by ADMARC, and restocking the Strategic Grain Reserves (SGR)). With support from donors, the SGR guidelines were reviewed to improve the SGR's response to addressing emergency and non-emergency operations. Even though the sector developed an Agriculture Risk Management Strategy (ARMS) in 2016, the lack of champions to translate it into action poses a threat for effective implementation.

Inefficiency prevail as regards to identifying, assessing, monitoring, and mapping disaster risks at all levels, with clear roles among stakeholders but overlaps at implementation. Although some efforts have been made by different stakeholders to carry out vulnerability assessments, these have been small-scale and project-based. The current tools for disaster risk assessment and risk profiles are less systematic to guide operational planning. Some attempts were made to develop risk profiles and hazard maps, but these are not fully operationalized, at times are not updated, and are ad hoc. With World Bank support, recent efforts were made to build capacity to develop a Post Disaster Needs Assessment (PDNA) and to mainstream this within the core work of DODMA. Following the 2015 floods, a PDNA on floods was undertaken, and another one on drought in 2016. This, not withstanding, there is clear roles for players within the DRM structure i.e. DODMA as custodian of disaster risk management policy, Department of Climate Change and Meteorological Services for early warning systems, surveys for risk mapping, and water resources for flood information. However, at implementation level, some overlaps on the roles remain a challenge for effective coordination.

[3] A SWOT analysis was used to assess the capacity of DODMA as a coordination institution to ensure that it effectively carries out its mandate.

Table 2: SWOT analysis of DODMA and DRM architecture in Malawi

STRENGTHS	WEAKNESSES
1. High political will (leadership from Office of President and Cabinet). 2. Existence of institutional structures/dialogue platforms (various sectors involved). 3. Policies and frameworks in place, mostly recent and incorporate DRM and climate change. 4. Existence of DODMA as a recognized leading institution (by law), sitting within Office of President and Cabinet. 5. Clear roles among players within DRM architecture	1. Inadequate staff (and technical capacity) at DODMA compared to expanding mandates of increasing severity of disasters. 2. Delayed release of funds to respond to disasters, with limited readily available DRM budget line for response. 3. Inadequate physical resources, equipment technological advancement, emergency operational centers. 4. Poor coordination and information flow from national to district and community.
OPPORTUNITIES	**THREATS**
1. Good will/support from donors, various projects in place. 2. High on national agenda (MGDS III priority #1: Agriculture and Climate Change Management). 3. Adoption of shock-responsive safety nets (and expanded social protection scope across the country). 4. High demand dimension due to worsening climate change effects (with increased severity of droughts, floods, and other disasters).	1. Outdated DRM law (1991) that does not accommodate expanded mandates of DODMA and increased severity of disasters, and is not fully in line with international protocols. 2. Poor road conditions, affecting delivery of relief items during disasters. 3. Increased environmental degradation, leading to more severe droughts and floods. 4. High donor dependency in most projects on DRM and climate change. 5. Uncoordinated and parallel interventions among stakeholders.

Source: Adapted from Capacity Development Plan for DODMA (2015).

2.6.2 District- and Community-Level Human Resource Capacity Assessment

Positions for DRM officers were to be established under the Planning Units in all 28 districts. However, recruitment has not yet taken place. Positions of DRM officers have not yet been established in urban councils. Currently, non-established positions of Assistant District Disaster Risk Management Officers (ADDRMOs) exist only in the 15 disaster-prone districts. The rest of the districts and urban authorities only have Desk Officers. According to DODMA (2015), the current positions of ADDRMOs are junior staff, and do not give incumbents the necessary clout to coordinate and advise either GoM or NGO stakeholders. Furthermore, Desk Officers are not very effective given the demands of their substantive appointments and lack of resources for DRM.

In disaster-prone districts, CPCs are established as the technical committee for the District Executive Committee responsible for DRM, but are active mostly during disasters (i.e., reactive). CPC members are trained mainly by NGOs on their roles and responsibilities following a training manual developed by DODMA. However, the CPCs are not equally active across districts. Due to lack of capacity and resources, CPCs are active mostly where NGOs are active in the district to facilitate training or development of action plans for DRM preparedness and response. Similarly, at community level, ACPCs and Village Civil Protection Committees (VCPCs) are established as first points of contact in a disaster. These structures are mostly functional in disaster-prone districts. Most of the non-prone districts and Urban Councils do not have functional committees. The structures are dominated by male leaders, despite wide evidence that women are more adversely affected by DRM activities.

Despite the existence of CPCs, the engagement of agricultural stakeholders is sporadic and limited. This is despite the fact that most response and contingency plans are agriculture-based. Such disconnect leads to lack of ownership of the priorities, which are as mostly led by DRM considerations, while implementation is mostly led by agricultural constituents. Clear responsibilities among actors at district level are needed, while ensuring that DRM is strongly integrated among sectors (agriculture in particular); the role of DRM should merely be to ensure coordination among various players and vertical links to DODMA. Where DODMA focal points came from the agriculture sector, improved coordination and ownership was observed in some cases. The agriculture sector happens to be the most decentralized, with structures (including infrastructure) all the way down to community level (extension planning areas) in all districts in Malawi.

Chapter 3: Assessment of Disaster Preparedness Instruments

Several disasters in Malawi have revealed the country's lack of preparedness, mainly due to poor or insufficient contingency planning (FEWS NET 2004). In some cases, contingency plans are developed and shelved without being reviewed, while others are not implemented due to funding constraints. Where such plans exist, there is little evidence of full operationalization in practice. Various disaster preparedness instruments have been applied to predict weather, strengthen readiness, and ultimately reduce the anticipated effects of disasters. This chapter reviews Malawi's status of and efforts made in contingency planning as well as experiences in implementing various disaster preparedness instruments.

3.1 Contingency Planning Processes in Malawi

Contingency planning is a management tool used to ensure adequate arrangements are made in anticipation of a crisis; its application in Malawi has yielded mixed experiences. In line with good UN practice, the contingency planning process in Malawi begins with the release of annual weather forecasts, which then inform the process of consultations and development of contingency plans, while resources are mobilized to support the processes and actions in the contingency plans. Once the contingency plans are developed, they are validated and monitored across implementation (Figure 8).

Figure 8: National- and district-level contingency planning process in Malawi

Source: GoM 2015.

Contingency plans are developed through the Cluster System (coordinated by DODMA), with less bottom-up integration, but implementation is hampered by inadequate financing. DODMA mobilizes financial support from the GoM for the contingency planning process. The NCP is drafted by government ministries and departments, UN agencies, the Malawi Red Cross Society, and NGOs, led by DODMA. The NCP is supposed to support district-level contingency plans, yet district representation is limited (GoM 2009). Instead, district plans are drafted by the clusters at national level, coordinated by DODMA. Interestingly, some districts develop contingency plans that are not related to the NCP. Key informant interviews revealed districts' lack of awareness of the NCP, although they were aware of district contingency plans. Mabaso, Siambala, and Manyena (2013) observed that Malawi's NCP is never followed by districts during an actual disaster response. The main challenge has been lack of financial support to implement the NCP, as the response focus has been reactionary rather than proactive.

District contingency plans suffer from lack of funding, and are often supported by key NGOs supporting DRM work, with less influence from the NCP. District contingency planning involves the cluster-led departments, NGOs, District Civil Protection Committees, and ACPCs. Usually, NGOs provide funding for the planning process but the process is led by a DODMA official, usually the Disaster Risk Response Officer (DRRO). The GoM's resources and leadership capacity are inadequate to effectively coordinate and monitor the development and implementation of contingency plans. Mabaso, Siambala, and Manyena (2013) cited best practices from Mozambique that strengthen coordination and promote transparency and mutual trust between national and local levels; there, subnational-level organizations develop guidelines and plans that inform Mozambique's NCP. In Malawi, using district contingency plans to inform the NCP would enhance coordination and promote increased inclusivity, ownership, transparency, and accountability.

3.2 Quality of Contingency Plans and Their Use

All disaster-prone districts in Malawi develop disaster contingency plans. During disasters, the contingency plan acts as a reference for the number of people affected and for the quantity and cost of materials needed in response and recovery efforts. However, some districts' contingency plans were not updated:

- In Phalombe, the plan was first prepared in 2004 and updated in 2016/2017. In Nsanje, the contingency plan was first prepared in 2008 and updated in 2015/2016.
- Chikwawa had draft contingency plan for 2015/2016 that was never finalized because of inadequate resources.
- Zomba had a draft contingency plan for 2016/2017 that was not finalized due to lack of resources.
- A national floods contingency plan was developed in 2006 in a participatory process, but never referenced when major floods took place in 2015.

The involvement of the District Social Welfare Office, Community Development Office, and Social Protection cluster representatives from village level helps to ensure that gender is mainstreamed in contingency plans. Some communities have their own contingency plans; others have flood risk maps developed with assistance from the DRRO. Among other things, these contingency plans describe areas to be used as safe zones during floods, preliminary response plans to any weather-related disasters, and contact addresses for all critical district authorities, including the District Commissioner, DRRO, NGOs' DRR Officers, and others.

Agriculture and food security dominate the NCP's priorities. In the 2017 NCP, the Agriculture and Food Security Clusters comprised 53 percent of the overall contingency budget (approximately US$98,772), of which 51 percent was exclusively for food security. Agriculture Cluster interventions included sensitization campaigns on disaster preparedness in prone districts, including livestock vaccination campaigns, water/catchment management, facilitation of distribution of agricultural inputs (seeds, fertilizers, vaccines, pesticides, and dewormers), irrigation, crop diversification, and livestock promotion. Food Security Cluster interventions included food security assessment, provision of immediate food/cash assistance to food insecure populations affected by disasters, and coordination of activities.

3.3 Indigenous Knowledge

Indigenous knowledge is becoming officially recognized as potentially useful for predicting hazards and disasters. According to the GoM (2015f), four indigenous knowledge practices have been confirmed to have some scientific backing, and hence are acceptable for use. Box 2 provides an example of some indigenous knowledge used in practice.

Box 2: Indigenous knowledge practices used in Malawi to predict weather-related hazards

While some local indigenous knowledge can be verified scientifically, most has no scientific bearing on the occurrence of floods and droughts. Four have been verified scientifically:

- The migration of frogs and hippos to riverbanks and floodplains, away from fast-flowing rivers, portends severe flooding. Generally, frogs and hippos are able to notice increases in the flow velocities of rivers, and move away to avoid being washed away by floods. This observation was manifested during the 2015 floods that wreaked havoc in the Lower Shire Valley – most of the frogs and hippos moved out the Shire River. People who observed this moved to dry land in good time, avoiding being swept away by flash floods
- The blowing of strong southeast trade winds over an area during the rainy season is a sign that dry spells will be prevalent during the season. The rainy season in Malawi is characterized by the prevalence of the Inter Tropical Convergence Zone (ITCZ) and the dominance of northeast trade winds, which are generally weak and bring rain to the entire country.
- The prolonged blowing of northeast trade winds brings high rainfall and therefore a high chance of flooding.
- When Chosos' (a type of wild bird) nests point to the north, the rainy season will be dominated by southeast trade winds; hence little rain will fall and droughts will prevail.

Source: Field case study.

In communities with no or limited access to advanced scientific applications, advanced local knowledge will continue to be used. Given the lack of advanced weather forecasting mechanisms, many communities continue to rely on indigenous knowledge systems. The challenge is how local communities can be supported to effectively transfer to new generations those aspects of the indigenous knowledge that have proved to be instrumental in DRM interventions at the local level. Failure to transfer intergenerational knowledge will leave newer generations unable to absorb, understand, and carefully interpret local signs to inform weather forecasting scenarios.

3.4 Preparedness and Response Instruments

This section reviews the key national preparedness instruments used in Malawi to respond to extreme weather events (

Table 3). It also analyzes the extent to which Malawi has adopted these instruments and their impact in practice.

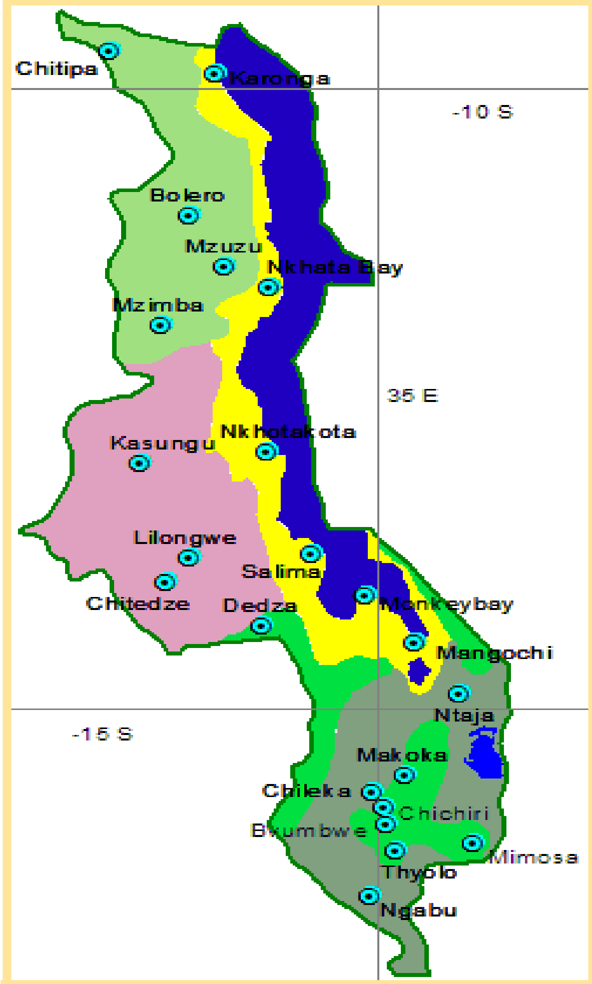
Table 3: Main preparedness and response instruments used in Malawi

Preparedness and Response Instrument	Examples
Early warning systems	• Weather forecasts • Automated weather stations • Satellite images and maps • Hydrological monitoring systems • Malawi Vulnerability Assessment • Agricultural Production Estimates Survey (APES)
Hazard and safe zone mapping	• Contingency plans • Flood risk mapping • Evacuation centers
Agricultural insurance	• Malawi Maize Index (MMI) • Africa Risk Capacity (ARC) • Weather index insurance
Social safety nets/targeted food and cash transfer programs	• Food distribution program • Cash transfer program • Inputs for assets • Food for work
Flood mitigation	• Dykes • Dam construction • Gully reclamation structures

3.4.1 Early Warning Systems

3.4.1.1 Weather Forecasts

Figure 9: Main meteorological stations in Malawi



Source: Met website (www.metmalawi.com).

The Department of Climate Change and Meteorological Services (DCCMS) is the lead national institution on meteorological issues. It collates, analyzes, and disseminates weather data. Dissemination is done widely though radio, newspapers, local television, website, emails, YouTube, and social media like WhatsApp, Facebook, and Twitter. A major challenge is the quality of weather information. When rains and droughts are forecasted, they still fall short of precision in terms of timing, amounts, and geographical zones of occurrence. Sometimes there are predictions of El Niño, La Niña, and La Nada (no events) in the same year, which is confusing. However, in general, the accuracy of weather forecasting has gradually improved.

Malawi currently has 22 full meteorological stations (Figure 9) that collect weather data regularly. The minimum data collection frequency per station is two per day at one-man stations and only on Saturdays and Sundays. Currently, the two airport stations (Lilongwe and Blantyre) collect weather data continuously (i.e., 24 hours per day).

3.4.1.2 Automated Weather Stations

The GoM, with support from the World Bank-funded Shire River Basin Management Programme, installed 32 automatic weather stations and two special weather observing systems at Kamuzu International Airport and Chileka Aviation Station. By 2017, the country had about 50 automatic weather stations placed across the country. However, functionality has been a big challenge as only 12 are reported to be fully operational. The remaining are not functional due to lack of system upgrades, currently underway,[4] as well as to vandalism. DCCMS lacks weather radars that would help to accurately forecast weather events in specific locations. These challenges, coupled with the lack of skilled meteorological personnel at both district and community level, all result in gaps in the collection, compilation, and use of weather information at all levels.

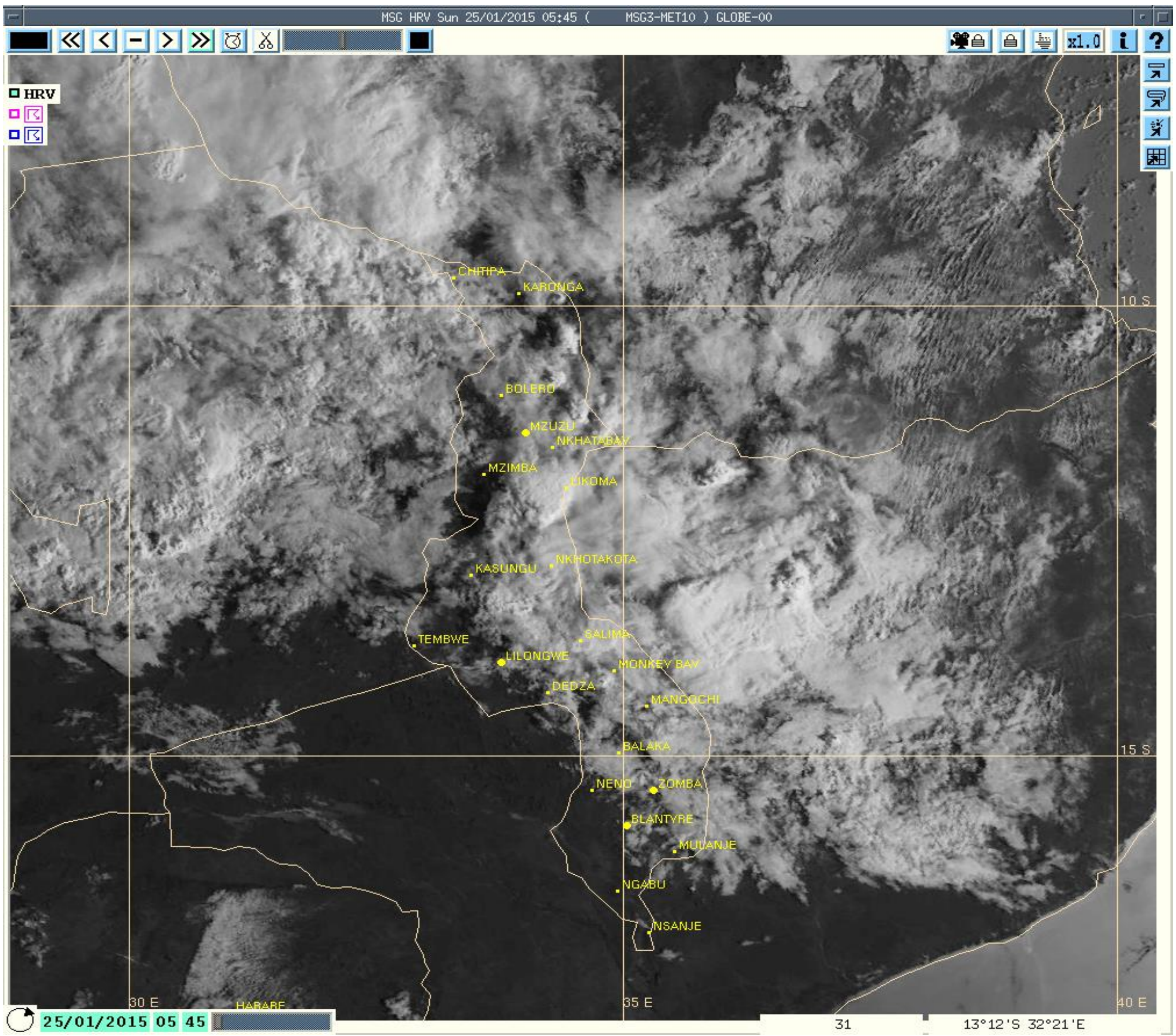
3.4.1.3 Satellite Images and Maps

Satellite images and maps and other satellite systems are a fundamental component of Malawi's weather monitoring and forecasting processes. The DCCMS has a satellite receiver that receives data from the second-generation series of satellites. The satellite images are updated every 24 hours. Besides general weather monitoring, the satellite images have been used in various agricultural insurance schemes to predict rainfall patterns. The Africa Risk Capacity (ARC) Initiative recently used satellite rainfall

[4] Supported by the World Bank-funded Shire River Basin Management Programme, which involves installation of data loggers for data downloading, and coming up with a sustainability plan for automated weather stations.

values as a basis to determine the customization under the Water Requirement Satisfaction Index (WRSI). Similarly, Monsanto seed company introduced a weather insurance policy on seeds, informed by satellite weather data, from 2017 to hedge farmers from adverse weather conditions. Infrared images are generated in the same manner.

Figure 10: Cloud picture of Malawi from satellite image



Source: http://www.metmalawi.com/satellite/visible.php

3.4.1.4 Hydrological Monitoring Systems

For a long time, Malawi has installed river gauges at different zones in critical rivers for monitoring water levels during the rainy season. Flood forecasting and monitoring is mainly instituted in the Lower Shire River, a flood-prone area. The "Flood Warning System for the Lower Shire Valley" combines rainfall observations and forecasts from DCCMS with observations of river levels at four hydrological stations in the Lower Shire Basin: Ruo at Sandama (14D3); Ruo at Sinoya (14D1); Shire at Chiromo (1G1); and the Shire at Chikwawa (1L12). Observations from the gauges are disseminated manually by gauge observers to DODMA and the MoAIWD using cellphones. The decision to issue warnings is then decided on a fourstage alert system using predefined threshold values. Warnings are issued through press and other media. However, this system has a number of systemic operational limitations: (i) manual readings and reporting via telephone/SMS are prone to errors; (ii) lead times are limited to the travel time from gauge stations to flood-prone areas; (iii) forecast accuracy is limited by the accuracy of the gauge-to-gauge correlations and the assessed impact of rainfall on these correlations; (iv) forecasts are not provided to end users in a timely and systematic way; (v) warnings are sometimes delayed due to administrative procedures; and (vi) daily collection of readings is not currently possible and hence delays occur.

Efforts to build capacity at different scales were observed at district level in conjunction with DODMA and other stakeholders. Examples include establishment of a Disaster Response and Recovery Section in disaster-prone district councils that installed hydrometric scales or river gauges in upland and low-lying areas; these help communities (VCPCs) to monitor water levels to predict flooding. Through the DRR office, rain gauges installed in some communities are monitored by VCPCs trained in weather interpretation. Some NGOs have taken broader measures to strengthen communities' capacity in forecasting through construction and installation of river gauging structures. They have also provided communities with drums, whistles, and cellphones through which upstream communities warn their lowland counterparts of possible flooding after observing water levels in the river gauges. This is a form of strengthening and spreading awareness communication among communities.

Figure 11: A twin-brick course line extending from Shire River at Gome 1 Irrigation Scheme in Nsanje district

Source: Field photo.

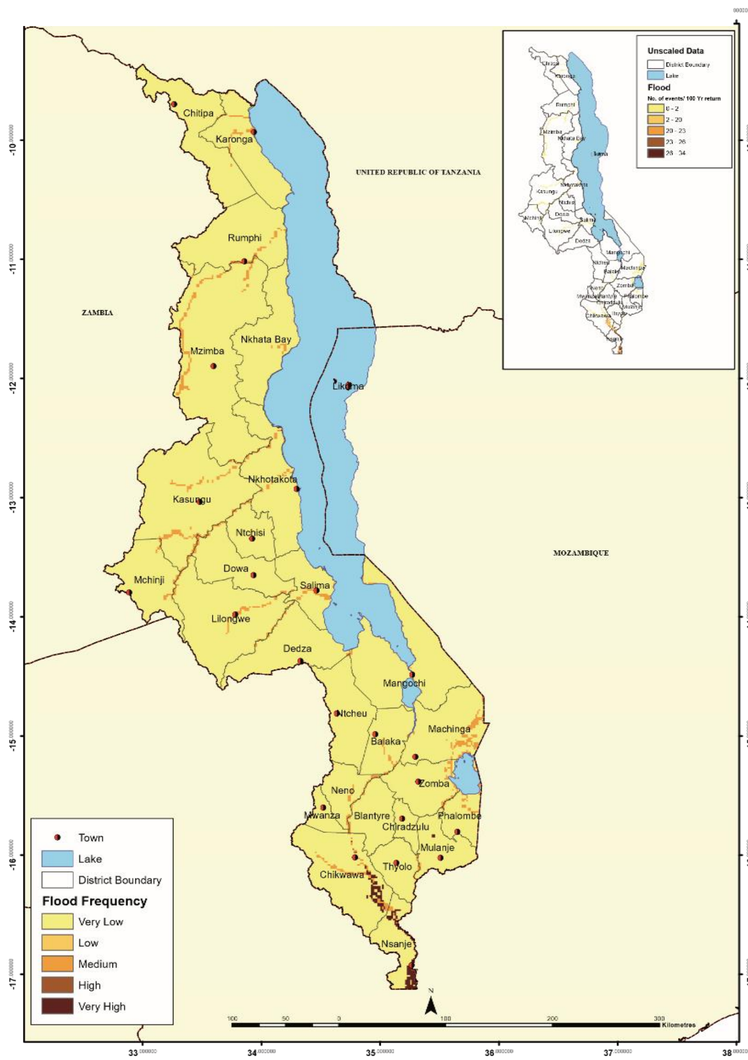
Note: This is a river gauging system that allows observation of water levels as water rises along the course line.

3.4.2 Flood Risk Assessment and Hazard Maps

In Malawi, flood risk/hazard maps offer a useful tool to understand patterns of hazards, vulnerability, and risk to climate change at multiple scales, but they are applied at small scale and mostly project-based. Flood risk and hazard maps were prepared by DODMA at national level and by Disaster Risk Response Officer (DRRO) at district/community level (Figure 12). Maps are prepared as part of vulnerability assessment mapping, an activity that accounts for all possible hazards such as floods, droughts, earthquakes, disease outbreaks, landslides, wildfires, etc. They usually form part of the contingency planning process that guides disaster response.

The spatial hazard risk and vulnerability assessments and allied mapping methods are useful tools for understanding patterns of hazards and vulnerability to extreme weather events at multiple scales, from local to national. Maps based on socioeconomic, climate, and biophysical data and information have become part of the standard toolkit for communicating impacts, vulnerability, and adaptation and climate risks. So-called "hotspots" maps are often used to direct attention to areas where impacts are expected to be greatest and potentially require adaptation interventions.

Figure 12: Flood risk map for Malawi



Source: Malawi Hazards and Vulnerability Atlas, 2015.

Hazard maps contain hazard incidence by geographical area and by exposed population. In some districts, flood risk/hazard maps are also produced for specific locations, such as those prone to floods (e.g., at the TA level), to inform community-level decision making. The ACPCs in such areas are trained on how to read and interpret maps to citizens. However, application of hazard maps and risk profiles is not yet fully institutionalized, and often such tools are not updated. Coupled with this are challenges of lack of capacity and equipment to execute quality maps. The World Bank is currently supporting the GoM to update and develop comprehensive risk profiles and hazard maps for the entire country.

Hazard and risk assessment is the foundation upon which all emergency planning efforts in a community are built. The Regional Centre for Mapping of Resources for Development was asked to help DODMA build capacity through development of the Malawi Hazard and Disaster Risk Identification and Mapping System. The system's aim is to improve the understanding of hazard, risk, and vulnerability in Malawi. The project developed a hazard and disaster database, available as an atlas and an online visualization for Malawi, and will ultimately transfer the maintenance and hosting of the database to stakeholders within Malawi. The Malawi Hazard and Disaster Risk Identification and Mapping System provides analysis to help users better understand potential threats facing a community. By pinpointing the location, extent, and magnitude of past disasters or emergency situations, and by examining knowledge of new or emerging risks, it is possible to determine the probability of such events occurring and the vulnerability of people and property. Further, by viewing this information along with relevant land use, economic, and demographic information from a well-prepared risk profile, emergency managers can make assumptions about those segments of a community that might be impacted by various types of incidents. Other hazard and vulnerability maps also exist in Malawi (Table 4).

Table 4: Existing hazard/vulnerability maps in Malawi

Stakeholder (National-level)	Existing hazard/vulnerability maps
Geological Survey Department	Geohazard maps (landslide, earthquake)
Climate Change and Meteorology Department	Weather maps, temperature and rainfall maps
Land Survey Department	Agricultural practices, topography, water levels at lakes, rivers
Forestry Department	Forestry maps, wildlife maps
National Statistics Office	Census maps, poverty maps
FEWS NET	Food security maps, weather hazards maps (floods, dryness, drought)

Source: UNDP/COOPI 2012.

Some institutions have considerable experience in hazard mapping (e.g., Geological Survey Department and FEWS NET), even though such capacity is inadequately institutionalized. The main challenges relate to limited capacity to use and interpret the maps, inadequate infrastructure and tools (hardware and software), and ultimately, limited resources. The situation is worse at district level, where equipment like GIS and remote sensing is nonexistent.

3.4.3 Evacuation Centers

Evacuation centers[5] act as safe zones for people fleeing from disasters; but in normal times they are used for some social services. During disasters DODMA supports the erection of tents across affected areas to shelter evacuated households. This support is coordinated through the Shelter and Camp Cluster and supported by various stakeholders. When evacuation centers are not being used for disasters, they act as community convergence centers where NGOs deliver trainings and other capacity-building initiatives. The GoM (under the China-Malawi/UNDP project) constructed evacuation centers in Karonga, Salima, Mangochi, and Nsanje districts to host future evacuees (Figure 13). These evacuation centers are part of the UN's support to enhance the country's DRM capacity, using financial assistance from the Chinese government. The centers will be used for income-generating activities and as classrooms for children when there are no disasters occurring. In the absence of evacuation centers, schools, churches, health centers, and maize mills often serve as shelters, disrupting their normal operations.

[5] Each evacuation center accommodates a maximum of 200 people and has separate rooms for men and women, a store room, and an office room.

Figure 13: Evacuation center in Karonga district supported under the China-Malawi UNDP project

Source: UNDP 2018.

3.4.4 Dykes and Gully Reclamation Structures

Dykes are strategically constructed to prevent floodwater from affecting some section of an area, such as a village or farms. The GoM has constructed dykes for years; e.g., the Likangala dyke in Zomba was constructed in 1967. Other dykes constructed include: the North Rukulu dyke in Karonga; Nkasi, Mwaye, and Nsija Rivers dyke in Machinga; and Phalombe dyke at Namasoko in Phalombe. Local leaders encourage people to repair dykes themselves because there is no more support from the GoM or NGOs to repair them. As such, local people pack sand/soil in bags to reinforce the dykes in those areas (Figure 14). Some NGOs provide cement and wire to construct gully reclamation structures in critical areas to reduce siltation and subsequent flooding downstream.

Figure 14: Community Leaders and researchers on a sandbag-reinforced dyke on the edge of Likangala River in Zomba

Source: Field photo.

3.4.5 Agricultural Production Estimates Survey (APES)

Malawi has collected agricultural production data since 1983, covering all major crops and livestock, with observed inefficiencies. Collection of APES data involves the use of stylized sampling techniques to ensure random sampling of farming households for the crop estimate survey. A two-stage stratified, systematic sampling plan is used to sample the Primary Sampling Unit for the major crops. The first step involves identification of major crops from 25 percent of the blocks[6] in each Extension Planning Area (EPA), with the blocks themselves sampled using a systematic random method. The second step involves identification of a Secondary Sampling Unit of farming households drawn from the selected blocks. Sampling of these households starts with listing all households in each given block, serially listing them, and then using a systematic random method to list 20 percent or not more than 15 households. From this sampling process, the overall sampling fraction represents about 5 percent of all farming households. Actual data collection involves Agricultural Extension and Development Officers (AEDOs) measuring and recording the household garden area planted with crops. Using this sampling method, the MoAIWD produces three rounds of agricultural production estimates every year.

Notwithstanding the rigor of the APES methodology, concerns have arisen that it is not the best practice for collecting agricultural production data, because:

- It is labor-intensive for the limited number of frontline agricultural extension workers.
- Limited ICT and inadequate advanced equipment lead to poor information management and data errors.
- The data collection process allows for adjustments to the data by different stakeholders.
- A large number of staff (more than 2,000) are needed to conduct the crop estimates, making the exercise too costly.

The first crop estimates are a guess of what farmers intend to grow during the season. The second round of the data collection process is considered unreliable as it is based on data from immature field crops that cannot accurately estimate output and can be subjective. The third crop estimates, which involve weighing the crop harvest, should be the most useful data for determining household vulnerability to plan for response. Unfortunately, this round is conducted considerably after the annual budget session. Thus, the major challenge related to the national budget process is that it starts shortly after the end of the agricultural season, making it difficult to plan for emergencies that might occur from extreme weather events.

Given these limitations, the MoAIWD piloted two new methodologies in the 2014/15 agricultural season with support from the Agriculture Sector Wide Approach Support Project (ASWAp SP). The pilots used remote sensing[7] and satellite imagery to improve agricultural production estimates in 2014. The specific methods piloted were (i) Area Frame designed by Airbus, and (ii) Point Frame by ITA & EFTAS. These were compared with the List Frame (traditional APES methodology). Table 5 shows the results of a comparative assessment of the three methodologies.

[6] According to the GoM, 2008 APES Manual, each EPA consists of sections and individual sections comprise eight agricultural blocks. The block is the Primary Sampling Unit used in the APES.

[7] Remote sensing is only now being piloted in Malawi, but was adopted for collection of agricultural production statistics in the 1970s in the United States and other countries with the launch of the Landsat MSS satellite (Global Strategy 2015).

Table 5: Comparison of crop production estimate methodologies

Parameter	Area Frame (Airbus)	Point Frame (ITA & EFTAS)	List Frame (traditional APES)
Image/hectarage estimation	Uses high resolution (6m) satellite imagery	Uses good satellite maps, varies from year to year	Uses sample plot measurements
Yield estimation	Very precise – includes objective yield assessment, in addition to farmer interviews Uses moisture sensors	Limited to farmer interviews and limited objective assessment	Weighing scales used to measure crop cuttings yield on sample plots No measurement of moisture
Timeliness	Timely, results by May	Timely, results by May	Not timely, results beyond May
Cost	Relatively cheaper (over 4-year period) Less transport requirements Initial investment of purchase of satellite imagery costly, but can be used for 5 years	Relatively cheaper (over 4-year period) High transport requirements	More costly, high sample size (over 4-year period) High transport requirements
Labor intensity	Less labor-intensive – requires 2 staff per district for 20 days to capture 3,000 points	Relatively less labor-intensive – requires 40 surveyors for 6 weeks to capture 24,000 points.	More labor-intensive (about 2,000 extension officers involved)
Crops	Used for maize only	Used for maize and other major food crops	Covers all major crops, livestock
Capacity	Staff in the MoAIWD trained Some equipment in place (additional data analysis training needed)	Staff in the MoAIWD trained Some equipment in place (additional training on data analysis and methodology needed)	Capacity of the MoAIWD in place, as traditionally applied since 1983, with existence of agricultural extension workforce
Data transmission, errors	Real-time data transmission (tablets) Less scope for errors No scope for manipulation	Real-time data transmission (tablets) via cloud server Less scope for errors No scope for data manipulation	Does not use tablets (real-time), mostly paper-based Aggregation at various levels Scope for data manipulation

Source: Analysis from GoM 2015b.

Results of the pilots showed that the Point Frame method was superior in estimating hectarage, while the Area Frame method was superior in estimating yield. The latter included objective yield assessments in addition to farmer interviews, on which the former relies. Significant improvements were observed in electronic data transmission when information was transmitted directly from tablets to servers (the "cloud"), with less scope for manipulation and errors. This is unlike the traditional APES, which is done manually, with a lot of aggregation of data at various levels. Another significant improvement with the satellite imagery methods is the lower labor intensity needed to carry out the exercise. This frees agricultural extension workers to do other important tasks, rather than spending most of their time on crop estimates. Another advantage is the earlier release of the findings, which can inform the GoM on actions needed in anticipation of disasters from extreme weather events. This is critical for planning.

Based on the above results, the key recommendations are to:

- Adopt the Point Frame (ITA & EFTAS) methodology for hectarage estimation
- Adopt the Area Frame (Airbus) methodology for yield estimation
- Adopt electronic, real-time data transmission
- Develop an electronic database, with the central server at the MoAIWD, to receive and aggregate data on a real-time basis
- Adopt the use of moisture sensors
- Build the MoAIWD's capacity to implement these methodologies

3.4.6 Food Balance Sheet (FBS)

The MoAIWD computes and releases information on the national food security situation using the Food Balance Sheet (FBS), which guides the design and implementation of humanitarian responses, and places high weights on maize. The major concern with the current FBS computation is that it is based on the assumption that 73 percent of calories consumed are from maize. However, some IFPRI studies using Integrated Household Survey data have established that 66 percent of calories consumed are from maize (Babu et al. 2017). The figure used matters, as shown below, and has important implications, as the FBS information is often used as a starting point for consideration of food insecurity disaster declarations.

Babu et al. (2017) undertook a comprehensive review of the current formula for FBS computation. They changed assumptions about the maize caloric consumption weight and postharvest losses, and added wheat into the FBS. Table 6 shows how the total food gap changes as a result of changes in these factors. Reducing the maize caloric consumption weight from 73 percent to 66 percent translates into a 20 percent reduction in the national food gap, from 834,000 MT to 666,000 MT. Furthermore, maintaining the 73 percent maize caloric weight but assuming improved postharvest loss conditions for maize to 10.7 percent from 12.9 percent translates into a 6 percent reduction in the total food gap (to 782,000 MT from the original 834,000 MT).

The analysis shows that Malawi could improve its food gap estimate by reconsidering its assumptions about the maize caloric consumption weight while working to reduce its maize postharvest losses. Other options to improve the FBS include: (i) proper estimation of opening stock balances (often understated), informed by an elaborate assessment, including of private sector stocks; and (ii) inclusion of other food crops (e.g., roots, tubers, and rice).

Table 6: Changes in total food gap with changes in maize caloric consumption weight and postharvest losses

	Original (Sept. 2016 version of FBS)	Caloric weight	Postharvest loss
Maize caloric weight (%)	73	66	73
Food use (maize) (MT)	2,788,086	2,520,735	2,788,086
Maize postharvest loss (%)	12.9	12.9	10.7
Net production (maize) (MT)	2,063,828	2,063,828	2,115,957
Total food gap (MT)	(834,083)	(666,034)	(781,954)

Source: Adopted from Babu et al. 2017.

3.4.7 Agricultural Insurance

Various crop insurance programs have been attempted in Malawi, with mixed experience. They have often been proven expensive to the GoM, with low demand and uptake by targeted farmers. Incentives to invest in agricultural insurance have been limited as the threshold levels set are often too high to trigger payments. The greatest challenge has been to design a sound insurance product that meets the requirements of farmers, while ensuring effective demand. This section outlines three key agricultural insurance initiatives undertaken as an option toward preparedness to extreme weather events in Malawi.

3.4.7.1 Malawi Maize Index (MMI)

The GoM has purchased macro-level insurance derivative programs since 2008, with maize as a target crop. These programs aim to: (i) improve drought risk assessment and early warning tools; (ii) identify contingent sources of financing that can be used to support responses; (iii) strengthen the GoM's risk management capacity; and (iv) improve planning and budgeting for national disasters. The technical work on macro-level weather insurance began in 2004, with the World Bank's response to the GoM's request for funding insurance in the event of severe drought. The Malawi Maize Index (MMI) was viewed as the best ex ante approach to disaster (as opposed to handouts). Implementation of the MMI program began when the GoM purchased an insurance contract with coverage against severe drought risk during the rainfall season in 2008. The model that Malawi used was based on the yield satisfaction index, a modification of the Water Requirement Satisfaction Index (WRSI) developed by FAO. The model uses daily rainfall as an input for forecasting maize yield but monitored in dekads (10-day periods). Under this insurance scheme, payments are triggered according to prespecified and agreed conditions based on an index, with premiums paid in advance. The MMI was designed with a linear payout measured by the number of index units below the strike price. In the 2011/12 growing season contract, for example, the unit payouts were US$147,000. This meant that if the index at the end of the season was 89, the GoM would receive a payout of US$147,000; if the index was 80, then a payout of US$1.47 million would be made, with a potential maximum payout of US$4.1 million.

Despite the prevalence of localized droughts, the overall trigger was not met in 2011/12, as heavy rainfall caused floods in other parts of the country. In fact, Malawi did not receive a payout in the entire four-year period (2008–2012), as the overall index was above 95 percent (or 95 MMI units). This led to the conclusion that the triggers might have been set too high.

3.4.7.2 Africa Risk Capacity (ARC) Initiative

The ARC Initiative is an insurance risk pool whose objective is to capitalize on the natural diversification of weather risk across Africa by allowing countries to manage their risk as a group to respond to probable but uncertain risks. Malawi officially joined the ARC Initiative in 2014, among the first participating countries. ARC allows subscribing countries to select the level at which they wish to participate by selecting the amount of risk they wish to retain and financing the coverage they would want from ARC for droughts of varying severity. ARC uses its core product, called Africa Risk View, to cover drought in participating countries. Africa Risk View combines agricultural drought early warning models with data on vulnerable populations and builds a standardized model for estimating food insecurity response costs.

From 2013 to 2015, the World Bank supported Malawi to customize the Africa Risk View model, as well as capacity building and institutionalization of the ARC technical working group. The GoM approved and signed up for the ARC policy in 2015, followed by a premium payment of US$4.7 million, in anticipation of a maximum payout of US$30 million. The season coincided with the worst drought in 2016. However, the preliminary model simulation results indicated that no payout would be triggered. Ground truthing was conducted to confirm and revisit model parameters, revealing differences, particularly regarding the duration of maize varieties used by farmers. Eventually a payout of US$8.1 million was made.

Both the MMI and the ARC model use country-level triggers to determine payouts, a challenge as the country does not have a homogeneous climatic zone. Consequently, the GoM only receives a payout when a severe drought affects all agricultural ecological zones in the same season, a rare phenomenon. Generally, the southern region has a different rainfall pattern than the central and northern regions. The Upper Shire River, for example, experiences droughts almost every year and people are always in need of humanitarian aid. The insurance models do not capture this if the other agricultural ecological zones receive good rainfall. Thus, it would be prudent to review the models and adjust the trigger levels according to Malawi's agricultural ecological zones.

3.4.7.3 Micro Insurance and Other Models

Malawi piloted the first weather index insurance at micro level in 2005 with funding from the World Bank and technical assistance from MicroEnsure and the World Bank's Commodity Risk Management Group. The pilot ran from 2005 to 2010, implemented by financial institutions and farmers' associations. The insurance scheme targeted smallholder farmers growing commercial crops. The initial phase covered groundnut farmers followed by those growing both maize and groundnuts before moving to tobacco farmers. No payout was triggered, as there were design flaws, with lack of proper education to stimulate demand for insurance.

WFP and Oxfam America used the initial success of HARITA[8] to build the Rural Resilience Initiative (R4), launching the model at a large scale in multiple countries. The R4 represents risk reduction, risk reserve, risk transfer, and risk taking. It is a new model for building resilience using existing government-owned and -led productive safety nets to reduce disaster risk and to deliver a mechanism to expand insurance and other financial services. Its fundamental principal is to link labor-based safety nets, which provide cash or food in exchange for work or household assets, and community risk reduction activities, which protect assets against disasters and improve agricultural productivity. Instead of WFP providing food or cash to communities for work, WFP pays a premium as insurance on behalf of targeted households. This gives agricultural insurance coverage to poor households that ordinarily could not afford it, without them having to pay a premium directly. The model has been tested and found to work in Ethiopia, Senegal, Malawi, and Zambia. In Malawi, WFP is implementing the R4 program in Balaka district. The insurance has triggered some payments to insured farmers, although at a small pilot scale.

Insurance companies in Malawi are reluctant to offer agricultural insurance due to the risk, as farmers' uptake is very low. This leaves most farmers with little or no option of transferring risk. Nonetheless, traditional coverage is not uncommon for most commercial farmers, although most policies are limited to coverage for fire and/or floods. One of the oldest insurance companies (National Insurance Company of Malawi) has a new innovation for a multi-peril crop insurance dubbed *Mtetezi* (Protection) that is offered to tobacco farmers. *Mtetezi* protects tobacco farmers against (i) loss or damage to the crop as a result of hail, windstorm, floods, and excessive rainfall, and (ii) damage caused while tobacco is in transit to the auction floor. Although the coverage is open to all farmers, the focus has been on those borrowing from commercial banks, as it easier to sell the product bundled with loans. Generally, uptake of insurance is low for all insurance schemes, as evidenced by the low penetration rate (3 percent).

The World Bank first piloted weather index insurance in Malawi in 2005 to reduce the impact of drought faced by smallholder farmers ex ante. Stakeholders involved in the pilot study included: National Smallholder Farmers Association of Malawi (NASFAM); Opportunity International Bank of Malawi; Malawi Rural Finance Company (defunct); Insurance Association of Malawi; and the Malawi Meteorological Department (which provided historical weather data). The pilot worked to the advantage of farmers as payouts were made at the end of the season. These payouts were triggered as a result of dry spells in Lilongwe district.

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[8] The Horn of Africa Risk Transfer for Adaptation (HARITA) is an integrated risk-management framework developed by Oxfam America, the Relief Society of Tigray, and their partners. HARITA has broken new ground in the field of rural risk management by enabling Ethiopia's poorest farmers to pay for crop insurance with their own labor. HARITA has shown promising results and has grown from 200 households in one village in 2009 to over 13,000 enrolled households in 43 villages in 2011, directly affecting 75,000 people.

In the 2007/08 growing season, a tripartite lending model was introduced in weather index insurance to address side-selling issues and give leverage to financial institutions to recover their funds. In this model, financial institutions worked with farmers' associations that were on outgrower schemes or contract arrangements with an agribusiness company. The latter provided extension services and guaranteed a market while banks provided financial resources for inputs. Farmers accessed the loan in kind through inputs obtained through the agribusiness, and sold their crops at an agreed price to the agribusiness, which paid farmers through the bank. Through this arrangement, banks could deduct the loans before remitting the balance to farmers.

3.4.7.4 Lessons Learned in Agricultural Insurance

Agricultural insurance works well where other systems are functioning, with strong public–private partnerships. Agricultural insurance has significant potential to help reduce agricultural risks where production, financing, processing, and marketing are well functioning and integrated. Insurance can be a suitable risk management option, but it cannot solve problems related to agricultural production inefficiencies. Good public–private partnerships arrangements are key given the high fiscal burden of premiums; hence support from other public agencies and donors is still needed.

Packaging and delivery channels are crucial for the success of an agricultural insurance product. Selling insurance as a standalone product is a difficult task, hence the old adage: *"No one wakes up in the morning wanting to buy insurance."* People do not plan to buy insurance, despite being aware of the risks they face daily. The success of a sales proposition depends on how the product is packaged. This is why weather index insurance has not been sold as a standalone product in Malawi, but as a bundled product with agriculture credit. In Malawi, Opportunity Bank worked with NASFAM as an aggregator in delivering weather index insurance to farmers.

Agricultural insurance is a powerful tool for a sustainable farmer's livelihood. The weather index insurance program in Malawi not only addressed food security but also proved to be a livelihood solution, as farmers had access to farm loans that translated to food on their tables and cash in their pockets from crop sales. The cropping combination of maize and groundnuts was ideal for farmers as both food and cash crops were covered by weather index insurance.

Product awareness and financial education are the key to successful implementation of an agricultural insurance scheme. When product awareness and financial education precede implementation, insurance uptake is high. Few people have financial knowledge about how insurance works. As such, people develop a negative attitude toward insurance. Addressing their misperceptions is thus necessary before an insurance scheme begins.

Chapter 4: Responses to Extreme Weather Events

DODMA is responsible for the development of the Food Insecurity Response Plan (FIRP), which provides details on the number of food insecure people, their location, proposed actions, resources required, accountability, and implementation arrangements. FIRP is informed by or aggregated from the response plans developed by the clusters. Those response are informed by the results of the Malawi Vulnerability Assessment Committee (MVAC), which provides details on the number of vulnerable people in each affected district. The MVAC's results are released around April/May and later updated around October after factoring in the final results of the APES.

4.1 Vulnerability Assessments

MVAC is a consortium of the GoM, NGOs, and UN agencies in Malawi. It works to provide accurate and timely information on food insecurity, thereby informing policy formulation, development programs, and emergency interventions to reduce food insecurity and vulnerability (Giertz et al. 2015). The MVAC was historically funded by different donors, particularly the UK Department for International Department (DFID) and the European Union. The GoM has spent minimal financial resources to support MVAC operations. Babu et al. (2017) observed that the MVAC's current capacity to sustainably implement a revised assessment process is questionable given institutional and funding issues around MVAC operations. MVAC data collection and analysis was based on the Household Economy Approach (HEA) methodology developed in 1995. HEA was used to predict short-term changes in access to food by translating Amartya Sen's entitlement theory to obtain information for appropriate action (ibid). The HEA approach therefore helps to quantify the number of people that fail to obtain enough food, but also suggests possible approaches to intervention. After the MVAC results are released, WFP commissions a market assessment on behalf of DODMA. These two reports inform the combination of response mechanisms (i.e., the balance of food- versus cash-based transfers) as part of the development of the FIRP, the main resource mobilization instrument.

In the past few years, concerns regarding the MVAC included: the reliability of food insecure population statistics; the methodological approaches used; and the financial sustainability of the institution. During the consultations, some stakeholders expressed the concern that since the MVAC is mostly funded by development partners such as UN agencies, they may have some influence over the statistical outcomes. Specifically, the concern is that MVAC statistics on food insecure households are sometimes inflated to justify some stakeholders' interests in the humanitarian sector. To this effect, reference was made to the infamous 2016/17 "maize gate scandal," believed to have emanated from inflated MVAC statistics on the number of food insecure households requiring food and cash assistance. The HEA methodology has been criticized for putting insufficient value on cereals, legumes, and vegetables, while not integrating nutrition strongly as part of the measures for vulnerability. As of 2017, the HEA was replaced by the Integrated Phase Classification (IPC), a standard tool developed by FAO that addresses shortfalls associated with the HEA methodology.

4.2 Food- and Cash-Based Responses

The results of the MVAC and the market assessment guide Malawi's food insecurity responses. The market assessment determines where markets are working and therefore cash-based responses are feasible. On average, 28 percent of food insecure people were given cash to purchase food in areas where grain supplies were available, as guided by the market assessment. The cash response is coordinated through the INGO Consortium led by Save the Children. The remaining 72 percent were assisted through food-based transfers, all for a period of approximately four to five months (November to March/April each year).

The food-based response is coordinated by WFP, co-lead of the Food Security Cluster, under DODMA leadership. Guided by the MVAC results and market assessment, WFP delivers food-based rations to affected households, using implementing NGOs on the ground. The ration pack includes 50 kg of maize, 10 kg of pulses, and 1.84 kg of oil per household. Households with children under two years old receive an additional 6 kg of super cereal. Throughout the response, WFP submits monthly reports showing the status of the distributions; these are discussed in various cluster and platform meetings. The cash-based response is coordinated by the INGO Consortium.

Any drawdown for MVAC support is approved by the SGR and the Maize Marketing Committee, co-chaired by the Principal Secretary of MoAIWD and DODMA, with members drawn from donors (including WFP), private sector, Ministry of Finance, Economic Planning and Development, ADMARC, and the National Food Reserve Agency. The SGR operates with funding from the GoM and donors. The minimum grain stock in the SGR used to be 75,000 MT but recently increased to 217,000 MT in the revised SGR guidelines. The SGR stock is used for buffer stock, emergency, safety nets, and market stabilization. The National Food Reserve Agency, which manages the SGR, submits monthly information on grain stock levels. On the commercial maize markets, ADMARC is a key player in determining prices; it handles approximately 50,000 MT per year, with maize positioned in 337 outlet markets spread across the country for subsidized sales. The market stabilizes when ADMARC enters the market at a good time; for example, in 2016/17 maize market prices stabilized at around MKW 250/kg.

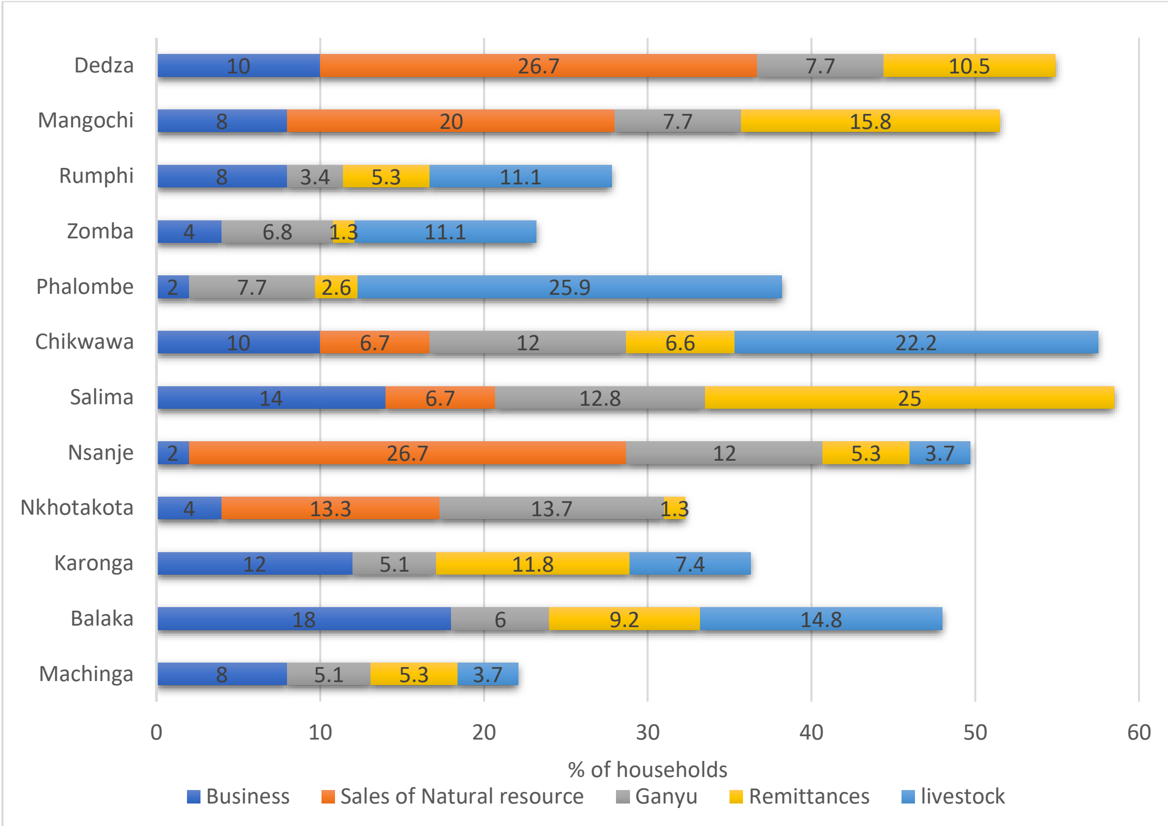
4.3 Smallholders' Coping Strategies

Overall, the number of vulnerable people in Malawi is generally increasing as a result of climate change. Consequently, smallholder farmers are adopting various adaptation strategies[9] to mitigate the effects of rainfall variability and low food production. Figure 15 shows some of the main coping strategies adopted by sampled farmers, by district.

Households clearly adopt many coping strategies, some of which are destructive, such as sale of natural resources (such as charcoal) and livestock. The sale of natural resources is a popular strategy among households in Dedza and Nsanje (27 percent), Mangochi (20 percent), and Nkhotakota (13 percent) districts. Sale of livestock is popular among households in Phalombe (26 percent), Chikwawa (22 percent), and Balaka (15 percent) districts. Short-term seasonal labor *(Ganyu)*is the main coping strategy among households in Balaka (18 percent) and Karonga (12 percent) districts. Reliance on remittances is the most important coping strategy among households in Salima (25 percent), Karonga (12 percent), and Dedza (11 percent) districts, and border districts of Mangochi (16 percent).

[9] Adaptation strategies are long-term coping measures used by households when faced with unwelcomed events, whether expected or unexpected.

Figure 15: Household coping strategies, by district, Malawi



Source: Survey data.

4.4 Social Protection and Resilience Responses

Social protection programs target the ultra-poor as a way of building their resilience to and early recovery from food insecurity. These mainly include the Farm Inputs Subsidy Programme (FISP), public works, cash for work, inputs for assets, and social cash transfer programs. Under the FISP, targeted beneficiaries (approximately 900,000 households) receive coupons to purchase subsidized agricultural inputs such as fertilizer (2 50-kg bags) and seeds (5 kg of maize and 2 kg of legumes). Under public works, beneficiaries do some form of work to receive cash or food, while others receive cash for work. Social cash transfers target the poorest 10 percent of households, mostly the elderly and women. The social cash transfer program is being rolled out to all districts in Malawi.

The cash component of the humanitarian response is implemented by the INGO Consortium, led by Save the Children, with membership including Concern Worldwide, Goal Malawi, Oxfam, and United Purpose. The central feature of the humanitarian response by the INGO Consortium over the years has been provision of complementary interventions (along with cash transfers) to promote the long-term resilience of affected households to future food insecurity shocks. However, the design and implementation of resilience programming within the humanitarian response is modified every year based on lessons from the previous year's operations.

In the past few years, the resilience component of the INGO MVAC response focused more on the promotion of village savings and loan associations (VSLAs) to allow project beneficiaries to save some

of the cash receiving during the response to buy productive assets. As time went on, other resilience-building activities were introduced, including the provision of seeds. In a 2015/16 INGO Consortium MVAC response, for example, beneficiaries were linked to implementing partners' other long-term development interventions in their respective communities. These included irrigation farming, intercropping, conservation agriculture, nutrition interventions, DRR programs, and VSLAs, among others. The external evaluation of the 2015/16 MVAC response confirmed that linking beneficiaries to long-term programs, especially VSLAs, was essential to promoting long-term resilience. The provision of cash allowed beneficiaries to save part of the cash with VSLAs and to accumulate household assets, which is essential in building resilience. Box 3 shows some of the benefits of linking resilience-building activities to the humanitarian response in Malawi.

Several social protection programs funded and implemented by development partners are adapting to reflect the need for stronger resilience and DRR (e.g., prevention, mitigation) in their design. This is a key aspect of the broader approach to shock-sensitive social protection, which aims to prevent or mitigate the impacts of seasonality and climate shocks, as well as to improve shock response. The GoM has been driving a strategic discussion with key stakeholders on how to learn from these experiences, with a focus on strengthening and linking social protection and humanitarian systems to make them more "shock-sensitive." This thinking allows social protection and humanitarian sectors to work together along the resilience spectrum – from prevention to preparedness, response, recovery, and long-term development. The objective is to enhance the capacity of individuals, communities, and national systems to become more resilient, foster wellbeing, and break the cycle of hunger and humanitarian crises in Malawi.

Evidence shows that some social protection programs play a protective role in supporting food security in the lean season. For example, social cash transfers have had positive effects on school attendance during the lean season (the peak hunger period), particularly for girls in higher grades (GoM 2017d). The recent impact evaluation of the Social Cash Transfer Program demonstrated that cash transfers can help protect beneficiary households from food insecurity in the lean season. The role of savings and access to loans are also important programming features to mitigate the impacts of future risks: households can set money aside in advance of seasonal food insecurity – or save it for use in the event of a future shock.

Box 3: Benefits of resilience building: INGO Consortium humanitarian response

In 2017, the INGO Consortium, led by Save the Children, commissioned an analysis of the benefits of the resilience-building activities that were part of the 2016/17 National Food Insecurity Response in Malawi. Building on lessons learned from previous responses and longer-term programming, the INGO Consortium targeted a subset of the total MVAC caseload with a tailored package of complementary or "wrap around" interventions. These interventions were designed to boost household capacity (especially productive capacity), fast track recovery, and support longer-term resilience building, thereby contributing to breaking the cycle of hunger in Malawi.

A subset of MVAC beneficiaries was selected to participate in the resilience-building activities. These beneficiaries were required to work in their own field (practicing the various agricultural techniques) for at least 18 days per month to qualify for a monthly transfer of around MWK 14,400. Lead farmers, working in partnership with government extension workers and the implementing partner, were responsible for verifying that this condition was met before the transfer was made to the beneficiary. These conditionalities were much more intense prior to the planting season (September–November), while during the lean season (January–April) the conditionalities were relaxed (i.e., the conditionality was nonbinding to ensure the humanitarian imperative was upheld).

The analysis found that:

- Average maize yields for the 2016/17 season were significantly higher for beneficiaries who received cash and other resilience-building activities, compared to those who received cash only.
- Beneficiaries who received cash transfers and the resilience-building package are likely to subsist with own food for seven months in the 2017/18 consumption year, compared to beneficiaries who received only cash transfers (five months), a statistically significant difference.

Source: Makoka and Mbendela 2017.

Resilience and diversification is receiving increased attention from the GoM and donors as an option to address medium- to long-term vulnerability to extreme weather events. The GoM and development agencies, especially local and international NGOs in Malawi, are undertaking various development initiatives that aim at promoting households' resilience to future livelihood shocks.[10] Some of the key interventions include diversification, promotion of drought-tolerant crops, road maintenance, reforestation, woodlots, small-scale irrigation, and inputs for assets. In response to the high susceptibility of maize to climate change (besides its high input requirements), emphasis on promoting diversification has increased. As a result, increased production and yield increases have been observed for sweet potatoes, Irish potatoes, cassava, legumes, and sorghum. Growing drought-tolerant crops has assisted in strengthening household resilience and reducing vulnerability. The research system[11] has responded positively by breeding various drought-tolerant crop varieties. However, the key gap on resilience activities is the fragmented approach to implementation. Where coordination has improved, good results

[10] The World Bank is supporting the Malawi Floods Emergency Recovery Project (MFERP) and the Malawi Drought Recovery and Resilience Project (MDRRP), which both promote resilience. As part of deepening resilience and diversification, the World Bank (with funding from Norway, the European Union, USAID, Flanders, Irish Aid, and DFID) is supporting the Agriculture Sector Wide Approach Support Project.

[11] Through the Department of Agricultural Research Services (DARS) and the Consultative Group on International Agricultural Research (CGIAR).