



Food and Agriculture
Organization of the
United Nations

Position paper

Striking before disasters do

Promoting phased Anticipatory Action for slow-onset hazards



Efficient humanitarian assistance
requires anticipation. For FAO, this means
harnessing risk information systems to act
faster and avert acute hunger.

QU Dongyu
FAO Director-General

Position paper

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Summary

Hazards may occur suddenly (sudden onset) or develop over time (slow onset) and threaten people's lives and livelihoods and all the pillars of sustainable development. Disasters exert a heavy toll on all agricultural sectors, particularly on vulnerable smallholder farmers.

This paper summarizes the Food and Agriculture Organization of the United Nations' (FAO's) conceptual and programmatic approach for anticipating and mitigating the impact of slow-onset hazards on the most vulnerable people depending on agriculture for their livelihoods and food security. The phased approach to Anticipatory Action seeks to identify multiple windows of opportunity for action across the duration of the slow-onset events to protect diverse livelihood groups at the right time and under the minimum possible uncertainty.

The phased approach recommended by FAO for anticipating and mitigating the impact of slow-onset hazards on agriculture and food security follows a five-step process by considering:

- Step 1.** Who is at risk and when?
- Step 2.** Which actions can be taken to mitigate hazard impacts, and when?
- Step 3.** How much time is needed to implement the actions selected?
- Step 4.** What kind of early warning information is available at the critical points in time identified?
- Step 5.** Bringing all the information together to define the action phases.

Since 2016, FAO has supported extensive country-level work on Anticipatory Action for several slow-onset hazards such as drought (e.g. in Afghanistan, Kenya, Madagascar, Pakistan, the Philippines and the Sudan, among others), cold waves (e.g. *dzud* in Mongolia), pests and diseases (e.g. desert locusts in the Greater Horn of Africa and Yemen, and West Africa), Rift Valley fever in Kenya and the secondary consequences of COVID-19 (e.g. in Afghanistan, Bangladesh, the Democratic Republic of the Congo, Haiti, Kenya, Senegal, Sierra Leone, the Syrian Arab Republic and Zimbabwe). Drawing on FAO's experiences in implementing Anticipatory Action and the technical expertise built over decades of supporting agriculture-based livelihoods, this paper recommends a phased approach to Anticipatory Action for slow-onset hazards as it reduces uncertainties associated with early warning information, improves the targeting of Anticipatory Action interventions and helps adapt the selection of Anticipatory Action options to the evolving hazard context.



Introduction

Disasters threaten people's lives and livelihoods, but they also threaten all three pillars of sustainable development: social, economic and environmental (FAO, 2021a). Humanitarian needs have risen to unprecedented levels, driven by different, often compounding risks and hazards. On a global level, the economic loss associated with all disasters, be they climatological, hydrological, biological or geophysical, has averaged roughly USD 170 billion per year over the past decade. In 2011 and 2017, losses surpassed the USD 300 billion mark (FAO, 2021a). These disasters may occur suddenly or develop over time, and they exert a heavy toll on all agricultural sectors, particularly on vulnerable smallholder farmers: between 2008 and 2018, disasters caused declines in crop and livestock production worth USD 280 billion globally (FAO, 2021a).

Given the increasing availability of risk and forecasting information and the interconnectedness of the humanitarian system, there is a growing consensus that vulnerable communities should be protected ahead of predictable hazards. The steadily rising needs imply that the way humanitarian assistance has functioned for decades is no longer sustainable. Anticipating shocks allows communities, governments, and humanitarian and development actors to protect lives, livelihoods and food security. It also represents a more dignified and cost-effective form of assistance because it doesn't wait for communities to suffer devastating losses before acting. A change in thinking from managing disaster response to managing disaster risk is a fundamental shift towards ensuring that communities are resilient. At minimum, an inclusive and conflict-sensitive intervention which ensures no harm to vulnerable groups, does not compound existing inequalities and does not create or exacerbate tensions or violence, will ensure that no one is left behind and thus lessens risks that can push vulnerable people further into poverty (Jones *et al.*, 2020).

This position paper draws on FAO's experiences and technical expertise built over decades of supporting agriculture-based livelihoods. The paper summarizes FAO's conceptual and programmatic approach to anticipating and mitigating the impact of slow-onset hazards on farmers, their agricultural livelihoods and food security.

Anticipatory Action is an approach that links early warning information with flexible funds to trigger actions that mitigate the impact of predictable shocks on the most vulnerable people. Anticipatory actions are short-term disaster risk management interventions implemented during the critical time window between an early warning trigger (the point in time when forecasts show that a hazard is likely to occur in the future) and the actual occurrence of the shock, i.e. before impacts on lives and livelihoods materialize. A trigger system is developed, and dedicated funds are pre-allocated to be quickly released ahead of a crisis when pre-agreed thresholds are reached. At the basis of this trigger system are relevant forecasts (e.g. rainfall, temperature, soil moisture, vegetation conditions and others), along with other stress indicators such as seasonal observation and information on which communities are most vulnerable to a given shock at a given time.



Instead of rebuilding what is already lost, Anticipatory Action aims to reinforce the capacities of vulnerable communities to protect their livelihood assets and food security. As such, Anticipatory Action is integral to risk management as it helps predefine needs and responds to them more effectively, thus reducing the impact of a hazard or threat on lives and livelihoods. More specifically, Anticipatory Action aims to:

- safeguard lives and livelihoods from the immediate effects of hazards, thus reducing humanitarian needs and protecting development gains;
- improve overall effectiveness of assistance and reduce the cost of humanitarian response;
- allow vulnerable people to uphold their dignity during and after the shocks; and
- improve the resilience of vulnerable communities to shocks over time.

The types and modalities of Anticipatory Action interventions primarily build on tested disaster risk reduction and emergency response good practices. However, they need to be adapted to the specific circumstances under which they are implemented.

The types and modalities of action are different when implemented in anticipation rather than in response to a shock. For example, only commercial and not slaughter destocking can qualify as an anticipatory action; similarly, agricultural advisory services, types of inputs and recommendations on the use of cash are very different when provided ahead rather than after the hazard. Such contextualization of Anticipatory Action interventions requires an inclusive, gender- and conflict-sensitive



approach to ensure that existing inequalities are not compounded, while potentially negative impacts are reduced and positive impacts are accentuated in the community.

FAO has been among the first organizations working with governments to establish Anticipatory Action systems to protect livelihoods and food security ahead of different shocks. Each type of hazard requires a specific programmatic approach to Anticipatory Action, which depends on the timing of impacts on agricultural livelihoods and food security, the availability of early warning information, and the kind of mitigation activities that can be implemented ahead of the shock.

This paper focuses on slow-onset hazards. A well-defined programmatic approach for Anticipatory Action against slow-onset hazards is needed, given their complexity and gradual impacts on livelihoods. These hazards can lead families to adopt negative coping strategies over time, such as selling off assets, ultimately driving them into destitution and hunger. They can also push people to migrate to search for work or seek help from relatives. Negative coping strategies and migration may expose vulnerable people to additional hazards and violence, including gender-based violence.

The primary target audiences of this paper are practitioners who deal with Anticipatory Action programming for slow-onset hazards. The paper also addresses decision-makers and aims to contribute further to understanding the basic theory and practice of Anticipatory Action for livelihood protection in slow-onset events.



Slow-onset hazards and impacts on food security

The United Nations Office for Disaster Risk Reduction (UNDRR) defines a hazard as “a process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation” (UNDRR, 2017). A slow-onset disaster is defined as “one that emerges gradually over time and could be associated with, e.g. drought, desertification, sea-level rise, epidemic disease” (UNDRR, 2017). Other examples of slow-onset hazards are some plant pests and animal diseases, a gradually deteriorating political situation leading to conflict, and, more recently, the socioeconomic effects of COVID-19 leading to various humanitarian impacts, including food insecurity. On the contrary, a sudden onset disaster is “triggered by a hazardous event that emerges quickly or unexpectedly. Sudden-onset disasters could be associated with, e.g. earthquake, volcanic eruption, flash flood, chemical explosion, critical infrastructure failure, transport accident” (UNDRR, 2017).

Slow-onset hazards progressively erode livelihoods, especially among the most vulnerable, often leading to negative coping strategies, increasing vulnerability and hunger. There is significant evidence on the impact of slow-onset hazards on agricultural livelihoods and food security.

Drought

Droughts are multi-faceted phenomena categorized into meteorological, agricultural, hydrological and socioeconomic droughts (FAO, 2013). A meteorological drought happens when rainfall is below the long-term norm, whereas an agricultural drought happens when there is insufficient soil moisture to meet the needs of a particular crop at a particular time. Hydrological drought refers to deficiencies in surface and subsurface water supplies, and socioeconomic consequences of drought occur when human activities are affected by reduced precipitation and related water availability.

Drought mainly affects agriculture: 82 percent of all damage¹ and loss² caused by drought was absorbed by agriculture in low- and lower-middle-income countries between 2008 and 2018 (FAO, 2021). Although the drivers of food crises are often interlinked and mutually reinforcing, making it difficult to pinpoint the specific trigger or driver of each food crisis (Food Security Information Network [FSIN] and Global Network Against Food Crises [GNAFC], 2021), drought is one of the major drivers of acute food insecurity and food crises. In agriculture, the crop sector experiences the first impacts of drought, which directly affect the livelihoods of farmers and people who depend on crops for their income, such as seasonal agricultural workers. As water reservoirs deplete and pasture availability for livestock becomes limited, livestock keepers, pastoralists and fisherfolk/aquaculturalists increasingly feel the adverse effects.

In countries with high levels of food insecurity, the agricultural losses caused by drought can result in severe food insecurity and push families further into the poverty trap. For example, in Madagascar's Grand South

districts, consecutive years of severe drought wiped out harvests and hampered access to food. The Integrated Food Security Phase Classification (IPC) analysis in Madagascar's Grand South for November–December 2021, April–September 2021 and October–December 2020 showed that up to 1.64 million, 1.1 million and 1.06 million people, respectively, were facing Crisis or worse levels of acute food insecurity (IPC Phase 3 and above) (IPC, 2021).

COVID-19

In addition to its effects on people's health, the COVID-19 pandemic has had considerable socioeconomic repercussions and has strained both the demand and supply sides of the global food chain. Consequentially, it has resulted in significant impacts on livelihoods and food security worldwide. An FAO study found that COVID-19-related restrictions strongly correlate with food insecurity, similar to conflict or natural hazards (FAO, 2021b). Food price fluctuations, rising unemployment, and market and trade disruptions affect people's purchasing power and erode their livelihoods, with the most vulnerable bearing the brunt. In highly food-insecure countries, COVID-19 restrictions had a significant impact on the incomes of vegetable farmers, fishers and livestock keepers whose produce is highly perishable. As in a slow-onset hazard, these effects materialize gradually. Therefore, analysis of various scenarios on the way the pandemic would progress became crucial to understand the risks it would pose to different groups, and thus mitigate such effects to prevent further human suffering.

Pests and diseases

Pests and diseases affecting plants or animals have historically been a destabilizing factor for agriculture and a major threat to food security. Locusts, armyworms, fruit flies, banana diseases, cassava diseases and wheat rusts are among the most destructive transboundary plant pests and diseases (FAO, 2021a). On the other hand, animal diseases such as foot-and-mouth disease, *peste des petits ruminants*, classical or African swine fevers, and Rift Valley fever (RVF) affect livestock on which people depend, livestock production and trade, and ultimately food security and nutrition.

A clear example of the gradual effects of pests on food security is the desert locust, which is considered the most destructive migratory pest globally. A swarm sized one square kilometre can consume the equivalent of crops that could feed 35 000 people for a year. Locust swarms can also move quickly, covering 100 to 150 km per day. If left uncontrolled, desert locusts can ravage enormous quantities of crops, trees and pastureland, destroying food and vegetation and jeopardizing the livelihoods of rural communities along their path (Food Security and Nutrition Working Group [FSNWG], 2020). A desert locust outbreak can cause a deterioration in the food security situation, especially in the Greater Horn of Africa and Yemen.

Rift Valley fever is an example of an animal disease whose outbreaks are associated with specific climatic conditions and whose effects on animal health can result in severe cascading effects on human health, livelihoods and food security. In eastern Africa, for instance, RVF outbreaks are closely associated with periods of heavy rainfall that is often linked to the warm phase of the El Niño/Southern Oscillation (ENSO) phenomenon, which leads to an increase in mosquito populations acting as vectors and reservoirs of the disease. Early warning systems have been developed to allow timely action to control the spread of the disease (FAO and World Health Organization [WHO], 2008). An RVF outbreak threatens to progressively disrupt the livelihoods and food security of vulnerable livestock keepers depending on animal trade. After the 2006–2007 RVF outbreaks in Kenya, import bans from other countries shrunk external and internal markets, leading to significant losses along the livestock production and marketing chain, including milk production losses, lost sales because of animal deaths, closures of slaughterhouses, and decreasing demand and drops in livestock prices (Rich and Wanyoike, 2010).

Cold waves

Cold wave is a meteorological event generally characterized by a sharp drop of air temperature near the surface leading to extremely low values, steep rise of pressure and strengthening of wind speed, or associated with hazardous weather, like frost and icing (Radovic and Iglesias, 2019). Extreme cold waves can have significantly detrimental impacts on agricultural production and food security. An example of such a hazard is *dzud*, a Mongolian term for extreme winters characterized by freezing temperatures reaching lows of -25°C (10°C below the average), heavy snow and frozen ground that hinders animals from reaching pasture (FAO, 2018). These conditions are commonly preceded by a dry summer, resulting in scant grazing which means livestock will struggle to build up adequate stores of fat needed to endure the winter (International Federation of Red Cross and Red Crescent Societies [IFRC], 2020). In addition, the poorest Mongolian herders cannot afford extra fodder to ensure the survival of their livestock and livelihoods. Past *dzuds* have severely impacted crops such as potatoes, buck and wheat (FAO and World Food Programme [WFP], 2017). Poor households are particularly vulnerable and often require assistance when a *dzud* hits. In 2010 for instance, approximately 10 million animals – 23 percent of the total national livestock in Mongolia – perished during the *dzud*, causing an economic loss of USD 345 million (Nandintsetseg *et al.*, 2018). An estimated 75 000 households lost half or more of their herd, while 12 000 households lost their entire herd. It is estimated that 30 000 households migrated to the capital following the 2010 *dzud*.



When and how to act: building crisis timelines for a phased approach to Anticipatory Action

The cascading timing of the impact of slow-onset hazards on agricultural livelihoods and food security presents a certain level of programming complexity. At the same time, it provides multiple windows of opportunity in which action can be taken before the full brunt of the impact materializes.

An effective way to identify these windows is by building a crisis timeline. Crisis timelines are created by overlaying an agricultural calendar with all the critical information to monitor risks. This includes local climate information and the types of agricultural activities people engage in for their livelihoods. It also includes data on the historical occurrence of a hazard (or hazards), its impacts on different sectors or target groups, and the availability of early warning information to trigger Anticipatory Action.³ Finally, the timeline also lists a set of potential anticipatory actions and the window of opportunity to implement them, including the expected time needed to assist at-risk households when an early warning trigger is reached.

This section provides a general overview of the phased approach recommended by FAO for anticipating and mitigating the impact of slow-onset hazards on agricultural livelihoods and food security. It follows the steps required to build a crisis timeline mentioned above. For clarity, an example of drought is used, built on extensive country-level work conducted in close collaboration with national governments and humanitarian, development and scientific partners, including in the framework of the interagency Anticipatory Action framework facilitated by the Office for the Coordination of Humanitarian Affairs and the Central Emergency Response Fund.

Step 1. Who is at risk and when?

A slow-onset hazard can affect agricultural livelihood groups through different pathways and timings. When planning for Anticipatory Action, the first step is identifying the livelihoods at risk. Thus, it is crucial to have a clear understanding of the calendar of agricultural activities in the targeted areas, the climate patterns relevant to those activities, and the observed impacts of the hazard in the past and their evolution over time.

Key vulnerability factors⁴ should be considered when carrying out this step, including social (e.g. loss of income or employment), physical (e.g. structural and non-structural damage), economic (e.g. interruption of activities due to the shock), and environmental (e.g. degradation of natural resources). In addition to direct impacts on livelihood groups, indirect impacts should also be considered, such as possible cascading effects on food prices, labour and movement of people.

Depending on the hazard and context, the most relevant information should be selected for the timeline. For example, in case of climate, this includes the timing of rainy and dry seasons and any other relevant climate patterns. Following this, the calendar of activities for each livelihood group⁵ can be added, for example:

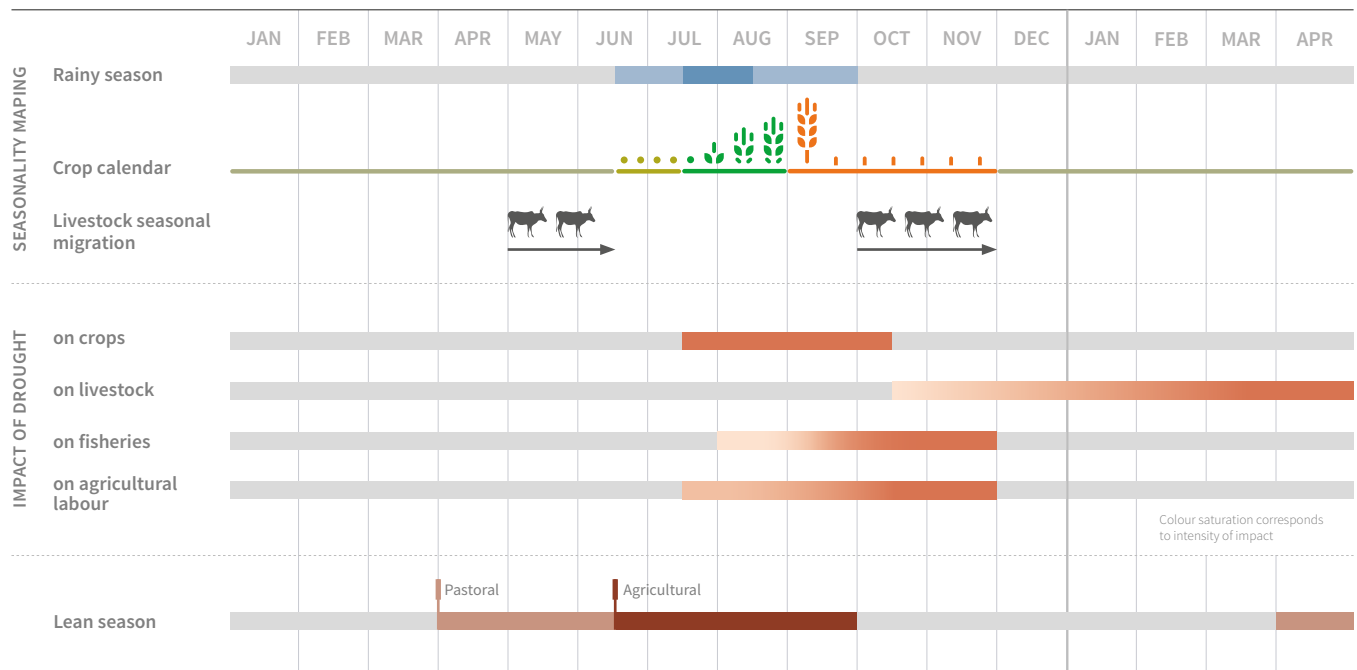
- **Farmers:** What are the periods for land preparation, crop planting, growing and harvesting, and when do products go to market?
- **Livestock keepers:** What are the periods (and which are the routes) for seasonal migration, livestock production – calving, lambing, kidding and milking – and when is the peak of the livestock trade?
- **Fishers (freshwater and aquaculture):** What are the critical periods for fish breeding, catching or harvesting, drying and trading?
- **Agricultural labourers:** When is the peak of labour demand, and when do people usually migrate for labour?
- Finally, **the timing of the hazard's impact** on the different livelihoods should be identified in the crisis timeline, including an indication of the peak(s) of the impact on each livelihood group based on historical information.

Figure 1 provides an example of a crisis timeline for drought in an area with a unimodal rainfall regime, meaning a season with one rainfall peak period. In this example, the rainy season spans from mid-June to the end of September, the main crop planting and harvesting occur between mid-July and October, and seasonal livestock migration occurs before the start of rainy season between May and mid-June and at the end of the rainy season between October and November. The peak demand for agricultural labour usually coincides with land preparation in mid-June to mid-July. Meteorological drought can start in June if the rains start to subside, and it can rapidly turn into agricultural drought if rainfall deficits affect crop water requirements at the early stages of crop growth. Prolonged rainfall deficits during the season can lead to the progressive drainage of surface and groundwater reserves. Thus, depleting pastures eventually affect animal health because animals have limited access to water and fodder.

The timeline consolidates the following information on who is at risk and when:

- Farmers are likely to feel the impacts of drought on their livelihoods if they don't receive timely support to ease the impacts on their crops, or substitutes/other kinds of support. For example, a rainfall deficit, a late start or an early end to the rainy season, all impact soil moisture, crop growth and crop health. The timing and intensity of drought impact on crops vary depending on crop types and varieties, and cultivation practices (e.g. rainfed crops, irrigated or flood-receding crops, and home gardening).

Figure 1. Example of a crisis timeline for drought in an area with a unimodal rainfall regime



Source: Author's own elaboration.

- Livestock keepers are also at risk of declining animal health during a drought. Reduced availability of pasture and water can deteriorate livestock body conditions, reduce animals' capacity to feed their offspring and make them more susceptible to diseases. Such impacts usually begin towards the end of the drought-affected rainy season, when pastures and water resources start to deplete.
- Fishers' livelihoods can suffer under increased lake or pond water temperatures and reduced water levels, leading to reduced fish catch and increased fish deaths in ponds. Such conditions can also increase water salinity, impacting both freshwater and aquaculture practices. It can have adverse effects on the diversity and size of fish populations.
- If rains and harvests fail, agricultural labourers may lose seasonal employment and thus, their only income opportunity in rural areas.

For vulnerable households, the impacts of drought on livelihoods, as mentioned above, if not prevented or mitigated, are likely to translate into a deterioration of their food security situation after a certain amount of time that varies depending on pre-hazard vulnerabilities (e.g. food stocks and alternative income-generating opportunities).

Step 2. Which actions can be taken to mitigate hazard impacts, and when?

Once there is clarity on which groups of people and livelihoods are at risk and when they are likely to experience the hazard's peak impact, it is time for key stakeholders to identify suitable anticipatory actions. These actions should protect the livelihoods of the most vulnerable people in order to mitigate the impacts of the hazard on food security. In the case of slow-onset hazards, the impact on agricultural livelihoods (e.g. animals losing weight and dying, crops failing and fish dying in ponds) does not always coincide with the start of the hydro-meteorological phenomenon (i.e. lack of rainfall). FAO recommends identifying actions that anticipate the peak of a hazard's impact on the livelihoods that sustain food security. In addition, the actual timing of Anticipatory Action needs to be adapted to each national and regional context. Below are examples of anticipatory actions to protect farmers and their agricultural livelihoods from slow-onset hazards. These examples are most relevant to drought, but they are not exhaustive and should be adapted based on the context. The actions are categorized based on their main objective.

Protecting food production

Depending on the context and target livelihood, stakeholders engaged in Anticipatory Action planning can prioritize different actions to protect food production ahead of the shock. Examples include input distribution and water management.

Input distribution

Today's increasing variety of tools and technologies can equip rural communities to better cope with slow-onset hazards and protect their livelihoods. However this requires awareness, availability and access to such inputs. Vulnerable people may face difficulties accessing adequate inputs such as stress-tolerant seed varieties, animal feed or supplements to mitigate the impact of slow-onset hazards on their production. This is likely to create a vicious cycle of declining production, reduced work opportunities and increasing food prices. In turn, farming families may resort to negative coping strategies, like selling assets, which contribute to increased food insecurity in agricultural communities.

Anticipating challenges in people's ability to access farming inputs and acting on warning signs before the hazard's peak, requires a targeted approach for different livelihood groups. In the case of drought, some examples include:

- Project implementers can distribute stress-tolerant seed varieties for **farmers**, adapted to the warning system's specific shock and to the local agroecological conditions ahead of the planting season to sustain their food production. Off-season, short-cycle crop seeds can be distributed to allow rapid food production and compensate for potential losses in main season crops.

- **Livestock keepers** may require inputs such as animal feed and mineral supplements to sustain core breeding herds, which should be distributed before the hazard has an impact on the availability of fodder, or access to grazing areas, to prevent animal morbidity and mortality and maintain the production of crucial animal products such as milk. In addition, providing animal treatment at the proper time can further reduce the incidence of diseases that increase with climatic shocks.
- **Aquaculture farmers and freshwater fishers**, in turn, need fish feed, tools to monitor water quality, and inputs to maintain the health of their animals and the aquatic system they live in. Depending on the context, providing fertilizer or fish species adapted to warmer and shallower water can be additional options. Support to reduce the salinity of the water can also be implemented.

Water management and good agricultural practices

When a slow-onset hazard is expected to impact the availability or quality of water resources for food production, timely actions can help mitigate such effects. For instance, in the case of drought, the rehabilitation or installation of water harvesting structures and efficient irrigation systems is critical across livelihood sectors. In the livestock sector, the rehabilitation of water points can be vital in ensuring access to drinking water for animals. At the same time, applying good agricultural practices to retain soil moisture (e.g. mulching) or prevent the outbreak of water-borne diseases can complement water infrastructure activities. In addition, reducing the required water input, such as rice production with alternate wetting and drying, can save water and enable farmers to continue their production. The interventions need to be finalized before the hazard's peak impact to qualify as anticipatory actions. For instance, rehabilitating water points should occur before animals start suffering from a lack of water due to drought. Most of the work on water management should ideally be carried out before the season starts, to avoid technical impediments during the rainy season.

Promoting livelihood diversification

When a forecast hazard is likely to affect a family's primary source of income, vegetable gardens and small livestock holdings can ensure food security and nutrition for rural households. Similarly, a temporary switch to short-cycle crops can ease pressure on farmers who cannot plant, process or sell their regular products as usual or could only obtain inputs too late in the season. In addition to traditional planting, hydroponic systems, which allow farmers to grow crops in water without soil, can facilitate food production, provided farmers also receive the proper training. Similarly, mushroom-growing kits can provide an alternative source of food and income because they can withstand high temperatures and poor soil conditions.



While maintaining food production is critical during droughts, in some instances, off-farm employment may be the best option to ensure the family remains food secure. Training can be provided to agricultural labourers and smallholders on the diversification of income sources ahead of expected peak impacts on livelihoods. Overall, livelihood diversification may require longer-term support, capacity building and efforts to make rural communities aware of the benefits of alternative livelihoods; therefore, Anticipatory Action should build on and scale up existing programmes focusing on tested and context-specific practices to deliver within the short window of opportunity.

Ensuring economic access to food

Slow-onset hazards can affect the incomes of vulnerable people who depend on agriculture and can constrain their economic ability to access food, affecting their food security. Cash-based assistance provided before the hazard has an impact is crucial to address the expected immediate needs of the most vulnerable people and to help them better cope with the incoming shock. Cash-based assistance helps people avoid adopting negative coping strategies and protects their livelihoods and food security. These may include:

- **Farmers, pastoralists, fishers:** Productive safety nets can support the continuation of agricultural activities before the hazard has an impact. One example is cash+, a type of support that provides people with money and specific items that help them protect their livelihoods. Inputs like seeds and animal feed, combined with unconditional cash transfers that cover a family's other immediate needs to prepare ahead of a crisis, can ensure they hold on to their agricultural livelihoods. It can also prevent them from selling assets or taking on loans before it is too late. These activities should be implemented before the planting season or before the livestock keepers' lean seasons to anticipate and mitigate later adverse effects. In case of fishers' livelihoods, the activities should be implemented before the hazard impacts the quality and quantity of water.
- **Agricultural labourers:** Unconditional cash transfers can provide vital support to casual agricultural workers who risk losing employment. In some cases, cash-for-work initiatives may effectively address workers' needs while sustaining the supply of agricultural labour in rural areas. These activities should be implemented ahead of the peak of demand for agricultural labour to prevent unemployed labourers from adopting negative coping strategies due to the lack of vital income sources. The peaks usually coincide with land preparation, sowing and harvesting periods for crop production.
- **People dependent on markets for food:** Unconditional cash or voucher initiatives can improve access to food for vulnerable people whose purchasing power is expected to be affected by hazard impacts. The transfers should be made before people start adopting negative coping strategies. To ensure they correctly anticipate all impacts, stakeholders engaged in Anticipatory Action planning should also consider seasonal food security trends, like the lean season and the expected timing of price increases, for example, those related to foreseeable disruptions in food supply chains.
- Where **social protection systems** exist, they represent a channel to reach the most vulnerable people and deliver cash assistance. Expanding social protection coverage is crucial to providing financial protection to the most vulnerable households expected to lose their income due to the hazard.

Strengthening early warning and agricultural advisory services

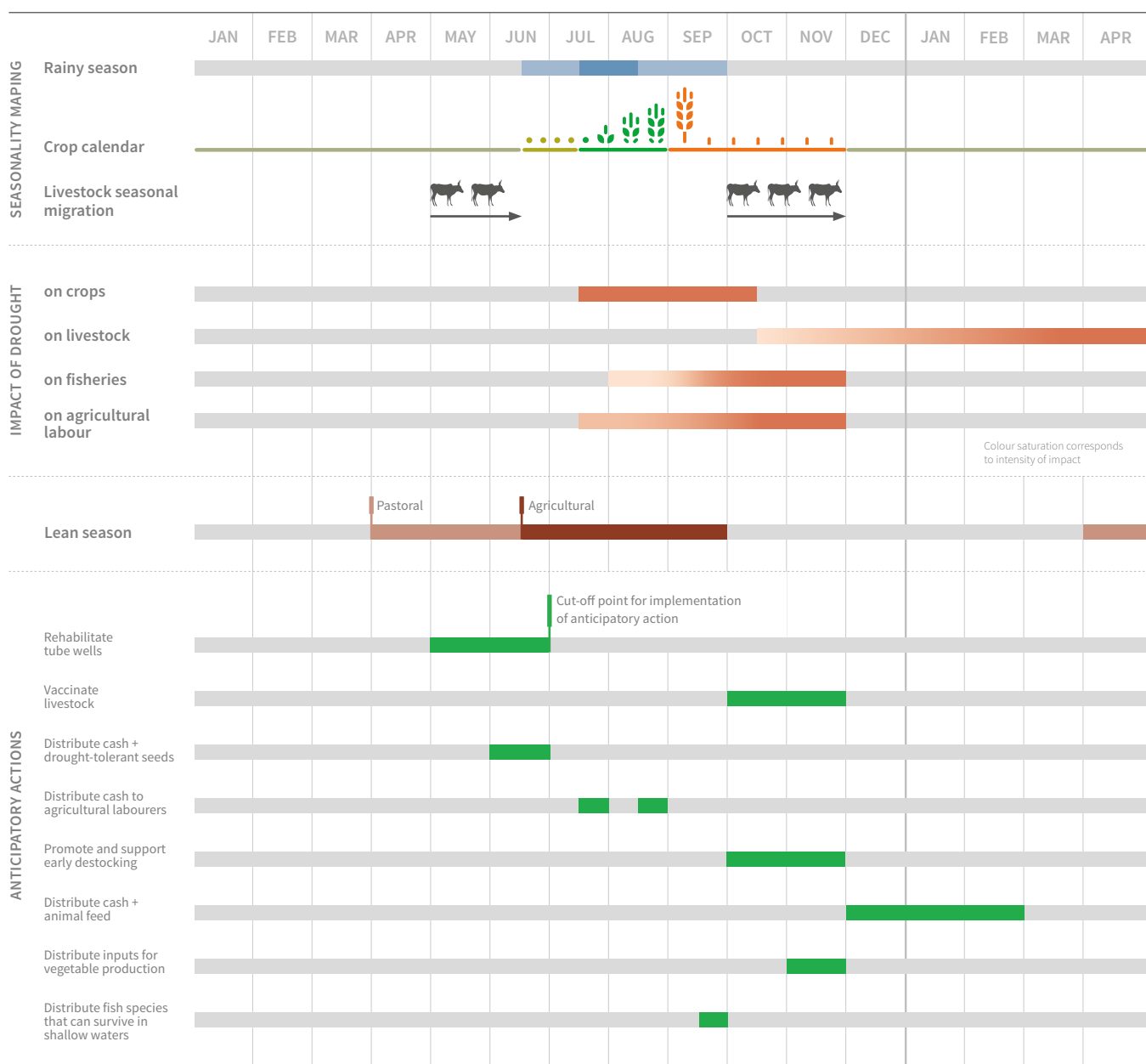
Communities are always the first responders to any disaster's impacts; therefore, it is imperative that they are engaged in disaster management activities at the local level. Communities should be engaged to identify, evaluate and triangulate existing and required early warning information, and identify context-specific actions and good agricultural practices to minimize hazard impacts. The engagement of communities is crucial to ensure that the Anticipatory Action process is people-centred and caters to the needs of the most vulnerable groups. Therefore, early warning and agricultural advisory messages also need to reach the most remote areas

where people have limited access to information. Communication methods and techniques should be gender-, diversity- and inclusion-sensitive, and adapted to the context of rural farming, fishing and livestock raising communities. Actions to mitigate hazard impacts through early warning and agricultural advisory services include, among others:

- early warning and agricultural advisory campaigns through SMS messages, social media, radio, farmer field schools, livestock field schools, animal health clubs, Dimitra clubs, and other networks;
- capacity building of local authorities and extension services on communicating early warning messages and good agricultural practices to mitigate drought impacts. These groups include animal surveillance staff, forestry authorities, farmers, forest users, women and youth groups; and
- advice on potential early destocking, which can be a suitable action for livestock raisers under certain conditions.⁶ This should occur before animal prices start to decline and animal body conditions deteriorate.

Continuing from the example in Step 1, Figure 2 shows how selected anticipatory actions for drought can be added to the crisis timeline in Step 2, indicating the latest possible point when the action must be completed, preceding the peak of the impact on livelihoods. For example, seasonal agricultural labourers should receive support, such as cash distributions, before the drought impacts their casual work opportunities in land preparation, planting and harvesting later. Wells should be rehabilitated and drought-tolerant seeds distributed ahead of the start of the planting season to mitigate the effects of foreseen rainfall deficits on the production of main crops. Other actions, such as vaccinating livestock and distributing animal feed, should be concluded before animals are affected by drought impacts. The distribution of inputs for off-season crop production, such as vegetable gardening, should be finalized by the end of the harvest period. This allows rapid food production to compensate for losses in the main crop production and avoid an earlier-than-usual lean season. Fish farmers, in turn, could receive support in the form of distributions of fish species that can survive in shallow waters before water levels in aquaculture ponds begin to decline. Selected anticipatory actions should furthermore consider and address the gendered impacts that slow-onset hazards may have.

Figure 2. Selected anticipatory actions for drought



Source: Author's own elaboration.

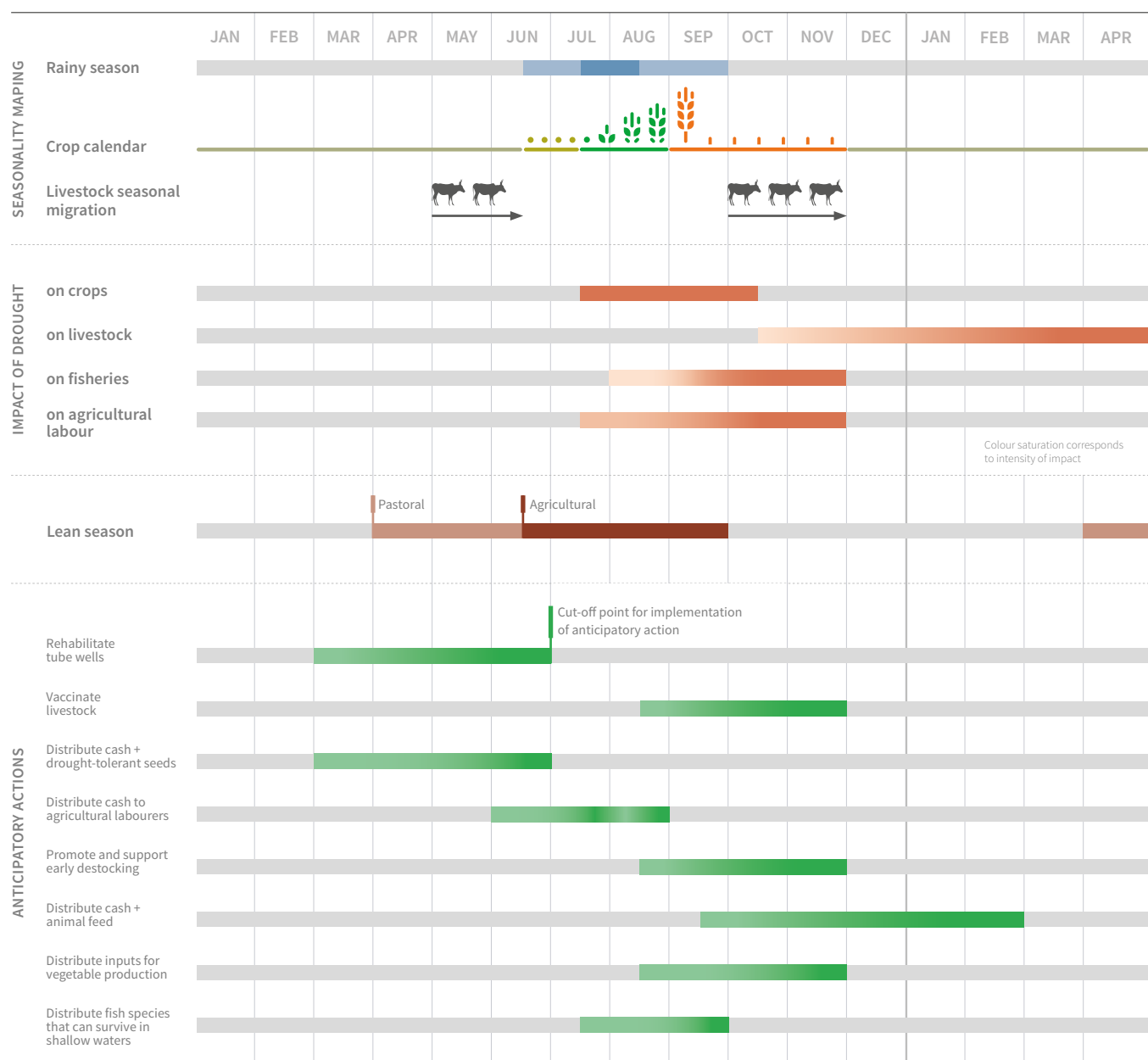
Step 3. How much time is needed to implement the actions selected?

Understanding how much time is needed to implement each selected action is critical. In other words, how long does it take to complete all the actions that need to happen until the assistance reaches the beneficiaries, such as technical clearances, procurement, transportation and distribution? Knowing the length of the implementation process allows the designers of anticipatory actions to define the point when a final decision must be made regarding the activation of a specific intervention – the more substantial the preparedness level and operational capacities of the implementers, the shorter the implementation time.

Continuing on the previous example on drought, Figure 3 shows an updated crisis timeline indicating a fictitious timing of implementation for each of the selected anticipatory actions. Some actions – such as rehabilitating tube wells and vaccinating livestock – require more time to be implemented, while others, such as promoting early destocking or distributing cash to agricultural labourers, can be completed relatively quickly.



Figure 3. Crisis timeline indicating a fictitious timing of implementation for each of the selected anticipatory actions



Source: Author's own elaboration.

Step 4. What kind of early warning information is available at the critical points in time identified?

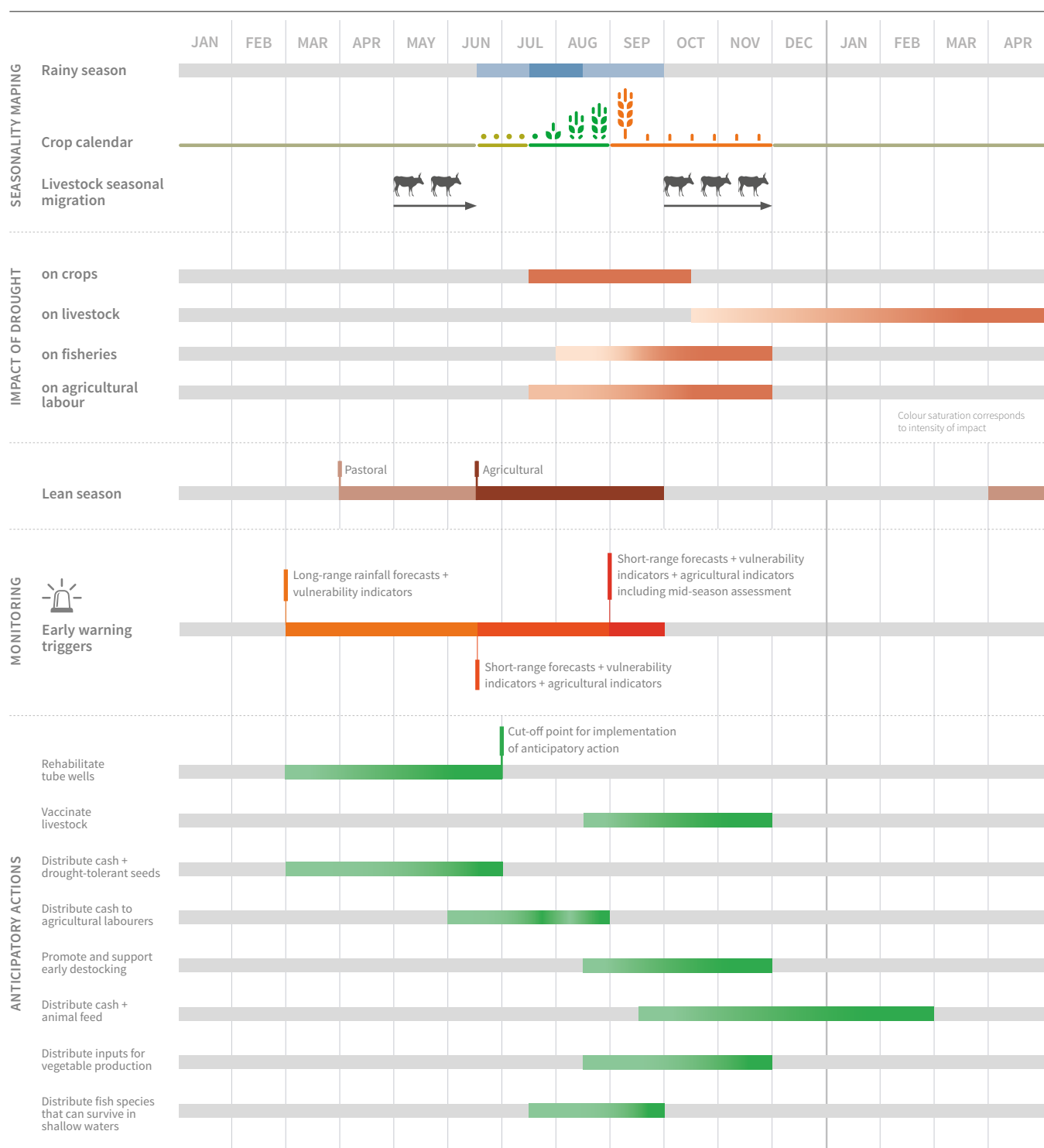
It is crucial to assess which early warning information is available and can be used to trigger the implementation of selected actions. Some types of early warning information are available throughout the year, e.g. desert locust monitoring systems and near-real-time food price monitoring. Other early warning information becomes available at different times and with different accuracies. Examples include long-range and short-range seasonal rainfall forecasts or remote sensing information on crop conditions. The selection and combination of reliable early warning information should follow a rigorous process to set up the most effective trigger mechanism.

Continuing with the previous example on drought, Figure 4 shows an updated crisis timeline indicating the type of early warning information available along with the window of opportunity for Anticipatory Action. In this example, long-range seasonal rainfall forecasts become available more than four months before the rainy season, corresponding with the start of the crop growing season, where farmers step up agricultural activities such as ploughing and planting.

The seasonal forecasts are updated approximately one month before the start of the rainy season. In this time window – between one and four months before the start of the rainy season – action triggers can be based on long-range forecasts (to evaluate the risk of hazard) combined with key vulnerability indicators (to evaluate the risk that the hazard turns into a humanitarian disaster). Starting one month before the rainy season, the national meteorological services release an updated seasonal forecast, followed by short-range forecasts as the season gets underway. The seasonal forecasts are also available from sources at both regional and global levels. In the time that begins one month before the start of the main crop planting season and lasts until the end of that season, anticipatory actions can be triggered by updated seasonal forecasts, short-range forecasts, seasonal observation indicators and vulnerability indicators.

Seasonal observation indicators use data recorded during a season to understand the current situation based on in-situ or remote sensing measurements. Examples of seasonal observation indicators are vegetation, rainfall, soil moisture and temperature, among others. Seasonal observation indicators such as vegetation indices could be used to trigger not only crop-based anticipatory actions by signaling stressed vegetation conditions during cropping season but also livestock-based anticipatory actions by providing information on pasture productivity, especially in pastoral communities which rely on pastures and grasslands as the main source of fodder. Vulnerability indicators could be current IPC analyses and near-real-time monitoring of market prices, among others. Finally, mid-season assessments become available during the cropping season and can be used as additional information to trigger anticipatory actions.

Figure 4. Updated crisis timeline⁷ indicating the type of early warning information available along the window of opportunity for anticipatory actions



Source: Author's own elaboration.



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Step 5. Bringing all the information together to define the action phases

At this stage, all the relevant information is available to build the crisis timeline and use it as a programmatic tool to decide when and how to implement anticipatory actions for slow-onset hazards. There are multiple phases for mitigating the impact of a hazard on different livelihood groups. Identifying those phases depends on the context, hazard and early warning information. The phased approach can be adapted to each country's context, including different livelihoods, climate conditions and operational capacities.

Example 1 – Drought

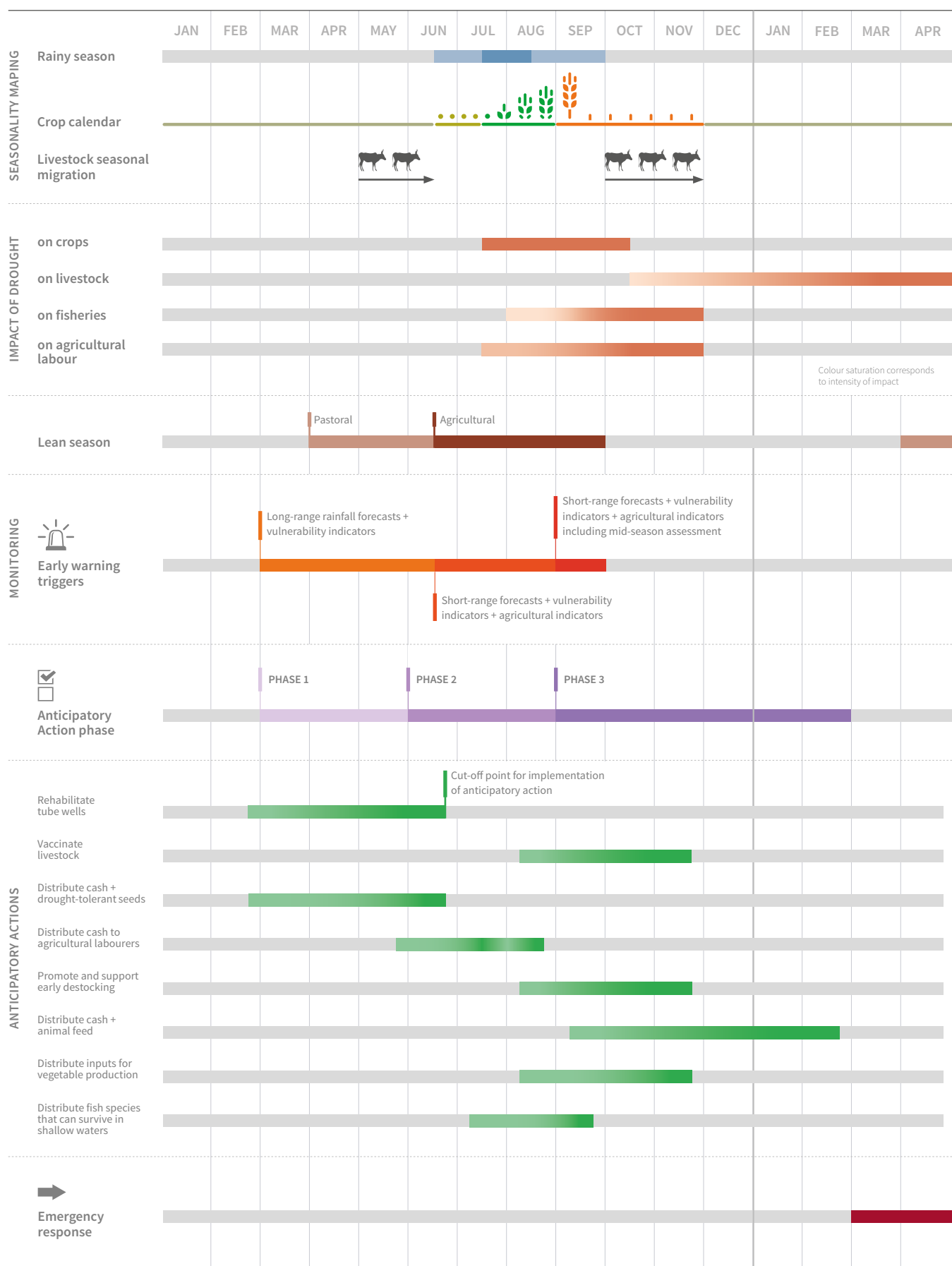
Continuing with the previous drought example, Figure 5 shows three key phases or windows of opportunity for triggering anticipatory actions. In each phase, different early warning information is critical and sets in motion different types of actions.

Phase 1. The window of opportunity for Anticipatory Action spans from the beginning of March, when long-range forecasts become available, to mid-June, when the rainy season starts. Anticipatory actions implemented in this phase might include actions to support the upcoming agricultural campaign such as preparatory activities for the distribution of cash and stress-tolerant agricultural inputs, as well as water management actions such as the rehabilitation of water points, among others.

Phase 2. The window of opportunity for Anticipatory Action runs from the beginning of land preparation activities in mid-June until the end of the planting period at the end of August. Anticipatory actions in this phase are designed to support farmers in the planting season for rainfed crops by providing drought-tolerant crop and forage seeds and rapidly rehabilitating irrigation. This is also a crucial window of opportunity to support agricultural labourers and mitigate the impact of drought on their seasonal income, for example, by distributing cash or alternative livelihood assets.

Phase 3. The window of opportunity for Anticipatory Action starts at the beginning of September – when the rainy season is still ongoing, but the planting period is over. In case of livestock-related interventions, e.g. feed distribution, the time for implementing anticipatory actions can extend beyond the affected rainy season, before the drought-induced pasture depletion starts affecting animal conditions. Indeed, enough information and time are available to foresee and prevent a potential deterioration in animal body conditions and animal deaths. Anticipatory actions might include promoting early destocking,⁸ distributing animal feed, organizing animal treatment/vaccination campaigns, or distributing short-cycle crop seeds and small-scale irrigation equipment for rapid off-season production. This phase will end when drought impacts on pastoralist livelihoods appear, such as animals becoming weak, sick or dying at a higher rate than normal. The time needed for such impacts to materialize depends not only on the intensity of the drought but also on pre-existing vulnerabilities, such as animal body condition and pasture availability before the drought started.

Figure 5. Three key phases or windows of opportunity for triggering anticipatory actions



Source: Author's own elaboration.

Box 1. Balancing inaction against uncertainties of forecast

Using early warnings as a basis for action carries an inherent degree of risk of acting 'in vain' because forecasts cannot tell what will happen in the future with 100 percent confidence. As such, four possible outcomes are possible:

- An event is forecast, and the event occurs (hit).
- An event is forecast, and the event does not occur (false alarm).
- An event is not forecast, and the event occurs (miss).
- An event is not forecast, and the event does not occur (correct rejection).

A forecast can go wrong in two ways: predicting something that does not happen (false alarm), which may lead to acting in vain, or failing to predict an event that happens

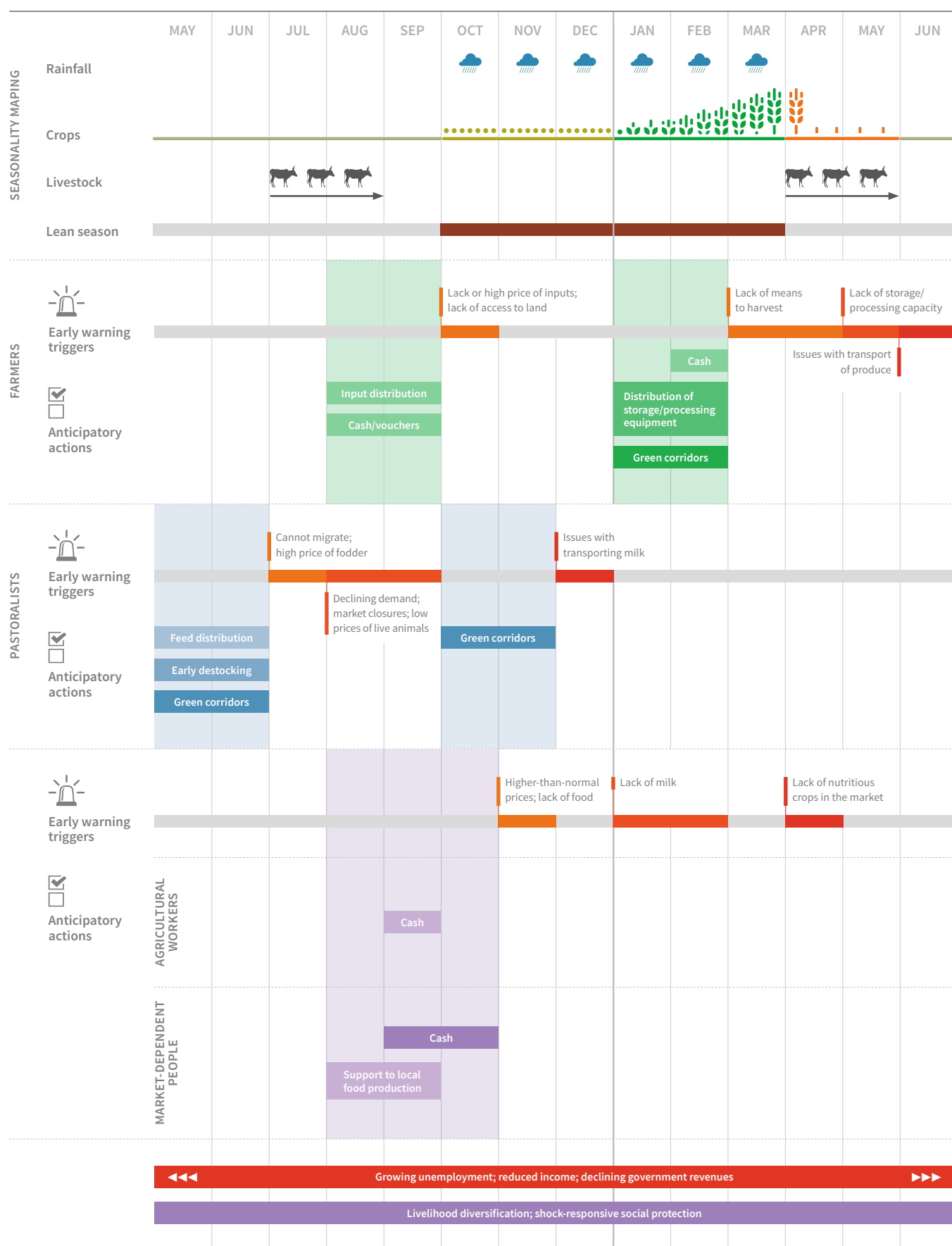
(misses). Adopting a no-regret or low-regret approach helps to mitigate against false alarms and thus ensures that vulnerable families benefit even if the expected shock does not materialize. As a general rule, it is better to take action based on longer-range (and thus more uncertain) warnings than not to take action at all. For instance, if the actions recommended for Phases 2 and 3 cannot be implemented within the windows of opportunity – for example, because the implementation takes longer in that specific context – the advice is to implement them earlier, based on triggers for Phase 1. To mitigate against misses, it is essential to use the best available information, triangulate data and (when possible) allow for multiple Anticipatory Action windows.

Source: Author's own elaboration.

The end of the three Anticipatory Action phases marks the transition into emergency response.⁹ This is the point when the humanitarian needs caused by the hazard have fully materialized. While this marks the end of the window of opportunity to implement protective anticipatory actions, the work done to prepare for and implement such actions can still facilitate the implementation of emergency response interventions. That said, the type of assistance provided to beneficiaries in an emergency response phase is often different from the Anticipatory Action phase for several reasons, including:

- Anticipatory actions can include a wide range of prevention and mitigation actions. This means they are a clear link between disaster risk reduction and post-disaster response. On the other hand, several livelihood protection actions cannot be implemented in the response phase as it would be too late to intervene effectively. For instance, if a drought has already impacted crops, it would be too late to distribute resistant seeds to prevent production losses.
- The targeting of Anticipatory Action is done based on potential needs, while the emergency response is based on observed needs. As a result, response interventions can be tailored to the specific needs of surveyed households and calibrated against the actual observed impacts of the hazard.
- While some anticipatory actions are the same type of action as in emergency response, the technical specifications of the inputs provided might be different given the different timeframes. For example, the type of feed would be different if provided to animals in good condition before the hazard hits, rather than to deteriorated animals after the impacts of the drought.

Figure 6. A conceptual approach to Anticipatory Action for COVID-19 secondary impacts on agricultural livelihoods and food security



Source: Author's own elaboration.

Example 2 – COVID-19

The COVID-19 pandemic has shown the importance of accounting for unexpected shocks and better understanding the complex interplay between multiple risk factors. Since the pandemic started, FAO has conducted forward-looking analyses in multiple countries to anticipate the potential knock-on effects of COVID-19 on agricultural livelihoods and food security, and inform Anticipatory Action programming.

Examples of such secondary effects are farmers not having access to seeds because of market closures, or herders being unable to reach their seasonal pastures because of pandemic containment measures such as movement restrictions. In each case, scenario analysis informed the country-specific crisis timelines. It made it possible to explore potential outcomes about the implications, opportunities and risks of specific actions or policies to curb these negative impacts on people's sources of food and income. These different scenarios were critical in a context with limited availability of forward-looking information, and allowed humanitarian actors to be prepared as the pandemic progressed. FAO made this approach the central component of its contribution to the United Nations-coordinated Global COVID-19 Humanitarian Response Plan (FAO, 2020a), and it guided investments in Anticipatory Action across several countries at high risk.

Figure 6 presents a conceptual approach to Anticipatory Action applied by FAO to mitigate the secondary impacts of COVID-19 on agricultural livelihoods and food security, highlighting the critical windows of opportunity for triggering Anticipatory Action. This generic crisis timeline¹⁰ shows that the expected secondary effects of the pandemic would occur at different points in time along the agrifood chain, thus affecting different livelihood groups and requiring well-targeted and timed interventions. The timeline assumes that COVID-19 containment measures, such as movement restrictions, travel bans and closures of facilities are in force. When critical information is available on the potential spread of the virus or the expected intensification or lifting of containment measures, it is also factored into the analysis of a specific country's context. The timeline also indicates generic anticipatory actions that were triggered to prevent or mitigate expected impacts on agricultural livelihoods and food security. Some examples, by livelihood group, include:

- **Farmers:** Each phase of the production cycle offers different windows of opportunity for Anticipatory Action. In many countries, the disruption of supply chains and declining purchasing power challenged the availability of and people's access to inputs for their agricultural production (FAO, 2021b). Some ways to mitigate such effects include providing cash and inputs ahead of the planting season and deciding on the assistance modality based on market assessments. It was also essential to keep monitoring other climate-related risks that might affect the planting season at the same time. Then, during harvest and post-harvest periods, movement restrictions resulted in farmers needing support to store and commercialize their most

perishable products. Even when reaching markets was not a problem, selling the produce became difficult due to reduced demand in the context of an economic downturn and a decline in people's purchasing power. These dynamics resulted in major food losses, especially for perishable agricultural commodities such as fresh fruits and vegetables, which represent a key source of livelihood and food security for many small producers and are a fundamental source of nutrients for diverse and healthy diets.

- **Pastoralists:** This group's critical windows for Anticipatory Action were before migration periods – such as transhumance to summer or winter pastures – and before key trading periods of animals and animal products. Pastoralists were likely to require inputs such as animal feed and fodder, especially if movement restrictions were expected to hamper traditional migratory routes, thereby hindering access to grazing areas. In addition, cash support ahead of key trading periods might have been required to compensate for declining demand, market closures and low prices of animals and animal products resulting from the overall socioeconomic impact of the pandemic. The establishment of green corridors,¹¹ distribution of meat processing technologies and support for establishing processing and storage facilities at the community level are interventions implemented before the peak production periods.
- **Agricultural workers:** The most immediate secondary impact of COVID-19 is the slowdown of economic activities due to the measures put in place by governments to contain the spread of the virus. For people on the brink of food insecurity, even a small reduction in income can hinder their capacity to fulfil basic needs, including access to sufficient food. The most affected livelihood groups were informal workers in urban and peri-urban areas and seasonal agricultural workers (FAO, 2021b). Cash-based anticipatory actions implemented ahead of the usual peak labour demand periods, such as land preparation time or harvest season, were crucial to address the expected immediate needs of struggling workers and to prevent them from adopting negative coping strategies and protect their food security and that of their families.
- **People dependent on markets for food:** In some cases, the pandemic contributed to declining incomes and rising food prices, which threatens the food security of people who are dependent on markets for their food. Cash support by expanding national social safety nets, for example, was crucial to mitigating the loss of purchasing power that families experience as a result. Furthermore, supporting local food producers by building their capacity and providing them with essential inputs, when feasible, helped them with additional food sources at lower prices. At the same time, it created new income-generating opportunities for the most vulnerable.

Effectiveness of FAO's phased approach to Anticipatory Action for slow-onset hazards

Since 2016, FAO has supported extensive country-level work on Anticipatory Action against slow-onset hazards in different countries, working with national governments and humanitarian, development and scientific partners. The following section presents case studies of FAO anticipatory actions based on the phased approach.

Drought

FAO has implemented several Anticipatory Action interventions for drought across different continents. In-depth analyses have been conducted to analyse the effectiveness and impact of some of these interventions.

In Madagascar, the Anticipatory Action interventions between November 2017 and May 2018 aimed at protecting farmers and their livelihoods from forecast drought in Amboasary, Ambovombe, Bekily, Beloha and Tsihombe districts (FAO, 2019a). In the first phase, FAO distributed high quality seeds for staple rainfed crops to allow vulnerable farmers to take advantage of any rainfall they received. Then, in the second phase, micro-irrigation systems, water pumps and water storage tanks were distributed together with vegetable seeds with a short growing cycle. This was done to ensure multiple production cycles and to mitigate the expected impact of drought on main rainfed crops. Households were also given training on better agricultural techniques, including crop diversification, using organic fertilizers, fighting plant diseases and improving crop storage. The Anticipatory Action intervention targeted 8 400 vulnerable households for early action. Agricultural tools and seeds (vegetable and staple crop seeds) were distributed to allow planting on a total of 3 200 ha. In addition, 228 water pumps and 488 micro-irrigation kits were distributed. Support for main rainfed crops was less successful (and late in some places) than support for off-season vegetable production and irrigation, which was timely and provided alternative food and income opportunities during drought. A return on investment analysis showed that for every USD 1 invested by FAO, households gained USD 2.5 in the form of increased vegetable production and avoided loss of staple crops.

In the Philippines, the Anticipatory Action interventions between November 2018 and May 2019, supported vulnerable rice farmers by shielding their livelihoods against forecast drought and creating alternative income opportunities in Mindanao (FAO, 2020b). The focus was on two municipalities: Pigcawayan in Cotabato Province and Datu Saudi Ampatuan in Maguindanao Province. A phased intervention adapted to the different livelihood calendars of the two provinces became crucial. FAO distributed drought-tolerant rice seeds to Cotabato farmers who hadn't planted, while Maguindanao farmers – whose rice paddies were already planted – received livelihood diversification support through small livestock and vegetable gardens. The growing tension across Maguindanao province, which could erupt into violence and cut off access to rice fields, meant that families in Datu Saudi Ampatuan needed support to build alternative livelihoods. Women farmers' cooperatives received a mix of ducks and goats to produce eggs, milk and meat and to shore up

their asset base. The animals were kept at community farms where all families worked together to rear their livestock and share the gains. The farm also served as a training hub where men and women could learn to integrate crop and livestock farming in ways that would reduce the impact of drought. Next, families received seeds, tools and irrigation support to set up small vegetable gardens at home too. This was meant to boost their nutrition and generate extra income. To make up for the potential loss of income due to rice harvest failure, the most vulnerable families in Datu Saudi Ampatuan received cash in exchange for labour. This work consisted of cleaning local water canals that were critical for irrigation in the area. This, in turn, also helped other farmers who did not directly participate in the project but who were potentially affected by the dry conditions. The project also partnered with the local government to install wells and pump irrigation systems to make it easier for farmers to water their crops. The government, FAO and other organizations also went town-to-town as part of a public awareness campaign that alerted farmers across the Mindanao region of the coming drought and provided tips on how best to protect their crops. The Anticipatory Action interventions, which were implemented more than four months earlier compared to the usual timing of drought response in that area, benefitted 1 500 vulnerable households. In Datu Saudi Ampatuan, the analysis showed that for every USD 1 FAO spent, families reaped benefits worth USD 4.4 (FAO, 2020b).

In the Sudan, the Anticipatory Action intervention aimed to protect pastoralist livelihoods ahead of drought in 2017, targeting 5 000 pastoralist households (FAO, 2019b). A phased approach was crucial: in the first phase, a total of 30 000 livestock were vaccinated and dewormed, and their owners received training on the benefits of early destocking. Then, in the second phase, concentrated animal feed and mineral licks were distributed to protect core breeding stocks. The intervention was closely coordinated with federal, state and local authorities and partners. For every USD 1 invested, households gained USD 6.7 – this included the value of animals saved from death, the avoided value loss because of poor health and body condition, and the gains from the extra milk they produced.

COVID-19

FAO has implemented nine projects to mitigate the secondary effects of COVID-19 on agricultural livelihoods and food security, such as movement restrictions and the closure of markets where farmers would buy and sell products. The projects took place in Afghanistan (FAO, 2020c), Bangladesh, the Democratic Republic of the Congo (FAO, 2020d), Haiti (FAO, 2020e), Kenya, Senegal, Sierra Leone (FAO, 2020f), the Syrian Arab Republic and Zimbabwe (FAO, 2020g). Marketgoers and nomadic herders were made aware of the dangers the virus posed to their health and the functioning of markets to reduce the spread of COVID-19 along the agrifood chain. This was crucial to ensure the success of any other action.

In Sierra Leone, anticipatory actions mitigated the consequences of the COVID-19 pandemic on the food security and livelihoods of vulnerable

farming households in Moyamba, Bo, Kenema and Western Area rural districts. Actions were implemented between June and November 2020. Scenario analysis showed that pandemic-related restrictions would have increasingly affected people's access to agricultural inputs and their ability to sell their agricultural products, especially perishable goods, during this time. In the first phase, farmers received inputs for vegetable production. Women were the main recipients of this action. Then, the same group received training and support to improve their post-harvest management, packaging and commercialization of vegetables, all of which were designed to eventually limit their potential post-harvest losses during the restrictions. In addition, FAO selected two youth agribusinesses and supported them with equipment, technologies and transportation. This action aimed to connect the producers who participated in the project with agribusinesses in the area and make it easier for them to purchase, process, package, preserve, distribute and market the processed vegetables and fruit they purchased from the women and youth farmers.

In Afghanistan, FAO carried out anticipatory actions between June and November 2020 to minimize potential impacts of COVID-19 on the agricultural livelihoods of vulnerable and food-insecure households ahead of peak impacts. The focus was on nine districts in six provinces: Badakhshan, Herat, Kandahar, Laghman, Paktika and Samangan. In the first phase, vendors and marketgoers received information on the risks that COVID-19 posed and training on good hygiene practices at the market. This was to ensure that markets would remain functional. Then Kuchi herders, whose transhumance routes were expected to be interrupted by the restrictions, received livestock protection packages consisting of animal feed and healthcare. In addition, unconditional cash was provided to landless agricultural labourers during the usual key periods of agricultural activities to make up for any income they might lose due to limited planting and harvesting. Such actions helped build momentum and played a catalytic role in attracting resources to provide a broader coverage to the greater needs across the country.

In the Democratic Republic of the Congo, anticipatory actions helped to limit the effects of COVID-19 on the incomes and food security of people in the peri-urban areas of the capital, Kinshasa. COVID-19 restrictions were expected to affect food supply chains, especially in the city, given that the town imports most food from neighbouring provinces. The intervention, which FAO implemented between June and December 2020, set out to boost local food production in the city's surrounding areas so people in the city would have better access to food, and spikes in food prices would be mitigated in the capital. The first phase focused on providing farmers with production inputs. Then, in the second phase, they received training in harvest management. Awareness-raising campaigns on good practices to prevent the spread of the virus were carried out in the project areas, including the distribution of leaflets in the local language, exchange forums and radio broadcasts. The distribution of vegetable seeds and tools helped boost production, which entered the supply circuit of Kinshasa. Training on rice value chains and post-harvest management was also provided.



Pests and diseases

Starting at the beginning of 2020, a severe and widespread desert locust upsurge threatened crops and pasture across the Greater Horn of Africa and Yemen, with the potential to have strong impacts on livelihoods and food security (FAO, 2021c). An anticipatory approach was prioritized based on forecasts of desert locust movements and rainfall, given the potential impacts on East Africa's main planting season, and thus on the food security of an already vulnerable region. In the first phase, the priority was to scale up surveillance and control efforts to curb the spread of the pest. In the second phase, anticipatory livelihood protection interventions were implemented to mitigate expected losses and prevent affected people from adopting negative coping strategies, such as selling their assets or migrating, which can generate tension over natural resources. Cash distributions provided families with the means to purchase food for themselves or feed for their animals, and to compensate for crop or milk production loss. Fodder and feed distributions allowed (agro)pastoralists to keep their livestock healthy and productive. Seed distributions, in turn, allowed farmers to either increase the area of land they cultivated (taking advantage of above-average rainfall during the first half of 2020) or save money from the purchase of inputs to cover other basic needs.



Between January 2020 and the end of August 2021, FAO, in partnership with governments through funding from resource partners, managed to treat around 2.2 million ha, saving over 4.4 million tonnes of crops and close to 872 million litres of milk – worth USD 1.7 billion (FAO, 2021c). FAO successfully protected the crop and pastoral livelihoods of up to 40 million people. In addition, as it was not possible to protect 100 percent of all crops and rangelands in areas infested by desert locusts, the Anticipatory Action plan also included providing over 305 000 households with livelihood protection packages and cash. Lessons learned from the 2004–2005 outbreak in West Africa showed that damage caused by locusts could drive food insecurity, particularly in contexts of multiple shocks and already high vulnerability: in the Niger in 2005, for instance, 2.4 million people were estimated to be affected by severe food shortages due to compounding effects of drought, locusts and production shocks (Famine Early Warning Systems Network [FEWS NET], 2014). In the Greater Horn of Africa and Yemen in 2020, FAO estimated that approximately 3.6 million additional people were at risk of food insecurity because of the impact of desert locust across Ethiopia, Kenya, Somalia, the Sudan and Yemen (FAO, 2020h).

Cold waves (*dzud*)

An Anticipatory Action intervention helped protect the livelihoods of herders from a forecast *dzud* in Mongolia during the 2017/2018 winter, after warnings showed that extreme weather posed a major risk to vulnerable livestock herders. The phased approach was crucial. In the first phase, herders were encouraged to participate in early livestock destocking. This meant they would slaughter their weaker animals, and FAO would purchase the carcasses at the beginning of winter before the prices of animals would fall. Households used most of the cash to purchase animal feed ahead of the harsh winter, at a time when feed was still available and affordable in markets. In the second phase, based on more reliable forecasts and early observations, FAO distributed animal feed directly to keep animals alive and healthy: the timing was crucial because purchasing feed had become difficult for herders due to scarce availability and high prices. The feed was successfully distributed before animal body conditions started deteriorating. At the end of the winter, when animals were weak, the distribution of animal health equipment and portable corrals to enclose animals helped prevent disease outbreaks. For every USD 1 invested, households gained USD 7.1 in return (FAO, 2018). This included the value of adult and newborn animals saved, the loss avoided in cashmere production value, the extra milk animals produced and the avoided drop in the value of livestock that would have occurred if animals had become sick, weak or emaciated. By itself, the value of the animals that herders were able to save was enough to buy almost four cows or 33 goats per household.



Why is a phased approach recommended?

These various examples point to the existence of three main elements that are inherent to a phased approach to Anticipatory Action for slow-onset hazards.

- **It reduces uncertainties associated with early warning information.** The goal is to implement anticipatory actions not too early and not too late. Action should be taken at the right point in time, i.e. before the impact of the hazard, based on analysis of the most reliable forecast and early warning information. Given that agricultural livelihoods are affected at different points in time as the hazard evolves in slow-onset events, there is an opportunity to establish different triggers and reduce the risk of acting in vain.
- **It improves the targeting and appropriateness of Anticipatory Action interventions.** Implementing Anticipatory Action as close as possible to the expected drought impact on a given livelihood group makes it easier to select the most appropriate interventions (i.e. based on more accurate information on the agroecological zones and livelihood areas where the hazard is expected to hit) as well as to identify the most vulnerable households that should benefit from the assistance. In other words, such a phased approach facilitates impact-based forecasting.¹²
- **It helps adapt the selection of Anticipatory Action options to the evolving hazard context.** Project implementers can still adapt the anticipatory actions based on the evolution of the hazard. For example, they can change the type of inputs, the amounts of cash or the type of agricultural advice they plan to provide. This means that while they are still bound by several factors, such as the need for early procurement and predefined funding agreements, the technical experts, in consultation with affected communities, can adapt the actions to the observed evolution of the hazard to maximize their effectiveness.



Conclusion

Natural hazards caused major economic losses over the past decade due to their increasing frequency and intensity driven by climate change. Slow-onset hazards progressively erode livelihoods, especially among the most vulnerable people, and often force people to adopt negative coping strategies that make them even more vulnerable to future shocks and hunger. Anticipatory Action tries to break this downward spiral by building the capacity of at-risk communities to protect their assets and food security from impending shocks. This is achieved by acting in the period between the moment a shock becomes probable and the moment the shock begins to impact people in critical ways.

By not waiting for people to lose everything, aid resources can instead contribute to an upward spiral, making them more resilient to similar shocks in the future. The phased approach to Anticipatory Action helps humanitarian and development actors identify multiple windows of opportunity for action across the duration of the slow-onset event to protect diverse livelihood groups at the right time. Crisis timelines are the foundation of this phased approach and a simple and effective tool to identify these windows and appropriate actions. Such timelines allow actors to know who is at risk and when; what actions can be taken to mitigate the risk and when; how much time will be needed to implement the actions; what early warning information is available; and, ultimately, what the action phases will be.

In-depth analyses of past FAO projects have confirmed that this approach is highly effective. In Mongolia, herding families saw a return of USD 7.1 for every USD 1 FAO invested in early livestock support to anticipate severe winter conditions. For drought events, farming families have seen a return on investment ranging from 2.5:1 in Madagascar to 6.7:1 in the Sudan. But Anticipatory Action is equally effective against risks from pests and diseases. Early action against desert locusts through surveillance, control and anticipatory livelihood protection managed to treat around 2.2 million ha, saving over 4.4 million tonnes of crops and close to 872 million litres of milk, worth USD 1.7 billion between January 2020 and August 2021 in the Greater Horn of Africa and Yemen, and it protected the livelihoods and food security of 40 million people. In the case of COVID-19, the forward-looking analysis helped identify anticipatory actions that addressed the knock-on effects that herders, farmers, vendors and consumers would feel from severe movement restrictions, such as limited access to markets, inputs and veterinary care.

Despite the positive results and lessons learned, Anticipatory Action has not yet reached the right scale. Acute food insecurity has risen to extremely concerning levels globally. If implemented at scale, Anticipatory Action has the potential to overhaul the existing response paradigm and position livelihoods protection as a critical component of disaster risk management. Recognizing that agriculture is central in anticipating and averting hunger, FAO is a long-time advocate of a system-wide shift from a reactive to an anticipatory approach to food crises.

References

- FAO & WHO.** 2009. *Joint FAO-WHO Experts Consultation on Rift Valley Fever Outbreak Forecasting Models, 29 September–1 October 2008*. Rome. apps.who.int/iris/handle/10665/70194
- FAO.** 2013. *Drought*. Factsheet. Rome. fao.org/3/aq191e/aq191e.pdf
- FAO & WFP.** 2017. *FAO/WFP crop and livestock assessment mission to Mongolia, 22 December 2017*. Rome. fao.org/3/i8377EN/i8377en.pdf
- FAO.** 2018. *Mongolia: Impact of Early Warning Early Action*. Rome. fao.org/3/ca2181en/ca2181en.pdf
- FAO.** 2019a. *Madagascar: Impact of Early Warning Early Action*. Rome. fao.org/3/ca3933en/ca3933en.pdf
- FAO.** 2019b. *The Sudan: Impact of Early Warning Early Action*. Rome. fao.org/3/ca4653en/ca4653en.pdf
- FAO.** 2020a. *Coronavirus disease 2019 (COVID-19) | Addressing the impacts of COVID-19 in food crises: April–December 2020, May update, FAO’s component of the Global COVID-19 Humanitarian Response Plan*. Rome. doi.org/10.4060/ca9192en
- FAO.** 2020b. *The Philippines: Impact of Early Warning Early Action*. Rome. fao.org/3/ca9371en/ca9371en.pdf
- FAO.** 2020c. *Afghanistan | Revised humanitarian response (May–December 2020): Coronavirus disease 2019 (COVID-19)*. Rome. doi.org/10.4060/cb0199en
- FAO.** 2020d. *The Democratic Republic of the Congo | Revised humanitarian response (May–December 2020): Coronavirus disease 2019 (COVID-19)*. Rome. doi.org/10.4060/cb0181en
- FAO.** 2020e. *Haiti | Revised humanitarian response (May–December 2020): Coronavirus disease 2019 (COVID-19)*. Rome. doi.org/10.4060/cb0176en
- FAO.** 2020f. *Sierra Leone | Humanitarian response (May–December 2020): Coronavirus disease 2019 (COVID-19)*. Rome. doi.org/10.4060/cb0210en
- FAO.** 2020g. *Zimbabwe | Revised humanitarian response (May–December 2020): Coronavirus disease 2019 (COVID-19)*. Rome. doi.org/10.4060/cb0272en
- FAO.** 2020h. *Greater Horn of Africa and Yemen – Desert locust crisis appeal, January 2020–June 2021: Revised appeal for sustaining control efforts and protecting livelihoods (six-month extension)*. Rome. fao.org/3/cb2445en/cb2445en.pdf
- FAO.** 2021a. *The impact of disasters and crises on agriculture and food security: 2021*. Rome. doi.org/10.4060/cb3673en
- FAO.** 2021b. *Agricultural livelihoods and food security in the context of COVID-19: Results from household surveys in 11 countries with high pre-existing levels of food insecurity – Cross-country monitoring report, May 2021*. Rome. doi.org/10.4060/cb4747en
- FAO.** 2021c. *Desert locust upsurge: Progress report on the response in the Greater Horn of Africa and Yemen, May–August 2021*. Rome. doi.org/10.4060/cb7161en
- FEWS NET.** 2014. *Niger Food Security brief*. Washington, D.C. tinyurl.com/yckm5728
- FSIN & GNAFC.** 2021. *Global Report on Food Crises 2021*. Rome. tinyurl.com/mr2pcedd
- FSNWG.** 2020. *East Africa desert locust and food security update: Current upsurge threatens upcoming 2020 agricultural season*. tinyurl.com/2tbatxc8
- IFRC.** 2020. *Mongolia: Dzud – Early Action Protocol Summary, December 2020*. tinyurl.com/3sn89sys
- IPC.** 2021. *Madagascar [Grand South]: Food Security and Nutrition Snapshot, July 2021*. tinyurl.com/yvamx58t
- Jones, C., Guerten, N., Hillesland, M. & Koechlein, E.** 2020. *Applying an inclusive and equitable approach to anticipatory action*. FAO. Rome. tinyurl.com/bdfta72j
- Nandintsetseg, B., Shinoda, M., Du, C. & Munkhjargal, E.** 2018. *Cold-season disasters on the Eurasian steppes: Climate-driven or man-made*. Scientific reports, 8(1), 14769. doi.org/10.1038/s41598-018-33046-1

Rich, K.M. & Wanyoike, F. 2010. An assessment of the regional and national socio-economic impacts of the 2007 Rift Valley fever outbreak in Kenya. *American Journal of Tropical Medicine and Hygiene*, 83(2 Suppl.): 52–57
doi.org/10.4269/ajtmh.2010.09-0291


UNDRR. 2017. Terminology. In: *United Nations Office for Disaster Risk Reduction Online Glossary*. Geneva, Switzerland. Cited 13 September 2022.
undrr.org/terminology

Notes

- ¹ **Damage:** The total or partial destruction of physical assets and infrastructure in the disaster-affected areas, in terms of their monetary value expressed as the replacement cost.
- ² **Losses:** Changes in economic flows arising from the disaster which continue until the achievement of full economic recovery and reconstruction. Typical losses for the agriculture sector include the decline in production of agriculture, livestock, fisheries/aquaculture and forestry and possible higher costs of production in them and lower revenues and higher operational costs in the provision of services.
- ³ As slow-onset hazards may affect men, women, boys and girls differently, the timeline could disaggregate impacts by gender, e.g. young men embarking on longer and irregular migration routes in search of water and pasture for livestock, and women and girls having to cover longer distances in search of water for the household. The crisis timeline may also reflect seasonal conflict events, where they occur, to guide the identification of conflict-sensitive actions.
- ⁴ **Vulnerability factors** should as a minimum be gender, age and disability disaggregated but may also have to consider additional diversity dimensions such as literacy level, access to and control over resources, ethnic affiliation, displacement status, health status, etc.
- ⁵ **Livelihood groups** should be disaggregated by gender, e.g. who is responsible for the various seasonal activities, and other diversity dimensions as relevant.
- ⁶ **A context analysis** is critical to ensure that identified anticipatory actions are conflict sensitive and do not create or compound conflict drivers, e.g. by engaging in livestock-related activities that may increase the risk of cattle rustling or raiding during seasonal migration.
- ⁷ **The crisis timeline** focuses on windows of opportunity for a single hazard. The Anticipatory Action timing and windows of opportunity will differ based on livelihoods.
- ⁸ **Destocking** is the removal of animals before they become emaciated, lose their value, die, or pose a risk to public health. Destocking provides much needed cash (or meat) to vulnerable communities.
- ⁹ To be noted that **emergency response** for pastoralists could start at different points in time depending on the context and the type of livelihood.
- ¹⁰ This **timeline** is fictitious and simplified for illustrative purposes.
- ¹¹ **Green corridors** refer to measures that alleviate movement restrictions on goods, in order to minimize disruptions of food supply chains during the pandemic.
- ¹² **Impact-based forecasting** is a structured approach for combining hazard, exposure, and vulnerability data to identify the expected impacts of a forecast hazard and support decision-making, with the ultimate objective of guiding Anticipatory Action.



Anticipatory Action safeguards lives
and livelihoods, builds resilience to future
shocks, and eases pressure on strained
humanitarian resources.



FAO's Anticipatory Action uses risk analysis and forecasts to trigger interventions before a crisis escalates into a humanitarian emergency.

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