Food Chain Crisis
Early Warning Bulletin

Forecasting threats to the food chain affecting food security in countries and regions

No. 28
July-September 2018
The purpose of the FCC (Food Chain Crisis) Early Warning Bulletin is to inform FAO and other international organizations, countries, scientific experts, and decision makers on the forecast of threats to animal and plant health and food safety having a potential high impact on food and nutrition security for the three months ahead. These threats are transboundary animal and plant pests and diseases including forest pests and aquatic diseases, and food safety threats.

The bulletin contains official and unofficial information from various sources collected and analyzed by FAO experts.

The FCC Early Warning Bulletin is a product of collaboration between the Intelligence and Coordination Unit of the Food Chain Crisis Management Framework (FCC-ICU), the FAO Emergency Prevention System (EMPRES) for transboundary animal and plant pests and diseases and food safety threats, the FAO Global Early Warning System for transboundary animal diseases, including zoonoses (GLEWS), and the Global Information and Early Warning System (GIEWS). FCC-ICU coordinates and produces the bulletin.

Website: www.fao.org/food-chain-crisis
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Transboundary animal and plant pests and diseases, including forest pests and aquatic diseases, and food safety threats are raising public awareness due to their potential high impact on food security, human health, livelihoods, and trade. These threats have highlighted the need to predict such threats in a comprehensive and integrated manner, oriented at the whole food chain. Predicting threats will allow timelier implementation of preventive and control measures, and thus will reduce their impact and limit their geographic spread.

FAO Food Chain Crisis-Intelligence and Coordination Unit (FCC-ICU) has developed an integrated forecasting approach to assess the likelihood of occurrence of threats to the food chain (FCC threat) for the upcoming three months. Based on this approach and upon availability of FAO data, a number of forecast events are presented at country level. Data are collected, analyzed, and further presented in this quarterly FCC Early Warning Bulletin (see country section, page 19).

The **Likelihood of occurrence of a FCC threat** in a country is defined according to the result of the assessment of two main epidemiological parameters:

- **Parameter 1:** *likelihood of introduction* of the threat from another country and its further *spread* within the country (calculated as shown in Table 1), and
- **Parameter 2:** *likelihood of its re-emergence (amplification)* within the country, in case a threat is already present in the country.

Based on a conservative approach, the likelihood of occurrence of the threat will be considered equal to the higher level of the two parameters.

**TABLE 1: Crossing table of likelihood of introduction and likelihood of spread (Parameter 1)**

<table>
<thead>
<tr>
<th>Level of likelihood of introduction</th>
<th>Level of likelihood of spread</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0  1  2  3</td>
</tr>
<tr>
<td>1</td>
<td>1  1  1  2</td>
</tr>
<tr>
<td>2</td>
<td>1  1  2  2</td>
</tr>
<tr>
<td>3</td>
<td>2  2  2  3</td>
</tr>
</tbody>
</table>

The likelihood of occurrence, the likelihood of introduction, the likelihood of spread, and the likelihood of re-emergence of a FCC threat can be rated as Nil, Low, Moderate, or High, as shown in Table 2.

**TABLE 2: FCC Likelihood scale**

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil (0)</td>
<td>Very unlikely</td>
</tr>
<tr>
<td>Low (1)</td>
<td>Unlikely</td>
</tr>
<tr>
<td>Moderate (2)</td>
<td>Likely</td>
</tr>
<tr>
<td>High (3)</td>
<td>Highly likely</td>
</tr>
</tbody>
</table>
Fall Armyworm (*Spodoptera frugiperda*)

FAW continues to be a threat in Africa. FAW infestations have spread to millions of hectares of maize and other crops that predominantly belong to smallholder farmers. Almost all of sub-Saharan Africa is now affected. Northern African and Near Eastern countries have requested FAO assistance to face the FAW threat since the pest has been detected in all neighboring countries to the south where the FAW situation is expected to be severe.

Recent developments include an official declaration of FAW presence from Eritrea. FAO’s regional office has started to prepare a regional project to support countries in training for FAW identification and management.

FAW is particularly concerning because of its impacts on the food security and livelihoods of smallholder farmers. It can result in a significant yield decline, and there are concerns that the pest will develop pesticide resistance. Furthermore, it has been observed that the time between two growing seasons in some countries is not long enough to regulate the numbers of FAW populations, which are at a high level.

*At the sub-regional level, during this forecast period (July to September 2018):*

**North Africa and Near East** will have to remain vigilant to the possible introduction of the pest, as FAW is present in neighboring countries. Strong surveillance and monitoring are recommended.

**Western Africa** is at significant risk of further damage from FAW, because the forecast period overlaps with the maize season in many of the countries.

**Central African** maize is also at risk. Furthermore, there have been reports of FAW on alternate crops including sugarcane and sorghum. Conducting robust control operations is highly advised.

**Eastern Africa** is at risk of further damage from FAW, because the forecast period overlaps with the maize season in many of the countries. In some countries, the forecast period coincides with the major maize growing season, and in others, FAW will continue its development on alternate hosts.

**Southern Africa** is at risk due to the rising temperatures, which could favor pest multiplication and spread on maize crops cultivated under irrigation and moisture harvesting regimes.

**Ebola virus disease**

An Ebola virus disease (EVD) outbreak in humans has been occurring in the Democratic Republic of the Congo. WHO conducted a formal *rapid risk assessment*, which determined that the public risk is high in the Central African region; particularly in the Central African Republic and Congo, due to the low capacity of their health systems to cope with the virus. In the spirit of One Health, FAO is supporting the efforts of the public health sector in response to the Ebola virus disease outbreak in the Democratic Republic of the Congo.

**Rift Valley fever**

After a period of abnormal, heavy rainfall and floods in the Eastern African region, an outbreak of Rift Valley fever (RVF) was reported among humans and animals in Kenya. This outbreak among animals and humans is ongoing and poses a threat to the whole region. Although, the upcoming season from July onwards will be unsuitable for the vector populations in most of the Eastern African region, localized suitable conditions may favor RVF vector amplification.

Given the density of domestic animals in the area, uncontrolled cross-border movements of livestock, conflicts, and a lack of veterinary services can facilitate the spread of RVF in East Africa. Therefore, FAO advises the veterinary services and livestock farmers’ communities in the region to remain vigilant to the potential occurrence and spread of RVF in humans and/or animals.
Forecasts for the period July-September 2018: Overview

During the period July to September 2018, Food Chain Crisis (FCC) threats are expected to occur in Africa, the Americas, Asia, Europe, and Oceania where they can persist within a country, spread to neighboring countries, remain latent, or re-emerge/amplify.

The dynamics and likelihood of occurrence of FCC threats depend on a number of risk factors or drivers. These include agro-ecological factors (e.g. intensive farming systems, deforestation, overgrazing, etc.), climate change (e.g. droughts, extreme weather events, flooding, heavy rains, heat waves, the El Niño-Southern Oscillation -ENSO, changes in vegetation cover, water temperature, etc.), human behaviour (e.g. cultural practices, conflicts and civil insecurity, trade, etc.) and natural disasters.

In relation to food security, and according to the last “Crop prospects and food situation” report (April-June 2018), FAO estimates that, globally, 39 countries (31 in Africa, seven in Asia, and one in Americas) are in need of external assistance for food. Persisting conflicts continue to be the dominant factor driving high levels of severe food insecurity. Weather shocks have also adversely impacted food availability and access. FCC threats can compound food insecurity in fragile countries stricken by weather shocks and conflicts.

Main FCC threats

Thirty-four plant and forest pests and diseases and animal and aquatic diseases were forecasted by FAO experts for the period July to September 2018. A total of 265 forecasts were conducted in 113 countries.

According to the forecasts, the following pests and diseases represent a high or moderate risk to the food chain for the period July to September 2018: African swine fever, Avian influenza, Ebola virus disease, Foot-and-mouth disease, and Rift Valley fever for Animal diseases including zoonosis; Enterocytozoon hepatopenaei, Epizootic ulcerative syndrome, and Tilapia Lake Virus disease for Aquatic diseases; Bark beetles, Blue gum chalcid, Boxwood blight, Boxwood moth, Bronze bug, Charcoal disease, Dry cone syndrome, Pine processorynary moth, Red gum lerp psyllid, and Western conifer seed bug for Forest pests and diseases; Desert Locust, Italian Locust, Moroccan Locust, and Red Locust for Locusts; Banana bunchy top disease, Banana fusarium wilt disease, Cassava brown streak and mosaic diseases, Coffee wilt disease, Fall armyworm, Tomato leaf miner, and Wheat rust for Plant pests and diseases.

All pests and diseases forecasted in this bulletin are listed in the table hereafter.

**Table 3: FCC threats monitored and forecasted**

<table>
<thead>
<tr>
<th>Animal diseases including zoonosis</th>
<th>Aquatic diseases</th>
<th>Forest pests and diseases</th>
<th>Locusts</th>
<th>Plant pests and diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td>African swine fever (ASF)</td>
<td>Acute hepatopancreatic necrosis disease (AHPND)</td>
<td>Bark beetles</td>
<td>Desert Locust</td>
<td>Banana bunchy top disease (BBTD)</td>
</tr>
<tr>
<td>Avian influenza (AI)</td>
<td><em>Enterocytozoon hepatopenaei</em> (EHP)</td>
<td>Blue gum chalcid</td>
<td>Italian Locust</td>
<td>Banana fusarium wilt disease</td>
</tr>
<tr>
<td>Ebola virus disease (EVD)</td>
<td>Epizootic ulcerative syndrome (EUS)</td>
<td>Boxwood blight</td>
<td>Migratory Locust</td>
<td>Cassava brown streak disease (CBSD)</td>
</tr>
<tr>
<td>Foot-and-mouth disease (FMD)</td>
<td>Tilapia lake virus (TiLV)</td>
<td>Boxwood moth</td>
<td>Moroccan Locust</td>
<td>Cassava mosaic disease (CMD)</td>
</tr>
<tr>
<td>Lumpy skin disease (LSD)</td>
<td></td>
<td>Bronze bug</td>
<td>Red Locust</td>
<td>Coffee wilt disease</td>
</tr>
<tr>
<td>Rift Valley fever (RVF)</td>
<td></td>
<td>Charcoal disease</td>
<td></td>
<td>Fall armyworm (FAW)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chestnut gall wasp</td>
<td></td>
<td>Tomato leaf miner</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dry cone syndrome</td>
<td></td>
<td>Wheat rust</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pine processorynary moth</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Red gum lerp psyllid</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Western conifer seed bug</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FORECAST FOR THE PERIOD JULY-SEPTEMBER 2018: REGIONAL OVERVIEW

AFRICA

In Africa, a total of 151 FCC events were forecasted comprising plant pests and diseases, locusts, animal and aquatic diseases, and forest pests. The likelihood of occurrence varies from Nil to High. The following FCC events have significant regional implications:

Plant pests and diseases

- **Fall armyworm (FAW)** - *Spodoptera frugiperda*, continues to be of high concern for Africa, particularly, because it can have a very detrimental impact on maize, which is a staple crop for many people. In addition to maize, the pest has been detected on an increasing number of other crops (e.g., sorghum and sugarcane). FAW, therefore, can affect the food security and livelihoods of many people. Managing FAW can be difficult, for example, in some countries, it has been observed that the time between the two growing seasons is not long enough to regulate FAW populations which then remain at high levels. During the forecast period, July to September 2018, FAW development and spread will continue and cause severe damage, mainly on maize, unless appropriate action is taken. Countries need to adopt appropriate management measures to reduce and constrain damage as well as spread. In most of the affected countries, FAO is developing projects to implement FAW management activities and to strengthen national capacities.

In **Northern Africa**, all countries have been alerted by an official FAO communication on the Fall armyworm threat since this pest has been detected in neighboring countries wherein the FAW situation is expected to be severe. All Northern Africa countries are potentially at risk and surveillance should be implemented; some countries have already started to do so.

In **Western Africa**, FAW is currently established in all 15 countries. The forecast period will coincide with the major maize season in many of these. Therefore, FAW populations are likely to amplify and cause severe damage—especially to maize. FAW is not currently present in Mauritania, but its presence in neighboring countries (Mali and Senegal) presents a risk of introduction.

In **Central Africa**, all eight countries in the sub-region have FAW-infested maize crops. In Equatorial Guinea and Gabon, FAW has been observed but no official government declaration has been made. During this forecast period, FAW spread and damage are expected to be moderate to high in most of the countries. In addition to maize, the pest has also been detected on sugarcane, sorghum, and on an increasing number of other crops. Some countries (i.e., Cameroon, Chad, Sao Tome and Principe) have implemented management and early warning measures. All countries in this sub-region should carry out robust control operations to avoid significant yield losses.

In **Eastern Africa**, FAW presence is now confirmed in all countries except for in Djibouti. In some of these countries, the forecast period coincides with the major maize growing season, and in others, it coincides with the maize and sorghum harvesting season. FAW will most likely continue its development on alternate hosts and spread further, unless appropriate action is taken.

In **Southern Africa**, FAW is present throughout the entire sub-region, with the exceptions of Lesotho and Mauritius (no information available for Comoros). It has continued to cause damage to maize across the sub-region, since it was first reported towards the end of 2016. Southern Africa experienced serious dry spells from mid-December 2017 to the end of January 2018, and this drought caused some maize harvest losses. Damage by FAW is expected to exacerbate these losses. The forecast period is characterized by relatively high...
temperatures which could favor pest multiplication and spread on maize crops cultivated under irrigation and moisture harvesting regimes.

In Central Africa, Banana bunchy top disease continues to be a problem in some countries and can escalate. **Tomato leaf miner** (*Tuta absoluta*) has been observed in four countries (Cameroon, the Democratic Republic of the Congo, Equatorial Guinea, and Sao Tome and Principe), and the pest has caused severe damage to tomato production. To avoid its spread to other countries and to preserve the livelihoods and food security of many marginalized groups, control measures need to be established. Additionally, capacity building for farmers and extension officers for pest management should be implemented.

In Eastern Africa, **Cassava brown streak and mosaic diseases** continue to affect many countries and might amplify in areas where weather conditions are favorable. **Tomato leaf miner** (*Tuta absoluta*) infestations vary with the seasons. In this sub-region, insect pest populations and infestation levels are likely to be relatively low across countries in the sub-region during this forecast period, because it generally coincides with the main rainy season during which there is limited tomato production. Tomato is mainly produced under irrigation during the warm dry season, and these conditions happen to be favorable for the pest to flourish. Currently, no data are available at the country level for *Tuta absoluta* infestations. **Wheat stem** and **Yellow rust** may spread in Eastern Africa, as per seasonal pattern.

In Western Africa, **Tomato leaf miner** (*Tuta absoluta*) is present throughout Southern Africa except for in Madagascar and Mauritius (no information available for Comoros). It continues to cause serious damage to tomatoes in the sub-region. This affects the livelihoods and food security of many marginalized groups including small-scale farmers, women marketers, and youths. The forecast period is characterized by relatively high temperatures and widespread tomato cultivation. These factors could favor the pest spread.

**Locusts**

In Northern Africa, no significant developments are expected for the **Desert Locust**, except for in areas that received rainfall within Algeria and Sudan where small-scale breeding may occur and will recur, respectively. In **Western Africa**, small-scale breeding will occur in the northern Sahel, causing locust numbers to increase slightly. In **Eastern Africa**, small-scale breeding of the Desert Locust is likely to occur; in Ethiopia and Somalia, the main driver behind this is rainfall from cyclone Sagar.

In **Eastern Africa**, the **Red Locust** situation will be the same throughout the sub-region. Vegetation burning will force adult locusts to aggregate into denser groups in remaining suitable vegetation; if not controlled, these groups can later move to cultivated areas and cause damage. In Madagascar, no developments are expected during the winter period.
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FORECAST FOR THE PERIOD JULY-SEPTEMBER 2018: REGIONAL OVERVIEW

AFRICA

Animal diseases

The Western African region is approaching the wet season, which will present favorable conditions for vector amplification and therefore Rift Valley fever (RVF) occurrence. The National Oceanic and Atmospheric Administration (NOAA)\(^1\) precipitation forecast for June-September 2018 predicts above average rainfall in south-west Mali and south-east Niger, which are both endemic countries for RVF. These countries should remain vigilant about RVF in the coming months.

After a period of abnormal, heavy rainfall and floods in the Eastern African region, an outbreak of Rift Valley fever (RVF) was, first, reported in humans in Kenya; later it was confirmed that the disease was present in animals. These outbreaks are ongoing and pose a threat to the whole Eastern African region. Although, the upcoming season from July onwards will be unsuitable for the vector populations in most of the Eastern African region (except for Ethiopia, South Sudan, and southern Sudan), the potential spread of the disease through animal movements and informal trade routes within and outside of Kenya is likely to occur. Therefore, FAO advises the veterinary services and livestock farmers’ communities in the region to remain vigilant to the potential occurrence and spread of RVF in humans and/or animals. In particular, the risk of RVF spread is considered to be very high in Kenya and moderate in Djibouti, Eritrea, Ethiopia, Rwanda, Somalia, South Sudan, Sudan, Uganda, and United Republic of Tanzania. In addition, given the current and predicted above average precipitation forecasts for the period June-September 2018, southern Sudan and western Ethiopia may also experience suitable environmental conditions for RVF vector amplification.

The outbreak in Kenya is not the first RVF re-emergence in the region: during the past seven months, RVF infections have been reported in Uganda (November 2017) and South Sudan (December 2017). Informal cross-border movement of livestock, conflicts, and a lack of veterinary services can facilitate the spread of RVF within the affected countries in East Africa.

The winter is an unfavorable season for the Rift Valley fever vectors, and consequently the risk of RVF vector amplification in South Africa is considered to be low for the forecast period. However, given the fact that a RVF outbreak is ongoing in the country, the risk of further spread within the country is considered to be moderate due to movement of infected livestock. The South African region has a low risk of vector amplification and spread from animal movements, because it is entering the winter season, which is cold and dry with low rainfall, and because of the highly localized nature of the outbreak in South Africa.

In some countries, H5N1 and H5N8 Highly pathogenic avian influenza (HPAI) viruses may cause new outbreaks, but overall, risks are low for the next quarter.

- In Western Africa, H5N1 and H5N8 HPAI viruses in Nigeria may pose a risk to neighboring countries since it is the main poultry producer in West Africa with a large production of eggs and poultry in commercial and intensified systems. The last H5N8 HPAI outbreak in Nigeria was reported in January 2018. Consequently, the risk for the forecast period is considered low.

- In Central, Eastern, and Southern Africa, H5N8 HPAI virus, which has been spreading globally since November 2016, continues to be reported in some countries. The last outbreaks were observed in the Democratic Republic of the Congo (December 2017), Togo (March 2018) and South Africa (June 2018).

\(^{1}\) http://www.noaa.gov/weather
AFRICA

Due to wild bird migratory patterns and based on flu seasonal patterns, the risk for the forecast period is considered to be low for Central and Eastern Africa and moderate for South Africa which is entering the winter season.

An Ebola virus disease (EVD) epidemic has been occurring in humans since 4 April 2018 in the Democratic Republic of the Congo. The country has a history of frequent re-emergences of this virus. The risk of disease spread is considered high within the country and moderate in neighboring ones (Central Africa region); in particular in the Central African Republic and Congo and, due to the low capacity of their health systems to cope with the virus.

In Southern Africa, Foot-and-mouth disease (FMD) (serotype O) outbreaks can occur since the virus was detected in Zambia (April 2018). Further spread from this country is concerning to this region since it has never been affected by this type of topotype. In addition, further spread of FMD outbreaks are likely to occur in Malawi in non-vaccinated areas.

Aquatic diseases

In Eastern Africa, Botswana, Zambia, and Zimbabwe are at risk of a fish disease, Epizootic ulcerative syndrome (EUS), reemerging. Furthermore, United Republic of Tanzania is at risk because the disease is present in neighboring countries and water temperatures during the forecast period in these countries will range from 18 to 25 °C; these are optimal temperatures for the development of the oomycete fungus that causes the disease.

Tilapia Lake virus (TiLV) may have a wider distribution than is currently known. High awareness and vigilance for TiLV are required in tilapia producing countries in Northern, Eastern, and Southern Africa. A surveillance plan may be necessary to determine its geographical extent and to prepare mitigation measures to limit its spread. Appropriate diagnostic testing is encouraged when unexplained mortalities of tilapia occur; testing is particularly needed when clinical signs are similar to those reported for TiLV and when permissive water temperatures (between 22 °C – 32 °C) are present. Public information campaigns are recommended to advise aquaculturists on the threat posed by TiLV and on the need to report unexplained large-scale mortalities to biosecurity authorities. TiLV is likely to occur in countries where water temperatures range between 22 °C – 32 °C (usually between May and November in some countries). The following farmed tilapia species are susceptible: Hybrid tilapia (Oreochromis niloticus x O. aureus hybrids), Nile tilapia (O. niloticus), and Red tilapia (Oreochromis sp.). Tilapia lake virus (TiLV), which is already present in Egypt (scientific literature), is likely to have a wide distribution and may become a threat to the tilapia industry in Africa (Ghana, Nigeria, Uganda, Zambia, and Zimbabwe).

Forest pests

In Eastern Africa, Blue gum chalcid and Red gum lerp psyllid insect pests are likely to continue spreading, causing severe damage in eucalyptus plantations. Applications of silvicultural practices and biological control agents to reduce these insect pest populations are in progress, in some countries.
FORECAST FOR THE PERIOD JULY-SEPTEMBER 2018: REGIONAL OVERVIEW

AMERICAS

In the Americas, a total of 21 FCC events were forecasted comprising aquatic diseases and forest pests. The likelihood of occurrence varies from Low to High. The following FCC events have significant regional implications:

Aquatic diseases

- **Introduction of Acute hepatopancreatic necrosis disease** (AHPND) in the shrimp species *Penaeus monodon* and *Penaeus vannamei* in uninfected shrimp producing Latin America and the Caribbean countries is possible from infected countries, through trading of live animals (e.g. live polychaetes, clams, oysters, etc.) that are used as feed for broodstock as well as through infected live shrimps.

- **Introduction of the shrimp disease Enterocytozoon hepatopenaei (EHP)** to Latin America and the Caribbean countries from infected countries is possible, through trading of live animals (e.g. live polychaetes, clams, oysters, etc.) that are used as feed for broodstock.

- **Tilapia Lake virus (TiLV)** may have a wider distribution than is currently reported or recognized. High awareness and vigilance for TiLV are required in tilapia producing countries. A surveillance plan may be necessary to determine the geographical extent of the infection and to prepare mitigation measures to limit its spread. Appropriate diagnostic testing is encouraged when unexplained mortalities of tilapia occur; testing is particularly needed when clinical signs are similar to those reported for TiLV and when permissive water temperatures (between 22 °C – 32 °C) are present. Public information campaigns are recommended to advise aquaculturists on the threat posed by TiLV and on the need to report unexplained large-scale mortalities to biosecurity authorities. TiLV is likely to occur in countries where water temperatures range between 22 °C – 32 °C (usually between May and November). The following farmed tilapia species are susceptible: Hybrid tilapia (*Oreochromis niloticus* x *O. aureus hybrids*), Nile tilapia (*O. niloticus*), and Red tilapia (*Oreochromis* sp.). TiLV is already present in Colombia (scientific literature), Ecuador (scientific literature), and Peru (OIE notification); it may become a threat to other tilapia producing countries in Latin America and the Caribbean.

Forest pests

- **Severe infestations of Bark beetles**, in particular the *Dendroctonus frontalis* species, are occurring in the dry corridor of Central America and will continue in the pine forests of Guatemala, Honduras, and Nicaragua. Pine species, *Pinus caribea*, *Pinus oocarpa*, and *Pinus patula*, within natural forests and plantations have become more vulnerable to the beetles’ attacks because they are already stressed by prolonged drought and weakened due to poor forest management practices. FAO, in collaboration with regional partners, is working to increase the capacities to implement pest management practices.
FORECAST FOR THE PERIOD JULY-SEPTEMBER 2018: REGIONAL OVERVIEW

ASIA

In Asia, a total of 70 FCC events were forecasted comprising plant pests and diseases, locusts, animal and aquatic diseases, and forest pests and diseases. The likelihood of occurrence varies from Nil to High. The following FCC events have significant regional implications:

Plant pests and diseases

- **In the Near East**, countries bordering Africa are potentially at risk of **Fall armyworm** introduction and surveillance should be implemented. Additionally, Syria and Yemen have requested FAO assistance to deal with the FAW risk. FAO’s regional office has started to prepare a regional project to support countries in training on FAW identification and management.

- **In South-Eastern Asia**, **Banana Fusarium wilt disease Tropical race 4** is continuing to affect banana production. It was recently reported in the Lao People’s Democratic Republic, Myanmar, and Viet Nam, and it might spread further from initial sites and cause damage.

Locusts

- **In Western Asia**, breeding of the **Desert Locust** may occur in parts of southern and eastern Yemen, southern Oman, and in the Empty Quarter of eastern Saudi Arabia that received rain from cyclones in May, causing locust numbers to increase. In **Southern Asia**, small-scale breeding of the Desert Locust will occur along both sides of the Indo-Pakistan border, causing locust numbers to increase slightly.

- **In the Caucasus (Western Asia)**, adult populations of the **Italian and Moroccan Locust** will lay eggs and eventually disappear by the end of the forecast period. In **Central Asia**, fledging of the Moroccan Locust has already started and most of the control operations against that pest have been completed. However, remaining adult populations may form mobile groups able to cross borders and lay eggs that will hatch in spring 2019. In this sub-region, the Italian and the **Migratory locusts** are currently present as hoppers forming groups and bands, which are the main targets for control operations. Fledging will start from late June, from southern to northern Central Asian countries, and it will be followed by mating, egg-laying, and natural disappearance.

Animal diseases

- Based on seasonal patterns, a reduction of **Avian Influenza** outbreaks in poultry during the forecast period is expected. However, three **Highly Pathogenic Avian Influenza (HPAI)** serotypes and several H5 clades are still circulating in **Eastern, Southern, and South-Eastern Asia** and may cause new outbreaks.
  - **H5N1 HPAI** continues to be reported in China, Indonesia, and Viet Nam and re-emerged in Nepal in May 2018. The outbreak incidences and reports occur in accordance with seasonal patterns.
  - The recent **H5N6 HPAI** expansion has particularly stricken the poultry sector of Japan, the Republic of Korea, and Taiwan Province of China. In July-August 2017, the virus occurred, for the first time, in the Philippines and re-emerged in Myanmar. In November 2017, a new re-assortant strain of the H5N6 HPAI virus, different from the one circulating in Asia in the past, was detected in wild birds in Japan and Taiwan, Province of China, environmental samples, and domestic ducks in the Republic of Korea. In January-February 2018 and March 2018, it was reported in Viet Nam and then in Japan and Republic of Korea, respectively.
ASIA

This new strain can heavily affect poultry and wild birds in neighboring Asian countries such as the Lao People's Democratic Republic, Myanmar, and Thailand.

- **H5N6 HPAI** and **H5N8 HPAI** were reported in Iran (Islamic Republic of) in wild birds and poultry, between January and March 2018. Further spread of H5N8 and H5N6 HPAI in the country and further incursions into neighboring countries might still occur but they are unlikely.

- The **H5N8 HPAI** strain emerged in China in May 2016 and has been spreading since; it has already spread to Japan, India, Iran (Islamic Republic of), Nepal, and the Republic of Korea. In March 2018 the virus was detected in some captive birds in Pakistan and it might still affect additional countries. In the Middle East, H5N8 HPAI introductions were detected in poultry farms in Israel and Kuwait (in December 2016) and in Kazakhstan (in January 2017). In September 2017, H5N8 was found in a buzzard in Cyprus, and in December 2017, H5N8 virus was detected in Iraq and Saudi Arabia's poultry. Further spread of H5N8 HPAI in the already affected countries and further incursions into neighboring countries might still occur but they are unlikely.

In **Western Asia**, **Foot-and-mouth disease (FMD)** is likely to occur. If mitigation measures in place are not effective, FMD viruses will likely continue spreading in the Middle East. Currently, there are serotype O and A in Israel and serotype A in the Gaza strip, Jordan, and the West bank. Due to poor vaccine matching for serotype A, neighboring countries of the latter three countries should be aware of possible introduction.

In **Eastern Asia**, **African swine fever (ASF)** introduction may occur from the Russian Federation where the ASF virus was detected in late March 2017 in a backyard pig farm (40 pigs) in Irkutsk Oblast. This marked the first ASF introduction into the eastern part of the Russian Federation, and this jump (from the west), was over 3 000 km eastward. This increases the risk of ASF introduction into China that would have devastating consequences for animal health, food safety, and food security, and raise the possibility of further spread to Southeast Asia including Japan and the Korean Peninsula.

Aquatic diseases

- **Introduction or re-emergence of Acute hepatopancreatic necrosis disease (AHPND)** in the shrimp species *Penaeus monodon* and *Penaeus vannamei* in Asia is possible from infected countries, through trading of live animals (e.g. live polychaetes, clams, oysters, etc.) that are used as feed for broodstock as well as through infected live shrimps.

- **Introduction or re-emergence of the shrimp disease Enteroctozone hepatopenaei** (EHP) in Asia from infected countries is possible, through trading of live animals (e.g. live polychaetes, clams, oysters, etc.) that are used as feed for broodstock.

- **Tilapia Lake virus** (TiLV) may have a wider distribution than currently reported or recognized. High awareness and vigilance for this emerging threat are required in Tilapia producing countries and exist in Asia. A surveillance plan may be necessary to determine the geographical extent of the infection and to prepare mitigation measures to limit its spread. Appropriate diagnostic testing is encouraged when unexplained mortalities of Tilapia occur; testing is particularly needed when clinical signs are similar to those reported for TiLV and when permissive water temperatures (between 22 °C – 32 °C) are present. Public information campaigns are recommended to advise aquaculturists on the threat posed by TiLV and on the need to report unexplained...
ASIA

large-scale mortalities to biosecurity authorities. TiLV is likely to occur in countries where water temperatures range between 22 °C – 32 °C (usually between May and November). The following farmed tilapia species are susceptible: Hybrid tilapia (*Oreochromis niloticus* x *O. aureus* hybrids), Nile tilapia (*O. niloticus*), and Red tilapia (*Oreochromis* sp.). Tilapia lake virus (TiLV) is already present in Chinese Taipei (OIE notification), India (scientific report), Indonesia (scientific literature), Israel (scientific literature and OIE notification), Malaysia (OIE notification), the Philippines (OIE notification), and Thailand (scientific report and OIE notification); it also presents a threat to the tilapia industry in other tilapia producing countries in Asia.

Forest pests and diseases

In Western Asia, dieback of natural boxwood stands (*Buxus hyrcana* and *Buxus colchica*), caused by Boxwood blight (pathogen *Calonectria pseudonaviculata*) and Boxwood moth (*Cydelima perspectalis*) will cause severe damage in Georgia and in the Caspian forest of the Iran (Islamic Republic of) due to high pest activities in the summer. In Lebanon, Dry cone syndrome and Western conifer seed bug are causing severe losses in pine nut harvest, and the pest damage will continue. In Turkey, Chestnut gall wasp is causing damage to chestnut trees and threatening the livelihoods of local communities. Integrated Pest Management (IPM), based on biological control, is in progress to reduce pest populations. It is expected that the pest pressure will decrease due to pest control activities.

FORECAST FOR THE PERIOD JULY-SEPTEMBER 2018: REGIONAL OVERVIEW
FORECAST FOR THE PERIOD JULY-SEPTEMBER 2018: REGIONAL OVERVIEW

EUROPE

In Europe, a total of 22 FCC events were forecasted comprising locusts, animal diseases, and forest pests. The likelihood of occurrence varies from Low to High. From these, the following FCC events have significant regional implications:

Locusts

- In the Russian Federation, hopper development of the Italian, Migratory, and Moroccan locusts is in progress and control operations will continue for at least one additional month. Egg-laying should start in August.

Animal diseases

- In Northern and Eastern Europe, African swine fever (ASF) outbreaks and transmission are likely to continue in the affected countries (Estonia, Latvia, Lithuania, Poland, Republic of Moldova, the Russian Federation, and Ukraine) where the virus is endemic in wild boar populations and is sporadically transmitted to domestic pigs through feeding and other infected material. Recently, ASF affected the Czech Republic, Romania, and Hungary. This has increased the possibility of introduction into neighboring countries (e.g., Belarus, and Slovakia) via live animals and animal product movements along pig value chains and transmission between seasons through infected carcasses of dead wild boars. In some of these countries, namely, Belarus, Moldova, the Russian Federation, and Ukraine, control measures are in use. Examples include additional cleaning and disinfection measures for trucks that are used in the transport of live pigs returning from at risk areas. The European Union uses identical control measures that consist of establishing restriction zones and prohibiting the movement of domestic pigs and pig products. The restriction zones are regularly adapted to take into account the epidemiological situation (Decision 2014/709/EU). Measures are also taken for affected third countries (Belarus, Moldova, the Russian Federation, and Ukraine). Additional cleaning and disinfection measures are taken for trucks used in the transport of live pigs from these countries as well as for trucks returning from at-risk areas located in the EU.

- Two H5 Highly pathogenic avian influenza (HPAI) serotypes and several H5 clades are circulating in Europe, in accordance with seasonal patterns. A reduction of outbreaks and reports of Avian Influenza in poultry, during the forecast period, is expected.
  - A low risk of H5N8 HPAI spread into already affected European countries exists. Detected for the first time in May 2016 in China’s wild bird population and in June in the Russian Federation, H5N8 HPAI has been spreading globally, following wild bird migration routes. Since mid-October 2016, the virus has been striking Eastern Europe; the disease has also been detected in deceased wild birds in Belgium, Croatia, Hungary, and Poland. Additionally, HPAI introductions have been reported in 30 out of the 43 European countries, particularly in Western and Eastern Europe. Since summer 2017, the reported number of infections has been decreasing, and the disease only affected Bulgaria and Italy in the first four months of 2018.
  - In November 2017, a new re-assortant strain of H5N6 HPAI virus, different from the one circulating in Asia in the past, was detected in wild birds in Japan and Taiwan, Province of China, in environmental samples, and in domestic ducks in the Republic of Korea. Since December 2017, this particular strain has also begun to circulate in Europe, affecting wild and domestic birds in nine countries (Denmark, Finland, Germany, Ireland, the Netherlands, Slovakia, Sweden, Switzerland, and the United Kingdom of Great Britain and Northern Ireland) and will continue to circulate in the period July-September with a lower intensity due to the increasing temperatures in Europe.
FORECAST FOR THE PERIOD JULY-SEPTEMBER 2018: REGIONAL OVERVIEW

EUROPE

1. **Lumpy Skin Disease (LSD)** outbreaks are likely to re-emerge in already affected **Southern European countries** (i.e., Albania, Greece, Montenegro, the Russian Federation, Serbia, and the former Yugoslav Republic of Macedonia) due to favorable weather conditions for the vector amplification during the forecast period, but impacts can be mitigated through control measures that are currently in place in the countries (i.e. vaccination).

Forest pests

2. In **Eastern Europe**, particularly in Belarus and Ukraine, **Bark beetles**' infestations will continue to damage pine plantations. The movement of beetles will increase and outbreaks are likely to occur in the summer, and thus it will be necessary to continue monitoring the pest movement and to apply silvicultural measures to remove the infested and weakened trees in the forests.
SHORT TAKE ON: AVIAN INFLUENZA - FAO’S SUPPORT FOR EARLY WARNING AND ACTION

WHAT: Avian influenza (AI) viruses can cause severe disease with high mortality, known as highly pathogenic avian influenza (HPAI), in poultry and wild birds. Many different strains of AI virus exist and some, called zoonotic strains, can infect and even kill humans. Should an AI virus become capable of spreading easily between humans, a pandemic could unfold; fortunately, none has occurred in the past 50 years. Notably, AI viruses have become established in other mammalian species including pigs (1979), dogs (2007), and seals (2014). These viruses can spread with great ease and cause significant damage; they also have the capacity to mutate or exchange genes with other co-circulating AI viruses. Consequently, countries must develop systems for early detection of emergent variant viruses or viruses that suddenly appear in places previously free from infection. Early detection of AI viruses is key for timely implementation of remedial measures.

WHY: AI viruses have spread widely both through trade in poultry and via wild birds. These viruses, which emerged in East Asia, have spread globally and cause severe disruption and losses for poultry producers across much of South and Central Asia, the Middle East, Europe, Africa, and the Americas. Human cases have been reported from Asia and the Middle East. In countries with strong veterinary capacity and well-regulated poultry production and marketing systems, it is possible to eliminate incursions through rapid identification of infected birds and stamping out. In other countries, AI viruses may become established in poultry populations and can only be contained using a range of control measures including vaccination. Here, the objective of early warning systems is to monitor for any variant viruses and to provide information on the extent of circulation or new introductions.

HOW: FAO has a series of measures in place to support countries and the global community for early warning of circulating virus strains and novel AI virus introductions and spread. These measures include, among others, (i) support for active, risk-based poultry surveillance; (ii) rapid testing of samples at the point of sample collection; (iii) organization of proficiency testing to ensure capabilities of national laboratories; (iv) support for shipment of samples from the field to OIE/FAO reference laboratories; (v) organization of cross-border and regional meetings to facilitate the exchange of information; (vi) rapid distribution of results from analysis of field reports and risk assessments; (vii) consolidation of international data through FAO’s global animal disease information system EMPRES-I; (viii) and regular sharing of data with the World Health Organization (WHO) and the scientific community through the OIE/FAO Network of Expertise on animal influenzas (OFFLU).

FAO further engages with veterinary services to build or enhance their capacities for prevention and control of AI; capacity building includes field surveillance, laboratory diagnostics vaccination, farm biosecurity enhancement, improved market hygiene and management, awareness raising, and risk communication. FAO also supports national authorities in designing and implementing emergency and mid- to long-term control strategies.

WHO, WHERE: FAO is working in collaboration with countries, regions, partner agencies, reference centres and resource partners at the global, regional, and national levels.

With donor support, FAO’s Emergency Centre for transboundary animal diseases (ECTAD) is currently helping combat avian influenza in several affected and at-risk countries in Asia, the Middle East, and West and Central Africa. Given the threats posed to both poultry-related livelihoods and human health, cross-sectoral engagement under a One Health approach is key for effective preparedness and control.
FCC THREATS FORECASTING AT COUNTRY LEVEL

This section provides, at country level, for the upcoming three months, forecasting of FCC threats having potential high impact on food and nutrition security. It also provides, when available and appropriate, background information on other factors impacting food and nutrition security.

The country section includes countries for which information are available. This section assigns countries and areas to geographic regions on the basis of the current composition of macro geographical (continental) regions of the United Nations Statistics Division (United Nations Statistics Division- Standard Country and Area Codes Classification (M49); http://unstats.un.org/unsd/methods/m49/m49regin.htm).

The assessment of the likelihood of occurrence was performed using FAO data and information available at the time of preparation of this bulletin and might be subject to changes later.

Legend

<table>
<thead>
<tr>
<th>Threats category</th>
<th>Likelihood of occurrence</th>
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<tbody>
<tr>
<td></td>
<td>High</td>
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<tr>
<td>Animal and zoonotic diseases</td>
<td>![Animal Icon]</td>
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<td>Aquatic diseases</td>
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<td>Forest pests and diseases</td>
<td>![Forest Icon]</td>
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<tr>
<td>Locusts</td>
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<tr>
<td>Plant pests and diseases</td>
<td>![Plant Icon]</td>
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</table>

- **High**: an event is highly likely to occur
- **Moderate**: an event is likely to occur
- **Low**: an event is unlikely to occur
- **Nil**: an event is very unlikely to occur
AFRICA

ALGERIA

Threat category: Locusts
Threat name: Desert Locust
Likelihood of occurrence: Moderate
Forecast (July-September 2018): Small-scale breeding will occur in the southern Sahara if rains fall; no significant developments are expected.
Context: Numerous Desert Locust (Schistocerca gregaria) populations are a threat to agricultural production in Africa, the Middle East, and Asia, and they have a negative impact on food security. This voracious insect can affect the livelihoods of at least one tenth of the world’s population. Desert locusts are potentially the most dangerous locust pests due to swarms’ ability to fly quickly over long distances.

ANGOLA

Threat category: Plant pests and diseases
Threat name: Fall armyworm (FAW)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): Progressively rising temperatures along with the start of the off-season maize production under irrigation and the residual moisture cropping regimes will likely favor pest spread.
Context: FAW presence was first reported during the 2016/17 season, and the pest continued to cause serious damage to the maize crop during the 2017/18 production season.

Threat category: Plant pests and diseases
Threat name: Tomato leaf miner
Likelihood of occurrence: High
Forecast (July-September 2018): Progressively rising temperatures and widespread tomato production is highly likely to favor pest spread.
Context: The pest has been causing damage to tomatoes, since 2016.

BENIN

Threat category: Plant pests and diseases
Threat name: Fall armyworm (FAW)
Likelihood of occurrence: High
Forecast (July-September 2018): The forecast period coincides with the end of the main maize growing season; additionally, as maize has been present for many months now, FAW populations have had time to increase. Furthermore, the second maize sowing period overlaps with the forecast period. As a result, FAW is highly likely to amplify.
Context: Benin was among the first countries affected by FAW in April 2016. Actions to monitor and manage the pest are ongoing. A FAO project is being implemented.

Threat category: Plant pests and diseases
Threat name: Tomato leaf miner
Likelihood of occurrence: High
Forecast (July-September 2018): Progressively rising temperatures and widespread tomato production is highly likely to favor pest spread.
Context: The pest has been causing damage to tomatoes, since 2016.

BOTSWANA

Threat category: Plant pests and diseases
Threat name: Fall armyworm (FAW)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): Progressively rising temperatures along with either the start of the off-season maize production under irrigation or the flood recession regimes will likely favor pest spread.
Context: FAW presence was first reported during the 2016/17 season, and the pest continued to cause serious damage to the maize crop during the 2017/18 production season.

Threat category: Plant pests and diseases
Threat name: Tomato leaf miner
Likelihood of occurrence: High
Forecast (July-September 2018): Progressively rising temperatures and widespread tomato production is highly likely to favor pest spread.
Context: The pest has been causing damage to tomatoes, since 2016.

Threat category: Aquatic diseases
Threat name: Epizootic ulcerative syndrome (EUS)
Likelihood of occurrence: Low
Forecast (July-September 2018): Further spread of Epizootic ulcerative syndrome (EUS) to other parts of the country is possible, but unlikely, through heavy rainfall, flooding, poor biosecurity, movement of infected fish, or birds.
Context: The water temperature, beginning in July/August, ranges from 18 to 25 °C, which is optimal for the development of the oomycete fungus responsible for the disease. However, the disease has not been reported in the country in recent years.
BURKINA FASO

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** The forecast period coincides with the rainy season, and maize will be available in the country. FAW infestations are highly likely to amplify.  
**Context:** A FAO project has been launched to address FAW challenges in the country.

BURUNDI

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** According to the Burundi Crop Calendar, harvesting of maize and sorghum for agricultural season B started in June and will continue until the end of July. Sowing of maize and sorghum for agricultural season A will start in September. Thus, during the forecast period, there will not be sufficient maize to sustain FAW populations. However, FAW is likely to survive on alternate hosts and continue its spread.  
**Context:** In Burundi, the pest has infested all 17 provinces of the country.

CABO VERDE

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** The forecast period coincides with the rainy season, and maize will be available for FAW feeding. The FAW population is highly likely to amplify and cause severe damage on young seedlings.  
**Context:** FAW is a serious food security threat to the country because maize, the preferred FAW host, is the main staple food. Actions to monitor and manage the pest are ongoing through a FAO project that was launched in early March 2018. Additional funds from the African Development Bank will allow for implementation of more activities for FAW surveillance and management.

CAMEROON

**Threat category:** Plant pests and diseases  
**Threat name:** Tomato leaf miner  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** Insect pest populations and infestation levels are likely to be high during this forecast period. Three regions are reportedly affected by the pest and it will likely progress to other regions of the country.  
**Context:** Three regions (Eastern north, West and South) have been affected with severe yield losses up to 100%. Tomato is produced during the whole year and Tomato leaf miner (Tuta absoluta) infestations are currently an important threat to tomato production in the country. Tomato leaf miner (Tuta absoluta) infestations vary with the season. Tomato is mainly produced under irrigation during the warm dry season.

CENTRAL AFRICAN REPUBLIC

**Threat category:** Plant pests and diseases  
**Threat name:** Coffee wilt disease  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Coffee wilt disease is likely to continue spreading.  
**Context:** The disease was observed in the eastern part of the coffee production zone, and the whole area has been confirmed as infested. External symptoms include chlorosis and drying of the leaves, followed by gradual and unilateral dieback leading to defoliation and complete wilting of the entire tree. The disease is suspected to be of fungal origin, but the species and strains are not yet fully known. Currently, the disease is spreading towards the south-west part of the country. Damage is considered severe and urgent prevention and mitigation actions are needed. The disease might also become a threat to other countries in the region.
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CENTRAL AFRICAN REPUBLIC

Threat category: Plant pests and diseases
Threat name: Fall armyworm (FAW)
Likelihood of occurrence: Low
Forecast (July-September 2018): The forecast period coincides with the maize harvesting period; therefore, FAW will likely survive on crop residues. FAW spread and damage on crops will be limited.
Context: In July 2017, FAW presence was confirmed within a 50-km radius of Bangui- the Capital. The country is implementing a FAO project on FAW mapping.

Threat category: Animal and zoonotic diseases
Threat name: Ebola virus disease (EVD)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): Ebola virus disease (EVD) infections in humans are occurring in the neighboring Democratic Republic of the Congo (DRC), and the disease has a high potential to spread to other countries. Of these, World Health Organization (WHO) considers Congo and the Central African Republic more at risk, given the current low capacity of their health systems to cope with EVD.
Context: Since 4 April 2018, the neighboring DRC has been experiencing its ninth epidemic of EVD in its history. The index case is still unknown, but the epidemic started in the Equateur province in the Bikoro area. Ebola Virus Disease (EVD), formerly known as Ebola hemorrhagic fever, is a severe, often fatal illness in humans. The virus is transmitted to people from wild animals and spreads in the human population through human-to-human transmission via direct contacts. It is thought that fruit bats of the Pteropodidae family are natural Ebola virus hosts. EVD is introduced and spreads in the human population through human-to-human contact.

CHAD

Threat category: Plant pests and diseases
Threat name: Fall armyworm (FAW)
Likelihood of occurrence: High
Forecast (July-September 2018): Early rain from the end of the previous forecast period will allow for land preparation for the main agricultural season. Maize and sorghum will be available in the field and will allow FAW to spread during the forecast period.
Context: In December 2016, FAW presence was first reported. Fourteen administrative regions were surveyed for FAW presence. It was confirmed in four, on maize and sorghum, with the pest incidence ranging from 17 to 49.5 percent.

Threat category: Animal and zoonotic diseases
Threat name: Ebola virus disease (EVD)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): The beginning (i.e July 2018) of the forecast period coincides with the end of the second maize cropping season. This means FAW will probably survive on crop residues. The end of the forecast period coincides with the beginning of the main maize season, and FAW will likely spread and cause damage on young maize crops.
Context: In July 2017, FAW was reported in the country. The pest was identified in four maize production areas in the northern, central, and southern parts of the country. It has also been observed on sugarcane. However, as of now, the Government does not have the entire mapping of pest infestations nor statistics on production losses. Smallholder farmers, experimental farms in agricultural centers, and large private farms have been affected.

CONGO

Threat category: Plant pests and diseases
Threat name: Fall armyworm (FAW)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): The forecast period coincides with the end of the second maize cropping season. This means FAW will probably survive on crop residues. The end of the forecast period coincides with the beginning of the main maize season, and FAW will likely spread and cause damage on young maize crops.
Context: In July 2017, FAW was reported in the country. The pest was identified in four maize production areas in the northern, central, and southern parts of the country. It has also been observed on sugarcane. However, as of now, the Government does not have the entire mapping of pest infestations nor statistics on production losses. Smallholder farmers, experimental farms in agricultural centers, and large private farms have been affected.

Threat category: Animal and zoonotic diseases
Threat name: Ebola virus disease (EVD)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): Ebola virus disease (EVD) infections in humans are occurring in the neighboring Democratic Republic of the Congo (DRC), and the disease has a high potential to spread to other countries. Of these, World Health Organization (WHO) considers Congo and the Central African Republic more at risk, given the current low capacity of their health systems to cope with EVD.
Context: Since 4 April 2018, the neighboring DRC has been experiencing its ninth epidemic of EVD in its history. The index case is still unknown, but the epidemic started in the Equateur province in the Bikoro area. Ebola Virus Disease (EVD), formerly known as Ebola hemorrhagic fever, is a severe, often fatal illness in humans. The virus is transmitted to people from wild animals and spreads in the human population through human-to-human transmission via direct contacts. It is thought that fruit bats of the Pteropodidae family are natural Ebola virus hosts. EVD is introduced into the human population through close contact with the blood, secretions, organs, or other bodily fluids of infected animals including monkeys, fruit bats, forest antelope, and porcupines. Infection can occur from ill or dead animals found in the rainforest.
**CÔTE D’IVOIRE**

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** Maize will be available for FAW to feed on. Therefore, FAW populations are highly likely to amplify and spread throughout the whole country.  
**Context:** FAW presence was officially confirmed in September 2017. A two-year action plan was developed and a FAO project was approved to implement FAW management activities.

**DEMOCRATIC REPUBLIC OF THE CONGO**

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** The forecast period coincides with the main maize season in central, northern regions; maize plants will enable FAW spread and experience damage. In the southern region, the end of the forecast (i.e. September 2018) coincides with the sowing period of the main maize season, and young maize plants will be available. FAW, therefore, is highly likely to spread and will cause severe damage.  
**Context:** FAW was reported for the first time in the country in December 2016. Actions are ongoing to manage the pest.

**Threat category:** Plant pests and diseases  
**Threat name:** Tomato leaf miner (Tuta absoluta)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** In the extreme southern region, insect pest populations and infestation levels are likely to be moderate because the forecast period coincides with the dry season during which tomato is mainly grown. In the extreme north, central, and southern regions, the forecast period coincides with the main rainy season during which there is limited tomato production. Insect pest populations and infestations levels will be relatively low in these regions.  
**Context:** Pest presence is suspected in the country but has not been officially reported. It has been observed in greenhouses in the municipality of N’sele (in Kinshasa). Tomato leaf miner (Tuta absoluta) infestations vary with the season. Tomato is mainly produced under irrigation during the warm dry season.

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Avian influenza (AI)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** H5N8 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are unlikely to occur, due to the increasing temperatures during the forecast period.  
**Context:** H5N8 HPAI outbreaks were reported in April 2017 in the area of Ituri, near Lake Albert shore, in Djugu Territory (approximately 250 km from the site, near Lake Victoria in Uganda, where a H5N8 HPAI outbreak occurred in January 2017). The last observed outbreak occurred in December 2017. HPAI is a highly contagious disease that causes high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Avian influenza viruses can affect humans.

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Ebola virus disease (EVD)  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** Ebola virus disease (EVD) infections in humans are highly likely to occur, and the disease has a high potential to spread to neighboring countries.  
**Context:** Since 4 April 2018, the country has been experiencing its ninth epidemic of EVD in its history. From 4 April to 18 June, 60 cases of human infections with EVD were recorded in DRC. The index case is still unknown, but the epidemic started in the Equateur province in the Bikoro area. Multi-partnership teams are on the field. Epidemiological links with animals are still to be investigated. Ebola Virus Disease (EVD), formerly known as Ebola hemorrhagic fever, is a severe, often fatal illness in humans. The virus is transmitted to people from wild animals and spreads in the human population through human-to-human transmission via direct contacts. It is thought that fruit bats of the Pteropodidae family are natural Ebola virus hosts. EVD is introduced into the human population through close contact with the blood, secretions, organs, or other bodily fluids of infected animals including monkeys, fruit bats, forest antelope, and porcupines. Infection can occur from ill or dead animals found in the rainforest.

**Threat category:** Aquatic diseases  
**Threat name:** Epizootic ulcerative syndrome (EUS)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Further spread of Epizootic ulcerative syndrome (EUS) to other parts of the country and potentially to other parts of Africa is possible, but unlikely, through heavy rainfall, flooding, poor biosecurity, movement of infected fish, or birds.  
**Context:** The country experienced its first heavy fish mortalities in December 2014 and this continued until March 2015. The laboratory diagnosis through PCR (polymerase chain reaction) and histology testing was positive, confirming that these mortalities were due to EUS. Fish belonging to the families of Channidae, Claridae, and Protopridae are of great importance because these fish are major food commodities in the DRC. They are also a type of air-breathing and marketable fish, which are transported to and from markets while alive; this creates an effective pathway for pathogen transfer.
DJIBOUTI

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Introduction of FAW is highly likely to occur from the neighboring country of Ethiopia. Nevertheless, its spread will be limited due to arid conditions and a limited availability of its preferred host (maize).  
**Context:** The pest has not been reported in Djibouti yet.

**Threat category:** Locusts  
**Threat name:** Desert Locust  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Significant activity is unlikely to occur.  
**Context:** Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East, and Asia, and they have a negative impact on food security. This voracious insect can affect the livelihoods of at least one tenth of the world’s population. Desert locusts are potentially the most dangerous locust pests due to swarms’ ability to fly quickly over long distances.

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Rift Valley fever (RVF)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** The approaching dry season, from July onwards, will be unsuitable for the Rift Valley fever (RVF) vector populations in most of the Eastern African region. However, the potential spread of the disease through animal movements and informal trade routes within and outside of Kenya, which is already affected, is likely to occur.  
**Context:** FAO advises the veterinary services and livestock farmers’ communities in the region to remain vigilant to the potential occurrence and spread of RVF in humans and/or animals. In particular, the risk of RVF spread is considered to be very high in Kenya, (where an outbreak has been ongoing since 8 June 2018) and moderate in Djibouti, Eritrea, Ethiopia, Rwanda, Somalia, South Sudan, Sudan, Uganda, and United Republic of Tanzania. Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing severe diseases in both animals and humans. The disease also results in significant economic losses due to death and abortion among RVF-infected livestock.

EGYPT

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** FAW has not been reported in Egypt yet. However, its introduction from the River Nile State (Sudan) to the southern part of the country, particularly the Aswan Governorate, is likely to occur. If introduced, FAW may spread quickly because sugarcane is widespread in the south of Egypt and it will be the maize growing season.  
**Context:** FAW is present in the neighboring country Sudan. Egypt has already begun a surveillance program that uses light traps, in the southern regions.

**Threat category:** Locusts  
**Threat name:** Desert Locust  
**Likelihood of occurrence:** Nil  
**Forecast (July-September 2018):** Significant activity is very unlikely to occur.  
**Context:** Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East, and Asia, and they have a negative impact on food security. This voracious insect can affect the livelihoods of at least one tenth of the world’s population. Desert locusts are potentially the most dangerous locust pests due to swarms’ ability to fly quickly over long distances.

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Avian influenza (AI)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** H5N1 and H5N8 Highly pathogenic avian influenza (HPAI) outbreaks are likely to occur in poultry due to further spread of the viruses within the country, though the number of events may decrease due to the increasing temperatures.  
**Context:** H5N1 HPAI is endemic in Egypt. Outbreaks in poultry are reported every month, even during the incoming hot season in which the number of infections usually decreases. H5N8 HPAI has spread to 17 out of the 27 governorates within the country, since late November 2016. The other influenza virus circulating in poultry in the country is H9N2 LPAI. HPAI is a highly contagious disease that causes high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Avian influenza viruses can affect humans.
EGYPT

**Threat category:** Aquatic diseases  
**Threat name:** Tilapia lake virus (TiLV)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** TiLV spread is likely to occur.  
**Context:** The presence of TiLV in Egypt has been reported in the scientific literature. TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized fish and a high stocking density.

EQUATORIAL GUINEA

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Given that the maize crop will not be available in the field during the forecast period, FAW presence and spread are unlikely.  
**Context:** FAW has been observed on maize in the insular region (Malabo and Musola). It has yet to be formally identified in the continental region. No official government declaration has been made so far.

**Threat category:** Plant pests and diseases  
**Threat name:** Tomato leaf miner  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** The pest presence in the country is suspected and it is highly likely to spread during the forecast period because it coincides with the tomato production period.  
**Context:** Pest presence is suspected in the country but has not been officially reported. *Tomato leaf miner* (*Tuta absoluta*) infestations vary with the season. Tomato is mainly produced under irrigation during the warm dry season.

ERITREA

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** In March 2018, the pest was reported as being in the country for the first time. The pest will likely spread due to the widespread production of maize in the intermediate altitude zone of the country.  
**Context:** FAW was first reported in the country at the end of March 2018. After that, the government embarked on pest awareness campaigns. Furthermore, FAO supported the government, through a project, to respond to the pest threat.

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Rift Valley fever (RVF)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** The approaching dry season, from July onwards, will be unsuitable for the Rift Valley fever (RVF) vector populations in most of the Eastern African region. However, the potential spread of the disease through animal movements and informal trade routes within and outside of Kenya, which is already affected, is likely to occur.  
**Context:** FAO advises the veterinary services and livestock farmers’ communities in the region to remain vigilant to the potential occurrence and spread of RVF in humans and/or animals. In particular, the risk of RVF spread is considered to be very high in Kenya, (where an outbreak has been ongoing since 8 June 2018) and moderate in Djibouti, Eritrea, Ethiopia, Rwanda, Somalia, South Sudan, Sudan, Uganda, and United Republic of Tanzania. *Rift Valley fever* (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing severe diseases in both animals and humans. The disease also results in significant economic losses due to death and abortion among RVF-infected livestock.
**ETHIOPIA**

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** The forecast period coincides with the main cropping season (Meher) and is thus characterized by the widespread sowing of maize over most of the country. During this period, maize will be present at different vegetative stages in most maize growing areas of Ethiopia. Early vegetative-stage FAW infestation can cause more leaf damage and yield losses than late vegetative-stage infestation.  
**Context:** In Ethiopia, FAW attacks maize planted in all seasons; namely, short rainy season, main rainy season, and irrigated maize season. During the irrigation season (January to April 2018), the total area affected was 66,730 ha (16%) of maize out of the total 405,800 ha that was planted.

**Threat category:** Plant pests and diseases  
**Threat name:** Wheat rust  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Due to the presence of inoculum of different races and as per seasonal pattern, Stem rust and Yellow rust diseases might amplify and cause outbreaks.  
**Context:** In recent years Ug99 and Digalu races of Stem rust and PstS11 (formerly known as AF2012) race of Yellow rust have severely affected wheat.

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Rift Valley fever (RVF)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Given the current and forecasted above average precipitation in the western part of the country as well as the current Rift Valley fever (RVF) outbreak in Kenya, RVF re-emergence is likely.  
**Context:** FAO advises the veterinary services and livestock farmers’ communities in Ethiopia to remain vigilant about the occurrence of RVF. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing severe diseases in both animals and humans. The disease also results in significant economic losses due to death and abortion among RVF-infected livestock.*

**GABON**

**Threat category:** Plant pests and diseases  
**Threat name:** Banana bunchy top disease (BBTD)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Disease spread from the initial outbreak areas is likely.  
**Context:** The disease is already present in the country and impacts banana production. *Banana bunchy top disease affects the whole banana plant by causing stunting, a bunchy appearance, and by preventing fruit formation. If any fruit is produced, which is unusual, it will be deformed.*

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Small-scale breeding may occur in areas that received rains from Cyclone Sagar, between Jijiga (Ethiopia) and Djibouti.  
**Context:** Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East, and Asia, and they have a negative impact on food security. This voracious insect can affect the livelihoods of at least one tenth of the world’s population. Desert locusts are potentially the most dangerous locust pests due to swarms’ ability to fly quickly over long distances.
GAMBIA

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** During the forecast period, FAW will be actively feeding on early-planted maize and populations are highly likely to increase.  
**Context:** A FAO project is being implemented to strengthen the country's capacities in FAW management.

GHANA

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** The maize season started at the end of March in the coastal and rainforest zones, this will have allowed FAW populations to increase. FAW will spread towards northern regions and large-scale infestations are highly likely to occur during the forecast period.  
**Context:** Since March 2017, FAW has been established in all ten regions. It prefers to feed on maize, but it has also been sighted on other crops (okra and rice). Ghana is currently implementing actions to strengthen its capacity to respond to FAW through a FAO emergency project. Ghana recently placed traps in maize growing zones for surveillance of FAW. Extensionists and plant protection staff have been trained on the Application for FAW Monitoring and Early Warning System (FAMEWS), which was developed by FAO.

GUINEA

**Threat category:** Aquatic diseases  
**Threat name:** Tilapia lake virus (TiLV)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** TiLV has not been reported, but it may be introduced and spread through live fish movements of infected hosts.  
**Context:** There are reports of unexplained tilapia mortalities. *TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized fish and a high stocking density.*

GUINEA-BISSAU

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** The maize growing season will start at the beginning of the forecast period. FAW populations are highly likely to amplify.  
**Context:** Actions for FAW management are ongoing through a FAO project, and African Development Bank funds are expected to be approved soon.

KENYA

**Threat category:** Plant pests and diseases  
**Threat name:** Cassava brown streak disease (CBSD)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Spread of Cassava brown streak disease (CBSD) is likely.  
**Context:** The disease is present in the northern part of the country at a limited scale. The disease can cause brownish rots in tubers rendering them inedible, which leads to a severe loss of economic value. Farmers may be unaware of their infected cassava crops until they are harvested and see the tuber lesions, as leaves might appear asymptomatic in some cases.

**Threat category:** Plant pests and diseases  
**Threat name:** Cassava mosaic disease (CMD)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Spread of Cassava mosaic disease (CMD) is likely.  
**Context:** The disease is present in the northern part of the country at a limited scale. CMD is considered one of the most damaging diseases of cassava in Africa. The disease is caused by a virus, which causes chlorosis and distortions of the leaves that reduce yields. It is transmitted by infected cuttings and white flies.
KENYA

Threat category: Plant pests and diseases  
Threat name: Fall armyworm (FAW)  
Likelihood of occurrence: Moderate  
Forecast (July-September 2018): Outbreaks of Stem rust in wheat are likely to occur, as per seasonal pattern. A new race of Yellow rust, which is present in Ethiopia, may be introduced.  
Context: Stem rust is a recurrent problem in Kenya. In addition to Ug99 inoculum presence, a new race of Stem rust (Digalu race) and Yellow rust (PstS11 formerly known as AF2012), which were recently detected in Ethiopia, have the potential to spread in the country.

Threat category: Animal and zoonotic diseases  
Threat name: Rift Valley fever (RVF)  
Likelihood of occurrence: High  
Forecast (July-September 2018): Given the ongoing outbreak in the country Rift Valley fever (RVF) is highly likely to spread through animal movements and trade as well as through potential amplification of the vector population in secondary hotspots (irrigation areas).  
Context: On 19 May 2018, National Authorities issued an alert for the possible occurrence of RVF due to the above average rainfall experienced in previous months (March-May). An outbreak of RVF occurred in Wajir county, in the North Eastern region, on May-June 2018. Both humans and animals (camelids) were confirmed infected in the area. At the 20 June, 26 cases were reported among humans, and three outbreaks among livestock (camelids, sheep, and goats) occurred in the Wajir and Tana river counties. In late November 2017, three human cases were confirmed in neighboring Uganda, in the Kiboga, Kiruhura, and Mityana districts. Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing severe diseases in both animals and humans. The disease also results in significant economic losses due to death and abortion among RVF-infected livestock.

LESOTHO

Threat category: Plant pests and diseases  
Threat name: Fall armyworm (FAW)  
Likelihood of occurrence: Low  
Forecast (July-September 2018): FAW has not been reported in the country yet.  
Context: FAW has not been reported in the country yet.

Threat category: Plant pests and diseases  
Threat name: Tomato leaf miner  
Likelihood of occurrence: Moderate  
Forecast (July-September 2018): Progressively rising temperatures coupled with widespread tomato production is likely to favor pest spread.  
Context: The pest was reported in Lesotho by IPPC/FAO, in January 2018 for the first time.

LIBERIA

Threat category: Plant pests and diseases  
Threat name: Fall armyworm (FAW)  
Likelihood of occurrence: High  
Forecast (July-September 2018): FAW was found on maize, at the end of 2017. Since then, FAW has been causing serious damage to various vegetable crops. The populations are highly likely to increase during the forecast period, as the period coincides with the main maize season in all agro-ecological zones.  
Context: The country has received support for the assessment of FAW incidence in various districts of the country, and its presence is now confirmed in all districts. Serious infestations were also observed on vegetable crops including cabbages, eggplants, etc. A FAO project as well as funds from the African Development Bank have been availed for FAW management.

LIBYA (STATE OF)

Threat category: Plant pests and diseases  
Threat name: Fall armyworm (FAW)  
Likelihood of occurrence: Low  
Forecast (July-September 2018): Currently, the pest is not in Libya. Nevertheless, there is a risk of introduction since 3/5 of the neighboring countries (Chad, Niger, and Sudan) are infested.  
Context: FAW has not been reported in the country but it is present in neighboring Chad, Niger, and Sudan.
LIBYA (STATE OF)

**Threat category:** Locusts  
**Threat name:** Desert Locust  
**Likelihood of occurrence:** Nil  
**Forecast (July-September 2018):** Significant activity is very unlikely to occur.  
**Context:** Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East, and Asia, and they have a negative impact on food security. This voracious insect can affect the livelihoods of at least one tenth of the world’s population. Desert Locusts are potentially the most dangerous locust pests due to swarms’ ability to fly quickly over long distances.

MADAGASCAR

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Although the main maize growing season is over, FAW spread throughout the country is likely to continue as it has been detected on an increasing number of other crops.  
**Context:** The pest was first reported to be causing damage on crops in November 2017, and its presence has since been officially confirmed.

**Threat category:** Plant pests and diseases  
**Threat name:** Tomato leaf miner  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** The pest has not yet been detected in the country and its introduction is unlikely. However, due to the prevalence of relatively high temperatures, which are ideal for Tomato leaf miner, pest spread from the point of introduction would be likely if the pest were introduced.  
**Context:** The pest has not been reported in Madagascar yet.

MALAWI

**Threat category:** Plant pests and diseases  
**Threat name:** Cassava mosaic disease (CMD)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Outbreaks of Cassava mosaic disease are likely to occur.  
**Context:** Cassava mosaic virus was reported for the first time in Malawi in 1998. Recently, it has been significantly affecting the cassava in many districts. *CMD is considered one of the most damaging diseases of cassava in Africa.* The disease is caused by a virus, which causes chlorosis and distortions of the leaves that reduce yields. It is transmitted by infected cuttings and white flies.
MALAWI
Threat category: Plant pests and diseases
Threat name: Tomato leaf miner
Likelihood of occurrence: Moderate
Forecast (July-September 2018): The period is characterized by widespread tomato production and high temperatures; the pest, therefore, is likely to spread widely.
Context: The pest has been causing damage to tomatoes, since 2016.

Threat category: Locusts
Threat name: Red Locust
Likelihood of occurrence: Moderate
Forecast (July-September 2018): With vegetation burning, locusts will aggregate into bigger and denser groups in the remaining suitable areas, which, if not controlled, are likely to escape outbreak areas (Lake Chilwa/Lake Chiuta plains) and invade and damage cultivated areas.
Context: Red Locust plagues are a major threat to agriculture in Southern Africa. Failure to control locust outbreaks during the early stages of development can result in highly mobile swarms, which invade agricultural areas and can cause major crop damage.

Threat category: Animal and zoonotic diseases
Threat name: Foot-and-mouth disease (FMD)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): The further spread of Foot-and-mouth disease (FMD) is likely to occur within Malawi in non-vaccinated areas.
Context: In May 2018, an FMD outbreak was first detected. The Government of Malawi conducts regularly FMD vaccination, but the outbreaks occurred in a non-vaccinated area. FMD is a highly contagious disease among cattle, buffalo, sheep, and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most restrictive animal disease for livestock trade.

Threat category: Forest pests and diseases
Threat name: Blue gum chalcid
Likelihood of occurrence: High
Forecast (July-September 2018): Outbreaks of the insect pest Blue gum chalcid (Leptocybe invasa) is a major insect pest of young eucalyptus trees and seedlings.
Context: Blue gum chalcid continues to cause severe damage in nurseries and young eucalyptus plantations in Malawi. Blue gum chalcid is highly likely to continue occurring in eucalyptus nurseries and plantations.

Threat category: Forest pests and diseases
Threat name: Red gum lerp psyllid
Likelihood of occurrence: High
Forecast (July-September 2018): Red gum lerp psyllid is highly likely to spread in eucalyptus plantations.
Context: The combination of climate change with the general decline of forest conditions and the occurrence of Red gum lerp psyllid continue to damage plantations and small woodlots in Malawi.
Red gum lerp psyllid (Glycaspis brimblecombei) nymphs and adults feed on sugar rich phloem. Excessive feeding pressure causes premature leaf drop. Extensive and repeated defoliation events, caused by psyllid, weaken trees and cause premature deaths of highly susceptible eucalyptus species.

MALI
Threat category: Plant pests and diseases
Threat name: Fall armyworm (FAW)
Likelihood of occurrence: High
Forecast (July-September 2018): During the forecast period, the rainy season will be ongoing and maize will be present. FAW is, therefore, highly likely to amplify.
Context: FAW presence in the country was officially declared in early 2018 and a FAO emergency project is being implemented to enhance FAW management capacity in the country.

Threat category: Locusts
Threat name: Desert Locust
Likelihood of occurrence: Moderate
Forecast (July-September 2018): Small-scale breeding will occur in the north (Adrar des Iforas), causing a slight increase in locust numbers.
Context: Numerous Desert Locust (Schistocerca gregaria) populations are a threat to agricultural production in Africa, the Middle East, and Asia, and they have a negative impact on food security. This voracious insect can affect the livelihoods of at least one tenth of the world’s population. Desert locusts are potentially the most dangerous locust pests due to swarms’ ability to fly quickly over long distances.
MALI

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Rift Valley fever (RVF)  
**Likelihood of occurrence:** Moderate

**Forecast (July-September 2018):** The wet season will start in West Africa in July 2018. The NOAA (National Oceanic and Atmospheric Administration - USA) precipitation forecast for June – September 2018 predicts above average precipitation in south-west Mali. There is a moderate risk of Rift Valley fever (RVF) re-emergence.

**Context:** In September-October 2016 and June 2017 RVF infections were reported in animals and humans, respectively. The country is endemic for RVF and the situation for the next quarter should be monitored. *Rift Valley fever (RVF)* is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing severe diseases in both animals and humans. The disease also results in significant economic losses due to death and abortion among RVF-infected livestock.

MAURITANIA

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** Moderate

**Forecast (July-September 2018):** The pest is not currently present in Mauritania, but it is present in neighboring countries (Mali and Senegal), thus, there is a risk of introduction. During the forecast period, the FAW situation in these two neighboring countries will be severe. Additionally, the forecast period in Mauritania coincides with the sowing periods for maize, millet, rice, and sorghum, and at the end of this period it will be the cereal-growing season. Therefore, in the event of introduction, its spread is likely and may cause severe damage on young seedlings.

**Context:** FAW has not been reported in Mauritius yet.

MAURITIUS

**Threat category:** Plant pests and diseases  
**Threat name:** Tomato leaf miner  
**Likelihood of occurrence:** Low

**Forecast (July-September 2018):** This period is characterized by low temperatures, which could limit pest spread if the pest were to be introduced.

**Context:** The pest has not been reported in Mauritius yet.

MOROCCO

**Threat category:** Locusts  
**Threat name:** Desert Locust  
**Likelihood of occurrence:** Nil

**Forecast (July-September 2018):** Significant activity is very unlikely to occur.

**Context:** Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East, and Asia, and they have a negative impact on food security. This voracious insect can affect the livelihoods of at least one tenth of the world's population. Desert locusts are potentially the most dangerous locust pests due to swarms' ability to fly quickly over long distances.

MOZAMBIQUE

**Threat category:** Plant pests and diseases  
**Threat name:** Banana fusarium wilt disease  
**Likelihood of occurrence:** Moderate

**Forecast (July-September 2018):** Further spread of Banana fusarium wilt disease Tropical race 4 (TR4) is likely to occur.

**Context:** Banana fusarium wilt disease TR4 has been already reported in two farms in the Nampula province. *Banana fusarium wilt disease* is a soil-borne disease caused by a fungal pathogen that cannot be eradicated once established in the soil. Currently, TR4 poses a serious threat to global banana production. The disease attacks banana plants of all ages, initially appearing with a yellowing of the leaves; it causes wilting and plant death. Infected planting materials, water, and movement of infested soil particles with shoes, tools, and vehicles play a major role in spread. It can remain viable in soil for decades and containment and management are challenging. Thus, prevention of the spread is crucial.
MOZAMBIQUE

Threat category: Plant pests and diseases
Threat name: Fall armyworm (FAW)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): High temperatures accompanied by widespread maize production through irrigation and moisture harvesting regimes are likely to induce pest spread.
Context: FAW presence was first reported during the 2016/17 season. From then, it continued to cause damage to the maize crop in the 2017/18 rain-fed production season that lasted from November to March.

Threat category: Plant pests and diseases
Threat name: Tomato leaf miner
Likelihood of occurrence: High
Forecast (July-September 2018): This period is characterized by widespread tomato production and high temperatures; the pest, therefore, is likely to spread widely.
Context: The pest has been causing damage to tomatoes, since 2016.

Threat category: Locusts
Threat name: Red Locust
Likelihood of occurrence: Moderate
Forecast (July-September 2018): With vegetation burning, locusts will aggregate into bigger and denser groups, in the remaining suitable areas, which, if not controlled, are likely to escape outbreak areas (Buzi-Gorogona and Dimba plains and the bordering area with Malawi) and invade and damage cultivated areas.
Context: Red Locust plagues are a major threat to agriculture in Southern Africa. Failure to control locust outbreaks during the early stages of development can result in highly mobile swarms, which invade agricultural areas and can cause major crop damage.

Threat category: Aquatic diseases
Threat name: Acute hepatopancreatic necrosis disease (AHPND)
Likelihood of occurrence: Low
Forecast (July-September 2018): Introduction of Acute hepatopancreatic necrosis disease (AHPND) can occur from affected countries through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, and oysters that are used as feed for broodstock.
Context: Mozambique is home to shrimp species that are susceptible to AHPND. A strong awareness of shrimp diseases is present in the country, and awareness of AHPND has improved overtime.

NAMIBIA

Threat category: Forest pests and diseases
Threat name: Red gum lerp psyllid
Likelihood of occurrence: Moderate
Forecast (July-September 2018): Red gum lerp psyllid outbreaks are likely to continue occurring in eucalyptus plantations.
Context: Monitoring of the pest spread is in progress. Red gum lerp psyllid (Glycaspis brimblecombei) nymphs and adults feed on sugar rich phloem. Excessive feeding pressure causes premature leaf drop. Extensive and repeated defoliation events, caused by psyllid, weaken trees and cause premature deaths of highly susceptible eucalyptus species.

NIGER

Threat category: Plant pests and diseases
Threat name: Fall armyworm (FAW)
Likelihood of occurrence: High
Forecast (July-September 2018): The main maize growing season will start in July. Therefore, FAW is highly likely to amplify and spread during the forecast period.
Context: FAW was reported in Tahoua (border with Nigeria) and Tillabery (border with Mali), in 2017.
NIGER

**Threat category:** Locusts  
**Threat name:** Desert Locust  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Small-scale breeding will occur in the north (Tamesna, Air), causing a slight increase in locust numbers.

**Context:** Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East, and Asia, and they have a negative impact on food security. This voracious insect can affect the livelihoods of at least one tenth of the world’s population. Desert locusts are potentially the most dangerous locust pests due to swarms’ ability to fly quickly over long distances.

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Rift Valley fever (RVF)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** The wet season will start in West Africa in July 2018. The NOAA (National Oceanic and Atmospheric Administration - USA) precipitation forecast for June – September 2018 predicts above average precipitation in south-east Niger. There is a moderate risk of Rift Valley fever (RVF) re-emergence.

**Context:** The last RVF infections reported in Niger occurred at the end of 2016 for humans and animals and in July 2017 for cattle. The country, however, is endemic for RVF and the situation for the next quarter should be monitored. Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing severe diseases in both animals and humans. The disease also results in significant economic losses due to death and abortion among RVF-infected livestock.

NIGERIA

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** During the forecast period, major maize growing parts of the country will be experiencing the rainy season. Therefore, FAW populations are highly likely to amplify.

**Context:** FAW was reported for the first time in 2016. Recent information indicated a widespread infestation of FAW on maize during the last major season (2017). A FAO project is being implemented to strengthen pest management capacity in the country.

RWANDA

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** Throughout agricultural season B (from March to June), maize is grown in limited parts of the country. Maize harvesting will occur in July, but high FAW populations may survive on alternate hosts and continue to spread. In September, the sowing of maize and sorghum for the agricultural season A will start and high FAW populations will be a serious threat for the young maize seedlings.

**Context:** In Rwanda, the pest has infested all 30 districts of the country. During the previous agricultural season B, FAW affected 5 848 ha (23%) of maize out of the total 25 890 ha planted.
**RWANDA**

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Rift Valley fever (RVF)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** The approaching dry season, from July onwards, will be unsuitable for the Rift Valley fever (RVF) vector populations in most of the Eastern African region. However, the potential spread of the disease through animal movements and informal trade routes within and outside of Kenya, which is already affected, is likely to occur.  
**Context:** FAO advises the veterinary services and livestock farmers’ communities in the region to remain vigilant to the potential occurrence and spread of RVF in humans and/or animals. In particular, the risk of RVF spread is considered to be very high in Kenya, (where an outbreak has been ongoing since 8 June 2018) and moderate in Djibouti, Eritrea, Ethiopia, Rwanda, Somalia, South Sudan, Sudan, Uganda, and United Republic of Tanzania. Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing severe diseases in both animals and humans. The disease also results in significant economic losses due to death and abortion among RVF-infected livestock.

**SAO TOME AND PRINCIPE**

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Maize plants will be available in the field during the forecast period and FAW will likely spread. FAW continues to cause damage to maize production especially for late sown maize.  
**Context:** In April 2016, this became the first country in Central Africa to report FAW infestations. Late sown maize fields are more susceptible to FAW attacks.

**SENEGAL**

**Threat category:** Plant pests and diseases  
**Threat name:** Tomato leaf miner  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** Insect pest populations and infestation levels are likely to be high during this forecast period because it coincides with the tomato production period and there is a lack of suitable control measures.  
**Context:** Pest presence is suspected in the country but has not been officially reported. Significant damage has been observed in the field and in greenhouses. Tomato leaf miner (Tuta absoluta) infestations vary with the season. Tomato is mainly produced under irrigation during the warm dry season.

**Threat category:** Locusts  
**Threat name:** Desert Locust  
**Likelihood of occurrence:** Nil  
**Forecast (July-September 2018):** Significant activity is very unlikely to occur.  
**Context:** Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East, and Asia, and they have a negative impact on food security. This voracious insect can affect the livelihoods of at least one tenth of the world’s population. Desert locusts are potentially the most dangerous locust pests due to swarms’ ability to fly quickly over long distances.
**SEYCHELLES**

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** FAW spread throughout the country will be limited due to limited maize production.  
**Context:** FAW was first reported on maize around August 2017, and after sample analyses, its presence was officially confirmed.

**SIERRA LEONE**

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** FAW has been reported in all regions of the country, as of 2017. The maize season starts in January for swamp areas and in May for the uplands. During the forecast period, FAW populations are highly likely to amplify, as maize will be available.  
**Context:** Since the official report of FAW, trainings on identification and management options have been undertaken. A FAO project has been approved and is currently being implemented.

**SOMALIA**

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** In July, FAW will have access to maize and sorghum in almost all growing areas in the country and infestations are expected to be high. Starting in August, maize and sorghum harvesting will occur in the Shabelle and Juba valleys, Bay, Bakool, and Somaliland, but FAW populations are likely to survive on alternate hosts and continue their spread.  
**Context:** FAW has been reported in Somalia and an assessment exercise will be carried out by the Ministry of Agriculture and Irrigation to determine the impact FAW has had on maize.

**THREATS IN SOUTH AFRICA**

**Threat category:** Plant pests and diseases  
**Threat name:** Banana bunchy top disease (BBTD)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Disease spread from the initial outbreak areas is likely to continue.  
**Context:** The disease was reported for the first time in February 2017. Banana bunchy top disease affects the whole banana plant by causing stunting, a bunchy appearance, and by preventing fruit formation. If any fruit is produced, which is unusual, it will be deformed.
**SOUTH AFRICA**

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** High temperatures accompanied by widespread maize production through irrigation and moisture harvesting regimes are likely to induce pest spread.  
**Context:** FAW presence was first reported during the 2016/17 season. The pest caused serious damage to maize across the country and continued to do so during the 2017/18 cropping season (November to March). Fortunately, South Africa has institutional response capacities, which are expected to moderate the impact of the pest in the short run.

**Threat category:** Plant pests and diseases  
**Threat name:** Tomato leaf miner  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** Progressively rising temperatures and widespread tomato production is highly likely to favor pest spread.  
**Context:** The pest has been causing damage to tomatoes, since 2016.

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Avian influenza (AI)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** H5N8 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are likely to occur, due to the relatively low temperatures during the forecast period.  
**Context:** In June 2017, H5N8 HPAI virus was detected for the first time in South Africa on a commercial farm in the Mpumalanga region. Since then, additional outbreaks and infections have been observed, both in wild and domestic birds, in seven different regions of the country. The last outbreaks were reported in June 2018. HPAI is a highly contagious disease that causes high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Avian influenza viruses can affect humans.

**SOUTH SUDAN**

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** The forecast period coincides with the main crop-growing season, especially for the Equatorian states in the country. Maize and sorghum will be widely cultivated and FAW infestations are expected to be high.  
**Context:** In South Sudan, the pest has been reported in all of the former ten States of the country.
**SOUTH SUDAN**

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Rift Valley fever (RVF)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Given the current and forecasted above average precipitation for the forecast period in the southern part of the country as well as the current Rift Valley fever (RVF) outbreak in Kenya, RVF re-emergence is likely.  
**Context:** Sudan should be monitored during the upcoming season. Sudan is an endemic country for RVF; it was severely affected by a large outbreak in 2007/08, following the epidemic in Kenya and Tanzania. Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing severe diseases in both animals and humans. The disease also results in significant economic losses due to death and abortion among RVF-infected livestock.

**SUDAN**

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** The forecast period coincides with the main growing seasons for millet and sorghum; FAW is highly likely to continue its spread and cause severe damage.  
**Context:** FAW presence has been officially confirmed.

**Threat category:** Locusts  
**Threat name:** Desert Locust  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Small-scale breeding will occur between Darfur and Kassala, causing a slight increase in locust numbers.  
**Context:** Numerous Desert Locust (Schistocerca gregaria) populations are a threat to agricultural production in Africa, the Middle East, and Asia, and they have a negative impact on food security. This voracious insect can affect the livelihoods of at least one tenth of the world’s population. Desert locusts are potentially the most dangerous locust pests due to swarms’ ability to fly quickly over long distances.

**SWAZILAND**

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** High temperatures accompanied by widespread maize production through irrigation and moisture harvesting regimes are likely to induce pest spread.  
**Context:** FAW presence was first reported during the 2016/17 season. The pest caused serious damage to sorghum, millet, and maize across the country and it continued to do so during the 2017/18 season.

**TOGO**

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** The forecast period coincides with the end of the main maize growing season; additionally, as maize has been present for many months now, FAW populations have had time to increase. Furthermore, the second maize sowing period overlaps with the forecast period. As a result, FAW is highly likely to amplify.  
**Context:** FAW was detected in samples from Togo in 2016 and is currently present in all maize growing regions of the country. A FAO project is being implemented to strengthen capacity for FAW management.
## Uganda

**Threat category:** Plant pests and diseases  
**Threat name:** Cassava brown streak disease (CBSD)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Spread of Cassava brown streak disease (CBSD) is likely.  
**Context:** The disease is already present in the country. The disease can cause brownish rots in tubers rendering them inedible, which leads to a severe loss of economic value. Farmers may be unaware of their infected cassava crops until they are harvested and see the tuber lesions, as leaves might appear asymptomatic in some cases.

**Threat category:** Plant pests and diseases  
**Threat name:** Cassava mosaic disease (CMD)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Spread of Cassava mosaic disease (CMD) is likely.  
**Context:** The disease is already present in the country. CMD is considered one of the most damaging diseases of cassava in Africa. It is caused by a virus, which causes chlorosis and distortions of the leaves that reduce yields. It is transmitted by infected cuttings and white flies.

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** Maize and sorghum are important crops in the region that host FAW and infestations on these widespread crops are expected to be high.  
**Context:** In Uganda, the pest has been confirmed in all 121 districts of the territory. During the March-November period, crops at different stages of growth are expected in the field; some plants will be harvested while others will be growing, depending on the region.

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Avian influenza (AI)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** H5N8 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are unlikely to occur, due to the increasing temperatures during the forecast period.  
**Context:** In January 2017, H5N8 HPAI virus was detected in wild birds found dead (along the shores of Lake Victoria in the Wakiso District). It is the first AI introduction in Uganda, and the first one in this African sub-region since 2008. The disease was last reported in the country in May 2017. HPAI is a highly contagious disease that causes high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Avian influenza viruses can affect humans.

**Threat category:** Aquatic diseases  
**Threat name:** Tilapia lake virus (TiLV)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** TiLV has not been reported but may be introduced and spread through live movements of infected hosts.  
**Context:** TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized fish and a high stocking density. Where unexplained mortalities of Tilapia occur, appropriate diagnostic tests should be done. This is particularly necessary when clinical signs, similar to those reported for TiLV, and permissive temperatures are present.

**Threat category:** Forest pests and diseases  
**Threat name:** Blue gum chalcid  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Blue gum chalcid is likely to further spread in eucalyptus nurseries and plantations.  
**Context:** The pest is currently causing severe damage in eucalyptus nurseries, woodlots, and plantations. Management options of the pest are being provided to farmers. These include good nursery hygienic practices to reduce the pest population. Blue gum chalcid (Leptocybe invasa) is a major insect pest of young eucalyptus trees and seedlings.

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Rift Valley fever (RVF)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** The upcoming dry season is unsuitable for Rift Valley fever (RVF) vector amplification. However, given the current outbreak in Kenya, the risk of RVF spread due to animal movements is considered moderate.  
**Context:** RVF has been sporadically reported in the country, usually after a heavy rainy period, which represents favorable conditions for the vector. In late November 2017, three human cases were confirmed in the Kiboga, Kiruhura, and Mityana districts. Additional events both in humans and animals seem to have occurred up until May 2018 but no official reports are available. The human cases occurred along the cattle corridor between Kenya and Uganda in areas of low suitability for vector amplification but in medium/high suitability areas for RVF spread, based on climate and expert opinion models. Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing severe diseases in both animals and humans. The disease also results in significant economic losses due to death and abortion among RVF-infected livestock.

**Threat category:** Aquatic diseases  
**Threat name:** Tilapia lake virus (TiLV)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** TiLV has not been reported but may be introduced and spread through live movements of infected hosts.  
**Context:** TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized fish and a high stocking density. Where unexplained mortalities of Tilapia occur, appropriate diagnostic tests should be done. This is particularly necessary when clinical signs, similar to those reported for TiLV, and permissive temperatures are present.

**Threat category:** Forest pests and diseases  
**Threat name:** Blue gum chalcid  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Blue gum chalcid is likely to further spread in eucalyptus nurseries and plantations.  
**Context:** The pest is currently causing severe damage in eucalyptus nurseries, woodlots, and plantations. Management options of the pest are being provided to farmers. These include good nursery hygienic practices to reduce the pest population. Blue gum chalcid (Leptocybe invasa) is a major insect pest of young eucalyptus trees and seedlings.
UNITED REPUBLIC OF TANZANIA

Threat category: Plant pests and diseases
Threat name: Cassava brown streak disease (CBSD)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): Spread of Cassava brown streak disease (CBSD) is likely
Context: The disease is already present in the country. The disease can cause brownish rots in tubers rendering them inedible, which leads to a severe loss of economic value. Farmers may be unaware of their infected cassava crops until they are harvested and see the tuber lesions, as leaves might appear asymptomatic in some cases.

Threat category: Plant pests and diseases
Threat name: Cassava mosaic disease (CMD)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): Spread of Cassava mosaic disease (CMD) is likely
Context: The disease is already present in the country. CMD is considered one of the most damaging diseases of cassava in Africa. It is caused by a virus, which causes chlorosis and distortions of the leaves that reduce yields. It is transmitted by infected cuttings and white flies.

Threat category: Plant pests and diseases
Threat name: Fall armyworm (FAW)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): High temperatures accompanied by widespread maize production through irrigation and moisture harvesting regimes are likely to induce pest spread.
Context: FAW presence was first reported during the 2016/17 season, and the pest continued to cause damage to maize during the 2017/18 production season (November to March).

Threat category: Plant pests and diseases
Threat name: Tomato leaf miner
Likelihood of occurrence: High
Forecast (July-September 2018): Progressively rising temperatures and widespread tomato production is highly likely to favor pest spread.
Context: The pest has been causing damage to tomatoes, since 2016.

Threat category: Locusts
Threat name: Red Locust
Likelihood of occurrence: Moderate
Forecast (July-September 2018): With vegetation burning, locusts will aggregate into bigger and denser groups, in the remaining suitable areas, which, if not controlled, are likely to escape outbreak areas (Ikui-Katavi plains, Malagarasi Basin, and Rukwa plains) and invade and damage cultivated areas
Context: Red Locust plagues are a major threat to agriculture in Southern Africa. Failure to control locust outbreaks during the early stages of development can result in highly mobile swarms, which invade agricultural areas and can cause major crop damage.

Threat category: Animal and zoonotic diseases
Threat name: Rift Valley fever (RVF)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): The approaching dry season, from July onwards, will be unsuitable for the Rift Valley fever (RVF) vector populations in most of the Eastern African region. However, the potential spread of the disease through animal movements and informal trade routes within and outside of Kenya, which is already affected, is likely to occur.
Context: FAO advises the veterinary services and livestock farmers’ communities in the region to remain vigilant to the potential occurrence and spread of RVF in humans and/or animals. In particular, the risk of RVF spread is considered to be very high in Kenya, (where an outbreak has been ongoing since 8 June 2018) and moderate in Djibouti, Eritrea, Ethiopia, Rwanda, Somalia, South Sudan, Sudan, Uganda, and United Republic of Tanzania. Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing severe diseases in both animals and humans. The disease also results in significant economic losses due to death and abortion among RVF-infected livestock.

Threat category: Aquatic diseases
Threat name: Epizootic ulcerative syndrome (EUS)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): Epizootic ulcerative syndrome is likely to occur in the country due to the confirmed presence of the disease in neighboring Democratic Republic of the Congo and Zambia.
Context: Water temperatures during the forecast period will range from 18 to 25 °C, which are optimal for the development of the oomycete fungus responsible for the disease.
UNITED REPUBLIC OF TANZANIA

Threat category: Forest pests and diseases
Threat name: Blue gum chalcid
Likelihood of occurrence: Moderate
Forecast (July-September 2018): Blue gum chalcid is likely to spread in eucalyptus nurseries and plantations.
Context: This pest continues to cause damage in eucalyptus nurseries, woodlots, and plantations. Blue gum chalcid (Leptocybe invasa) is a major insect pest of young eucalyptus trees and seedlings.

ZAMBIA

Threat category: Plant pests and diseases
Threat name: Cassava brown streak disease (CBSD)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): Spread of Cassava brown streak disease (CBSD) is likely.
Context: The disease was reported in northern districts of the country, recently. The disease can cause brownishrots in tubers rendering them inedible, which leads to a severe loss of economic value. Farmers may be unaware of their infected cassava crops until they are harvested and see the tuber lesions, as leaves might appear asymptomatic in some cases.

Threat category: Plant pests and diseases
Threat name: Cassava mosaic disease (CMD)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): Cassava mosaic disease is likely to continue to spread.
Context: Cassava mosaic virus is already present in the country. It was found widely in six provinces in 2014. CMD is considered one of the most damaging diseases of cassava in Africa. The disease is caused by a virus, which causes chlorosis and distortions of the leaves that reduce yields. It is transmitted by infected cuttings and white flies.

Threat category: Plant pests and diseases
Threat name: Fall armyworm (FAW)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): High temperatures accompanied by widespread maize production through irrigation and moisture harvesting regimes are likely to induce pest spread.
Context: FAW presence was first reported during the 2016/17 season, and the pest continued to cause damage to maize during the 2017/18 production season (November to March).

Threat category: Locusts
Threat name: Red Locust
Likelihood of occurrence: Low
Forecast (July-September 2018): With vegetation burning, locusts will aggregate into bigger and denser groups, in the remaining suitable areas, which, if not controlled, are likely to escape outbreak areas (Kafue Flats) and invade and damage cultivated areas. However, this may occur at a smaller scale than in the neighboring countries.
Context: Red Locust plagues are a major threat to agriculture in Southern Africa. Failure to control locust outbreaks during the early stages of development can result in highly mobile swarms, which invade agricultural areas and can cause major crop damage.

Threat category: Animal and zoonotic diseases
Threat name: Foot-and-mouth disease (FMD)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): The further spread of Foot-and-mouth disease (FMD) serotype O within Zambia is likely to occur, and it may spread to neighboring countries.
Context: During April-May 2018, several outbreaks of FMD serotype O were detected in Zambia. From recent lab analysis it can be hypothesized that the topotype has been circulating in the United Republic of Tanzania for the last four years. These events are of concern because the disease may spread from Zambia into the Southern Africa region, which has never been affected by this particular topotype. FMD is a highly contagious disease among cattle, buffalo, sheep, and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most restrictive animal disease for livestock trade.

Threat category: Aquatic diseases
Threat name: Epizootic ulcerative syndrome (EUS)
Likelihood of occurrence: Low
Forecast (July-September 2018): Further spread of Epizootic ulcerative syndrome (EUS) to other parts of the country is possible, but unlikely, through heavy rainfall, flooding, poor biosecurity, movement of infected fish, or birds.
Context: Water temperatures during the forecast period will range from 18 to 25 °C, which are optimal for the development of the oomycete fungus responsible for the disease.
ZAMBIA

**Threat category:** Aquatic diseases  
**Threat name:** Tilapia lake virus (TiLV)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** TiLV has not been reported but may be introduced and spread through live movements of infected hosts.  
**Context:** TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized fish and a high stocking density. Where unexplained mortalities of Tilapia occur, appropriate diagnostic tests should be done. This is particularly important when clinical signs, similar to those reported for TiLV, and permissive temperatures are present.

**Threat category:** Forest pests and diseases  
**Threat name:** Blue gum chalcid  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Spread of the insect pest Blue gum chalcid is likely to continue in eucalyptus nurseries and plantations.  
**Context:** Zambia has initiated pest management activities based on silvicultural practices, breeding programmes, and quarantine measures, to reduce insect populations. Introduction of biological control agents to reduce Blue gum chalcid populations is in progress. *Blue gum chalcid* (*Leptocybe invasa*) is a major insect pest of young eucalyptus trees and seedlings.

**Threat category:** Forest pests and diseases  
**Threat name:** Red gum lerp psyllid  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Spread of Red gum lerp psyllid is likely to continue in eucalyptus plantations.  
**Context:** Pest management activities based on silvicultural practices are in progress. *Red gum lerp psyllid* (*Glycaspis brimblecombei*) nymphs and adults feed on sugar rich phloem. Excessive feeding pressure causes premature leaf drop. Extensive and repeated defoliation events, caused by psyllid, weaken trees and cause premature deaths of highly susceptible eucalyptus species.

ZIMBABWE

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** High temperatures accompanied by widespread maize production through irrigation and moisture harvesting regimes are likely to induce pest spread.  
**Context:** FAW presence was first reported during the 2016/17 season, and the pest continued to cause damage to maize during the 2017/18 production season (November to March).

**Threat category:** Aquatic diseases  
**Threat name:** Tilapia lake virus (TiLV)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** TiLV has not been reported but may be introduced and spread through live movements of infected hosts.  
**Context:** TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized fish and a high stocking density. Where unexplained mortalities of Tilapia occur, appropriate diagnostic tests should be done. This is particularly important when clinical signs, similar to those reported for TiLV, and permissive temperatures are present.

**Threat category:** Forest pests and diseases  
**Threat name:** Blue gum chalcid  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Spread of Blue gum chalcid is likely to continue in eucalyptus nurseries, woodlots, and plantations.  
**Context:** Pest management activities based on the application of biological control agents are in progress to reduce pest populations. *Blue gum chalcid* (*Leptocybe invasa*) is a major insect pest of young eucalyptus trees and seedlings.
ZIMBABWE

**Threat category:** Forest pests and diseases

**Threat name:** Red gum lerp psyllid

**Likelihood of occurrence:** Moderate

**Forecast (July-September 2018):** Spread of Red gum lerp psyllid is likely to continue in eucalyptus plantations.

**Context:** Pest management activities based on silvicultural practices are in progress to reduce pest populations. *Red gum lerp psyllid* (*Glycaspis brimblecombei*) *nymphs and adults feed on sugar rich phloem.* Excessive feeding pressure causes premature leaf drop. Extensive and repeated defoliation events, caused by psyllid, weaken trees and cause premature deaths of highly susceptible eucalyptus species.
**AMERICAS**

**BRAZIL**

Threat category: Aquatic diseases  
Threat name: Tilapia lake virus (TiLV)  
Likelihood of occurrence: Low  
Forecast (July-September 2018): TiLV has not been reported but may be introduced and spread through live movements of infected hosts.  
Context: TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized fish and a high stocking density. Where unexplained mortalities of Tilapia occur, appropriate diagnostic tests should be done. This is particularly important when clinical signs, similar to those reported for TiLV, and permissive temperatures are present.

**COLOMBIA**

Threat category: Aquatic diseases  
Threat name: Acute hepatopancreatic necrosis disease (AHPND)  
Likelihood of occurrence: Low  
Forecast (July-September 2018): Introduction of Acute hepatopancreatic necrosis disease (AHPND) is possible, but unlikely, from affected countries through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, and oysters that are used as feed for broodstock.  
Context: Strong awareness of shrimp AHPND is present in the country.

**COSTA RICA**

Threat category: Aquatic diseases  
Threat name: Tilapia lake virus (TiLV)  
Likelihood of occurrence: Low  
Forecast (July-September 2018): TiLV has not been reported in Costa Rica, and its introduction from a neighboring country is unlikely.  
Context: TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized fish and a high stocking density. Where unexplained mortalities of Tilapia occur, appropriate diagnostic tests should be done. This is particularly important when clinical signs, similar to those reported for TiLV, and permissive temperatures are present.

**ECUADOR**

Threat category: Aquatic diseases  
Threat name: Tilapia lake virus (TiLV)  
Likelihood of occurrence: Low  
Forecast (July-September 2018): There have been no further reports, since it was first reported in the literature in 2014.  
Context: TiLV has been reported in Ecuador, in the scientific literature. TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized fish and a high stocking density.

**GUATEMALA**

Threat category: Aquatic diseases  
Threat name: Acute hepatopancreatic necrosis disease (AHPND)  
Likelihood of occurrence: Low  
Forecast (July-September 2018): Introduction of Acute hepatopancreatic necrosis disease (AHPND) is possible, but unlikely, from affected countries through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, and oysters that are used as feed for broodstock.  
Context: Strong awareness of shrimp AHPND is present in the country.

**Threat category:** Forest pests and diseases  
**Threat name:** Bark beetles  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Bark beetles (mainly Dendroctonus frontalis) damage to pine plantations is likely to continue.  
**Context:** Silvicultural practices to reduce pest populations are in progress. Training of foresters on prevention and management practices is underway. The adults and larvae of Dendroctonus spp. are bark-feeding. Flight activities of D. frontalis are almost continuous throughout the year in Mesoamerica. In general, it attacks stressed trees.
### Honduras

**Threat category:** Aquatic diseases  
**Threat name:** Acute hepatopancreatic necrosis disease (AHPND)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Introduction of Acute hepatopancreatic necrosis disease (AHPND) is possible, but unlikely, from affected countries through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, and oysters that are used as feed for broodstock.  
**Context:** Strong awareness of shrimp AHPND is present in the country.

### Mexico

**Threat category:** Aquatic diseases  
**Threat name:** Tilapia lake virus (TiLV)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** TiLV has not been reported but may be introduced and spread through live movements of infected hosts.  
**Context:** TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized fish and a high stocking density. Where unexplained mortalities of Tilapia occur, appropriate diagnostic tests should be done. This is particularly important when clinical signs, similar to those reported for TiLV, and permissive temperatures are present.

### Nicaragua

**Threat category:** Aquatic diseases  
**Threat name:** Acute hepatopancreatic necrosis disease (AHPND)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Introduction of Acute hepatopancreatic necrosis disease (AHPND) is possible, but unlikely, from affected countries through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, and oysters that are used as feed for broodstock.  
**Context:** Strong awareness of shrimp AHPND is present in the country.

### Bark beetles

**Threat category:** Forest pests and diseases  
**Threat name:** Bark beetles  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Bark beetles (mainly *Dendroctonus frontalis*) outbreaks, causing heavy losses in pine plantations, are likely to occur and will continue to be reported.  
**Context:** Bark beetles affect about 500,000 ha of conifer forests in Honduras. Training of foresters on prevention and management practices is in progress. The adults and larvae of *Dendroctonus spp.* are bark-feeding. Flight activities of *D. frontalis* are almost continuous throughout the year in Mesoamerica. In general, it attacks stressed trees.
### Panama

**Threat category:** Aquatic diseases  
**Threat name:** Acute hepatopancreatic necrosis disease (AHPND)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Introduction of Acute hepatopancreatic necrosis disease (AHPND) from affected countries is possible, but unlikely, through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, and oysters that are used as feed for broodstock.  
**Context:** Strong awareness of shrimp AHPND is present in the country.

**Threat category:** Aquatic diseases  
**Threat name:** Enterocytozoon hepatopenaei (EHP)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Introduction of Enterocytozoon hepatopenaei (EHP) is possible, but unlikely, from other countries through trading of live animals (e.g. live polychaetes, clams, oysters, etc.) that are used as feed for broodstock.  
**Context:** Strong awareness of EHP is present in the country.

### Peru

**Threat category:** Aquatic diseases  
**Threat name:** Acute hepatopancreatic necrosis disease (AHPND)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Introduction of Acute hepatopancreatic necrosis disease (AHPND) is possible, but unlikely, from affected countries through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, and oysters that are used as feed for broodstock.  
**Context:** Strong awareness of shrimp AHPND is present in the country.

**Threat category:** Aquatic diseases  
**Threat name:** Enterocytozoon hepatopenaei (EHP)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Introduction of Enterocytozoon hepatopenaei (EHP) is possible, but unlikely, from other countries through trading of live animals (e.g. live polychaetes, clams, oysters, etc.) that are used as feed for broodstock.  
**Context:** Strong awareness of EHP is present in the country.

**Threat category:** Aquatic diseases  
**Threat name:** Tilapia lake virus (TiLV)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** TiLV spread is likely to occur.  
**Context:** TiLV is already present in the country. It was first observed in November 2017. A second outbreak was reported in December 2017. TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized and a high stocking density.
**AFGHANISTAN**

**Threat category:** Locusts  
**Threat name:** Moroccan Locust  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Adult populations, having escaped hopper control operations, will lay eggs (which will hatch in spring 2019) and eventually disappear.  
**Context:** Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests in Central Asia. The Italian Locust is also present in the country but was not reported as a pest in 2017.

**ARMENIA**

**Threat category:** Locusts  
**Threat name:** Italian Locust  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Adult populations will mate and lay eggs. Some limited infestations may have to be controlled.  
**Context:** Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. The Italian Locust is one of the two locust pests in the Caucasus.

**AZERBAIJAN**

**Threat category:** Locusts  
**Threat name:** Moroccan Locust  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Adult populations, having escaped hopper control operations, will lay eggs (which will hatch in spring 2019) and eventually disappear.  
**Context:** Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. The Moroccan Locust is one of the two locust pests in the Caucasus.

**BANGLADESH**

**Threat category:** Aquatic diseases  
**Threat name:** Tilapia lake virus (TiLV)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** TiLV has not been reported in the country but may be introduced and spread through live movements of infected hosts.  
**Context:** TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized fish and a high stocking density. Where unexplained mortalities of Tilapia occur, appropriate diagnostic tests should be done. This is particularly important when clinical signs, similar to those reported for TiLV, and permissive temperatures are present.

**CAMBODIA**

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Avian influenza (AI)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** H5N1 Highly pathogenic avian influenza (HPAI) outbreaks are unlikely to occur, due to the increasing temperatures during the forecast period.  
**Context:** Since 2013, H5N1 HPAI has widely circulated throughout the country, affecting poultry and causing 57 infections in humans. In the first three months of 2018, five outbreaks caused by the virus were reported; the latest occurred in the Phnom Kham province in February 2018. HPAI is a highly contagious disease that causes high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Avian influenza viruses can affect humans.

**CHINA**

**Threat category:** Animal and zoonotic diseases  
**Threat name:** African swine fever (ASF)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** African swine fever (ASF) may be introduced from the Russian Federation through transport-associated routes (TARs), illegal food imports, and Chinese workers working abroad. China’s northeastern region (Heilongjiang province) is where ASF is most likely to be introduced, followed by Inner Mongolia.  
**Context:** Entry of ASF into China would have devastating consequences for animal health, food safety, and food security, and it would raise the possibility of disease spread into Southeast Asia including Japan and the Korean Peninsula. Wild boar population density is the most relevant factor in the spread of the disease. ASF is most likely to persist and become endemic due to the presence of wild boar populations interacting with susceptible domestic species and a lack of biosecurity in smallholdings. However, due to restrictions on hunting in China, hunters are not likely to affect the spread and persistence of the disease. ASF is a highly contagious viral disease of swine, both domestic and wild, which can cause high mortality. So far, no vaccines are available.
**CHINA**

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Avian influenza (AI)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** H5 and H7 HPAI and LPAI virus outbreaks in poultry as well as in humans (although these are sporadic) are unlikely to occur, due to the increasing temperatures during the forecast period.  
**Context:** Several serotypes of HPAI and LPAI viruses are circulating and being detected in China. Outbreaks in poultry and humans usually follow a seasonal pattern, with peak observations occurring between January and February. During the fifth wave of H7N9, which ended in September 2017, H7N9 virus evolved from a low pathogenic into a highly pathogenic avian virus for the first time. Additionally, in late November 2017, Taiwan, Province of China, reported a variant H5N6 HPAI strain found in wild birds. The genetic analysis of the new circulating strain revealed it to be a new re-assortant strain, which can heavily affect poultry. The last occurrence of H5N6 HPAI was detected in March 2018 in Japan and Republic of Korea. HPAI is a highly contagious disease that causes high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Avian influenza viruses can affect humans.

**Threat category:** Aquatic diseases  
**Threat name:** Acute hepatopancreatic necrosis disease (AHPN)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** AHPND re-emergence may occur but its spread will be limited by biosecurity measures.  
**Context:** AHPND is already present in the country. Passive surveillance and mitigation measures are in place.

**Threat category:** Aquatic diseases  
**Threat name:** Enterocytozoon hepatopenaei (EHP)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Enterocytozoon hepatopenaei re-emergence may occur but its spread will be limited by biosecurity measures.  
**Context:** EHP is already present in the country. Active and passive surveillance and mitigation measures are in place.

**Threat category:** Aquatic diseases  
**Threat name:** Tilapia lake virus (TiLV)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** TiLV has not been reported in China but it may be introduced in Taipei and spread through live movements of infected hosts.  
**Context:** Active surveillance and mitigation measures are in place. TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized fish and a high stocking density. Where unexplained mortalities of Tilapia occur, appropriate diagnostic tests should be done. This is particularly important when clinical signs, similar to those reported for TiLV, and permissive temperatures are present.

**GAZA STRIP**

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Foot-and-mouth disease (FMD)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** The further spread of Foot-and-mouth disease (FMD) serotype O is likely to occur while a possible introduction of serotype A from a neighboring country is unlikely.  
**Context:** An FMD outbreak serotype A was detected on an Israeli cattle farm (Aramsha, Northern district) in May 2017. The episode is of concern for the neighboring regions (e.g., the Gaza Strip) because only poor vaccine matching for serotype A is available. The last observed FMD outbreaks in a Western Asian country occurred in April 2018 in Israel where serotype O was identified. FMD is a highly contagious disease among cattle, buffalo, sheep, and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most restrictive animal disease for livestock trade.

**GEORGIA**

**Threat category:** Locusts  
**Threat name:** Moroccan Locust  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Uncontrolled hopper populations will fledge, and adults will mate, lay eggs, and eventually disappear.  
**Context:** Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. The Italian Locust is one of the two locust pests in the Caucasus and in the country.

**Threat category:** Locusts  
**Threat name:** Moroccan Locust  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Uncontrolled hopper populations will fledge, and adults will mate, lay eggs, and eventually disappear.  
**Context:** Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. The Moroccan Locust is one of the two locust pests in the Caucasus.

**Threat category:** Locusts  
**Threat name:** Italian Locust  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Uncontrolled hopper populations will fledge, and adults will mate, lay eggs, and eventually disappear.  
**Context:** Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. The Moroccan Locust is one of the two locust pests in the Caucasus.

**Threat category:** Forest pests and diseases  
**Threat name:** Boxwood blight  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Boxwood blight will continue to be present and likely increase, due to high humidity in July and August.  
**Context:** Monitoring of disease spread is in progress. Boxwood blight (also known as box blight) is a widespread fungal disease caused by the pathogen Calonectria pseudonaviculata, affecting boxwood trees.
**GEORGIA**

**Threat category:** Forest pests and diseases  
**Threat name:** Boxwood moth  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** The moth has three to four generations per year in Georgia. The larvae will continue feeding on leaves, and these repeated attacks will lead to total defoliation of the trees.

**Context:** As part of the Integrated Pest Management (IPM) programme, biopesticide Btk (Bacillus thuringiensis kurstaki) and pheromone traps are being used to protect the native boxwood species. Boxwood moth (Cydalima perspectalis), native to Eastern Asia, is highly destructive and defoliates boxwood trees.

**INDIA**

**Threat category:** Locusts  
**Threat name:** Desert Locust  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Small-scale breeding will occur in Rajasthan, causing a slight increase in locust numbers.  

**Context:** Numerous Desert Locust (Schistocerca gregaria) populations are a threat to agricultural production in Africa, the Middle East, and Asia, and they have a negative impact on food security. This voracious insect can affect the livelihoods of at least one tenth of the world's population. Desert locusts are potentially the most dangerous locust pests due to swarms’ ability to fly quickly over long distances.

**Threat category:** Aquatic diseases  
**Threat name:** Acute hepatopancreatic necrosis disease (AHPND)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Introduction of Acute hepatopancreatic necrosis disease (AHPND) from affected countries is possible, but unlikely, through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, and oysters that are used as feed for broodstock.

**Context:** Surveillance for AHPND as well as a strong awareness of shrimp diseases is present in the country. Many small-scale producers are present.

**IRELAND**

**Threat category:** Aquatic diseases  
**Threat name:** Tilapia lake virus (TiLV)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** TiLV has not been reported but may be introduced and spread through live movements of infected hosts.

**Context:** TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized fish and a high stocking density. Where unexplained mortalities of Tilapia occur, appropriate diagnostic tests should be done. This is particularly important when clinical signs, similar to those reported for TiLV, and permissive temperatures are present.

**IRAN (ISLAMIC REPUBLIC OF)**

**Threat category:** Locusts  
**Threat name:** Desert Locust  
**Likelihood of occurrence:** Nil  
**Forecast (July-September 2018):** Significant activity is very unlikely to occur.

**Context:** Numerous Desert Locust (Schistocerca gregaria) populations are a threat to agricultural production in Africa, the Middle East, and Asia, and they have a negative impact on food security. This voracious insect can affect the livelihoods of at least one tenth of the world’s population. Desert locusts are potentially the most dangerous locust pests due to swarms’ ability to fly quickly over long distances.
**IRAN (ISLAMIC REPUBLIC OF)**

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Avian influenza (AI)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** H5 Highly pathogenic avian influenza outbreaks in poultry are unlikely to occur, due to the increasing temperatures during the forecast period.  
**Context:** A H5N1 HPAI outbreak was detected in January 2017 in the Mazdaran region. The H5N8 HPAI, which has been spreading globally, following wild bird migratory routes, since November 2016, has been detected in wild and domestic birds in eight governorates of the country. The last H5N6 HPAI official detection occurred in February 2017; however, in January 2018, it was detected in wild birds found dead on Azali wetlands in the Gilan province. In March, the same virus was reported affecting poultry in the same province; however, the official confirmation of the outbreak has yet to come. HPAI is a highly contagious disease that causes high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Avian influenza viruses can affect humans.

**Threat category:** Aquatic diseases  
**Threat name:** Acute hepatopancreatic necrosis disease (AHPND)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Introduction of Acute hepatopancreatic necrosis disease (AHPND) is possible, but unlikely, from affected countries through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, and oysters that are used as feed for broodstock.  
**Context:** Good surveillance and biosecurity measures are in place in the country.

**Threat category:** Forest pests and diseases  
**Threat name:** Boxwood moth  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** The moth has three to four generations per year in Iran. The larvae will continue feeding on leaves during summer, and these repeated attacks will lead to total defoliation of the trees.  
**Context:** The first introduction of Boxwood moth was reported in August 2016; since then, the native boxwood forests have been under threat. Early action, such as pheromone trapping for monitoring and treatment using biopesticide Btk (Bacillus thuringiensis kurstaki), is required to reduce further spread. FAO organized a visit from Georgia to Iran (Islamic Republic of) to share experiences on Btk application and on pheromone traps’ use. Boxwood moth (Cydalima perspectalis), native to Eastern Asia, is highly destructive and defoliates boxwood trees.

**Threat category:** Forest pests and diseases  
**Threat name:** Charcoal disease  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Oak charcoal disease (caused by pathogen Biscogniauxia mediterranea) will be moderately active during the forecast period due to sustainable forest health management activities.  
**Context:** In the Zagros region, the decline of Oak charcoal disease began in 2012 and has continued. Operations to minimize the impact of the charcoal disease and abiotic stresses are in progress. It has a negative impact on the livelihoods of nomadic people and watershed management.

**ISRAEL**

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Foot-and-mouth disease (FMD)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Foot-and-mouth disease (FMD) serotype O outbreaks are still likely to occur despite an ongoing vaccination campaign, while outbreaks of FMD serotype A are unlikely.  
**Context:** FMD serotype O outbreaks used to occur sporadically in the country. The latest FMD outbreaks observed in the region occurred in April 2018 and serotype O was detected. In May 2017, in Aramsha, Northern district, an FMD outbreak serotype A was detected on a cattle farm. The episode is of concern for Israel and neighboring regions because only poor vaccine matching for serotype A is available. No new outbreaks of this serotype were reported after June 2017 in the country. FMD is a highly contagious disease among cattle, buffalo, sheep, and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most restrictive animal disease for livestock trade.
**Japan**

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Avian influenza (AI)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** H5N6 Highly pathogenic avian influenza (HPAI) outbreaks are unlikely to occur, due to the increasing temperatures during the forecast period.  
**Context:** Japan experienced the first incursion of H5N6 HPAI in November 2016. Since then, the virus has spread to 27 out of the 47 prefectures in the country. Since November 2017, a new reassortant strain of H5N6 HPAI has been circulating in the region (Japan, the Republic of Korea, and Taiwan, Province of China). The last event in the region was observed in March 2018 in Japan and Republic of Korea. HPAI is a highly contagious disease that causes high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Avian influenza viruses can affect humans.

**Jordan**

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Foot-and-mouth disease (FMD)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** The further spread of Foot-and-mouth disease (FMD) serotype O is likely to occur, while a possible introduction of serotype A from a neighboring country is unlikely.  
**Context:** During February and March 2017, four FMD outbreaks, serotype O, were detected in cattle in three different regions of the country. An FMD outbreak serotype A was also detected on a cattle farm in May 2017 in Israel (Aramsha, Northern district). The episode is of concern for neighboring regions because only poor vaccine matching for serotype A is available. The last observed FMD outbreaks in a Western Asian country occurred in April 2018 in Israel where serotype O was identified. FMD is a highly contagious disease among cattle, buffalo, sheep, and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most restrictive animal disease for livestock trade.

**Kazakhstan**

**Threat category:** Locusts  
**Threat name:** Moroccan Locust  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Adult populations will lay eggs and eventually disappear.  
**Context:** Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia.
LAO PEOPLE’S DEMOCRATIC REPUBLIC

Threat category: Plant pests and diseases
Threat name: Banana fusarium wilt disease
Likelihood of occurrence: Moderate
Forecast (July-September 2018): Banana fusarium wilt disease Tropical race 4 (TR4) is likely to spread.
Context: Banana fusarium wilt disease TR4 was recently reported for the first time in the country on one farm. Since then, it has been reported from two provinces. Banana fusarium wilt disease is a soil-borne fungal disease that cannot be eradicated once established in the soil. Currently, TR4 poses a serious threat to global banana production. The disease attacks banana plants of all ages, initially appearing with a yellowing of the leaves; it causes wilting and plant death. Infected planting materials, water, and movement of infested soil particles with shoes, tools, and vehicles play a major role in spread. It can remain viable in soil for decades and containment and management are challenging. Thus, prevention of the spread is crucial.

MALAYSIA

Threat category: Aquatic diseases
Threat name: Acute hepatopancreatic necrosis disease (AHPND)
Likelihood of occurrence: Low
Forecast (July-September 2018): High water temperatures are usually observed in July-September, and these temperatures are within the permissive range for disease outbreaks to occur. However, the last reported outbreak was in 2014, and so the likelihood of re-emergence is low.
Context: Monitoring and active surveillance systems have been established.

LEBANON

Threat category: Forest pests and diseases
Threat name: Western conifer seed bug
Likelihood of occurrence: High
Forecast (July-September 2018): It is highly likely that Western conifer seed bug will be very active during the forecast period, because the nymphs will feed on young seeds.
Context: Monitoring of the pest population using traps is in progress. Western conifer seed bug (Leptoglossus occidentalis) is an invasive insect pest that feeds mainly on conifer seeds. The nymphs and adults spend the summer on pine trees where they use their piercing-sucking mouthparts to feed on twig and green pinecone sap. The adults will also eat fruits, seed pulp, and flowers.

Threat category: Forest pests and diseases
Threat name: Western conifer seed bug
Likelihood of occurrence: Moderate
Forecast (July-September 2018): It is highly likely that Western conifer seed bug will be very active during the forecast period, because the nymphs will feed on young seeds.
Context: Monitoring of the pest population using traps is in progress. Western conifer seed bug (Leptoglossus occidentalis) is an invasive insect pest that feeds mainly on conifer seeds. The nymphs and adults spend the summer on pine trees where they use their piercing-sucking mouthparts to feed on twig and green pinecone sap. The adults will also eat fruits, seed pulp, and flowers.

Threat category: Aquatic diseases
Threat name: Enterocytozoon hepatopenaei (EHP)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): High water temperatures are usually observed in July-September, and these temperatures are within the permissive range for disease outbreaks to occur.
Context: EHP is already present in the country. It was last reported in 2016 in Malaysia, since then no new mortalities have been observed. Monitoring and active surveillance systems have been established.

Threat category: Aquatic diseases
Threat name: Tilapia lake virus (TiLV)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): During July-September the production cycle of tilapia will be active. Additionally, the permissive temperature range for TiLV outbreaks will be present.
Context: TiLV is already present in the country. It was first observed in June 2017, and additional outbreaks were reported in July and October 2017. Monitoring and active surveillance systems have been established. TiLV occurs when the water temperature is between 22 °C – 32 °C (as experienced for example in Israel); it has also been observed in farms with large-sized fish and a high stocking density.
**MYANMAR**

**Threat category:** Plant pests and diseases  
**Threat name:** Banana fusarium wilt disease  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Banana fusarium wilt disease Tropical race 4 (TR4) is likely to spread.  
**Context:** Banana fusarium wilt disease TR4 was recently reported for the first time in the country on one farm. Since then, it has been reported on four others. Banana fusarium wilt disease is a soil-borne fungal disease that cannot be eradicated once established in the soil. Currently, TR4 poses a serious threat to global banana production. The disease attacks banana plants of all ages, initially appearing with a yellowing of the leaves; it causes wilting and plant death. Infected planting materials, water, and movement of infested soil particles with shoes, tools, and vehicles play a major role in spread. It can remain viable in soil for decades and containment and management are challenging. Thus, prevention of the spread is crucial.  

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Avian influenza (AI)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** H5 Highly pathogenic avian influenza (HPAI) outbreaks are unlikely to occur, due to the increasing temperatures during the forecast period.  
**Context:** Both H5N1 and H5N6 HPAI re-emerged in Myanmar in poultry in July 2017, after the last detections of these viruses in March-April 2016. A new re-assortant strain of H5N6 HPAI has been circulating in the region (Japan, the Republic of Korea, and Taiwan, Province of China), since November 2017. The last occurrence of this serotype in the region was detected in March 2018 in Japan and Republic of Korea. HPAI is a highly contagious disease that causes high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Avian influenza viruses can affect humans.

**OMAN**

**Threat category:** Locusts  
**Threat name:** Desert Locust  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Small-scale breeding may occur in areas that received rains from Cyclone Mekunu, in Dhofar and Al Wusta coastal and interior areas.  
**Context:** Numerous Desert Locust (Schistocerca gregaria) populations are a threat to agricultural production in Africa, the Middle East, and Asia, and they have a negative impact on food security. This voracious insect can affect the livelihoods of at least one tenth of the world's population. Desert locusts are potentially the most dangerous locust pests due to swarms' ability to fly quickly over long distances.

**PAKISTAN**

**Threat category:** Plant pests and diseases  
**Threat name:** Banana fusarium wilt disease  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Banana fusarium wilt disease Tropical race 4 (TR4) is likely to spread.  
**Context:** Banana fusarium wilt disease TR4 was recently reported for the first time in the country. It was initially reported on one farm and further study and preventive measures are needed. Banana fusarium wilt disease is a soil-borne fungal disease that cannot be eradicated once established in the soil. Currently, TR4 poses a serious threat to global banana production. The disease attacks banana plants of all ages, initially appearing with a yellowing of the leaves; it causes wilting and plant death. Infected planting materials, water, and movement of infested soil particles with shoes, tools, and vehicles play a major role in spread. It can remain viable in soil for decades and containment and management are challenging. Thus, prevention of the spread is crucial.

**Threat category:** Locusts  
**Threat name:** Desert Locust  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Small-scale breeding will occur along the Indo-Pakistan border, causing a slight increase in locust numbers.  
**Context:** Numerous Desert Locust (Schistocerca gregaria) populations are a threat to agricultural production in Africa, the Middle East, and Asia, and they have a negative impact on food security. This voracious insect can affect the livelihoods of at least one tenth of the world’s population. Desert locusts are potentially the most dangerous locust pests due to swarms’ ability to fly quickly over long distances.

**PHILIPPINES**

**Threat category:** Aquatic diseases  
**Threat name:** Enterocytozoon hepatopancreaticum (EHP)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Introduction of Enterocytozoon hepatopancreaticum (EHP) is possible, but unlikely, from other countries through trading of live animals (e.g. live polychaetes, clams, oysters, etc.) that are used as feed for broodstock.  
**Context:** Strong awareness of EHP is present in the country.

**Threat category:** Aquatic diseases  
**Threat name:** Tilapia lake virus (TiLV)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** During the forecast period, the production cycle of tilapia will be active.  
**Context:** TiLV is already present in the country. It was first observed in May 2017. Monitoring and active surveillance systems have been established. TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized fish and a high stocking density.
**SAUDI ARABIA**

**Threat category:** Locusts  
**Threat name:** Desert Locust  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Small-scale breeding may occur in areas that received rains from Cyclone Mekunu, in the Empty Quarter along the Yemen/Oman border.  
**Context:** Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East, and Asia, and they have a negative impact on food security. This voracious insect can affect the livelihoods of at least one tenth of the world’s population. Desert locusts are potentially the most dangerous locust pests due to swarms’ ability to fly quickly over long distances.

**SRI LANKA**

**Threat category:** Aquatic diseases  
**Threat name:** Acute hepatopancreatic necrosis disease (AHPND)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Introduction of Acute hepatopancreatic necrosis disease (AHPND) is possible, but unlikely, from affected countries through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, and oysters that are used as feed for broodstock.  
**Context:** Strong awareness of AHPND is present in the country. A national action plan on AHPND has been prepared.

**TAJIKISTAN**

**Threat category:** Locusts  
**Threat name:** Italian Locust  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Uncontrolled hopper populations will fledge, and adults will mate, lay eggs, and eventually disappear.  
**Context:** Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia.

**REPUBLIC OF KOREA**

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Avian influenza (AI)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** H5N8 Highly pathogenic avian influenza (HPAI) outbreaks are unlikely to occur, due to the increasing temperatures during the forecast period.  
**Context:** Since November 2016, H5N8 HPAI has been spreading globally, following bird migratory routes. In December 2017, the virus was first detected in the country in the Riyadh province. Since then, at least 60 outbreaks have been officially reported in five provinces. The last outbreak occurred in April 2018. HPAI is a highly contagious disease that causes high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Avian influenza viruses can affect humans.

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Foot-and-mouth disease (FMD)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** The further spread of Foot-and-mouth disease (FMD) (serotypes A and O) is unlikely to occur in the country.  
**Context:** In February 2017, the country experienced a new Foot-and-mouth disease introduction. The serotypes involved were the A and O. The last outbreaks prior to this occurred in April 2017. Since November 2017, a new re-assortant strain of H5N6 HPAI has been circulating in the region (Japan, the Republic of Korea, and Taiwan, Province of China). The last occurrence of this serotype in the region was detected in March 2018 in Japan and the Republic of Korea. HPAI is a highly contagious disease that causes high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Avian influenza viruses can affect humans.

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Acute hepatopancreatic necrosis disease (AHPND)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Introduction of Acute hepatopancreatic necrosis disease (AHPND) is possible, but unlikely, from affected countries through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, and oysters that are used as feed for broodstock.  
**Context:** Strong awareness of AHPND is present in the country. A national action plan on AHPND has been prepared.

**Threat category:** Locusts  
**Threat name:** Moroccan Locust  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Adult populations will lay eggs and eventually disappear.  
**Context:** Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia.
### Thailand

**Threat category:** Aquatic diseases  
**Threat name:** Acute hepatopancreatic necrosis disease (AHPND)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** AHPND is unlikely to occur during this forecast period because it has been reported to occur most frequently during the months between November and January.  
**Context:** AHPND has been present in the country since 2014. Active and passive surveillance are in place.

**Threat category:** Aquatic diseases  
**Threat name:** Enterocytozoon hepatopenaei (EHP)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Enterocytozoon hepatopenaei re-emergence may occur but it will be limited by biosecurity measures.  
**Context:** EHP has been present in the country since 2016. Active and passive surveillance are in place.

**Threat category:** Aquatic diseases  
**Threat name:** Tilapia lake virus (TiLV)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** During July-September the production cycle of tilapia will be active. Additionally, the permissive temperature range for TiLV outbreaks will be present.  
**Context:** TiLV is already present in the country. Monitoring and active surveillance systems have been established. TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized fish and a high stocking density.

### Turkey

**Threat category:** Forest pests and diseases  
**Threat name:** Chestnut gall wasp  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** The Chestnut gall wasp population will have limited activity in chestnut trees due to pest control measures.  
**Context:** Pest management activities, based on the application of biological control agents, are in progress to reduce the populations of the insect pest. Chestnut gall wasp (Dryocosmus kuriphilus) is a species of gall wasp native to China. It attacks many species of chestnut, including most cultivated varieties. The galls caused by the wasp can be very damaging to the tree. They occur on the new growth of the tree, disrupting the fruiting process, and can reduce a tree’s yield up to 70 percent.

### Turkmenistan

**Threat category:** Locusts  
**Threat name:** Moroccan Locust  
**Likelihood of occurrence:** Nil  
**Forecast (July-September 2018):** Adult populations will lay eggs and eventually disappear.  
**Context:** Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia.

### Uzbekistan

**Threat category:** Locusts  
**Threat name:** Italian Locust  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Uncontrolled hopper populations will fledge, and adults will mate, lay eggs, and eventually disappear.  
**Context:** Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia and in the country.

**Threat category:** Locusts  
**Threat name:** Migratory Locust  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Uncontrolled hopper populations will fledge, and adults will breed and eventually disappear except if local conditions allow a second breeding.  
**Context:** Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia and in the country.

**Threat category:** Locusts  
**Threat name:** Moroccan Locust  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Adult populations will lay eggs and eventually disappear.  
**Context:** Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia and in the country.
**VIET NAM**

**Threat category:** Plant pests and diseases  
**Threat name:** Banana fusarium wilt disease  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Banana fusarium wilt disease TR4 was recently reported for the first time in the country on one farm. Since then, it has been reported on three others. **Banana fusarium wilt disease is a soil-borne fungal disease that cannot be eradicated once established in the soil. Currently, TR4 poses a serious threat to global banana production. The disease attacks banana plants of all ages, initially appearing with a yellowing of the leaves; it causes wilting and plant death. Infected planting materials, water, and movement of infested soil particles with shoes, tools, and vehicles play a major role in spread. It can remain viable in soil for decades and containment and management are challenging. Thus, prevention of the spread is crucial.**

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Avian influenza (AI)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** H5 Highly pathogenic avian influenza (H5N1 and H5N6) outbreaks are unlikely to occur, due to the increasing temperatures during the forecast period.

**Context:** FMD outbreaks in a Western Asian country occurred in March 2018 in Japan, the Republic of Korea, and Taiwan, Province of China, since November 2017. It was also reported in Viet Nam in February 2018. The last occurrence of this serotype in the region was detected in March 2018 in Japan and Republic of Korea. HPAI is a highly contagious disease that causes high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Avian influenza viruses can affect humans.

**Threat category:** Aquatic diseases  
**Threat name:** Tilapia lake virus (TiLV)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** TiLV has not been officially reported but may be introduced and spread through live movements of infected hosts.

**Context:** TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized fish and a high stocking density. Where unexplained mortalities of Tilapia occur, appropriate diagnostic tests should be done. This is particularly important when clinical signs, similar to those reported for TiLV, and permissive temperatures are present.

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**WEST BANK**

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Foot-and-mouth disease (FMD)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** The further spread of Foot-and-mouth disease (FMD) serotype O is likely to occur, while a possible introduction of serotype A from a neighboring country is unlikely.

**Context:** An FMD outbreak serotype A was detected on an Israeli cattle farm (Aramsha, Northern district). The episode is of concern for the West Bank and neighboring regions because only poor vaccine matching for serotype A is available. The last FMD outbreaks observed in the West Bank occurred in December 2017, and serotype O was detected. The last observed FMD outbreaks in a Western Asian country occurred in April 2018 in Israel where serotype O was identified. FMD is a highly contagious disease among cattle, buffalo, sheep, and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most restrictive animal disease for livestock trade.

**YEMEN**

**Threat category:** Plant pests and diseases  
**Threat name:** Fall armyworm (FAW)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** FAW has not been reported in Yemen yet. However, its introduction from neighboring countries is likely to occur. If introduced, FAW could spread quickly and cause severe damage.

**Context:** FAW has not been officially reported in the country yet but it may be present. FAO is planning an expert mission in the country to assess the situation.

**Threat category:** Locusts  
**Threat name:** Desert Locust  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Small-scale breeding may occur along the southern coast and northeast interior where rains fell from cyclones Sagor and Mekunu, as well as on parts of the Red Sea coast, causing locust numbers to increase.

**Context:** Numerous Desert Locust (Schistocerca gregaria) populations are a threat to agricultural production in Africa, the Middle East, and Asia, and they have a negative impact on food security. This voracious insect can affect the livelihoods of at least one tenth of the world’s population. Desert locusts are potentially the most dangerous locust pests due to swarms’ ability to fly quickly over long distances.
**EUROPE**

### ALBANIA

**Threat category:** Forest pests and diseases  
**Threat name:** Pine processionary moth  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** The moth flies from May to August to lay eggs and the 1st- and 2nd-instar caterpillars are likely to cause early damages from August.  
**Context:** Mechanical removal of nests is in progress, to manage pest populations.

### BELARUS

**Threat category:** Animal and zoonotic diseases  
**Threat name:** African swine fever (ASF)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** African swine fever (ASF) outbreaks are likely to occur due to possible virus introduction from neighboring countries.  
**Context:** ASF virus presence has not been reported yet in Belarus. Informal and uncontrolled animal movements and poor biosecurity conditions in pig farms at the borders are risk factors for ASF introduction into unaffected areas. *ASF is a highly contagious viral disease of swine, both domestic and wild, which can cause high mortality. So far, no vaccines are available.*

### CZECH REPUBLIC

**Threat category:** Animal and zoonotic diseases  
**Threat name:** African swine fever (ASF)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** African swine fever (ASF) outbreaks are likely to continue to occur.  
**Context:** In July 2017, in the Zlín region, a dead wild boar was found that tested positive for ASF. This was the first introduction of the disease into the country. From then, a total of 213 infected wild boars were found, all of which were in the same region of the country. The last findings of dead boar occurred in April 2018.  
*ASF is a highly contagious viral disease of swine, both domestic and wild, which can cause high mortality. So far, no vaccines are available.*

### ESTONIA

**Threat category:** Animal and zoonotic diseases  
**Threat name:** African swine fever (ASF)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** African swine fever (ASF) outbreaks are likely to continue to occur.  
**Context:** Since the ASF introduction in September 2014, the presence of the virus has continued to be predominately reported in wild boars. However, a huge outbreak occurred in domestic pigs in July 2017, in a Saaremaa county farm with 3 200 animals. No new outbreaks have been observed since this event.  
*ASF is a highly contagious viral disease of swine, both domestic and wild, which can cause high mortality. So far, no vaccines are available.*

### HUNGARY

**Threat category:** Animal and zoonotic diseases  
**Threat name:** African swine fever (ASF)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** African swine fever (ASF) outbreaks are likely to continue to occur.  
**Context:** In April 2018, a dead wild boar was found infected with ASF in Heves province. This marked the first introduction of the disease into the country. From then until 31 May 2018, nine infected wild boars were found in the Heves (n=8) and in Szabolcs-Szatmár-Bereg (n=1) regions. National Authorities reported that the infections could be due to informal and uncontrolled pig products movement between Ukrainian borders and Hungary.  
*ASF is a highly contagious viral disease of swine, both domestic and wild, which can cause high mortality. So far, no vaccines are available.*
LATVIA

Threat category: Animal and zoonotic diseases
Threat name: African swine fever (ASF)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): African swine fever (ASF) outbreaks are likely to continue to occur.
Context: Virus presence continues to be reported both in wild boars and domestic pigs, and, during the first five months of 2018, 303 findings of infected wild boar events were reported. ASF is a highly contagious viral disease of swine, both domestic and wild, which can cause high mortality. So far, no vaccines are available.

LITHUANIA

Threat category: Animal and zoonotic diseases
Threat name: African swine fever (ASF)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): African swine fever (ASF) outbreaks are likely to continue to occur.
Context: In November 2017, wild boars were found dead in districts where the disease had not previously been reported. No new events have been reported since these cases. ASF is a highly contagious viral disease of swine, both domestic and wild, which can cause high mortality. So far, no vaccines are available.

MONTENEGRO

Threat category: Animal and zoonotic diseases
Threat name: Lumpy skin disease (LSD)
Likelihood of occurrence: Low
Forecast (July-September 2018): Lumpy skin disease (LSD) outbreaks are likely to occur due to favorable weather conditions for the vectors during the forecast period, but outbreaks can be mitigated through control measures that are currently in place (i.e. vaccination).
Context: The disease was first detected in April 2016. Since then, LSD spread has caused at least 60 outbreaks in seven municipalities. The last observed outbreak occurred in October 2017. An emergency vaccination campaign has been implemented, but some new outbreaks are still expected because of the upcoming favorable season for the vectors. LSD is a severe disease, transmitted by vectors that mainly affect cattle, causing important meat and milk production losses.

POLAND

Threat category: Animal and zoonotic diseases
Threat name: African swine fever (ASF)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): African swine fever (ASF) outbreaks are likely to continue to occur.
Context: Since the ASF introduction into the country in early 2014, virus presence has been continually reported in four regions of the country, both in wild and domestic pigs. ASF is a highly contagious viral disease of swine, both domestic and wild, which can cause high mortality. So far, no vaccines are available.

REPUBLIC OF MOLDOVA

Threat category: Animal and zoonotic diseases
Threat name: African swine fever (ASF)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): African swine fever (ASF) outbreaks are likely to continue to occur.
Context: Virus presence was first detected in Moldova (Republic of) in November 2016, following its introduction into Europe in early 2014. Since then, infections have been detected both in domestic and wild swine in seven districts of the country. The most recent event occurred in May 2018. ASF is a highly contagious viral disease of swine, both domestic and wild, which can cause high mortality. So far, no vaccines are available.

ROMANIA

Threat category: Animal and zoonotic diseases
Threat name: African swine fever (ASF)
Likelihood of occurrence: Moderate
Forecast (July-September 2018): African swine fever (ASF) outbreaks are likely to continue to occur.
Context: ASF was detected for the first time in July 2017 on two domestic pig farms in the Satu Mare region close to the border with Hungary. The last event occurred in March 2018 in the same region. ASF is a highly contagious viral disease of swine, both domestic and wild, which can cause high mortality. So far, no vaccines are available.
RUSSIAN FEDERATION

**Threat category:** Locusts  
**Threat name:** Italian Locust  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Having escaped large-scale control operations, hopper populations will fledge, and adults will mate, lay eggs, and eventually disappear.  
**Context:** Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia and adjacent areas as well as in the country.

**Threat category:** Locusts  
**Threat name:** Migratory Locust  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Having escaped control operations, hopper populations will fledge, and adults will mate, lay eggs, and eventually disappear.  
**Context:** Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia and adjacent areas as well as in the country.

**Threat category:** Locusts  
**Threat name:** Moroccan Locust  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** Uncontrolled hopper populations will fledge, and adults will mate, lay eggs, and eventually disappear.  
**Context:** Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia and adjacent areas as well as in the country.

**Threat category:** Animal and zoonotic diseases  
**Threat name:** African swine fever (ASF)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** African swine fever (ASF) outbreaks are likely to occur due to a possible introduction from neighboring countries.  
**Context:** No ASF outbreaks have been observed in the country, so far. However, since its introduction into Europe in early 2014, ASF has become endemic in some countries bordering Slovakia like the Czech Republic, Poland, and Ukraine. Informal and uncontrolled animal movements and poor biosecurity conditions in pig farms at the borders pose a risk of disease introduction. ASF is a highly contagious viral disease of swine, both domestic and wild, which can cause high mortality. So far, no vaccines are available.
THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

**Threat category:** Animal and zoonotic diseases  
**Threat name:** Lumpy skin disease (LSD)  
**Likelihood of occurrence:** Low  
**Forecast (July-September 2018):** Lumpy skin disease (LSD) outbreaks are likely to occur due to favorable weather conditions for the vectors during the forecast period, but outbreaks can be mitigated through control measures that are currently in place (i.e. vaccination).  
**Context:** In February and April 2017, two outbreaks were observed in the northern municipalities of the country. No new outbreaks were observed after those events. An emergency vaccination campaign has been implemented. LSD is a severe disease, transmitted by vectors that mainly affect cattle, causing important meat and milk production losses.

UKRAINE

**Threat category:** Animal and zoonotic diseases  
**Threat name:** African swine fever (ASF)  
**Likelihood of occurrence:** Moderate  
**Forecast (July-September 2018):** African swine fever (ASF) outbreaks are likely to continue to occur.  
**Context:** Since ASF introduction into the country in early 2014, virus presence has continued to be reported both in wild and domestic pigs, with new areas being affected. The last events occurred in May 2018. ASF is a highly contagious viral disease of swine, both domestic and wild, which can cause high mortality. So far, no vaccines are available.

**Threat category:** Forest pests and diseases  
**Threat name:** Bark beetles  
**Likelihood of occurrence:** High  
**Forecast (July-September 2018):** Bark beetles (mainly Ips spp.) may have up to three generations per year at warmer sites, of Europe and the flight for the second generation likely to start in July and August.  
**Context:** They are causing severe damage in pine plantations. Sanitary felling and other silvicultural practices are in progress to reduce the insect populations. The adults and larvae of Ips spp. are bark-feeding, mainly attacking declining trees and freshly cut wood. Outbreaks can cause heavy tree losses and significant economic impacts in plantations.
OCEANIA

AUSTRALIA

**Threat category:** Plant pests and diseases

**Threat name:** Banana fusarium wilt disease

**Likelihood of occurrence:** Low

**Forecast (July-September 2018):** Spread of Banana fusarium wilt disease Tropical race 4 (TR4) on banana is possible, but unlikely, due to strict measures undertaken to prevent spread.

**Context:** The disease is present in two locations in the north of the country, and a third infested site was recently reported. *Banana fusarium wilt disease is a soil-borne fungal disease that cannot be eradicated once established in the soil. Currently, TR4 poses a serious threat to global banana production. The disease attacks banana plants of all ages, initially appearing with a yellowing of the leaves; it causes wilting and plant death. Infected planting materials, water, and movement of infested soil particles with shoes, tools, and vehicles play a major role in spread. It can remain viable in soil for decades and containment and management are challenging. Thus, prevention of the spread is crucial.*
## GLOSSARY

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCC threat</td>
<td>Food chain crisis (FCC) threats are transboundary animal and plant pests and diseases, including forest pests and aquatic diseases, and food safety threats, that can affect any step of the food chain with a potential high impact on food and nutrition security. FCC threats may reach epidemic proportions by spreading within a country and to a number of countries necessitating control/management cooperation between several countries</td>
</tr>
<tr>
<td>Forecasting</td>
<td>Ability to predict future condition or occurrence of an FCC threat for the upcoming three months.</td>
</tr>
<tr>
<td>Likelihood of introduction</td>
<td>Chances of introduction of a FCC threat into a country, across border or to a specific area for the upcoming three months.</td>
</tr>
<tr>
<td>Likelihood of occurrence</td>
<td>Chances of a FCC threat to happen for the upcoming three months.</td>
</tr>
<tr>
<td>Likelihood of spread</td>
<td>Chances of geographical spread of a FCC threat within a country beyond its original introduction for the upcoming three months.</td>
</tr>
<tr>
<td>Likelihood of re-emergence/amplification</td>
<td>Chances of re-emergence/amplification (e.g. increase, breeding, etc.) of a threat already existing within a country for the upcoming three months.</td>
</tr>
<tr>
<td>Biosecurity</td>
<td>All the cumulative measures that can or should be taken to keep disease (viruses, bacteria, fungi, protozoa, parasites) from a farm and to prevent the transmission of disease (by humans, insects, rodents and wild birds/animals) within an infected farm to neighbouring farm (FAOTERM).</td>
</tr>
<tr>
<td>Incursion</td>
<td>An isolated population of a pest recently detected in an area, not known to be established, but expected to survive for the immediate future (FAOTERM).</td>
</tr>
<tr>
<td>Outbreak</td>
<td>A recently detected pest population, including an incursion, or a sudden significant increase of an established pest population in an area (FAOTERM).</td>
</tr>
<tr>
<td>Zoonosis</td>
<td>Any disease or infection which is naturally transmissible from animals to humans (FAOTERM).</td>
</tr>
</tbody>
</table>
INFORMATION SOURCES

Transboundary Animal and Aquatic Diseases

- Avian influenza (short take)
  - EMPRES – I: http://empres-i.fao.org/eipws3g/
- Global Animal Disease Information System (EMPRES-i) available at http://empres-i.fao.org/eipws3g/
- Global Early Warning System (GLEWS) at FAO

Desert Locust

FAO Desert Locust Information Service (DLIS) available at www.fao.org/ag/locusts
Locusts (three species) in Caucasus and Central Asia

Fall armyworm

Coffee wilt disease
https://apsjournals.apsnet.org/doi/pdfplus/10.1094/PHYTO-96-0663

Wheat rust disease
Global wheat rust monitoring system

Weather forecast
http://www.noaa.gov/weather
INFORMATION SOURCES

Threats to Food Security

Glossary
- ACAPS: https://www.acaps.org/