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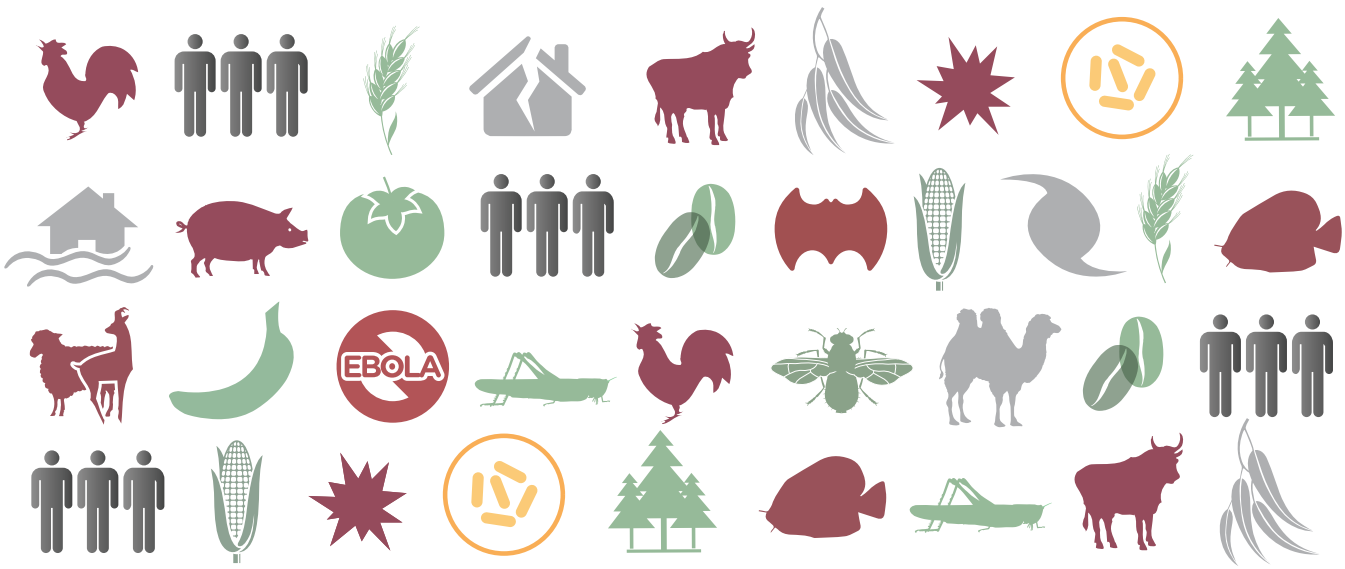
Early Warning Bulletin



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

No. 29
October-December 2018

NOTE TO THE READER

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.

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CONTENTS

FCC FORECASTING METHODOLOGY

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)**

		Level of likelihood of spread			
		0	**1**	**2**	**3**
Level of likelihood of introduction	**0**	0	0	0	0
	1	1	1	1	2
	2	1	1	2	2
	3	2	2	2	3

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**

Likelihood	Definition
Nil (0)	Very unlikely
Low (1)	Unlikely
Moderate (2)	Likely
High (3)	Highly likely

HIGHLIGHTS

African swine fever (ASF)

The African swine fever is a viral disease affecting pigs and wild boar with up to 100 percent fatality rate. There is no vaccine. The ASF virus can persist for a long time in the environment and in a variety of swine products.

ASF was first reported in Kenya in 1921 and then it has become endemic in most of sub-Saharan Africa countries. The disease emerged also in Europe (1957) and the Caribbean. In Europe, ASF was eradicated but it is still considered endemic in the Italian Island of Sardinia.

In 2007, ASF was re-introduced into Europe, through a new incursion, in the Eastern Europe countries from which it spread to the Russian Federation and the Caucasus. In 2017, ASF was found in the Russian Federation, 1000 Km from the border with China.

China reported the first ASF outbreak in August 2018 and by the end of September 2018, ASF outbreaks were spreading in eight provinces: Anhui, Inner Mongolia, Jiangsu, Heilongjiang, Jilin, Henan, Liaoning and Zhejiang. China is considered the home for half of global pig population, and then ASF entry could result in devastating consequences for animal health, livelihood and food security.

For this forecast period (October to December 2018), ASF is likely to spread further in China and it is considered a risk to the Eastern and South-eastern Asia countries.

In September, ASF was reported for the first time in Western Europe, in a wild boar in Luxembourg. The most relevant factor in ASF spread in this country is the high density of infected wild boar. This aspect will expose Luxembourg and the neighbouring countries to a high risk of ASF spread during the forecasted period.

Fall armyworm (FAW)

Fall armyworm - *Spodoptera frugiperda*, is a native pest to the Americas, which has been reported in Africa in early 2016, and then has continued to spread to the most of African countries.

In Africa, FAW continues to be of high concern, due to its impact on maize. In addition to maize, the pest has been detected on an increasing number of other crops like sorghum and sugarcane. FAW therefore can affect the food security and livelihoods of many people. During this forecast period (October to December 2018), FAW spread will continue mainly in maize unless appropriate actions are taken. In most of the affected countries, FAO has developed projects and tools to strengthen national capacities for FAW management.

In Eastern Africa, the pest is likely to spread and have access to significant amounts of maize, its preferred host.

During this forecast period, FAW spread and damage are expected to be low to moderate in most of the Central Africa countries except for Congo where FAW damage and spread are expected to be high.

The forecast period (October to December 2018) is the main maize and other cereals production time, accompanied with high temperatures that favour pest amplification in most Southern Africa countries. While in Western Africa, FAW spread will decline as the maize growing season comes to the end.

At the end of July 2018, FAW was detected in Yemen and reported in India as the first occurrence in Asia. The pest is likely to spread further from India to Southeast Asia, where it represents a threat to millions of small-scale farmers as FAW may invade maize and other 80 crops including rice, sugarcane, vegetables, groundnuts and cotton. In Western Asia, FAW is likely to spread from Yemen northwards along the Red Sea coast.

FORECAST FOR THE PERIOD OCTOBER-DECEMBER 2018: **OVERVIEW**

During the period October to December 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 neighbouring countries, remain latent, or re-emerge or 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 (July to September 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 affected food availability and access. FCC threats can compound food insecurity in fragile countries stricken by weather shocks and conflicts.

Main Food Chain Threats

Thirty – four plant and forest pests and diseases, locusts and animal and aquatic diseases were monitored and forecasted by FAO experts for the period October to December 2018. A total of **281** forecasts were conducted in **116** countries.

According to the forecasts, the following pests and diseases represent a **high** to **moderate risk** to the food chain in some countries:

For **animal diseases and zoonoses:** African swine fever in Asia and Europe, Rift valley fever in Africa, Foot-and-mouth disease in Africa and Asia, Peste des petits ruminants in Africa and Europe (The Russia federation) and Avian Influenza in Africa and Asia.

For **aquatic diseases:** Tilapia lake virus disease in Africa, Asia and Americas, Acute hepatopancreatic necrosis disease in Africa and Asia.

For **plant pests and diseases:** Fall armyworm in Africa and Asia, Tomato leaf miner in Africa, Banana fusarium wilt disease in Africa, Asia and Oceania, Cassava mosaic disease, Cassava brown streak disease, Wheat rust, and Swollen shoot virus disease of cocoa in Africa.

For **locusts:** the Desert locust in Africa and Asia, and Red locust in Africa.

For **forest pests and diseases:** Blue chalcid, Red gum psyllid and Bronze bug in Africa, Bark beetles in the Americas and Europe, Boxwood blight, Boxwood moth, Charcoal disease, Dry cone syndrome and Western conifer seed bug in Asia, and Pine processionary moth in Europe.

FORECAST FOR THE PERIOD OCTOBER-DECEMBER 2018: **OVERVIEW**

TABLE 3: **Food Chain Crisis Threats monitored and forecasted for October-December 2018**

Continent	FCC threats	Plant pests and diseases	Forest pests and diseases	Locusts	Animal diseases	Aquatic diseases
AFRICA	21	Fall armyworm (FAW) Tomato Leaf Miner Cassava Mosaic disease (CMD) Cassava Brown streak disease (CBSD) Banana Fusarium wilt disease Banana bunchy top disease Wheat rust Swollen shoot virus disease of cocoa	Blue gum chalcid Red gum lerp psyllid Bronze bug	Desert locust Migratory locust Red locust	Rift valley fever (RVF) Foot and mouth disease (FMD) Peste des petits ruminants (PPR) Avian Influenza (AI)	Epizootic ulcerative syndrome (EUS) Tilapia lake virus (TiLV) Acute hepatopancreatic necrosis disease (AHPND)
AMERICAS	4	-	Bark beetles	-	-	Tilapia lake virus (TiLV) Acute hepatopancreatic necrosis disease (AHPND) Entercytozoon hepatopenaei (EHP)
ASIA	19	Fall armyworm (FAW) Banana Fusarium wilt disease	Boxwood blight Boxwood moth Charcoal disease Dry cone syndrome Western conifer seed bug Chestnut gall wasp	Desert locust Migratory locust Italian locust Moroccan locust	African swine fever (ASF) Avian Influenza (AI) Foot and mouth disease (FMD) Peste des petits ruminants (PPR)	Tilapia lake virus (TiLV) Acute hepatopancreatic necrosis disease (AHPND) *Entercytozoon hepatopenaei* (EHP)
EUROPE	8	-	Pine processionary moth Bark beetles	Italian locust Migratory locust Moroccan locust	African swine fever (ASF) Lumpy skin disease (LSD) Peste des petits ruminants (PPR)	-
OCEANIA	1	Banana Fusarium wilt disease	-	-	-	-
TOTAL by threat category		8	11	5	6	4

FORECAST FOR THE PERIOD OCTOBER-DECEMBER 2018: **REGIONAL OVERVIEW**

AFRICA

In Africa, 145 FCC events were forecasted comprising plant pests and diseases, locusts, animal and aquatic diseases, and forest pests in 49 countries. 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 could spread to an increasing number of other crops like sorghum and sugarcane. FAW therefore can affect the food security and livelihoods of many people in particular the small-scale farmers. During this forecast period, October to December 2018, FAW spread will continue mainly in maize unless appropriate actions are taken. In most of the affected countries, FAO has developed projects and tools to strengthen national capacities for FAW management.

  In **Eastern Africa,** FAW presence is now confirmed in all the countries except Djibouti. In most Eastern Africa countries, the forecast period coincides with the short rainy season, therefore the pest likelihood of spread and damage will be high because it will have access to significant amounts of maize, its preferred host.

  In **Central Africa**, FAW has been detected and confirmed in five countries (Cameroon, Chad, the Central African Republic, the Democratic Republic of the Congo and Sao Tome and Principe) and observed in other three countries (Gabon, the Congo and Equatorial Guinea). During this forecast period, FAW spread and damage are expected to be low to moderate in most of the countries except for the Congo where FAW damage and spread are expected to be high. In addition to maize, the pest has also been detected on sugarcane (the Congo and Gabon), sorghum (Chad), and an increasing number of other crops. Some countries (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 **Southern Africa,** FAW is now present throughout the entire Southern African sub-region, though the pest has not yet been reported in Lesotho and Mauritius. In the 2017/18 cropping season, the pest continued to cause serious damage to maize and other cereals. The bulk of Southern Africa is forecasted by the Southern Africa Regional Climate Outlook Forum (SARCOF) to experience an El Niño event through the main production season (October 2018 to March 2019). From previous experiences, El Niño phenomena is associated with occurrence of drought in the region. The forecast period (October to December) is the main maize and other cereals production time and this season is accompanied by high temperatures that provide the favourable environment for amplification of the pest in most countries.

  In **North Africa**, FAW could appear in Upper Egypt after reaching the northern part of Sudan. It is now less likely to arrive in southern Mauritania from affected neighbouring countries until next summer.

  In **Western Africa**, FAW spread and increase will decline as the maize and other cereals growing season comes to the end. The risk of FAW occurrence on vegetable field is likely to increase due to forthcoming dry season favourable to vegetable.

FORECAST FOR THE PERIOD OCTOBER-DECEMBER 2018: **REGIONAL OVERVIEW**

AFRICA

- In **Eastern Africa**, **Tomato leaf miner** (*Tuta absoluta*) infestations vary with the seasons. Insect pest populations and infestation levels are likely to be relatively high across countries in the sub-region during this forecast period, because it generally coincides with the relatively warm, short rainy season during which much tomato is cultivated. Tomato is mainly produced during the warm season and these conditions also happen to be favourable for the pest to flourish. If left uncontrolled under these conditions, Tomato leaf miner infestations are typically high and can lead to significant yield losses.

  Wheat rust chances for epidemics appear to be limited in Eastern Africa, due to limited precipitation. However, should the rainfalls increase, **Yellow** and **Stem rust** epidemics might develop, as there is high level of inoculum from previous seasons. **Cassava mosaic** and **Brown streak diseases** continue to affect many countries and might amplify where weather conditions will be favourable.

- In **Central Africa, 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) with severe damage to tomato production. Control measures need to be established and pest management capacities built for the extension officers and farmers.

  Banana bunchy top disease continues to be a problem in some countries in Central Africa and can escalate. Similarly, **Cassava mosaic** and **Brown streak diseases** might also amplify where weather conditions will be favourable.

- In **Southern Africa**, **Tomato leaf miner** (*Tuta absoluta)* is present throughout Southern Africa except for Madagascar and Mauritius. The pest was reported in Lesotho for the first time in January 2018 (FAO/IPPC 2018). It has continued to cause serious damage to tomatoes in the region, affecting the livelihoods and food security of many marginalized groups including small-scale farmers, women marketers and youths. The forecast period (October- December) is characterized by high temperatures but the tomato cultivation is low which could moderate the pest amplification.

Locusts

- In **Eastern Africa,** small-scale winter breeding of **Desert Locust** will commence on the Red Sea coast of Sudan and Eritrea as well as the Gulf of Aden coast in northwest Somalia, causing locust numbers to increase slightly. Regarding the **Red Locust,** the current development of swarms in all its continental habitats will be favoured by grass burning and hot and dry weather in most countries. In Madagascar, the first generation of breeding of the **Migratory Locust** will occur.

- In **Northern Africa,** local breeding may occur in southern Algeria and Western Sahara; but no significant Desert Locust developments are expected.

- In **Western Africa,** Desert Locust small-scale breeding will occur in northwest and north Mauritania causing locust numbers to increase slightly.

FORECAST FOR THE PERIOD OCTOBER-DECEMBER 2018: **REGIONAL OVERVIEW**

AFRICA

Animal diseases

- In **Eastern Africa**, the precipitation forecasts for October-December 2018 predict above-normal rainfall, with 70 percent chance of El Niño occurrence in winter 2018-2019. Given the predicted environmental suitability for vector amplification as well as the previous and current **Rift Valley Fever** (RVF) situation in the region, the following countries are considered to be at high risk of RVF spread: Somalia, Kenya, the United Republic of Tanzania, South Sudan, Sudan, Uganda, Ethiopia, Eritrea, Djibouti, Rwanda, Burundi and the Democratic Republic of the Congo. FAO advises the veterinary services and livestock farmers' communities in those countries to remain vigilant about the occurrence and spread of RVF. The outbreak in Kenya is not the first RVF re-emergence in the region: during the past ten months, RVF infections have been reported in Uganda, Rwanda and South Sudan (December 2017). Informal cross-border movement of livestock, conflicts, and lack of veterinary services can facilitate the spread of RVF within the affected countries in East Africa.

  In **Southern Africa**, considering the climatic conditions in the region as well as the previous **Rift Valley Fever** (RVF) occurrence in South Africa, South Africa (particularly the eastern region), Swaziland, northern Botswana, southern Zimbabwe and Mozambique are predicted to be suitable areas for RVF vector amplification.

  In **Western Africa**, the forecasts for October-December 2018 predict above-normal precipitation particularly in Senegal, southern Mali and southern Niger. Small suitable areas for **Rift Valley Fever** (RVF) vector amplification are predicted along the Senegal River, the border between Mali and southeastern Mauritania, and in between southeastern Mali and western Niger.

- **Highly pathogenic avian influenza** (HPAI). In some countries, H5N1 and H5N8 Highly pathogenic avian influenza viruses may cause new outbreaks, but overall, risks are moderate for the forecasted period.
  - 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 risk for the forecasted period is considered moderate.
  - In **Central, Eastern**, and **Southern Africa**, **H5N8 HPAI** virus, which has been spreading globally since November 2016, continues to be reported in South Africa. The last outbreaks were observed in the Democratic Republic of the Congo (December 2017), Togo (March 2018) and South Africa (July 2018). Due to wild bird migratory patterns and based on flu seasonal patterns, the risk for the forecasted period is considered low for Central and Eastern Africa and moderate for South Africa.

- In **Southern Africa** countries, **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 this region because it has never been affected by the above-mentioned serotype. Further spread of FMD outbreaks are likely to occur in non-vaccinated areas of Malawi.

  In **Western Africa** countries (Guinea-Bissau, Sierra Leone and Guinea), several FMD outbreaks, serotype O, were reported in July-September 2018. The virus observed seems to be genetically very close to the virus circulating in Algeria since 2014 (serotype O, serotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, whose livestock is not immunized against this particular strain of the virus.

FORECAST FOR THE PERIOD OCTOBER-DECEMBER 2018: **REGIONAL OVERVIEW**

AFRICA

- In the last year, **Pest des petit ruminants** (PPR) outbreaks continued to be reported in United Republic of Tanzania and Democratic Republic of Congo, which are considered endemic for PPR. Giving this fact, the disease is likely to be introduced (e.g. through animal movement from affected countries) in neighboring Malawi and Mozambique and can re-emerge in Zambia.

Aquatic Diseases:

- In **Southern Africa**, Botswana and Zambia are at risk of the fish disease **Epizootic ulcerative syndrome** (EUS) re-emergence. The United Republic of Tanzania is at risk of EUS introduction as the disease is present in neighboring countries. Water temperatures during the period October to December in these countries range between 18 to 25°C, which are optimal temperatures for the development of the oomycete fungus that causes the disease.
- **Tilapia lake virus** (TiLV) may have a wider distribution than presently 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 the 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.). 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 and Diseases

- **Blue gum chalcid** insect pest is likely to continue to spread during the forecast period in Malawi, South Africa, Uganda, the United Republic of Tanzania, Zambia and Zimbabwe.
- **Red gum lerp psyllid** insect pest is likely to continue to spread in Malawi, Mozambique, Rwanda, Zambia and Zimbabwe, causing severe damage in Eucalyptus plantations. Applications of biological control agents to reduce these insect pest populations are in progress in some countries.
- **Bronze bug** spread is likely to occur, damaging Eucalyptus woodlots (Rwanda and Zimbabwe); however, pest management activities are in progress.

FORECAST FOR THE PERIOD OCTOBER-DECEMBER 2018: **REGIONAL OVERVIEW**

AMERICAS

In the Americas, a total of 21 FCC events in were forecasted comprising aquatic diseases, and forest pests10 countries. The likelihood of occurrence varies from Low to High. The following FCC events have significant regional implications:

Aquatic diseases

- **Tilapia Lake virus** (TiLV). Surveillance plan, control measures and awareness campaigns are required in tilapia producing countries. 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), Mexico (OIE notification) and Peru (OIE notification); it may become a threat to other tilapia producing Latin America and the Caribbean (LAC) countries.
- Introduction of **Acute hepatopancreatic necrosis disease** (AHPND) in the shrimp species *Penaeus monodon* and *Penaeus vannamei* in other uninfected shrimp producing LAC 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 infected live shrimps.
- Introduction of the shrimp disease ***Enterocytozoon hepatopenaei*** (EHP) within LAC 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.

Forest pests and diseases

- **Bark beetles.** Severe infestations, in particular the *Dendroctonus frontalis* species, are being experienced in the dry corridor of Central America and will continue during the forecast period, 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 most vulnerable to the beetles attacks because they are already stressed by prolonged drought triggered by El Niño and weakened due to poor forest management practices.

FORECAST FOR THE PERIOD OCTOBER-DECEMBER 2018: **REGIONAL OVERVIEW**

ASIA

In Asia, a total of 87 FCC events were forecasted comprising plant pests and diseases, locusts, animal and aquatic diseases, and forest pests in 38 countries. 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*- a native pest to the Americas, has been reported in Africa in early 2016 and it keeps spreading to most African countries. At the end of July 2018, FAW has been detected in Yemen and reported in India as the first occurrence in Asia. The pest is likely to spread further from India to Southeast Asia, where it represents a threat to millions of small-scale farmers as FAW invades maize and other 80 crops including rice, sugarcane, vegetables, groundnuts and cotton.

  In **Southern Asia,** FAW is more likely to spread eastwards from India but it may also appear in the Indus Valley and adjacent areas of Pakistan and eastern Afghanistan. In the **Near East,** FAW may spread from Yemen northwards along the Red Sea coast to Saudi Arabia, and perhaps east to Oman.

- **Banana Fusarium Wilt Disease** Tropical race 4 has been effective in Southeast Asia and recently reported in Pakistan and can further spread and cause damage.

Locusts

- In **Central Asia,** almost all adult populations have already disappeared and no further development is expected for any of the three locust pests (**Italian, Migratory and Moroccan locusts**) because of the upcoming winter period; while no significant **Desert Locust** developments are expected in **Southern Asia.**

- In **Western Asia**, small-scale winter breeding of **Desert locust** will commence on the Red Sea coast of Saudi Arabia and Yemen, causing locust numbers to increase slightly. Heavy rains from Cyclone Luban may provide good breeding conditions in southern Yemen and Oman for the next several months.

Animal diseases

- In **Eastern Asia**, **African swine fever** (ASF) was introduced in August 2018 in **China,** where the ASF virus was detected in late March 2017 in a backyard pig farm (40 pigs) in Irkutsk Oblast and probably introduced to China from the Russian Federation. This event is of high concern because it would have devastating consequences for animal health, food safety, and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs for animal welfare reasons is questionable. The risk of spread of ASF is considered high within China, and in neighboring Eastern and Southeastern Asian countries.

- **Highly pathogenic avian influenza** (HPAI). Based on seasonal patterns, a reduction on the number of outbreaks of Avian influenza 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 Southeastern Asia and may cause new outbreaks.

FORECAST FOR THE PERIOD OCTOBER-DECEMBER 2018: **REGIONAL OVERVIEW**

ASIA

- **H5N1 HPAI** continues to be reported in China, Indonesia, and Viet Nam and re-emerged in Nepal in May 2018. The outbreak reported incidences 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) and in environmental samples and domestic ducks in the Republic of Korea. In January-February 2018, it was reported in Viet Nam and in March 2018 in Japan and Republic of Korea. 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.
- The **H5N8 HPAI** strain emerged in China in May 2016 and has been spreading since then. It has already spread to Japan, India, Islamic Republic of Iran, 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 **Western Asia**, **Foot-and-mouth disease** (FMD) is likely to occur. If the mitigation measures are not effective, FMD viruses will likely to continue spreading in the Middle East. Currently, there is 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 2018, **Pest des petit ruminants** (PPR) outbreaks were detected in China in Northeastern and Eastern provinces of the country.

Aquatic diseases

- **Tilapia lake virus** (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 Chinese Taipei (OIE notification), India (scientific literature), Indonesia (local report), Israel (scientific literature and OIE notification), Malaysia (OIE notification), the Philippines (OIE notification), and Thailand (scientific reports and OIE notification); it also presents a threat to the tilapia industry in other tilapia producing countries in Asia.
- **Acute hepatopancreatic necrosis disease** (AHPND) introduction or re-emergence 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 infected live shrimps.
- ***Enterocytozoon hepatopenaei*** (EHP) introduction or re-emergence of the shrimp disease 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.

FORECAST FOR THE PERIOD OCTOBER-DECEMBER 2018: **REGIONAL OVERVIEW**

ASIA

Forest pests and diseases

- **Dieback of boxwood trees** (*Buxus hyrcana*), IUCN threatened species, caused by **Boxwood blight** (pathogen *Calonectria pseudonaviculata*) continues to be reported in the Caspian forest of the Islamic Republic of Iran and in Georgia. During the forecast period, it will continue to be present but its spread will be limited due to winter temperatures and lack of rainfall.
- **Boxwood moth** (*Cydalima perspectalis*) will cause less severe defoliation during this forecast period due to lower temperatures. In Lebanon, **Dry cone syndrome** and **Western conifer bug** are causing severe losses in pine nut harvest and the pest damage will continue but the activities of **Western conifer seed bug** will be limited due to winter temperatures.
- **Chestnut gall wasp** is causing damage to chestnut trees in Turkey and threatening livelihoods of local communities but the pest pressure will decrease thanks to biological control activities.

FORECAST FOR THE PERIOD OCTOBER-DECEMBER 2018: **REGIONAL OVERVIEW**

EUROPE

In Europe, 25 FCC events were forecasted comprising locusts and animal diseases in 18 countries. The likelihood of occurrence varies from Nil to High. The following FCC events have significant regional implications:

Locusts

- In **Eastern Europe**, adult populations are disappearing and because of the winter period, no further development is expected for any of the three locust pests (**Italian, Migratory and Moroccan locusts**).

Animal diseases

- **African swine fever** (ASF) outbreaks and transmission are likely to continue in the affected countries (Belgium, 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 feed and other infected fomites. Recently, it affected the Czech Republic, Romania, Hungary, Bulgaria and, in September 2018, Belgium. This has increased the possibility of introduction into neighboring countries (e.g., Belarus, and Slovakia).

  Measures are also taken for infected third countries (Russia, Belarus, Ukraine, and Republic of Moldova). 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 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, Italy and the Russian Federation in the first eight 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, United Kingdom and Northern Ireland). This strain will continue to circulate during October-December 2018 with moderate intensity due to the incoming decreasing temperatures in Europe.

- In 2018, **Pest des petit ruminants** (PPR) outbreaks were detected in Northeastern and Eastern provinces of China, leading to a moderate risk of spread of the disease in neighboring Eastern Russian oblasts.

SHORT TAKE ON: ANTIMICROBIAL RESISTANCE

WHY: Antimicrobial resistance (AMR) is a major global threat of increasing concern to human, animal and plant health with direct impact on consumer protection and food safety, food security, the environment and the economic wellbeing of millions of farming households.

WHAT: AMR refers to when micro-organisms – bacteria, fungi, viruses, and parasites – acquire resistance to antimicrobial substances, like antibiotics. Although this is a natural phenomenon, the misuse and overuse of antimicrobials is speeding up the process. As an effect of AMR, medicines that were once effective to treat disease become less effective or even useless, leading to a reduced ability to treat infections, increased mortality, more severe or prolonged illnesses and production losses in agriculture. The health consequences and economic costs of AMR are respectively estimated at 10 million human fatalities a year and a 2 to 3.5 percent decrease in global Gross Domestic Product (GDP), accumulating to US$100 trillion by 2050. However, the full impact remains hard to estimate.

HOW: FAO plays a key role in supporting governments, food producers, veterinarians and agronomists, traders and other stakeholders in understanding the importance of responsible use of antimicrobials in food production, animal husbandry, aquaculture, fisheries and consumer protection, thus helping reduce antimicrobial resistance. FAO's Thirty-ninth Conference (in June 2015) adopted **Resolution 4/2015**, which recognized that AMR poses an increasingly serious threat to public health and sustainable food production, and that an effective response should involve all sectors of government and society. To support the implementation of Resolution 4/2015, the **FAO Action Plan on AMR** addresses four major Focus Areas:

- improve awareness on AMR and related threats;
- develop capacity for surveillance and monitoring of AMR and AMU (antimicrobial use) in food and agriculture;
- strengthen governance related to AMU and AMR in food and agriculture;
- promote good practices in food and agricultural systems and the prudent use of antimicrobials.

This Action Plan supports the **Global Action Plan on Antimicrobial Resistance (GAP)** in highlighting the necessity of adopting a "One Health" approach, with the involvement of public health and veterinary authorities, the food and agriculture sector, financial planners, environmental specialists, and the empowerment of consumers. FAO works closely with its international partners in a tripartite initiative with the World Health Organization (WHO) and the World Organization for Animal Health (OIE), as well as with the UN Environment Programme (UNEP) and other partners (private sector, academia, civil society, financial institutions). It recognizes that a collaborative approach between different sectors, and both political and economic entities and disciplines, is essential in order to address AMR effectively.

WHERE: FAO is currently implementing the action plan on AMR at global, regional and national levels. The target countries are Ghana, Sudan, Tanzania, Zimbabwe, Zambia, Ethiopia and Kenya in the region of sub-Saharan Africa; ASEAN and SAARC countries in the region of Asia and Southeast Asia, Armenia, Belarus, Kazakhstan, Kyrgyz Republic, Tajikistan in the region of east Europe and Bolivia, Cuba, Dominican Republic, Ecuador, El Salvador, Honduras, Paraguay in the Americas.

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

Threats category	Likelihood of occurrence			
	High	Moderate	Low	Nil
Animal and zoonotic diseases				
Aquatic diseases				
Forest pests and diseases				
Locusts				
Plant pests and diseases				

- **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

FCC THREATS FORECASTING AT **COUNTRY LEVEL**

AFRICA

ALGERIA

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Small-scale breeding will occur near irrigated perimeters of Central Sahara and in areas of recent rains in the south; no significant developments expected.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and 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: High

Forecast (October-December 2018): High temperatures coupled with the start of the main maize production season will favour amplification of the pest.

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: Moderate

Forecast (October-December 2018): The temperature is high but since the production of tomatoes is low during the forecasted period in the country, the pest amplification will be limited.

Context: The pest has been causing damage to tomatoes, since 2016.

BOTSWANA

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): RVF outbreaks are likely to occur in the country given the current climatic conditions in the country, which are suitable for RVF vector amplification.

Context: Last reported occurrence of RVF in Botswana was in 2014. *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: Low

Forecast (October-December 2018): Further spread of Epizootic ulcerative syndrome (EUS) to other parts of the country is possible, but unlikely, through heavy rainfall, flooding, and poor biosecurity, movement of infected fish or birds.

Context: The water temperature in October 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.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): High temperatures coupled with the start of the main maize production season will favour amplification of the pest.

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: Moderate

Forecast (October-December 2018): The temperature is high but since the production of tomatoes is low during the forecasted period in the country, the pest amplification will be limit.

Context: The pest has been causing damage to tomatoes, since 2016.

BURUNDI

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: High

Forecast (October-December 2018): RVF outbreaks are highly likely to occur due to the short rainy season and the environmental suitability for vector amplification during this forecast period.

Context: In Eastern Africa, precipitation forecasts for October-December 2018 predict above-normal rainfall, with 70 percent chance of El Niño occurrence in winter 2018/19. FAO advises the veterinary services and livestock farmers' communities in those countries to remain vigilant about the occurrence and spread of RVF. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to death and abortion of RVF-infected livestock.*

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2018): In Burundi, maize is mostly grown during agricultural season A which starts from September, and thus during this period, FAW infestation is expected to be high.

Context: In Burundi, the pest has infested all 17 provinces of the country.

CAMEROON

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): The beginning of the forecast period coincides with the harvest period of the main maize season and with the vegetative growth stage of the second maize making maize plants available in the field. FAW will likely survive on crop residues and will reemerge on the maize plants during the current forecast.

Context: The presence of the pest has been confirmed in six out of the ten regions in the country: Centre (Ngoumou and Bokito), South (Mbalmayo), West (Foumbot and Dschang), Littoral (Melong, Manengolé and Douala), South-West (Debuncha) and the Extreme North (Guider, Maroua). The Government has prepared a strategic control plan to control the spread of the pest. This plan includes national activities such as raising farmers' awareness on FAW detection and control, a regional action plan for FAW management, and an exchange visit to Sao Tome and Principe. FAW population will likely be low during the harvesting period and moderate damage will occur on the second maize plants during the forecast period.

Threat category: Plant pests and diseases

Threat name: Tomato leaf miner

Likelihood of occurrence: High

Forecast (October-December 2018): Insect pest populations and infestation levels are likely to be high during this forecast period.

Context: Three regions (eastern north, west and south) have been affected with severe yield loss up to 100 percent. Tomato is produced during the whole year and Tomato leaf miner (*Tuta absoluta*) infestations is currently an important threat to tomato production in the country.

Threat category: Plant pests and diseases

Threat name: Banana bunchy top disease (BBTD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Banana bunchy top disease (BBTD) is likely to spread.

Context: The disease is currently present in the southern part of the country and has already affected banana production in recent years. Banana bunchy top disease is transmitted through infected plant materials or aphids and cause stunting and bunchy appearance. If any fruit were produced, which is unusual, it would be deformed.

CENTRAL AFRICAN REPUBLIC

Threat category: Plant pests and diseases

Threat name: Coffee wilt disease

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Coffee wilt disease is likely to continue spreading within the coffee production area. It may also become a threat to other countries in the region.

Context: The disease has been observed in the eastern part of the coffee production zone, and the whole area is infested. External symptoms include chlorosis and drying of the leaves, followed by gradual and often unilateral dieback and defoliation resulting in complete wilting of the entire tree. The disease is suspected to be of fungal origin, but species and strains are not yet fully known. Currently, the disease is spreading towards the south-west part. Damage is considered severe and urgent prevention and mitigation actions are needed.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2018): During the forecast period, maize crop will not be available in the field. FAW will likely survive on crop residues.

Context: In July 2017, FAW presence was confirmed within a 50-km radius of Bangui- the Capital. The country is implementing a TCP-F project on FAW mapping, and results are expected during this forecast period.

CHAD

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): The beginning of the forecast coincides with the harvesting period of maize, sorghum and millet and second cropping season. FAW will likely survive on crop residues and will re-emerge on second cropping plants during which 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. FAW damage will be likely moderate during the forecast period.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (October-December 2018): Small-scale breeding will decline after October and 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 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.

CONGO

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2018): The beginning (i.e. October 2018) of the forecast coincides with the beginning of the main maize cropping. FAW will likely spread and cause damage more damage.

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. FAW spread and damage will likely be high during the forecast period.

CÔTE D'IVOIRE

Threat category: Plant pests and diseases

Threat name: Swollen shoot virus disease of cocoa

Likelihood of occurrence: High

Forecast (October-December 2018): Spread of Swollen shoot virus disease of cocoa is very likely.

Context: The disease is present in the country and affecting production. The virus spreads particularly through mealybugs and It can further spread from current locations. Surveillance, rapid eradication and integrated management approaches are essential for control.

DEMOCRATIC REPUBLIC OF CONGO

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: High

Forecast (October-December 2018): RVF outbreaks are highly likely to occur due to the short rainy season and the environmental suitability for vector amplification during this forecast period.

Context: In Eastern Africa, precipitation forecasts for October-December 2018 predict above-normal rainfall, with 70 percent chance of El Niño occurrence in winter 2018/19. FAO advises the veterinary services and livestock farmers' communities in those countries to remain vigilant about the occurrence and spread of RVF. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to death and abortion of RVF-infected livestock.*

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5N8 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are likely to occur, as per AI seasonal pattern.

Context: H5N8 HPAI outbreaks was reported for the first time in April 2017. The last observed outbreak occurred in December 2017. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Avian influenza viruses can affect humans.*

DEMOCRATIC REPUBLIC OF THE CONGO

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): The forecast period coincides with the main maize season in southern region and with the second maize season in central region making maize plants available for FAW spread and damage. In the northern region, the beginning of the forecast (i.e. October 2018) coincides with the harvesting period of the main maize season. FAW will therefore survive on crop residues.

Context: FAW was reported for the first time in the country in December 2016. Actions are on going to manage the pest. Due to heavy rain at the beginning of the forecast, FAW spread and damage will likely be moderate and could go high when the rain intensity decreases.

Threat category: Plant pests and diseases

Threat name: Tomato leaf miner

Likelihood of occurrence: Low

Forecast (October-December 2018): Insect pest populations and infestation levels are likely to be relatively low during this forecast period, because it coincides with the main rainy season during which there is limited tomato production.

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.*

DJIBOUTI

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: High

Forecast (October-December 2018): RVF outbreaks are highly likely to occur due to the short rainy season and the environmental suitability for vector amplification during this forecast period.

Context: Precipitation forecasts for October-December 2018 in the region predict above-normal rainfall, with 70 percent chance of El Niño occurrence in winter 2018/19. FAO advises the veterinary services and livestock farmers' communities in those countries to remain vigilant about the occurrence and spread of RVF. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to death and abortion of RVF-infected livestock.*

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): FAW is highly likely to be introduced into the country from neighboring 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 officially reported in Djibouti yet.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Nil

Forecast (October-December 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 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.

EGYPT

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5N1 and H5N8 Highly pathogenic avian influenza (HPAI) and H9N2 Low pathogenic avian influenza (LPAI) outbreaks are likely to continue to occur as per AI seasonal pattern.

Context: H5N1 HPAI is endemic in Egypt. H5N8 HPAI is present in the country since November 2016. In addition, H9N2 LPAI is sporadically reported in the country. *HPAI is a highly contagious disease causing 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: Moderate

Forecast (October-December 2018): TiLV is likely to occur.

Context: The presence of TiLV in Egypt has been reported in the scientific literature. Significant mortalities of Nile tilapia have been observed during the summer months (June–October) when water temperatures typically rise to over 25 °C. 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.

EGYPT

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (October-December 2018): Small-scale breeding could commence on the Red Sea coast in the southeast if rains occur.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and 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: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2018): FAW could arrive in Upper Egypt from the south and impact crops along the Nile and farms in the Western Desert.

Context: FAW was not detected in the country, but it could be introduced from the Southern boarders.

EQUATORIAL GUINEA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): The forecast period coincides with the main maize-cropping season in the continental region. Therefore, FAW will be moderately spread during the forecast. In the insular region, the beginning of the forecast coincides with the end of the maize cropping, therefore, FAW will likely survive on maize plant debris and its presence and spread will be likely low in the insular region.

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: Moderate

Forecast (October-December 2018): In the insular region, the pest will moderately spread as the forecast period coincides with the crop production period. In the continental region, the forecast period coincides with the main raining season during which tomato is not mainly grown.

Context: Pest presence is suspected in the country but has not been officially reported.

ERITREA

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: High

Forecast (October-December 2018): RVF outbreaks are highly likely to occur due to the short rainy season and the environmental suitability for vector amplification during this forecast period.

Context: In Eastern Africa, precipitation forecasts for October-December 2018 predict above-normal rainfall, with 70 percent chance of El Niño occurrence in winter 2018/19. FAO advises the veterinary services and livestock farmers' communities in those countries to remain vigilant about the occurrence and spread of RVF. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to death and abortion of RVF-infected livestock.*

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Small-scale breeding will occur on the Red Sea coast, 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 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: Plant pests and diseases

Threat name: Wheat rust

Likelihood of occurrence: Low

Forecast (October-December 2018): Outbreaks of wheat yellow and stem rust diseases are possible.

Context: These diseases are already present in the country for years. Epidemics are possible due to presence of heavy inoculum loads from previous seasons. Severity is not expected to be high due to expected dry conditions, but might escalate if higher level of rainfalls are experienced. Wheat rusts infect mostly the leaves reducing photosynthesis area resulting in reduced number of and shriveled grains. Regular surveys and timely response are essential for management.

ERITREA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2018): The pest is likely to amplify in areas that receive the October to December rains.

Context: FAW was first reported in the country at the end of March 2018.

Threat category: Plant pests and diseases

Threat name: Tomato leaf miner

Likelihood of occurrence: Moderate

Forecast (October-December 2018): The pest is likely to moderately amplify in the low lands during this period due to extensive production of tomato.

Context: The pest has been reported in Eritrea.

ETHIOPIA

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: High

Forecast (October-December 2018): RVF outbreaks are highly likely to occur due to the short rainy season and the environmental suitability for vector amplification during this forecast period.

Context: In Eastern Africa, precipitation forecasts for October-December 2018 predict above-normal rainfall, with 70percent chance of El Niño occurrence in winter 2018/19. FAO advises the veterinary services and livestock farmers' communities in those countries to remain vigilant about the occurrence and spread of RVF. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to death and abortion of RVF-infected livestock.*

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (October-December 2018): Small-scale breeding may occur in eastern areas that received recent rains.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and 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: Plant pests and diseases

Threat name: Wheat rust

Likelihood of occurrence: High

Forecast (October-December 2018): Outbreaks of wheat yellow and stem rust diseases are very likely.

Context: These diseases are already present in the country for years. Epidemics are possible due to presence of heavy inoculum loads from previous seasons. Recent surveys and rainfall predictions indicate severe infections especially in zones of Arsi and Shewa. Wheat rusts infect mostly the leaves reducing photosynthesis area resulting in reduced number of and shriveled grains. Regular surveys and timely response are essential for management.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2018): In Ethiopia, growing of maize and sorghum in the main rainy season takes place from March to November. Although less maize is grown during the short rainy season from November to February, there will still be sufficient maize to sustain high FAW populations. Hence, during the forecast period, FAW infestation is expected to be high.

Context: In Ethiopia, FAW attacks maize planted in all seasons: main rainy season, short rainy season and irrigated maize. During this main rainy season, above 458 maize growing districts (woredas) were affected by FAW.

GABON

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): The beginning of the forecast (i.e. October 2018) coincides with the vegetative growth stage of maize. This allows young maize plants to be available in the field and will allow FAW to spread through the forecast period.

Context: In late July 2017, FAW infestations were reported in the Estuaire and Haut Ogooué provinces. However, no official declaration was made by the Government and no control measures have been undertaken so far. The country is implementing a TCP-F project to map FAW distribution and to confirm the status of the country.

GABON

Threat category: Plant pests and diseases

Threat name: Banana bunchy top disease (BBTD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Banana bunchy top disease (BBTD) is likely to occur due to earlier presence.

Context: The disease is currently present in the northern part of the country and has already affected banana production in recent years. Banana bunchy top disease is transmitted through infected cuttings or aphids and cause stunting and bunchy appearance. If any fruit were produced, which is unusual, it would be deformed.

GAMBIA

Threat category: Animal and zoonotic diseases

Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): FMD outbreaks are likely to continue to occur.

Context: In July-August 2018, three outbreaks of FMD (serotype not typed) were reported in the country. First analysis on FMD serotype O strain circulating during July-August 2018 in neighboring Sierra Leone and Guinea revealed that this strain is very close to the one circulating in Algeria since 2014 (serotype O, topotype EA3), there is concern for Mali itself and all Western African countries, whose livestock is not immunized against this strain. *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.*

GHANA

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are likely to occur, as per AI seasonal pattern.

Context: H5N1 HPAI was last reported in the country occurred in June 2018. *HPAI is a highly contagious disease causing 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 (October-December 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

Threat category: Animal and zoonotic diseases

Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: Since July 2018, outbreaks of FMD where reported in the country. First analysis on FMD serotype O strain circulating during July-August 2018 in Sierra Leone and Guinea revealed that this strain is very close to the one circulating in Algeria since 2014 (serotype O, topotype EA3), there is concern for Mali itself and all Western African countries, whose livestock is not immunized against this strain. *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.*

GUINEA - BISSAU

Threat category: Animal and zoonotic diseases

Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): The further spread of FMD serotype O is likely to occur in the country.

Context: In August 2018, four outbreaks of FMD, serotype O, were detected for the first time in the country. First analysis on FMD serotype O strain circulating during July-August 2018 in neighboring Sierra Leone and Guinea revealed that this strain is very close to the one circulating in Algeria since 2014 (serotype O, topotype EA3), there is concern for Mali itself and all Western African countries, whose livestock is not immunized against this strain. *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.*

KENYA

Threat category: Plant pests and diseases

Threat name: Cassava brown streak disease (CBSD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Spread of Cassava brown streak disease is likely.

Context: The disease is present in northern part of the country at a limited scale. The disease can cause brownish rots in tubers rendering them inedible, which leads to severe loss of economic value. Farmers may be unaware of their infected cassava crops until they harvest and see the tuber lesions, as leaves might appear asymptomatic in some cases. It is transmitted through infected cuttings and whiteflies. Use of virus free planting materials and integrated management is essential for control.

Threat category: Plant pests and diseases

Threat name: Cassava mosaic disease (CMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Spread of Cassava mosaic disease is likely to occur.

Context: The disease is present in northern part of the country at a limited scale. 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: Low

Forecast (October-December 2018): The forecast period coincides with the short rains season expected to commence in mid-October 2018. In eastern Kenya, this will be the main season for planting that include maize, sorghum, millets and pulses. The crop that will be planted early in the season is expected to escape FAW infestation while the crop that will be planted late is expected to have higher levels of infestation. In the west of the Rift Valley, few areas will have off-season maize crop at various growth stages (emergence to tasselling). However, in most areas, the maize crop will be at harvesting stage. The harvest loses on the MAM planted maize crop that will be harvested in October/ November is expected to be lower than 10percent. The effort by FAO and partners to enhance knowledge and FAW management skills of farmers and that of extension staff has contributed to reduced incidences of FAW. Generally, infestation is expected to be low due to lower FAW populations during the forecast period.

Context: FAW has been reported in 100 percent of the counties.

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: High

Forecast (October-December 2018): RVF outbreaks are highly likely to occur due to the short rainy season and the environmental suitability for vector amplification during this forecast period.

Context: An outbreak of RVF occurred in Wajir county, in the north eastern region, in May-June 2018. Both humans and animals (camelids) were confirmed infected in the area. As of June 2018, 26 cases of RVF were reported among humans and three outbreaks among livestock (camelids, sheep and goats). Precipitation forecasts for October-December 2018 in the region predict above-normal rainfall, with 70percent chance of El Niño occurrence in winter 2018/19. FAO advises the veterinary services and livestock farmers' communities in those countries to remain vigilant about the occurrence and spread of RVF.
Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to death and abortion of RVF-infected livestock.

LESOTHO

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): FAW has not been reported in the country yet, but as FAW is present in South Africa which surrounds Lesotho, FAW introduction could occur.

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 (October-December 2018): The period is mostly characterized by relatively higher temperatures and wide production of tomato, an aspect that could amplify the pest.

Context: The pest was reported in Lesotho by IPPC/FAO in January 2018 for the first time.

LIBYA

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Nil

Forecast (October-December 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 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: Locusts

Threat name: Migratory Locust

Likelihood of occurrence: Low

Forecast (October-December 2018): Adults having survived the dry and cool season will breed (first generation of breeding of the 2018/19 rainy season) and numbers will increase accordingly.

Context: Madagascar is prone to frequent Migratory Locust (*Locusta migratoria capito*) crises that affect the livelihoods as well as food and nutrition security of the population. The last plague occurred from April 2012 to July 2016 and threatened 13 million persons. Since then, and according to information received from the National Anti-Locust Center during the 2016/17 and the 2017/18 locust campaigns, the situation has been calm. Only four monthly bulletins were received during the 2017/18 campaign, which lasted from October 2017 to June 2018.

Threat category: Locusts

Threat name: Red Locust

Likelihood of occurrence: Low

Forecast (October-December 2018): Adults having survived the dry and cool season will breed (unique generation of breeding of the 2018/19 rainy season) and numbers will increase accordingly.

Context: The Red Locust (*Nomadacris septemfasciata*) produces much less frequent outbreaks than the Malagasy Migratory Locust.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2018): The period is characterized by high temperatures and cultivation of some cereals, an aspect that could amplify the pest in some areas.

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 (October-December 2018): However, the period is characterized by relatively high temperatures but the pest has not yet been detected in the country.

Context: The pest has not been reported in Madagascar yet.

MALAWI

Threat category: Animal and zoonotic diseases

Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): The further spread of Foot-and-mouth disease (FMD) is likely to occur within Malawi in non-vaccinated areas.

Context: FMD outbreaks were reported during the period May-August 2018. 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: Animal and zoonotic diseases

Threat name: Pest des petit ruminants (PPR)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Pest des petit ruminants (PPR) outbreaks are likely to occur due to its possible introduction from neighboring countries.

Context: So far, no outbreaks of PPR were officially reported in the country. PPR outbreaks continue to occur in neighboring United Kingdom of Tanzania and Democratic Republic of Congo, which are considered endemic for the disease. PPR is a highly contagious disease affecting sheep and goats; it is caused by a Morbillivirus and is considered one of the most damaging livestock diseases in Africa.

Threat category: Locusts

Threat name: Red Locust

Likelihood of occurrence: Low

Forecast (October-December 2018): Recent control operations treated more than 15 Red Locust swarms and concentrations on 6 550 ha. That may limit further swarm formation but there is a risk of invasion from neighboring Tanzania.

Context: Red Locust (*Nomadacris septemfasciata*) 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.

MALAWI

Threat category: Forest pests and diseases

Threat name: Blue gum chalcid

Likelihood of occurrence: High

Forecast (October-December 2018): Outbreaks of the insect pest Blue gum chalcid are highly likely to continue occurring in eucalyptus nurseries and plantations.

Context: Blue gum chalcid continues to cause severe damage in nurseries and young eucalyptus plantations in Malawi. *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: Low

Forecast (October-December 2018): Red gum lerp psyllid is 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.*

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2018): High temperatures coupled with the start of the main maize production season will favour amplification of the pest.

Context: FAW presence was first reported during the 2016/17 main rainy season (November-March). The pest has caused serious damage to maize across the country, off-season irrigated maize (April-October), and other crops like wheat.
The government declared a state of disaster due to the pest in the 2017/18 rainy fed cropping season(November to March).

Threat category: Plant pests and diseases

Threat name: Tomato leaf miner

Likelihood of occurrence: Moderate

Forecast (October-December 2018): The period is characterized by relatively low production of tomato, so limited amplification of the pest can be anticipated.

Context: The pest has been causing damage to tomatoes, since 2016.

MALI

Threat category: Animal and zoonotic diseases

Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): FMD serotype O outbreaks are likely to occur due to possible virus introduction from neighboring countries.

Context: FMD outbreaks were reported officially in May 2017 in Mali. FMD outbreaks of serotype SAT1 and SAT2 are reported yearly in Mali. First analysis on FMD serotype O strain circulating during July-August 2018 in neighboring Sierra Leone and Guinea revealed that this strain is very close to the one circulating in Algeria since 2014 (serotype O, topotype EA3). There is concern for Mali itself and all western African countries, whose livestock is not immunized against this strain. *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: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): RVF outbreaks are likely to occur in the country given the current climatic conditions in the country, which are suitable for RVF vector amplification.

Context: In September-October 2016 and June 2017, RVF infections were reported in animals and humans, respectively. In Western Africa, the forecasts for October-December 2018 predict above-normal precipitation particularly in Senegal, southern Mali and southern Niger. Small suitable areas for RVF vector amplification are predicted along the Senegal River, the border between Mali and southeastern Mauritania, and in between southeastern Mali and western Niger. *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: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (October-December 2018): Small-scale breeding will decline in the north after October and 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 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.

MAURITANIA

Threat category: Animal and zoonotic diseases

Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): FMD serotype O outbreaks are likely to occur due to possible virus introduction from neighboring countries.

Context: Last FMD outbreaks in Mauritania were reported officially in February 2015. First analysis on FMD serotype O strain circulating during July-August 2018 in Sierra Leone and Guinea revealed that this strain is very close to the one circulating in Algeria since 2014 (serotype O, topotype EA3). There is concern for Mali itself and all western African countries, whose livestock is not immunized against this strain. *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: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): RVF outbreaks are likely to occur in the country given the current climatic conditions in the country, which are suitable for RVF vector amplification.

Context: The last RVF infections reported in Mauritania occurred in livestock in October 2015. In Western Africa, the forecasts for October-December 2018 predict above-normal precipitation particularly in Senegal, southern Mali and southern Niger. Small suitable areas for RVF vector amplification are predicted along the Senegal River, the border between Mali and southeastern Mauritania, and in between southeastern Mali and western Niger. *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: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Small-scale breeding will occur in the west and northwest, 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 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: Plant pests and disease

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2018): There is a low possibility of FAW appearing in the Senegal River Valley and the extreme south.

Context: FAW was not detected in the country.

MAURITIUS

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2018): FAW has not been reported in the country yet. Wide spread production of maize on the African mainland, could slightly increase the possibility of introducing the pest.

Context: FAW has not been reported in Mauritius yet.

Threat category: Plant pests and diseases

Threat name: Tomato leaf miner

Likelihood of occurrence: Low

Forecast (October-December 2018): The pest has not yet been reported in the country. There could however be slight possibility of the pest being introduced from the African mainland.

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

MOROCCO

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (October-December 2018): Small-scale breeding may occur in the southern portion of Western Sahara in areas that receive rainfall.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and 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: Animal and zoonotic diseases

Threat name: Pest des petit ruminants (PPR)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Pest des petit ruminants (PPR) outbreaks are likely to occur due to its possible introduction from neighboring countries.

Context: So far, no outbreaks of PPR were officially reported in the country. PPR outbreaks continue to occur in neighboring United Kingdom of Tanzania and Democratic Republic of Congo, which are considered endemic for the disease. PPR is a highly contagious disease affecting sheep and goats; it is caused by a Morbillivirus and is considered one of the most damaging livestock diseases in Africa.

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): RVF outbreaks are likely to occur in the country given the current climatic conditions in the country, which are suitable for RVF vector amplification.

Context: RVF was last reported in the country in 2001. Given the current climatic conditions in the region as well as the previous RVF occurrence in neighboring South Africa, the risk of RVF occurrence is considered moderate in the country. *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: Acute hepatopancreatic necrosis disease (AHPND)

Likelihood of occurrence: Low

Forecast (October-December 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 there has been improved awareness of AHPND overtime.

Threat category: Locusts

Threat name: Red Locust

Likelihood of occurrence: Low

Forecast (October-December 2018): Upcoming vegetation burning somehow counterbalanced by recent significant rainfall will contribute to adult grouping and swarm formation.

Context: Red Locust (*Nomadacris septemfasciata*) 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: Forest pests and diseases

Threat name: Red gum lerp psyllid

Likelihood of occurrence: Low

Forecast (October-December 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.*

Threat category: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Spread of Fusarium wilt disease on banana is likely.

Context: A new race of the causal fungus of the disease (Tropical Race 4) has affected two farms in 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. 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: High

Forecast (October-December 2018): High temperatures coupled with the start of the main maize production season will favour amplification of the pest.

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 from November to March.

Threat category: Plant pests and diseases

Threat name: Tomato leaf miner

Likelihood of occurrence: High

Forecast (October-December 2018): The period is characterized by wide spread production of tomato. Coupled with characteristic high temperatures, amplification of the pest can be anticipated.

Context: The pest has been causing damage to tomatoes, since 2016.

NAMIBIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2018): High temperatures coupled with the start of the main maize production season will favour amplification of the pest.

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 from November to March.

Threat category: Plant pests and diseases

Threat name: Tomato leaf miner

Likelihood of occurrence: Low

Forecast (October-December 2018): The limited production of tomatoes in the country in this forecast period is likely to limit the spread of the pest.

Context: The pest has been causing damage to tomatoes, since 2016.

NIGER

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): RVF outbreaks are likely to occur in the country given the current climatic conditions in the country, which are suitable for RVF vector amplification.

Context: RVF is endemic in the country. In September-October 2016 and June 2017 RVF infections were reported in animals and humans, respectively. In Western Africa, the forecasts for October-December 2018 predict above-normal precipitation particularly in Senegal, southern Mali and southern Niger. Small suitable areas for RVF vector amplification are predicted along the Senegal River, the border between Mali and southeastern Mauritania, and in between south-eastern Mali and western Niger. *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: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (October-December 2018): Small-scale breeding will decline in the north after October and 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 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.

NIGERIA

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5N1 and H5N8 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are likely to occur, as per AI seasonal pattern

Context: H5N1 HPAI virus has been circulating in Central and West Africa since December 2014, and Nigeria was the most affected country with over 790 outbreaks reported in poultry across 26 states. However, the most recent outbreak of H5N1 HPAI was reported at the end of May 2017. H5N8 HPAI has been spreading globally, following bird migratory routes, since November 2016. In Nigeria, four outbreaks of H5N8 HPAI were reported between November 2016 and January 2018 (Kano, Nassarawa, and Ogun States). *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Avian influenza viruses can affect humans.*

NIGERIA

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (October-December 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, and it has been observed in farms with large-sized fish and 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.

RWANDA

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: High

Forecast (October-December 2018): RVF outbreaks are highly likely to occur due to the short rainy season and the environmental suitability for vector amplification during this forecast period.

Context: Precipitation forecasts for October-December 2018 in the region predict above-normal rainfall, with 70percent chance of El Niño occurrence in winter 2018/19. FAO advises the veterinary services and livestock farmers' communities in those countries to remain vigilant about the occurrence and spread of RVF. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to death and abortion of RVF-infected livestock.*

Threat category: Forest pests and diseases

Threat name: Bronze bug

Likelihood of occurrence: High

Forecast (October-December 2018): The insect pest Bronze bug is highly likely to spread in eucalyptus plantations.

Context: Results of a survey to identify damage by the Bronze bug indicate that this insect pest poses a serious threat to eucalyptus forestry in Rwanda. *Bronze bug* (Thaumastocoris peregrinus) *is a serious sap-sucking insect pest native to Australia. It is infesting eucalyptus plantations in Europe, Southern Africa, and South America. Severe infestations of this pest result in leaf senescence, leaf loss, thinning tree canopies, and branch dieback.*

Threat category: Forest pests and diseases

Threat name: Blue gum chalcid

Likelihood of occurrence: Moderate

Forecast (October-December 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: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2018): In Rwanda, during the previous agricultural season B, which had started from March to June, FAW had affected 5 848 ha (23percent) of maize out of the total 25 890 ha planted. Maize is mostly grown during agricultural season A that starts from September to February; more than 250 855 ha of maize plantation is planned for this season A (September 2018 to February 2019). During this period, a high Fall armyworm populations is expected and to be a serious threat especially for young maize seedlings.

Context: In Rwanda, the pest has infested all 30 districts of the country.

SAO TOME AND PRINCIPE

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): FAW continue posing damage to maize production especially for late sowed maize. Maize plants will be available in the field during the forecast period and FAW will likely spread.

Context: In April 2016, this became the first country in central Africa to report FAW infestations. Actions have been implemented, and they have been successful in managing the pest population. The FAW damage continue affecting maize farms particularly those sown late. During the forecast period, FAW damage will likely be moderate.

Threat category: Plant pests and diseases

Threat name: Tomato leaf miner

Likelihood of occurrence: High

Forecast (October-December 2018): Insect pest populations and infestation levels are likely to be high during this forecast period.

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.

SENEGAL

Threat category: Animal and zoonotic diseases

Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): The further spread of FMD serotype O is likely to occur in the country.

Context: FMD outbreaks of serotype SAT1 and SAT2 are reported yearly in Senegal. In 2018, FMD serotype O was detected for the first time in the country. First analysis on FMD serotype O strain circulating during July-August 2018 in Sierra Leone and Guinea revealed that this strain is very close to the one circulating in Algeria since 2014 (serotype O, topotype EA3). There is concern for Mali itself and all western African countries, whose livestock is not immunized against this strain. Africa *FMD is a highly contagious disease among cattle,* Africa *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: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): RVF outbreaks are likely to occur in the country given the current climatic conditions in the country, which are suitable for RVF vector amplification.

Context: The last RVF infection reported in Senegal occurred in some sheep in March 2018. In Western Africa, the forecasts for October-December 2018 predict above-normal precipitation particularly in Senegal, southern Mali and southern Niger. Small suitable areas for RVF vector amplification are predicted along the Senegal River, the border between Mali and southeastern Mauritania, and in between southeastern Mali and western Niger. *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: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Nil

Forecast (October-December 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 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 (October-December 2018): FAW numbers will increase but its amplification will be limited due to the limited production of maize in the country.

Context: FAW was first reported on maize around August 2017 and after sample analyses; its presence was officially confirmed.

Threat category: Plant pests and diseases

Threat name: Tomato leaf miner

Likelihood of occurrence: Moderate

Forecast (October-December 2018): The forecast period is characterized with high temperatures but the moderate production of tomatoes in the country is likely to moderate amplification of the pest.

Context: The pest has been causing damage to tomatoes since 2016.

SIERRA LEONE

Threat category: Animal and zoonotic diseases

Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: First analysis on FMD serotype O strain circulating during July-August 2018 in Sierra Leone and Guinea revealed that this strain is very close to the one circulating in Algeria since 2014 (serotype O, topotype EA3). There is concern for Mali itself and all western African countries, whose livestock is not immunized against this strain. *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.*

SOMALIA

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: High

Forecast (October-December 2018): RVF outbreaks are highly likely to occur due to the short rainy season and the environmental suitability for vector amplification during this forecast period.

Context: Precipitation forecasts for October-December 2018 in the region predict above-normal rainfall, with 70percent chance of El Niño occurrence in winter 2018/19. FAO advises the veterinary services and livestock farmers' communities in those countries to remain vigilant about the occurrence and spread of RVF. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to death and abortion of RVF-infected livestock.*

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (October-December 2018): Small-scale breeding could commence on the northwest coast if rains occur.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and 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: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2018): In Somalia, the main growing season of maize and sorghum will be from October to December. FAW will therefore have access to maize and sorghum in almost all growing areas in the country during the forecast period and infestation is expected to be high.

Context: FAW has been reported in Somalia but its distribution and impact are yet to be assessed.

SOUTH AFRICA

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5N8 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are likely to occur, as per AI seasonal pattern.

Context: In June 2017, H5N8 HPAI virus was detected for the first time in South Africa. 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 September 2018. *HPAI is a highly contagious disease causing 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: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2018): High temperatures coupled with the start of the main maize production season will favour amplification of the pest.

Context: FAW presence was first reported during the 2016/17 season. The pest caused serious damage to maize across the country and it continued during the 2017/18 cropping season (November to March). 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: Moderate

Forecast (October-December 2018): The forecast period is characterized by high temperatures in the country, but the pest spread will be moderate due to the limited tomato production.

Context: The pest has been causing damage to tomatoes, since 2016.

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): RVF outbreaks are likely to occur in South Africa (particularly in the eastern region) given the previous occurrence and the current climatic conditions in the region, which is suitable for RVF, vector amplification.

Context: RVF was last reported in the country in April 2018. *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.*

SOUTH SUDAN

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: High

Forecast (October-December 2018): RVF outbreaks are highly likely to occur due to the short rainy season during this forecast period.

Context: South Sudan is considered endemic for RVF. At the end of December 2017, there were reports of animal deaths and abortions in a herd from the county of Yirol East. In Eastern Africa, precipitation forecasts for October-December 2018 predict above-normal rainfall, with 70percent chance of El Niño occurrence in winter 2018/19. FAO advises the veterinary services and livestock farmers' communities in those countries to remain vigilant about the occurrence and spread of RVF. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to death and abortion of RVF-infected livestock.*

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): This forecast period coincides with the end of first season in the Green Belt and first quarter of first season in the other parts of the country. Following heavy build-up and infestation of Fall armyworm on maize during the first cropping season in Green Belt Zone (March-August) and sorghum planting that started from June to September, infestation by the FAW would be high especially on the second season (September – October) maize crop and sorghum. Infestation is however expected to decrease as the crops reach tasselling and maturity stages from (November-December).

Context: FAO and partners have received several reports of incidences of FAW damage to maize and sorghum across South Sudan during the first cropping season. Based on data received from the field in July - August, the pest infestation range from moderate to severe in maize and low to moderate in sorghum all over the former ten states of the country.

SUDAN

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2018): FAW spread will be limited in Nile valley due to arid conditions and a limited availability of its preferred host (maize).

Context: FAW is spreading in Sudan along Nile Valley. Last detection was in Dungola (less than 400km from Egyptian borders).

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Small-scale breeding will occur on the Red Sea coast and subcoastal areas, 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 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: High

Forecast (October-December 2018): RVF outbreaks are highly likely to occur due to the short rainy season and the environmental suitability for vector amplification during this forecast period.

Context: Precipitation forecasts for October-December 2018 in the region predict above-normal rainfall, with 70percent chance of El Niño occurrence in winter 2018/19. FAO advises the veterinary services and livestock farmers' communities in those countries to remain vigilant about the occurrence and spread of RVF. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to death and abortion of RVF-infected livestock.*

SWAZILAND

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): RVF outbreaks are likely to occur in the country given the current climatic conditions in the country, which are suitable for RVF vector amplification.

Context: Last reported occurrence of RVF in Swaziland was in 2008. *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.*

SWAZILAND

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2018): High temperatures coupled with the start of the main maize production season will favour amplification of the pest.

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 during the 2017/18 season.

Threat category: Plant pests and diseases

Threat name: Tomato leaf miner

Likelihood of occurrence: High

Forecast (October-December 2018): The forecast period is characterized by high temperatures in the country, but the pest spread will be moderate due to the limited tomato production.

Context: The pest has been causing damage to tomatoes, since 2016.

TOGO

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are likely to occur, as per AI seasonal pattern.

Context: H5N1 HPAI was first reported in Togo in August 2016. H5N1 Last outbreak in the country occurred in March 2018. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Avian influenza viruses can affect humans.*

UGANDA

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5N8 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are likely to occur, as per AI seasonal pattern.

Context: In January 2017, H5N8 HPAI virus was detected in wild birds for the first time in the country. This was the first HPAI introduction in this African sub-region since 2008. The disease was last reported in the country in May 2017. *HPAI is a highly contagious disease causing 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 (October-December 2018): TiLV is unlikely to occur and it has been reported in the scientific literature.

Context: The presence of TiLV in Uganda 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.

Threat category: Plant pests and diseases

Threat name: Cassava brown streak disease (CBSD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Spread of Cassava brown streak disease is likely.

Context: The disease is already present in the country. *This disease can cause brownish rots in tuber rendering them inedible, which leads to a severe loss of economic value. Farmers may be unaware of their infected cassava crops until they harvest and see the tuber lesions, as leaves might appear asymptomatic in some cases.* CBSD *is transmitted through infected cuttings and whiteflies. Use of virus free planting materials and integrated management is essential for control.*

Threat category: Plant pests and diseases

Threat name: Cassava mosaic disease (CMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Spread of Cassava mosaic disease is likely.

Context: The disease is already affecting cassava production in the country. *CMD is considered as 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 (October-December 2018): The second main rain season has begun in most parts of the country. Weather forecast indicates normal to above normal rains. Farmers in many districts are beginning to plant maize. In southern and eastern Uganda, FAW was observed on early planted sorghum. The infestation in the gardens observed was heavy and well above 50percent. Maize and sorghum are important crops in the region. FAW infestation is, therefore, expected to be widespread and high.

Context: In Uganda, the pest has been confirmed in all 121 districts, i.e. 100percent of the territory.

UGANDA

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: High

Forecast (October-December 2018): RVF outbreaks are highly likely to occur due to the short rainy season and the environmental suitability for vector amplification during this forecast period.

Context: RVF has been sporadically reported in the country, usually after a heavy rainy period, which represents favorable conditions for the vectors. Precipitation forecasts for October-December 2018 in the region predict above-normal rainfall, with 70percent chance of El Niño occurrence in winter 2018/19. FAO advises the veterinary services and livestock farmers' communities in those countries to remain vigilant about the occurrence and spread of RVF. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to death and abortion of RVF-infected livestock.*

UNITED REPUBLIC OF TANZANIA

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: High

Forecast (October-December 2018): RVF outbreaks are highly likely to occur due to the short rainy season and the environmental suitability for vector amplification during this forecast period.

Context: Precipitation forecasts for October-December 2018 in the region predict above-normal rainfall, with 70percent chance of El Niño occurrence in winter 2018/19. FAO advises the veterinary services and livestock farmers' communities in those countries to remain vigilant about the occurrence and spread of RVF. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to death and abortion of RVF-infected livestock.*

Threat category: Aquatic diseases

Threat name: Epizootic ulcerative syndrome (EUS)

Likelihood of occurrence: Low

Forecast (October-December 2018): EUS may occur in Tanzania due to the confirmed presence of the disease in neighboring Democratic Republic of the Congo and Zambia.

Context: Water temperatures during the forecasting period will range from 18 to 25 °C, which are optimal for the development of the oomycete fungus responsible for the disease.

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (October-December 2018): TiLV is unlikely to occur, and it has been reported in the scientific literature.

Context: The presence of TiLV in Tanzania 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.

Threat category: Locusts

Threat name: Red Locust

Likelihood of occurrence: Moderate

Forecast (October-December 2018): On-going vegetation burning will further concentrate existing adult groups and swarms.

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: Forest pests and diseases

Threat name: Blue gum chalcid

Likelihood of occurrence: Moderate

Forecast (October-December 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.*

Threat category: Plant pests and diseases

Threat name: Cassava brown streak disease (CBSD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Spread of Cassava brown streak disease is likely.

Context: The disease is already present in the country. *This disease can cause brownish rots in tuber rendering them inedible, which leads to a severe loss of economic value. Farmers may be unaware of their infected cassava crops until they harvest and see the tuber lesions, as leaves might appear asymptomatic in some cases. CBSD is transmitted through infected cuttings and whiteflies. Use of virus free planting materials and integrated management is essential for control.*

UNITED REPUBLIC OF TANZANIA

Threat category: Plant pests and diseases

Threat name: Cassava mosaic disease (CMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Spread of Cassava mosaic disease (CMD) is likely.

Context: The disease is already affecting cassava production in the country. *CMD is considered as 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 (October-December 2018): High temperatures coupled with the start of the main maize production season will favour amplification of the pest.

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: Moderate

Forecast (October-December 2018): The forecast period is characterized by low tomato production in the country which will limit the amplification of the pest.

Context: The pest has been causing damage to tomatoes, since 2016.

ZAMBIA

Threat category: Animal and zoonotic diseases

Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): The further spread of Foot-and-mouth disease (FMD) serotype O is likely to occur within the country.

Context: During April-May 2018, FMD serotype O outbreaks were detected in Zambia. 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 topo type. *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: Animal and zoonotic diseases

Threat name: Pest des petit ruminants (PPR)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Pest des petit ruminants (PPR) outbreaks are likely to continue to occur in the country.

Context: Last PPR detection in the country occurred in 2015, PPR outbreaks continue to occur in neighboring UnitedRepublic of Tanzania and Democratic Republic of Congo, which are considered endemic for the disease. PPR is a highly contagious disease affecting sheep and goats; it is caused by a Morbillivirus and is considered one of the most damaging livestock diseases in Africa.

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (October-December 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: Aquatic diseases

Threat name: Epizootic ulcerative syndrome (EUS)

Likelihood of occurrence: Low

Forecast (October-December 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 in October and November will range from 18 to 25 °C, which are optimal for the development of the oomycete fungus responsible for the disease.

Threat category: Locusts

Threat name: Red Locust

Likelihood of occurrence: Moderate

Forecast (October-December 2018): On-going vegetation burning and dry conditions will contribute to adult grouping and swarm formation on unburnt grass patches.

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.

ZAMBIA

Threat category: Forest pests and diseases

Threat name: Blue gum chalcid

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Spread of the insect pest Blue gum chalcid is likely to continue in eucalyptus nurseries and plantations.

Context: Pest management activities based on silvicultural practices, breeding programmes, and quarantine measures, to reduce insect populations are in progress. 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 (October-December 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.*

Threat category: Plant pests and diseases

Threat name: Cassava brown streak disease (CBSD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Spread of Cassava brown streak disease is likely.

Context: The disease has been recorded for the first time in the country. Since cassava is a key crop for food security and livelihoods, the disease poses a significant threat. *This disease can cause brownish rots in tuber rendering them inedible, which leads to a severe loss of economic value. Farmers may be unaware of their infected cassava crops until they harvest and see the tuber lesions, as leaves might appear asymptomatic in some cases. It is transmitted through infected cuttings and whiteflies. Avoiding sharing of infected cuttings and use of virus free planting materials and integrated management is essential for control.*

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2018): High temperatures coupled with the start of the main maize production season will favour amplification of the pest.

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: Moderate

Forecast (October-December 2018): The forecast period is characterized by low tomato production in the country, which will limit the amplification of the pest.

Context: The pest has been causing damage to tomatoes, since 2016.

ZIMBABWE

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): RVF outbreaks are likely to occur in the country given the current climatic conditions in the country, which are suitable for RVF vector amplification.

Context: Last reported occurrence of RVF in Zimbabwe was in 2001. *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 (October-December 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.

ZIMBABWE

Threat category: Forest pests and diseases

Threat name: Red gum lerp psyllid

Likelihood of occurrence: Moderate

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

Context: The occurrence of Red gum lerp psyllid continue to damage plantations and small woodlots in Zimbabwe.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2018): High temperatures coupled with the start of the main maize production season will favour amplification of the pest.

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: Moderate

Forecast (October-December 2018): The forecast period is characterized by low tomato production in the country which will limit the amplification of the pest.

Context: The pest has been causing damage to tomatoes, since 2016.

AMERICANS

BRAZIL

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (October-December 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 (October-December 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 (October-December 2018): Introduction of *Enterocytozoon hepatopenaei* (EHP) from other countries is possible, but unlikely, 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: Low

Forecast (October-December 2018): TiLV has been reported in Colombia in the scientific literature. Mitigation measures are in place.

Context: TiLV occurs when the water temperature is between 22 °C – 32 °C; it has been observed in farms with large-sized fish and a high stocking density.

COSTA RICA

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (October-December 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 (October-December 2018): TiLV is unlikely to occur. 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 (October-December 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.

GUATEMALA

Threat category: Forest pests and diseases

Threat name: Bark beetles

Likelihood of occurrence: Moderate

Forecast (October-December 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 is 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 (October-December 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 (October-December 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: Low

Forecast (October-December 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: Bark beetles

Likelihood of occurrence: Moderate

Forecast (October-December 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 is almost continuous throughout the year in Mesoamerica. In general, it attacks stressed trees.*

MEXICO

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: High

Forecast (October-December 2018): TiLV outbreaks have been first observed in July 2018. The disease may spread through live movements of infected hosts.

Context: TiLV is already present in the country. It was first observed in July 2018. 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.

NICARAGUA

Threat category: Aquatic diseases

Threat name: Acute hepatopancreatic necrosis disease (AHPND)

Likelihood of occurrence: Low

Forecast (October-December 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 (October-December 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.

NICARAGUA

Threat category: Forest pests and diseases

Threat name: Bark beetles

Likelihood of occurrence: High

Forecast (October-December 2018): It is highly likely that Bark beetles (mainly *Dendroctonus frontalis*) will continue to cause damage in pine plantations.

Context: Pest management activities based on silvicultural practices are in progress. *The adults and larvae of* Dendroctonus spp. *are bark-feeding. Flight activities of D. frontalis is 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 (October-December 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, 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: En*terocytozoon hepatopenaei* (EHP)

Likelihood of occurrence: Low

Forecast (October-December 2018): Introduction of E*nterocytozoon 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 (October-December 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 (October-December 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 (October-December 2018): TiLV 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. As reported in the OIE notification: El Niño is associated with warm and very wet weather months in April–October along the coasts of northern Peru and Ecuador, causing major flooding whenever the event is strong or extreme.

ASIA

AFGHANISTAN

Threat category: Locusts

Threat name: Moroccan Locust

Likelihood of occurrence: Nil

Forecast (October-December 2018): Adult populations have already disappeared. Eggs laid in early summer will stay in the ground until next spring.

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, *Dociostaurus maroccanus*, is one of the three locust pests in Central Asia. The Italian Locust (*Calliptamus italicus*) is also present in the country but was not reported as a pest in 2018.

ARMENIA

Threat category: Locusts

Threat name: Italian Locust

Likelihood of occurrence: Nil

Forecast (October-December 2018): Natural disappearance of the few remaining adult populations; eggs laid in early autumn will stay in the ground until next spring.

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 (*Calliptamus italicus*) is one of the two locust pests in the Caucasus.

AZERBAIJAN

Threat category: Locusts

Threat name: Moroccan Locust

Likelihood of occurrence: Nil

Forecast (October-December 2018): Natural disappearance of the few remaining adult populations; eggs laid in late summer will stay in the ground until next spring.

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 (*Dociostaurus maroccanus*) 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 (October-December 2018): TiLV has not been reported in the country but will likely 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: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2018): African swine fever (ASF) is very likely to occur due to its possible introduction from China.

Context: ASF was reported for the first time in Asia, specifically in China, in August 2018. Due to the several connections among China and neighboring countries (e.g. through associated routes (TARs), illegal imports of food, movement of workers moving in and out of China, etc..), a high risk of spread of the disease towards east and southeast Asia has to be highlighted. Spreading of ASF from China would have devastating consequences for animal health, food safety, and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5N1 Highly pathogenic avian influenza (HPAI) outbreaks are likely to occur, as per AI seasonal pattern.

Context: In 2018, seven outbreaks caused by the virus were reported in six different provinces; the latest occurred in August 2018. *HPAI is a highly contagious disease causing 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: High

Forecast (October-December 2018): African swine fever (ASF) outbreaks are very likely to continue to occur.

Context: ASF was reported for the first time in China in August 2018. As of 25 September 2018, ASF outbreaks has been reported in eight provinces (Anhui, Jiangsu, Heilongjiang, Inner Mongolia, Henan, Jilin, Liaoning and Zhejiang. An African Swine Fever Contingency Plan and Emergency Response Level II is under implementation in the country. Spreading of the disease within the country would have devastating consequences for animal health, food safety, and food security not just at national but also at global level, and it would raise the possibility of disease spread to neighboring countries in eastern and south-eastern Asia. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5 and H7 HPAI and LPAI virus outbreaks in poultry as well as in humans (although these are sporadic) are likely to occur, as per AI seasonal pattern.

Context: Several serotypes of HPAI and LPAI viruses are circulating and being detected in China. *HPAI is a highly contagious disease causing 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: Pest des petit ruminants (PPR)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Pest des petit ruminants (PPR) outbreaks are likely to continue to occur in the country.

Context: PPR is reported yearly in China, in particular, in 2018, the disease is occurring in North-Eastern and Eastern provinces of the country. PPR is a highly contagious disease affecting sheep and goats; it is caused by a Morbillivirus and is considered one of the most damaging livestock diseases in Africa.

Threat category: Aquatic diseases

Threat name: Acute hepatopancreatic necrosis disease (AHPND)

Likelihood of occurrence: Low

Forecast (October-December 2018): AHPND re-emergence may occur but its spread will be limited by biosecurity.

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 (October-December 2018): EHP re-emergence may occur but its spread will be limited by biosecurity.

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 (October-December 2018): TiLV has not been reported in China but it may be introduced 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.

DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2018): African swine fever (ASF) is very likely to occur due to its possible introduction from China.

Context: ASF was reported for the first time in Asia in China in August 2018. Due to the several connections among China and neighboring countries (e.g. through associated routes (TARs), illegal imports of food, movement of workers moving in and out of China, etc..), a high risk of spread of the disease towards east and southeast Asia has to be highlighted. Spreading of ASF from China would have devastating consequences for animal health, food safety, and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

GAZA STRIP

Threat category: Animal and zoonotic diseases

Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): The further spread of Foot-and-mouth disease (FMD) serotype O is likely to occur.

Context: FMD serotype O was last observed outbreaks in a Western Asian country occurred in September 2018 in Israel. *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: Italian Locust

Likelihood of occurrence: Nil

Forecast (October-December 2018): Natural disappearance of the few remaining adult populations; eggs laid in late summer will stay in the ground until next spring.

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 (*Calliptamus italicus*) is one of the two locust pests in the Caucasus.

Threat category: Locusts

Threat name: Moroccan Locust

Likelihood of occurrence: Nil

Forecast (October-December 2018): Natural disappearance of the few remaining adult populations; eggs laid in late summer will stay in the ground until next spring.

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 (*Dociostaurus maroccanus)* 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 (October-December 2018): Boxwood blight will continue to be present but likely to have less activity due to low humidity conditions from October to December.

Context: Monitoring of the 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.*

Threat category: Forest pests and diseases

Threat name: Boxwood moth

Likelihood of occurrence: High

Forecast (October-December 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. The last flight for the season likley to be in September October.

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. When the day-length drops below about 13.5hrs, the larvae will 'diapause' (the dormant stage of a developing insect) so that it can overwinter in a web spun on Buxus leaves.
In this state, it can survive temperatures down to - 30°C.
*Boxwood moth (*Cydalima perspectalis*), native to Eastern Asia, is highly destructive and defoliates boxwood trees.*

INDIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2018): FAW could spread and increase further during the growing season in southern and central areas.

Context: FAW was reported in July/August 2018 within the state of Karnataka, southern India, with many reports on the possibility of FAW spreading to other states.

Threat category: Aquatic diseases

Threat name: Acute hepatopancreatic necrosis disease (AHPND)

Likelihood of occurrence: Low

Forecast (October-December 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. Strong awareness of shrimp diseases is present in the country.

Threat category: Aquatic diseases

Threat name: *Enterocytozoon hepatopenaei* (EHP)

Likelihood of occurrence: Low

Forecast (October-December 2018): Introduction of *Enterocytozoon hepatopenaei* (EHP) from other countries through live animals (e.g. live polychaetes, clams, oysters, etc.) that are used as feed for broodstock is possible but unlikely.

Context: Good surveillance and biosecurity measures are in place. Strong awareness of shrimp diseases is present in the country.

INDIA

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Nil

Forecast (October-December 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 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.

INDONESIA

Threat category: Aquatic diseases

Threat name: Acute hepatopancreatic necrosis disease (AHPND)

Likelihood of occurrence: Low

Forecast (October-December 2018): Introduction of Acute hepatopancreatic necrosis disease (AHPND) from affected countries is possible, but unlikely, through trade 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.

Threat category: Aquatic diseases

Threat name: *Enterocytozoon hepatopenaei* (EHP)

Likelihood of occurrence: Low

Forecast (October-December 2018): Introduction of *Enterocytozoon hepatopenaei* (EHP) from other countries through live animals (e.g. live polychaetes, clams, oysters, etc.) that are used as feed for broodstock is possible but unlikely.

Context: Strong awareness of shrimp diseases is present in the country.

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (October-December 2018): TiLV is unlikely to occur and it has been reported by local scientific literature.

Context: TiLV is already present in the country. TiLV occurs when the water temperature is between 22 °C – 32 °C; it has also been observed in farms with large-sized fish and high stocking density.

IRAN (ISLAMIC REPUBLIC OF)

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5 Highly pathogenic avian influenza outbreaks in poultry are likely to occur as per AI seasonal pattern.

Context: The last H5N1 and H5N6 HPAI official detections occurred in the country in January 2018. The H5N8 HPAI virus, which has been spreading globally, following wild bird migratory routes, since November 2016, has been detected in wild and domestic birds in eight governorates in the country.
Last reporting of this serotype was in February 2018. *HPAI is a highly contagious disease causing 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 (October-December 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: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Nil

Forecast (October-December 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 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: Forest pests and diseases

Threat name: Boxwood blight

Likelihood of occurrence: High

Forecast (October-December 2018): Boxwood blight will continue to be present, and its spread will be high in summer due to high temperatures and high humidity.

Context: Boxwood blight was reported for the first time in the country in 2012. Currently, approximately 50 000 ha of boxwood forest are affected by the disease. Pest management activities in selected areas are in progress. *Boxwood blight (also known as box blight) is a widespread fungal disease caused by the pathogen* Calonectria pseudonaviculata*, affecting boxwood trees.*

Threat category: Forest pests and diseases

Threat name: Boxwood moth

Likelihood of occurrence: Moderate

Forecast (October-December 2018): The moth has three to four generations per year in Iran. The larvae will continue feeding on leaves during summer. The repeated attacks will lead to total defoliation of the trees. The last flight for the season likely to be in September October.

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. When the day-length drops below about 13.5hrs, the larvae will 'diapause' (the dormant stage of a developing insect) so that it can overwinter in a web spun on Buxus leaves. In this state, it can survive temperatures down to -30 °C. *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 (October-December 2018): Oak charcoal disease (caused by pathogen *Biscogniauxia mediterranea*) 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.

IRAQ

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5N8 Highly pathogenic avian influenza outbreaks in poultry are likely to occur, as per AI seasonal pattern.

Context: The H5N8 HPAI, which has been spreading globally, following wild bird migratory routes, since November 2016, has been lastly detected in the country in April 2018. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Avian influenza viruses can affect humans.*

ISRAEL

Threat category: Animal and zoonotic diseases

Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Foot-and-mouth disease (FMD) serotype O outbreaks are still likely to occur even if a vaccination campaign is ongoing.

Context: FMD serotype O outbreaks occur sporadically in the country. FMD was last reported in the country in September 2018. *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: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2018): African swine fever (ASF) is very likely to occur due to its possible introduction from China.

Context: ASF was reported for the first time in Asia, specifically in China, in August 2018. Due to the several connections among China and neighboring countries (e.g. through associated routes (TARs), illegal imports of food, movement of workers moving in and out of China, etc..), a high risk of spread of the disease towards East and Southeast Asia has to be highlighted. Spreading of ASF from China would have devastating consequences for animal health, food safety, and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

JAPAN

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5N6 Highly pathogenic avian influenza (HPAI) outbreaks are likely to occur, as per AI seasonal pattern.

Context: In 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 event in the country was observed in March 2018. *HPAI is a highly contagious disease causing 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 (October-December 2018): The further spread of Foot-and-mouth disease (FMD) serotype O is likely to occur.

Context: FMD serotype O was last reported in the region in September 2018 in Israel. *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: Italian Locust

Likelihood of occurrence: Nil

Forecast (October-December 2018): Natural disappearance of the few remaining adult populations; eggs laid in late summer will stay in the ground until next spring.

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, *Calliptamus italicus*, 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: Nil

Forecast (October-December 2018): Natural disappearance of the few remaining adult populations; eggs laid in late summer will stay in the ground until next spring.

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, *Locusta migratoria*, 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: Nil

Forecast (October-December 2018): Adult populations have already disappeared. Eggs laid in summer will stay in the ground until next spring.

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, *Dociostaurus maroccanus*, is one of the three locust pests present in Central Asia and in the country.

KYRGYZSTAN

Threat category: Locusts

Threat name: Italian Locust

Likelihood of occurrence: Nil

Forecast (October-December 2018): Natural disappearance of the few remaining adult populations; eggs laid in late summer will stay in the ground until next spring.

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, *Calliptamus italicus*, 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: Nil

Forecast (October-December 2018): Adult populations have already disappeared. Eggs laid in summer will stay in the ground until next spring.

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, *Dociostaurus maroccanus*, is one of the three locust pests present in Central Asia and in the country.

LAO PEOPLE'S DEMOCRATIC REPUBLIC

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2018): African swine fever (ASF) is very likely to occur due to its possible introduction from China.

Context: ASF was reported for the first time in Asia, specifically in China, in August 2018. Due to the several connections among China and neighboring countries (e.g. through associated routes (TARs), illegal imports of food, movement of workers moving in and out of China, etc..), a high risk of spread of the disease towards east and southeast Asia has to be highlighted. Spreading of ASF from China would have devastating consequences for animal health, food safety, and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5 Highly pathogenic avian influenza (HPAI) outbreaks are likely to occur, as per as per AI seasonal pattern.

Context: H5N6 HPAI virus was last reported in October 2015. 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 August 2018 in China. *HPAI is a highly contagious disease causing 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: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Spread of Fusarium wilt disease on banana is likely.

Context: A new race of the causal fungus of the disease (Tropical Race 4) has been reporded in the country recently and this can spread further. *Banana fusarium wilt disease is a soil-borne disease caused by a fungal pathogen that cannot be eradicated once established in the soil. 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.*

LEBANON

Threat category: Forest pests and diseases

Threat name: Dry cone syndrome

Likelihood of occurrence: High

Forecast (October-December 2018): It is highly likely that Dry cone syndrome will continue to cause damage to pine plantations (*Pinus pinea*).

Context: Heavy yield losses continue to impact rural livelihoods. Yield reduction of pine nuts has been reported throughout the country. Silvicultural practices to strengthen the trees are in progress.

Threat category: Plant pests and diseases

Threat name: Western conifer seed bug

Likelihood of occurrence: Moderate

Forecast (October-December 2018): It is likely that Western conifer seed bug will be less active from October onwards.

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.

MALAYSIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2018): African swine fever (ASF) is very likely to occur due to its possible introduction from China.

Context: ASF was reported for the first time in Asia, specifically in China, in August 2018. Due to the several connections among China and neighboring countries (e.g. through associated routes (TARs), illegal imports of food, movement of workers moving in and out of China, etc..), a high risk of spread of the disease towards East and Southeast Asia has to be highlighted. Spreading of ASF from China would have devastating consequences for animal health, food safety, and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

MALAYSIA

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5N1 Highly pathogenic avian influenza (HPAI) outbreaks are likely to occur, as per AI seasonal pattern.

Context: H5N1 HPAI was first detected in the country in 2006 and re-emerged in March 2017. The last occurrence was observed in September 2018. *HPAI is a highly contagious disease causing 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 (October-December 2018): Rainy season is usually observed in October-December; therefore, the temperatures are will not be within the permissive range for disease outbreaks to occur. 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.

Threat category: Aquatic diseases

Threat name: *Enterocytozoon hepatopenaei* (EHP)

Likelihood of occurrence: Low

Forecast (October-December 2018): Rainy season is usually observed in October-December; therefore, the temperatures are will not be within the permissive range for disease outbreaks to occur.

Context: EHP is already present in the country. It was last reported in September 2018 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: Low

Forecast (October-December 2018): During October-December, the production cycle of tilapia will be active. In the reporting period, the rainy season is usually observed; therefore, the permissive temperature range for TiLV outbreaks will not be present.

Context: TiLV is already present in the country. It was first observed in June 2017 and additional outbreaks were reported in July/October 2017 and July 2018. 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.

MONGOLIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2018): African swine fever (ASF) is very likely to occur due to its possible introduction from China.

Context: ASF outbreaks have been reported for the time in in China in September 2018 including Inner Mongolia, which is close to the border with Mongolia. A high risk of spread of the disease towards Mongolia has to be highlighted. Spreading of ASF from China would have devastating consequences for animal health, food safety, and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

MYANMAR

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2018): African swine fever (ASF) is very likely to occur due to its possible introduction from China.

Context: ASF was reported for the first time in Asia, specifically, in China in August 2018. Due to the several connections among China and neighboring countries (e.g. through associated routes (TARs), illegal imports of food, movement of workers moving in and out of China, etc..), a high risk of spread of the disease towards East and Southeast Asia has to be highlighted. Spreading of ASF from China would have devastating consequences for animal health, food safety, and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *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: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5 Highly pathogenic avian influenza (HPAI) outbreaks are likely to occur, as per AI seasonal pattern.

Context: 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 August 2018 in China. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Avian influenza viruses can affect humans.*

MYANMAR

Threat category: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Spread of Fusarium wilt disease on banana is likely.

Context: A new race of the causal fungus of the disease (Tropical Race 4) has been reported in the country recently and this can spread further. *Banana fusarium wilt disease is a soil-borne disease caused by a fungal pathogen that cannot be eradicated once established in the soil. 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.*

NEPAL

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5N1 Highly pathogenic avian influenza outbreaks in poultry are likely to occur, as per AI seasonal pattern.

Context: H5N1 HPAI was last reported in the country in June 2018. *HPAI is a highly contagious disease causing 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: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2018): There is no significant threat.

Context: The pest has not been observed in Oman but there is a possibility to reach the country form Yemen.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Nil

Forecast (October-December 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 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: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Nil

Forecast (October-December 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 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: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Spread of Fusarium wilt disease on banana is likely.

Context: A new race of the causal fungus of the disease (Tropical Race 4) has been reported in one location in the country and can spread further. *Banana fusarium wilt disease is a soil-borne disease caused by a fungal pathogen that cannot be eradicated once established in the soil. 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.*

PHILIPPINES

Threat category: Aquatic diseases

Threat name: *Enterocytozoon hepatopenaei* (EHP)

Likelihood of occurrence: Low

Forecast (October-December 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.

PHILIPPINES

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): During the forecasting period the production cycle of tilapia will be active, so the TiLV is likely to occur.

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 (as experienced for example in Israel); it has also been observed in farms with large-sized fish and a high stocking density.

REPUBLIC OF KOREA

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5 Highly pathogenic avian influenza (HPAI) outbreaks are likely to occur, as per AI seasonal pattern.

Context: H5N6 HPAI virus was first detected in the country in October 2016, with the last reported outbreaks occurring 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 country was detected in March 2018 *HPAI is a highly contagious disease causing 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: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2018): African swine fever (ASF) is very likely to occur due to its possible introduction from China.

Context: ASF was reported for the first time in Asia in China in August 2018. Due to the several connections among China and neighboring countries (e.g. through associated routes (TARs), illegal imports of food, movement of workers moving in and out of China, etc..), a high risk of spread of the disease towards East and Southeast Asia has to be highlighted. Spreading of ASF from China would have devastating consequences for animal health, food safety, and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

Threat category: Animal and zoonotic diseases

Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Low

Forecast (October-December 2018): FMD is unlikely to occur.

Context: Since 2014, FMD outbreaks have occurred every year, mostly from January to April, with particularly heavy consequences for the swine sector. FMD was last reported in the country in April 2018. *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.*

SAUDI ARABIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2018): FAW may appear and spread in the southwest (Red Sea coast and Najran areas) from Yemen.

Context: The pest has not been observed in Saudi Arabia but there is a possibility that FAW could be introduced from Yemen if it reaches the north of Yemen.

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5N8 Highly pathogenic avian influenza (HPAI) outbreaks are likely to occur, as per AI seasonal pattern.

Context: Since November 2016, H5N8 HPAI has been spreading globally, following bird migratory routes. The virus was first detected in the country in December 2016. The last outbreak occurred in July 2018. *HPAI is a highly contagious disease causing 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: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Small-scale breeding will occur early on the Red Sea coast, causing locust numbers to increase slightly.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and 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 (October-December 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: Nil

Forecast (October-December 2018): Natural disappearance of the few remaining adult populations; eggs laid in late summer will stay in the ground until next spring.

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, *Calliptamus italicus*, 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: Nil

Forecast (October-December 2018): Adult populations have already disappeared. Eggs laid in summer will stay in the ground until next spring.

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, *Dociostaurus maroccanus*, is one of the three locust pests present in Central Asia and in the country.

THAILAND

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2018): African swine fever (ASF) is very likely to occur due to its possible introduction from China.

Context: ASF was reported for the first time in Asia, specifically in China, in August 2018. Due to the several connections among China and neighboring countries (e.g. through associated routes (TARs), illegal imports of food, movement of workers moving in and out of China, etc..), a high risk of spread of the disease towards East and Southeast Asia has to be highlighted. Spreading of ASF from China would have devastating consequences for animal health, food safety, and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

Threat category: Aquatic diseases

Threat name: Acute hepatopancreatic necrosis disease (AHPND)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): AHPND is likely 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 (October-December 2018): EHP 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 (October-December 2018): During the forecasting period 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 (as experienced for example in Israel); 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 (October-December 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 (October-December 2018): Adult populations have already disappeared. Eggs laid in summer will stay in the ground until next spring.

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, *Dociostaurus maroccanus,* is one of the three locust pests present in Central Asia and in the country.

UZBEKISTAN

Threat category: Locusts

Threat name: Italian Locust

Likelihood of occurrence: Nil

Forecast (October-December 2018): Natural disappearance of the few remaining adult populations; eggs laid in late summer will stay in the ground until next spring.

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, *Calliptamus italicus*, 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 (October-December 2018): Natural disappearance of the few remaining adult populations; eggs laid by adults of the first and possibly second-generation will stay in the ground until next spring.

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, *Locusta migratoria*, 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: Nil

Forecast (October-December 2018): Eggs laid in summer will stay in the ground until next spring.

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, *Dociostaurus maroccanus*, is one of the three locust pests present in Central Asia and in the country.

VIET NAM

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2018): African swine fever (ASF) is very likely to occur due to its possible introduction from China.

Context: ASF was reported for the first time in Asia, specifically in China, in August 2018. Due to the several connections among China and neighboring countries (e.g. through associated routes (TARs), illegal imports of food, movement of workers moving in and out of China, etc..), a high risk of spread of the disease towards East and Southeast Asia has to be highlighted. Spreading of ASF from China would have devastating consequences for animal health, food safety, and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

VIET NAM

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): H5 Highly pathogenic avian influenza outbreaks are likely to occur, as per AI seasonal pattern.

Context: H5N1 and H5N6 HPAI outbreaks were reported in the country in 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), since November 2017. The last occurrences of this strain in the country was in September 2018. *HPAI is a highly contagious disease causing 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 (October-December 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.

Threat category: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Spread of Fusarium wilt disease on banana is likely.

Context: A new race of the causal fungus of the disease (Tropical Race 4) has been reporded in the country recently and this can spread further. *Banana fusarium wilt disease is a soil-borne disease caused by a fungal pathogen that cannot be eradicated once established in the soil. 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.*

WEST BANK

Threat category: Animal and zoonotic diseases

Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): The further spread of Foot-and-mouth disease (FMD) serotype O is likely to occur

Context: The last FMD serotype O outbreaks occurred in the West Bank in September 2018. The serotype was not 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 (October-December 2018): FAW's infestation could increase and spread further to further areas.

Context: FAW was reported in July/August 2018 in several areas of Yemen. It is mainly attacking maize but it was also reported on sorghum and Millet.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Small-scale breeding will occur early on the Red Sea coast, causing locust numbers to increase slightly.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and 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 (October-December 2018): The moth flies from May to August to lay eggs and the 1st- and 2nd-instar caterpillars are likely to cause earlyenter damages from August. Eggs are laid in the canopy of the trees and hatch in about 45 days, usually in early September. Throughout the autumn and winter, the larvae develop in a collective silk nest, protected from the cold, and usually placed in the most insulated part of the canopy, in order to be warmed by sunlight. Larvae abandon the nest during the night to feed, except when temperature is too low.

Context: Mechanical removal of nests is in progress, to manage pest populations.

BELARUS

Threat category: Forest pests and diseases

Threat name: Bark beetles

Likelihood of occurrence: High

Forecast (October-December 2018): Bark beetles (mainly *Ips spp.*) may have up to three generations per year at warmer sites, of Europe and the flight of the second generation likely to start in July and August and third generation in early September.

Context: They are causing severe damage in pine plantations in Belarus. 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.*

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): African swine fever (ASF) outbreaks are likely to occur due to possible virus introduction from neighboring countries.

Context: ASF has not been reported 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 cause high mortality. No vaccines are available.*

BELGIUM

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2018): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: On 13 September 2018, two dead wild boars were found positive to ASF in Etalle (province of Luxembourg). This represented the first introduction of the disease into the country and into Western Europe. Spreading of the disease in Western European countries, which never experienced ASF, would have devastating consequences for the whole pig sector. Wild boar population density is the most relevant factor in the spread of the disease in the country. ASF is most likely to persist and become endemic due to the presence of wild boar populations interacting with susceptible domestic species. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

BULGARIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: ASF was reported for the first time in August 2018 in the country. The single outbreak was controlled and no secondary spread has been detected. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

CZECH REPUBLIC

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: ASF was reported for the first time in July 2017 in the country. Infection in wild boar continued to be regularly reported until April 2018, in a highly decomposed carcass, which suggests that the disease may not be circulating anymore. However, it is still early to conclude that the disease is not present any longer. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

ESTONIA

Threat category: Animal and zoonotic diseases
Threat name: African swine fever (ASF)
Likelihood of occurrence: Moderate
Forecast (October-December 2018): African swine fever (ASF) outbreaks are likely to continue to occur.
Context: Since the ASF first introduction in the country in September 2014, the disease continues to be regularly reported in wild and domestic pigs. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

FRANCE

Threat category: Animal and zoonotic diseases
Threat name: African swine fever (ASF)
Likelihood of occurrence: High
Forecast (October-December 2018): African swine fever (ASF) outbreaks are likely to occur due to possible virus introduction from neighboring countries.
Context: On 13 September 2018, two dead wild boars were found positive to ASF in Etalle (province of Luxembourg) in neighboring Belgium. This represented the first introduction of the disease into Western Europe. Spreading of the disease in Western European countries, which never experienced ASF, would have devastating consequences for the whole pig sector. Wild boar population density is the most relevant factor in the spread of the disease in the country. ASF is most likely to persist and become endemic due to the presence of wild boar populations interacting with susceptible domestic species. In particular, the French territory close to infected area in Belgium presents a high density of wild boars. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

GERMANY

Threat category: Animal and zoonotic diseases
Threat name: African swine fever (ASF)
Likelihood of occurrence: High
Forecast (October-December 2018): African swine fever (ASF) outbreaks are likely to occur due to possible virus introduction from neighboring countries.
Context: On 13 September 2018, two dead wild boars were found positive to ASF in Etalle (province of Luxembourg) in neighboring Belgium. This represented the first introduction of the disease into Western Europe. Spreading of the disease in Western European countries, which never experienced ASF, would have devastating consequences for the whole pig sector. Wild boar population density is the most relevant factor in the spread of the disease in the country. ASF is most likely to persist and become endemic due to the presence of wild boar populations interacting with susceptible domestic species. In particular, the German territory close to infected area in Belgium presents a high density of wild boars. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

HUNGARY

Threat category: Animal and zoonotic diseases
Threat name: African swine fever (ASF)
Likelihood of occurrence: Moderate
Forecast (October-December 2018): African swine fever (ASF) outbreaks are likely to continue to occur.
Context: ASF was officially reported for the first time in the country in April 2018 in wild boar. The disease was last reported in September 2018, still confined to the same areas originally affected. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

LATVIA

Threat category: Animal and zoonotic diseases
Threat name: African swine fever (ASF)
Likelihood of occurrence: Moderate
Forecast (October-December 2018): African swine fever (ASF) outbreaks are likely to continue to occur.
Context: ASF continues to be regularly reported in wild and domestic pigs. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

LITHUANIA

Threat category: Animal and zoonotic diseases
Threat name: African swine fever (ASF)
Likelihood of occurrence: Moderate
Forecast (October-December 2018): African swine fever (ASF) outbreaks are likely to occur.
Context: Since the first ASF introduction in the country in January 2014, the disease continues to be regularly reported in wild and domestic pigs. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

LUXEMBOURG

Threat category: Animal and zoonotic diseases
Threat name: African swine fever (ASF)
Likelihood of occurrence: High
Forecast (October-December 2018): African swine fever (ASF) outbreaks are likely to occur due to possible virus introduction from neighboring countries.
Context: On 13 September 2018, two dead wild boars were found positive to ASF in Etalle (province of Luxembourg) in neighboring Belgium. This represented the first introduction of the disease into Western Europe. Spreading of the disease in Western European countries, which never experienced ASF, would have devastating consequences for the whole pig sector. Wild boar population density is the most relevant factor in the spread of the disease in the country. ASF is most likely to persist and become endemic due to the presence of wild boar populations interacting with susceptible domestic species. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

POLAND

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: ASF continues to be regularly reported in the country in wild and domestic pigs. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

REPUBLIC OF MOLDOVA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: Since ASF first introduction into the country in November 2016, ASF has been continually reported until September 2018, both in wild and domestic pigs. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

ROMANIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: ASF was detected for the first time in the country in July 2017. The last event occurred in September 2018. The disease has since spread rapidly among mostly backyard premises (around 1 000 outbreaks). The second largest pig farm in the EU with around 140 000 heads was also affected. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

SLOVAKIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): African swine fever (ASF) outbreaks are likely to occur due to a possible introduction from neighboring countries.

Context: ASF has not been reported in the country however, ASF has become endemic in Europe in some countries bordering Slovakia such as the Czech Republic, Poland, and Ukraine. Informal and uncontrolled animal movements and poor biosecurity conditions in pig farms at the borders pose a risk to disease introduction. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

THE RUSSIAN FEDERATION

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: ASF continues to be regularly reported in the country in wild and domestic pigs. In the last months of 2018, a new affected areas east and west, in Siberia and Kaliningrad were involved. The last events occurred at the end of September 2018. ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.

Threat category: Animal and zoonotic diseases

Threat name: Pest des petit ruminants (PPR)

Likelihood of occurrence: Moderate

Forecast (October-December 2018): Pest des petit ruminants (PPR) outbreaks are likely to occur due to its possible introduction from neighboring countries.

Context: The country never experienced PPR, although the disease is occurring in China in the Northeastern provinces, close to the Russian Federation borders. PPR is a highly contagious disease affecting sheep and goats; it is caused by a Morbillivirus and is considered one of the most damaging livestock diseases in Africa.

Threat category: Locusts

Threat name: Migratory Locust

Likelihood of occurrence: Nil

Forecast (October-December 2018): Natural disappearance of the few remaining adult populations; eggs laid in late summer will stay in the ground until next spring.

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, *Locusta migratoria*, is one of the three locust pests present in Central Asia and in the country.

Threat category: Locusts

Threat name: Italian Locust

Likelihood of occurrence: Nil

Forecast (October-December 2018): Natural disappearance of the few remaining adult populations; eggs laid in late summer will stay in the ground until next spring.

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, *Calliptamus italicus*, is one of the three locust pests present in Central Asia and in the country.

THE RUSSIAN FEDERATION

Threat category: Locusts

Threat name: Moroccan Locust

Likelihood of occurrence: Nil

Forecast (October-December 2018): Adult populations have already disappeared. Eggs laid in summer will stay in the ground until next spring.

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, *Dociostaurus maroccanus*, is one of the three locust pests present in Central Asia and in the country.

Threat category: Animal and zoonotic diseases

Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Low

Forecast (October-December 2018): Lumpy skin disease (LSD) outbreaks are unlikely to occur due to unfavorable weather conditions.

Context: After its re-emergence in May 2016 the country, LSD has spread north, east, and westwards, affecting 20 administrative subjects and causing almost 500 outbreaks. Several outbreaks were reported in July-August 2018. *LSD is a severe disease, transmitted by vectors, that mainly affects 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 (October-December 2018): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: ASF continues to be regularly reported in the country in wild and domestic pigs. The last events occurred in September 2018. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccines are available.*

Threat category: Forest pests and diseases

Threat name: Bark beetles

Likelihood of occurrence: High

Forecast (October-December 2018): Bark beetles (mainly *Ips spp.*) may have up to three3 generations per year at warmer sites, of Europe and the flight for the second generation likely to start in July and August and third generation in early September

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: Moderate

Forecast (October-December 2018): Spread of Fusarium wilt disease on banana is possible.

Context: A new race of the causal fungus of the disease (Tropical Race 4) has been present in two locations in the north of the country and a third infested site has been reported recently. *Banana fusarium wilt disease is a soil-borne disease caused by a fungal pathogen that cannot be eradicated once established in the soil. 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, containment and prevention of the spread is crucial.*

GLOSSARY

FCC threat	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
Forecasting	Ability to predict future condition or occurrence of an FCC threat for the upcoming three months.
Likelihood of introduction	Chances of introduction of a FCC threat into a country, across border or to a specific area for the upcoming three months.
Likelihood of occurrence	Chances of a FCC threat to happen for the upcoming three months.
Likelihood of spread	Chances of geographical spread of a FCC threat within a country beyond its original introduction for the upcoming three months.
Likelihood of re-emergence/amplification	Chances of re-emergence/amplification (e.g. increase, breeding, etc.) of a threat already existing within a country for the upcoming three months.
Biosecurity	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).
Incursion	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).
Outbreak	A recently detected pest population, including an incursion, or a sudden significant increase of an established pest population in an area (FAOTERM).
Zoonosis	Any disease or infection which is naturally transmissible from animals to humans (FAOTERM).

INFORMATION SOURCES

Transboundary Animal and Aquatic Diseases

- African swine fever risk assessment available at **http://www.fao.org/3/i8805en/I8805EN.pdf**
- Avian influenza (short take)
  - risk assessment: **http://www.fao.org/3/i8705en/I8705EN.PDF**
  - EMPRES – I: **http://empres-i.fao.org/eipws3g/**
  - OIE/FAO Network of Expertise on animal influenzas (OFFLU): **www.offlu.net**
- ECDC - Communicable disease threats report (CDTR) available at **https://ecdc.europa.eu/en/threats-and-outbreaks**
- FMD Situation Reports available at **http://www.fao.org/ag/againfo/commissions/eufmd/commissions/eufmd-home/fmd-surveillance/situation-reports/en/**
- Global Animal Disease Information System (EMPRES-i) available at **http://empres-i.fao.org/eipws3g/**
- Global Early Warning System (GLEWS) at FAO
- OIE World Animal Health Information Database (WAHID) Interface available at **http://www.oie.int/wahis_2/public/wahid.php/Wahidhome/Home**
- Tilapia Lake Virus (TiLV) disease card available at **http://www.oie.int/fileadmin/Home/eng/Internationa_Standard_Setting/docs/pdf/A_TiLV_disease_card.pdf**

Desert Locust

FAO Desert Locust Information Service (DLIS) available at **www.fao.org/ag/locusts**

Locusts (three species) in Caucasus and Central Asia

- Regional monthly bulletins on locust situations in CCA available at **http://www.fao.org/ag/locusts-CCA/en/1014/index.html**
- Reports of the annual Technical Workshop on Locusts in CCA available at **http://www.fao.org/ag/locusts-CCA/en/index.html**

Fall armyworm

http://www.fao.org/news/story/en/item/1100355/icode/

Coffee wilt disease

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

Wheat rust disease

Global wheat rust monitoring system

Weather forecast

https://iri.columbia.edu/our-expertise/climate/forecasts/seasonal-climate-forecasts/

http://www.noaa.gov/weather

INFORMATION SOURCES

Threats to Food Security

FAO GIEWS Crop Prospects and Food Situation No. 3, September 2018
available at **http://www.fao.org/3/ca1487en/CA1487EN.pdf**

Glossary

- FAO Term portal: **http://www.fao.org/faoterm/en/**
- IPPC Glossary: **https://www.ippc.int/en/publications/glossary-phytosanitary-terms/**
- FAO Food Safety and Quality website – A-z index:
  http://www.fao.org/food/food-safety-quality/a-z-index/ biosecurity/en/
- ACAPS: **https://www.acaps.org/**

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www.fao.org/food-chain-crisis