Food and Agriculture Organization of the United Nations

FOOD CHAIN CRISIS
EARLY WARNING BULLETIN

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

No. 33
October–December 2019

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Rome, 2019

Required citation
FAO. 2019. *Food Chain Crisis Early Warning Bulletin. Forecasting threats to the food chain affecting food security in countries and regions*. No. 33, October–December 2019. Rome, FAO.

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NOTE TO THE READER

The purpose of the FCC (Food Chain Crisis) Early Warning Bulletin is to inform Food and Agriculture Organization of the United Nations (FAO) and other international organizations, countries, scientific experts, and decision makers of forecast threats to animal and plant health and food safety that may have a 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 that has been collected and analysed by FAO experts.

The FCC Early Warning Bulletin is a product of the 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.

FOOD CHAIN CRISIS 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 them in a comprehensive and integrated manner, oriented towards the whole food chain. Predicting threats will allow for timelier implementation of preventive and control measures, and will thus reduce their impact and limit their geographic spread.

The FAO Food Chain Crisis-Intelligence and Coordination Unit (FCC-ICU) has developed an integrated forecasting approach to assess the likelihood of the occurrence of threats to the food chain (FCC threat) for the upcoming three months. Based on this approach and on the availability of FAO data, a number of forecast events are presented at country level. Data are collected, analysed and further presented in this quarterly FCC Early Warning Bulletin (see country section, page 18). The food safety threats will be included in future bulletins.

The likelihood of occurrence of an 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, if a threat is already present there

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)

ASF IN ASIA

ASF continues to be reported in the region. China (since August 2018); Mongolia (January 2019); Viet Nam (February 2019); Cambodia (April 2019); the Democratic People's Republic of Korea (May 2019); the Lao People's Democratic Republic (June 2019); Myanmar (August 2019); and the Philippines, the Republic of Korea and Timor Leste (September 2019) have reported outbreaks in domestic pigs and sporadic cases in wild boar (mainly captive).

The disease was also reported for the first time in wild boar in Jilin and Heilongjiang province in China in December 2018. As of 12 September 2019, outbreaks continue to be reported in Cambodia, China, the Lao People's Democratic Republic, the Democratic People's Republic of Korea, Myanmar, the Philippines, the Republic of Korea and Viet Nam. Over the last few months, there have been numerous detections of ASF virus in pork samples brought to countries in the region (e.g. Australia, Thailand and Japan).

As the majority of pigs are produced in Asia, especially China, the recent escalation of the ASF epidemic is likely to have devastating consequences for animal health and food security, as well as a noticeable impact on the pig industry and related businesses, not only in the region but worldwide.

ASF IN EUROPE

ASF outbreaks and transmission are likely to continue in affected countries (Belgium, Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Republic of Moldova, Serbia, Slovakia, the Russian Federation and Ukraine).

Introduction of the disease is likely to occur in currently unaffected neighbouring countries (particularly in the Balkan peninsula, such as Albania, Bosnia and Herzegovina, Croatia, Kosovo[1], Montenegro and the Republic of North Macedonia), without ruling out longer jumps such as those observed in Czechia or Belgium. Czechia was the first country in the European Union (EU) to be officially declared free from ASF in February 2019 after no new outbreak had been found in the country since April 2018. In September 2018, the virus affected the wild boar population in Belgium. This increased the possibility of introduction of the disease into neighbouring Western European countries (e.g. France, Germany and Luxembourg). In all affected countries, ASF is likely to persist and become endemic due to the presence of wild boar populations.

ASF RISK TO AMERICAS

The disease may spread from Asian or European infected countries to the Americas. The risk of further spread of ASF within the region is considered moderate to high, due to the movement of live pigs and pork products from infected countries.

[1] *References to Kosovo shall be understood to be in the context of United Nations (UN) Security Council Resolution 1244 (1999).*

OVERVIEW FCC FORECAST FOR THE PERIOD OCTOBER–DECEMBER 2019

During the period October–December 2019, Food Chain Crisis (FCC) threats are expected to occur in Africa, the Americas, Asia, Europe, and Oceania. In these regions, they may persist within a country, spread to neighbouring countries, remain latent, or re-emerge or amplify.

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

With regard to food security, and according to the latest "Crop prospects and food situation" report (covering the period October–December 2019), FAO estimates that globally, 41 countries (31 in Africa, 8 in Asia and 2 in the Americas) need 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 plant and forest pests and diseases, locusts and animal and aquatic diseases were monitored and forecasted by FAO experts for the period October–December 2019. A total of **245** forecasts were conducted in **113** countries.

OVERVIEW FORECAST FOR THE PERIOD OCTOBER–DECEMBER 2019

TABLE 3: Potential food chain threats[1] forecasted for the period October–December 2019

Continent	FCCs Threats	Plant pests and diseases	Forest pests and diseases	Locusts	Animal diseases	Aquatic diseases
AFRICA	15	■ Fall armyworm (FAW) ■ Cassava mosaic disease (CMD) ■ Cassava swollen shoot disease (CBSD) ■ Banana fusarium wilt disease (BFWD) ■ Banana bunchy top disease (BBTD) ■ Swollen shoot virus disease	■ Blue gum chalcid ■ Red gum lerp psyllid	■ Desert Locust ■ Migratory Locust ■ Red Locust	■ Rift Valley fever (RVF) ■ Foot-and-mouth disease (FMD) ■ *Peste des petits ruminants* (PPR) ■ Avian influenza (AI)	-
AMERICAS	3	■ Banana fusarium wilt disease (BFWD)	■ Bark beetles	-	■ Avian Influenza	
ASIA	10	■ Fall armyworm (FAW) ■ Banana fusarium wilt disease (BFWD)	■ Boxwood blight ■ Dry cone syndrome	■ Desert Locust	■ African swine fever (ASF) ■ Foot-and-mouth disease (FMD) ■ Avian Influenza (AI) ■ Lumpy skin disease	■ Tilapia lake virus (TiLV)
EUROPE	5	■ *Xylella fastidiosa* on olive trees	■ Pine processionary moth	-	■ African swine fever (ASF) ■ Lumpy skin disease (LSD) ■ *Peste des petits ruminants* (PPR)	-
TOTAL by FCC category		7	5	3	5	1

[1] Moderate-high likelihood

REGIONAL OVERVIEW FORECAST FOR THE PERIOD OCTOBER–DECEMBER 2019

AFRICA

In Africa, 120 FCC threats in 46 countries were forecasted, comprising plant pests and diseases, locusts, animal and aquatic diseases, and forest pests. The likelihood of occurrence varies from low to high. The following FCC events have significant regional implications:

PLANT PESTS AND DISEASES

- **Fall Armyworm (FAW) –** *Spodoptera frugiperda*
  - In **East Africa, Fall armyworm** (*Spodoptera frugiperda*), or FAW, presence has now been confirmed in all countries except Djibouti. In most East African countries, the forecast period coincides with the short rainy season. Unless appropriate action is taken, the likelihood of spread and damage will be high because the pest will have access to significant amounts of maize, which is its preferred host.
  - In **North Africa**, FAW has been reported in southern Egypt in maize, and is expected to continue spreading to the north of the country (the Nile Delta region). The climate conditions in this forecast period in Egypt and the Sudan may allow for continuous planting of host plants, which may increase the likelihood of spread and damage. There will be a low risk of FAW introduction to southern Algeria and southern Mauritania from their neighbouring countries to the south.
  - In **Southern Africa**, FAW was initially reported in some countries at the end of 2016. It is now present throughout the entire Southern African subregion, although the pest has not yet been reported in Lesotho. FAW may spread and increase as most countries will have maize during the forecast period, this will be subject to the weather conditions.
  - In **Central Africa**, FAW will spread and increase in those countries where maize will be present during the forecast period.
- In **East Africa**, the chances of **wheat rust** epidemics are forecasted as moderate due to inoculum built up in previous seasons. The severity of yellow and stem rust may escalate in areas where the rainfalls increase. **Cassava mosaic** and **brown streak diseases** continue to be effective and may amplify where weather conditions will be favourable. **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 subregion during this forecast period, because it generally coincides with the relatively warm, short rainy season during which large quantities of tomato are cultivated. Tomato is mainly produced during the warm season, when the atmospheric conditions also happen to be favourable for the pest to flourish. If left uncontrolled under these conditions, leaf miner infestations are typically high and can lead to significant yield losses.
- In **North Africa**, **Tomato leaf miner** will have a lower possibility of spread, as the main host plants are not yet grown in open fields.
- In **Central Africa**, **Banana bunchy top disease** continue to be a problem in some countries in the region and can escalate. Similarly, **Cassava mosaic** and **brown streak diseases** may also amplify where weather conditions will be favourable.

REGIONAL OVERVIEW FORECAST FOR THE PERIOD OCTOBER–DECEMBER 2019

AFRICA

LOCUSTS

- In **East Africa,** winter breeding of **Desert Locust** will occur on the Red Sea coast of the Sudan and Eritrea, and on the northwest coast of Somalia. Breeding may occur in Ethiopia and on the Somalia plateau. Locusts could move south to the Ogaden in Ethiopia, towards Kenya.

  The current development of **Red Locust** swarms in all of its continental habitats will be fostered by grass burning and hot and dry weather in most countries.

- In **South Africa,** in Madagascar, **Migratory Locust** breeding is expected with the onset of the rainy season.
- In **North Africa**, no significant Desert Locust developments are expected.
- In **West Africa**, no significant Desert Locust developments are expected.

ANIMAL DISEASES

- **Avian influenza (AI)**

  H5N1 and H5N8 Highly Pathogenic Avian Influenza (HPAI) viruses may sporadically cause new outbreaks in some countries. However, overall, the risk is considered nil to low for the forecast period, given the observed seasonality of the disease. Only in Egypt, where H5 HPAI viruses are circulating endemically, the risk is considered to be moderate, with the number of outbreaks expected to increase towards December.

  H9N2 Low Pathogenic Avian Influenza (LPAI) is considered endemically circulating in many African countries, causing losses to poultry production.

  - In *North Africa*, circulation of H5N1 HPAI, H5N8 HPAI and H9N2 LPAI is expected to continue in Egypt at a moderate intensity and to increase towards December 2019.
  - In *West Africa*, H5N8 HPAI reemerged in end 2018 in Nigeria. since then the country has not reported any outbreaks but continued circulation of the virus cannot be ruled out. The risk of occurrence of the disease for the period October-December 2019 is therefore considered low.
  - In *Central and East Africa*, reports of H5N8 HPAI virus have ceased, and the risk for the period October–December 2019 is considered nil.
  - In *Southern Africa*, the latest reports of H5N8 HPAI virus in South Africa and Namibia were reported in June–August 2019. As the warmer season is approaching in this hemisphere, the risk for the period October–December 2019 is considered nil in Namibia and low in South Africa.

  It should be noted that this assessment is based on relatively scarce data, given that, for example, LPAI viruses are not notifiable to the OIE and countries with endemic circulation of HPAI viruses are not required to report every individual Avian influenza event.

REGIONAL OVERVIEW FORECAST FOR THE PERIOD OCTOBER–DECEMBER 2019

AFRICA

Foot-and-mouth disease (FMD), serotype O

- In *Northern Africa* (Algeria, Libya, Mauritania, Morocco and Tunisia) and *West Africa* (Burkina Faso, Chad, Côte d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Mali, the Niger, Nigeria, Senegal and Sierra Leone) several FMD outbreaks, serotype O, were reported from July 2018 and July 2019. The virus observed appears to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and throughout the region, where livestock is not immunized against this particular strain of the virus. Exceptionally, in recent years, FMD has also been observed in small ruminants (Senegal, Mali, Mauritania, Morocco, Algeria, Tunisia, etc.), reflecting an unusual trend and likely new strains or subtypes circulating in the subregion.
- In *Southern and East Africa*, FMD, serotype O, which re-emerged in Zambia in August 2018, is likely to continue to occur in the Zambia (in non-vaccinated areas). These events are of concern because the disease may spread from Zambia into the Southern Africa region, reaching countries that have never been affected by this particular serotype (e.g. Botswana, Namibia and Zimbabwe). If this happens, the impact would be huge on the subregion's beef-exporting countries. In Comoros, an FMD, serotype O outbreak occurred in March 2019. The disease may have spread from the neighbouring United Republic of Tanzania (where it is endemic); this event is of concern because the disease can spread within Comoros itself or into neighbouring countries, such as Mozambique or Madagascar, through the movement of animals.

Peste des petits ruminants (PPR)

- PPR was first reported in Burundi in January 2018 and has been under control through mass vaccination. The first occurrence of PPR in Angola was recorded in December 2012. The following measures were undertaken: movement control inside the country, vaccination in response to the outbreak(s) and quarantine. Since then, no further outbreak was reported. Namibia was declared free on a zonal basis south of the veterinary cordon fence. Outbreaks continued to be reported in the United Republic of Tanzania and the Democratic Republic of the Congo at the end of 2018; these countries are considered endemic for PPR. The disease is likely to spread through small ruminant movement and pastoralism along border areas; in this way, it may be introduced into neighbouring Malawi, Mozambique and Zambia. Other countries in the region are either PPR-free or have never reported the disease, including Madagascar, which was declared free from the disease in 2018.

Rift Valley fever (RVF)

- *Central and Eastern Africa*: During the past three months above-average and heavy rainfall and flash floods occurred in the region particularly during the end of August and early September as well as in early October 2019. The precipitation forecasts predict above-average rains for the coming period (October-December 2019) for Chad, Central African Republic, southern the Sudan and the whole eastern Africa region. According to the FAO RVF Monitoring/Early Warning tool, there are large areas at risk of RVF vector amplification in central-southern Chad, western-central Kenya, central-southern the Sudan, eastern-southern Sudan, northern Uganda, and northern Tanzania. In August 2019, the first confirmed case ever of RVF in humans was reported in Bangui, Central African Republic. In early October 2019, media reported suspected cases of RVF in humans and animals in Red Sea state (north-eastern Sudan)

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AFRICA

and cases of hemorrhagic fever in humans in Kassala (eastern Sudan) and North Darfur states (western Sudan). Considering the past and recent RVF outbreaks occurrence in the region, Chad, Kenya, the Sudan, South Sudan and Central African Republic could be considered at high risk of RVF occurrence. The other countries of the region could be considered at moderate risk of RVF due to the predicted suitability for RVF vector amplification as well as animal movement of potential infected animals.

- *Southern Africa:* The precipitation forecasts predict from normal to below-normal rains for the coming period (October–December 2019) for the whole southern African region, except for northern Mozambique. The FAO RVF Monitoring/Early Warning tool highlights a large area at risk of RVF vector amplification in north and center Mozambique. The latter was an area heavily hit by the cyclone Idai in March 2019. Extensive and protracted flooding and retain of water may have increased the vegetation cover in the area, thus enhancing the suitability for vector amplification. These areas could be considered at moderate risk of RVF occurrence. Small localized risk areas for vector amplification are also predicted in central South Africa and south-west Madagascar. Where, the risk could be considered low.
- *West Africa:* During the past months, wet conditions were observed over much of West Africa, except for Senegal and Mauritania. Abundant and torrential rains fell over southern and central Mali, Guinea-Conakry, Cote d'Ivoire, Burkina Faso, Togo, Benin, the Niger and southern Nigeria. In September 2019, torrential rains in Mali and Senegal damaged infrastructure and crops over many local areas. Above-normal rains is predicted for October 2019 maintaining the flood in these areas. The precipitation forecasts for November and December 2019 predict normal rains in the region. According to the FAO RVF Monitoring/Early Warning tool, and given the current presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals, a potential risk of RVF occurrence can be considered along the Senegal River between Mauritania and Senegal, in east-central Senegal, in larger areas in central Mali, in south-eastern Mauritania and in small, localized, areas in the Niger. These countries could be considered at low to moderate risk.

FOREST PESTS AND DISEASES

- In **Eastern Africa, Blue gum chalcid, Bronze bug** and **Red gum lerp psyllid** insect pests are likely to continue spreading, causing severe damage in eucalyptus nurseries and plantations. Applications of biological control agents to reduce these insect pest populations are in progress in some countries.

  The polyphagous shot hole borer is likely to spread from South Africa to neighbouring countries.

AQUATIC ANIMAL DISEASES

- In **Southern Africa**, Zambia is at risk of re-emergence of the fish disease **Epizootic Ulcerative Syndrome (EUS)**. The United Republic of Tanzania is at risk of EUS introduction as the disease is present in neighbouring countries (Congo and Zambia). Water temperatures during the period October–December in these countries range between 18 and 25°C, optimal temperatures for the development of the oomycete fungus that causes the disease.

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AFRICA

- **Tilapia lake virus (TiLV)** may have a wider distribution than presently known. Based on an expert knowledge elicitation risk assessment for TiLV (http://www.fao.org/3/CA2864EN/ca2864en.pdf), the risk of TiLV spreading (in the absence of any controls) within a country where it is already present was found to be very high, whereas the risk of TiLV spreading from infected countries to other countries in the African region was found to be high.

  High awareness and vigilance for TiLV are required in tilapia-producing countries in North Africa (including Egypt, the world's second largest tilapia producer), Eastern Africa (which includes major tilapia-producing countries such as Kenya, the Sudan, Uganda, etc.), and Southern Africa (where major tilapia-producing countries such as Malawi, Mozambique, the United Republic of Tanzania, Zambia, Zimbabwe, etc. are located). A surveillance plan may be necessary to determine the geographical extent of the spread and to prepare mitigation measures to limit it. Appropriate diagnostic testing is encouraged when unexplained mortalities of tilapia occur. Testing is particularly required when clinical signs are similar to those reported for TiLV and when permissive water temperatures (between 22°C and 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 and 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*.).

REGIONAL OVERVIEW FORECAST FOR THE PERIOD OCTOBER–DECEMBER 2019

AMERICAS

In the Americas, 8 FCC threats in **7** countries were forecasted, comprising aquatic diseases and forest pests. The likelihood of occurrence varies from low to high. The following FCC events have significant regional implications:

PLANT PESTS AND DISEASES

- **Banana fusarium wilt disease, Tropical Race 4,** has been detected in Colombia recently and may spread further within the country. New incursions may occur in the region.

ANIMAL DISEASES

- **African swine fever (ASF)**

  A risk of **African swine fever (ASF)** spreading in America from Asian or European infected countries cannot be excluded.

  The risk of further spread of ASF within the region is considered moderate to high, through movement of live pigs and pork products from infected countries.

FOREST PESTS AND DISEASES

- Infestations of **Bark beetles**, in particular *Dendroctonus frontalis*, are occurring in the dry corridor of Central America and will continue in the pine forests of Guatemala, Honduras and Nicaragua. Pine species *Pinus caribea*, *Pinus oocarpa* and *Pinus patula* within natural forests and plantations have become more vulnerable to the beetles' attacks because they are already stressed by prolonged drought and weakened due to poor forest management practices.

AQUATIC ANIMAL DISEASES

- Based on an expert knowledge elicitation risk assessment for **Tilapia Lake virus (TiLV)** (**http://www.fao.org/3/CA2864EN/ca2864en.pdf**), the risk of TiLV spreading (in the absence of any controls) within a country where it is already present was found to be very high, whereas the risk of TiLV spreading from infected countries to other countries in the South American region was found to be high.

  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 and 32°C. The following farmed tilapia species are susceptible: Hybrid tilapia (*Oreochromis niloticus* x *O. aureus* hybrids), Nile tilapia (*O. niloticus*) and Red tilapia (*Oreochromis sp.*). According to the scientific literature, TiLV is already present in Colombia and Ecuador; in an OIE notification, it was reported that TiLV is also present in Mexico, Peru and the United States of America. The disease may become a threat to other tilapia-producing countries in the Latin America and the Caribbean (LAC) region.

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ASIA

In Asia, a total of 78 FCC threats were forecasted in 33 countries, comprising plant pests and diseases, locusts, animal and aquatic diseases, and forest pests. The likelihood of occurrence varies from low to high. The following FCC events have significant regional implications:

PLANT PESTS AND DISEASES

- **Fall Armyworm (FAW) –** *Spodoptera frugiperda*

  In **Southeast Asia**, **Fall Armyworm (FAW)** has been reported in most countries of the subregion. It is expected to continue to spread within tropical countries; however, it will decline in temperate countries as temperatures become cold.

  In **West Asia**, Yemen officially declared the introduction of FAW in 2018. This may increase the risk of introduction of the pest to other neighbouring countries, such as Saudi Arabia and Oman.

  In **Southeast Asia**, **Banana fusarium wilt disease, Tropical race 4,** has been active and may expand into new areas and cause damage.

  In **Southern Asia**, **Banana fusarium wilt disease, Tropical race 4,** has been active in Southern Asia and was recently reported in India and Pakistan. It can spread further internally and cause damage.

LOCUSTS

- In **South Asia,** summer breeding of **Desert Locust** will end along the Indo–Pakistan border, where groups and small swarms will form and move west to the spring breeding areas of southwest Pakistan and southeast Iran; however, breeding is not likely to occur until temperatures warm up in the spring.

  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.

  In **West Asia,** swarms of **Desert Locust** will form in the Yemen interior and move to coastal areas to breed, causing additional hopper bands and swarms to form. Winter breeding will cause locust numbers to increase along the Red Sea coast of Saudi Arabia, where locusts will form groups and perhaps small bands and swarms.

ANIMAL DISEASES

- **Avian Influenza (AI)**

  Based on seasonal patterns and the decreasing temperature during this forecast period, an increase in numbers of **Avian Influenza (AI)** outbreaks in poultry is generally expected during the period October–December 2019. Four main **Highly Pathogenic Avian Influenza (HPAI)** subtypes and several H5 clades are endemically circulating in West, East, South and Southeast Asia. New outbreaks of these subtypes are at **a low to moderate** risk of occurring in the region during the forecast period, with an expected increase towards December 2019.

REGIONAL OVERVIEW FORECAST FOR THE PERIOD OCTOBER–DECEMBER 2019

ASIA

- **H9N2 Low Pathogenic Avian Influenza (LPAI)** is considered to endemically circulate in many Asian countries, causing losses to poultry production.
- **H5N1 HPAI** continues to endemically circulate in Bangladesh, China, India, Indonesia and Viet Nam, and re-emerged in Cambodia, the Lao People's Democratic Republic and Malaysia in 2018, and in Bhutan and Nepal in April–May 2019. This serotype was last reported in Nepal in September 2019.
- **H5N2 HPAI** is circulating in Taiwan, Province of China and was last observed in August 2019.
- The latest reports of **H5N6 HPAI** in Asia were made in August 2019 in Viet Nam and China (one human infection), while in Cambodia, the last outbreak was observed in March 2019.
- The **H5N8 HPAI** strain currently circulating, which emerged in China in May 2016, has spread to Japan, India, the Islamic Republic of Iran, Nepal, the Republic of Korea, Pakistan, Israel and Kuwait (December 2016); Kazakhstan (January 2017); and Saudi Arabia (in December 2017). In 2019, H5N8 HPAI has been reported so far in the Islamic Republic of Iran, Pakistan, Kuwait and Iraq, and in April 2019, in Israel.

It should be noted that this assessment is based on relatively scarce data, given that, for example, LPAI viruses are not notifiable to the OIE and countries with endemic circulation of HPAI viruses are not required to report every individual AI event.

- **African swine fever (ASF)**

ASF continues to be reported in the region. China (since August 2018); Mongolia (January 2019); Viet Nam (February 2019); Cambodia (April 2019); the Democratic People's Republic of Korea (May 2019); the Lao People's Democratic Republic (June 2019); Myanmar (August 2019); and the Philippines, the Republic of Korea and Timor Leste (September 2019) have reported outbreaks in domestic pigs and sporadic cases in wild boar (mainly captive).

The disease was also reported for the first time in wild boar in Jilin and Heilongjiang province in China in December 2018. As of 12 September 2019, outbreaks continue to be reported in Cambodia, China, the Lao People's Democratic Republic, the Democratic People's Republic of Korea, Myanmar, the Philippines, the Republic of Korea and Viet Nam. Over the last few months, there have been numerous detections of ASF virus in pork samples brought to countries in the region (e.g. Australia, Thailand and Japan). The risk of further spread of ASF within the countries is considered high in countries that have already been infected, which also poses a risk of ASF introduction into other countries in East and Southeast Asia, through movement of live pigs and pork products. As the majority of pigs are produced in Asia, especially China, the recent escalation of the ASF epidemic is likely to have devastating consequences for animal health and food security, as well as a noticeable impact on the pig industry and related businesses, not only in the region but worldwide.

- **Foot-and-mouth disease (FMD)** is likely to continue to occur in *West Asia*. Currently, serotypes O and A are circulating in Israel, while serotype O have been reported in the Gaza Strip and in Jordan in 2017, and in April 2019 in the West Bank. In these three locations, a significant number of not-typed events were reported in 2018–2019.

REGIONAL OVERVIEW FORECAST FOR THE PERIOD OCTOBER–DECEMBER 2019

ASIA

- **Lumpy skin disease (LSD)**
  - In *West and Central Asia*, outbreaks are likely to re-emerge in Turkey (which is considered endemic for the disease) and in neighbouring Caucasus countries (i.e. Azerbaijan, Armenia and Georgia) due to the increasing of temperatures, which determines favourable weather conditions for vector amplification during the forecast period. The impact of the disease can be mitigated through prevention measures implemented in the countries (i.e. vaccination).
  - In *South Asia,* LSD was reported for the first time ever in September 2019, in Bangladesh. There is concern for spread of the disease within Bangladesh and in neighbouring countries.
- ***Peste des petits ruminants* (PPR)** outbreaks are likely to continue to be reported in China and Israel. The last detection of the disease in China occurred in June 2018, while in Israel, the last outbreak occurred in July 2019. PPR is likely to be introduced in eastern oblasts of the Russian Federation due to the presence of the disease in neighbouring China.

FOREST PESTS AND DISEASES

- **Boxwood blight** (pathogen *Calonectria pseudonaviculata*) and **Boxwood moth** (*Cydelima pesrpectalis*) will cause further damage to boxwood trees (*Buxus hyrcana*), an IUCN threatened species, in Georgia and in the Caspian forest of the Islamic Republic of Iran.
- In Lebanon, **Dry cone syndrome** and **Western conifer seed bug** are causing severe losses to the pine nut harvest, and pest damage will continue; however, the activities of the Western conifer seed bug will decrease due to the colder temperatures prevailing in winter months.
- In Turkey, the **Chestnut gall wasp** is causing damage to chestnut trees and threatening the livelihoods of local communities. Biological control is in progress to reduce pest populations. In the Islamic Republic of Iran, a low incidence of **Charcoal disease** is likely to continue in oak forests in the Zagros area.

AQUATIC ANIMAL DISEASES

- Based on an expert knowledge elicitation risk assessment for **Tilapia lake virus** (TiLV) (http://www.fao.org/3/CA2864EN/ca2864en.pdf), the risk of TiLV spreading (in the absence of any controls) within a country where it is already present was found to be very high, whereas the risk of TiLV spreading from infected countries to other countries in Asia (including in East and South Asia, which host the world's major tilapia-producing countries such as China, Indonesia, the Philippines, Thailand, Bangladesh, Viet Nam, Myanmar, etc.) was found to be high.

  TiLV is likely to occur in countries where water temperatures range between 22°C and 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*.).

REGIONAL OVERVIEW FORECAST FOR THE PERIOD OCTOBER–DECEMBER 2019

EUROPE

In Europe, 38 FCC threats were forecasted in 27 countries, comprising locusts and animal diseases. The likelihood of occurrence varies from low to high. The following FCC events have significant regional implications:

PLANT PESTS AND DISEASES:

In **Southern Europe,** olive decline caused by *Xylella fastidiosa* has caused significant damage to olives in the Puglia region of Italy, and has been reported afterwards from the Balearic Islands of Spain and more recently from two sites on the Mediterranean coast of France. There is a significant risk of its further spread in southern Europe and even North Africa.`

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, Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Republic of Moldova, Serbia, Slovakia, the Russian Federation and Ukraine). Introduction of the disease is likely to occur in currently unaffected neighbouring countries (particularly in the Balkan peninsula, such as Albania, Bosnia and Herzegovina, Croatia, Kosovo[1], Montenegro and the Republic of North Macedonia), without ruling out longer jumps such as those observed in Czechia or Belgium. Czechia was the first country in the European Union (EU) to be officially declared free from ASF in February 2019 after no new outbreak had been found in the country since April 2018. In September 2018, the virus affected the wild boar population in Belgium. This increased the possibility of introduction of the disease into neighbouring Western European countries (e.g. France, Germany and Luxembourg). In all affected countries, ASF is likely to persist and become endemic due to the presence of wild boar populations.
- **Avian Influenza (AI)**
  - Two **H5 Highly pathogenic avian influenza (HPAI)** subtypes are circulating in Europe. In accordance with seasonal patterns (decreasing temperatures and starting wild bird migration movements), the overall risk for the period October–December 2019 is considered low to moderate.
  - A low risk of **H5N8 HPAI** occurrence in affected European countries exists. Since the virus was first introduced into Eastern Europe in mid-October 2016, it has been detected in 30 out of 43 European countries, particularly in Western and Eastern Europe. In 2019, the reported number of infections decreased drastically, and the disease affected mainly domestic poultry in Bulgaria and the Russian Federation. The last detection of the strain occurred in April 2019 in Bulgaria. Nonetheless, the strain may be reintroduced by wild birds, and may be detected sporadically during the forecast period.

[1] *References to Kosovo shall be understood to be in the context of UN Security Council Resolution 1244 (1999).*

REGIONAL OVERVIEW FORECAST FOR THE PERIOD OCTOBER–DECEMBER 2019

EUROPE

- In 2018, a local reassortant strain of the **H5N6 HPAI** virus, and thus different from the strain circulating in Asia, was detected in wild and domestic birds in Denmark, Finland, Germany, Ireland, the Netherlands, Slovakia, Sweden, Switzerland and the United Kingdom of Great Britain and Northern Ireland. This strain may continue to be sporadically detected during the period October–December 2019 given the decreasing temperatures expected during the approaching winter season in Europe and associated wild bird movements. The last report of this H5N6 HPAI strain occurred in Denmark in January 2019.

- ***Peste des petits ruminants*** **(PPR**) is likely to be introduced in eastern oblasts of the Russian Federation due to the presence of the disease in neighbouring China.

- **Lumpy skin disease (LSD)** is unlikely to occur in affected countries of Southern Europe (i.e. Greece, Serbia, Kosovo, Albania, Montenegro and the Republic of North Macedonia) and the Russian Federation because during the forecast period, temperatures will decrease, determining unfavourable weather conditions for vector amplification.

FOREST PESTS AND DISEASES

- **Bark beetle** infestations will continue to damage pine plantations in Belarus and Ukraine. Application of silvicultural measures and removal of infested and weakened trees in forests during the winter months are appropriate measures to reduce outbreaks in spring. In Albania, the **Pine processionary moth** is likely to continue causing damage in pine forests.

REGIONAL OVERVIEW FORECAST FOR THE PERIOD OCTOBER–DECEMBER 2019

OCEANIA

- In **Australia**, **Banana fusarium wilt disease, Tropical Race 4,** is present in two locations in the north of the country; further spread is possible. The fungus also poses a threat to other banana-producing countries in the region.

SHORT TAKE ON: TROPICAL RACE 4 (TR4)

WHAT: **Banana fusarium wilt (FW)** is a disease caused by the fungus *Fusarium oxysporum* f.sp. *cubense*. The fungus (abbreviated as Foc), is soilborne and infects banana plants through the roots. As it gradually grows within the plant, it blocks the vascular tissues, with no visible external symptoms in the initial stages. In general, as the infection develops, leaf margins first start yellowing, and then dry up completely when the vascular system is blocked. This results in complete wilting and death of the infected plants.

The disease has been recognized as a major threat to bananas for more than a century. Of current concern is a specific race of the fungus, Tropical Race 4 (TR4). It affects most banana varieties, including the Cavendish variety, which accounts for approximately half of global banana production and dominates the international market.

Scientific reports indicate the presence of TR4 in numerous countries in Asia (China, mainland and Taiwan, Province of China), India, Indonesia, Israel, Jordan, the Lao People's Democratic Republic, Lebanon, Malaysia, Myanmar, Pakistan, the Philippines, Oman and Viet Nam); in Africa (Mozambique); Australasia (Queensland and the Northern Territory, Australia); Europe (an indoor rainforest biome in the United Kingdom of Great Britain and Northern Ireland); and Latin America (Colombia).

WHY: TR4 is considered the greatest challenge to banana for several reasons: (i) there are no means to eradicate the disease completely from infected soils; (ii) currently, there is no consumer-accepted resistant variety that can be readily used in place of Cavendish; (iii) if not contained immediately in sites where the disease is detected, the fungus can cause a loss of 100 percent in infested plantations; (iv) 400 million people rely on banana as their staple food or as a source of income. As of today, 100 000 ha of banana have been affected by TR4, mostly in Asia. Scientists estimate that if no measures are taken, TR4 has the potential to spread to 1.7 million ha by 2040 – equivalent to 15 percent of the current banana-grown area, producing fruits worth USD 10 billion per year.

HOW: FAO has alerted the global community on outbreaks and escalation of the disease through numerous new releases and events at global, regional and local levels. FAO, together with Bioversity International, the International Institute of Tropical Agriculture (IITA) and the World Banana Forum (WBF), has developed a global programme to promote preventive approaches and support efforts for preparedness and management of the disease. In addition, FAO has provided technical assistance and policy guidance to affected countries to limit the spread of the disease.

WHERE: Upon detection of TR4 for the first time in Africa, an FAO emergency Technical Cooperation Project (TCP) has been implemented in Mozambique. Recently, three dedicated TR4 technical sessions have been organized during the regional workshops of the International Plant Protection Convention (IPPC) for Africa, Latin America and Caribbean; these took place in Kenya, Colombia and Antigua and Barbuda respectively.

A regional TCP is soon to be completed in Southeast Asia, assisting development of capacities of Cambodia, China, p. 17 please spell out the Lao People's Democratic Republic, Myanmar, Thailand and Viet Nam. With regard to countries of the Southern African Development Community, the topic has been included among the target pests, to develop capacities for integrated pest management and to improve agricultural production and trade. A new TCP has been initiated to facilitate development of action plans and strengthening of national capacities in ten countries[1]* in Latin America and the Caribbean.

[1] *Ecuador, Colombia, Panama, Dominican Republic, Guatemala, Dominica, Saint Lucia, Jamaica, Suriname and Trinidad and Tobago.*

FOOD CHAIN CRISIS 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
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

FOOD CHAIN CRISIS THREATS FORECASTING AT COUNTRY LEVEL

AFRICA

ALGERIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2019): The possibility of introduction to the country is low.

Context: FAW has not been reported in Algeria yet. Egypt has reported the pest, which was able to cross the natural barrier of the Sahara Desert. Therefore, North African countries are at risk of FAW introduction.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (October-December 2019): Small-scale breeding may occur near the irrigated perimeters of the central Sahara and during October in the south; no significant developments are expected.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population may be affected by this voracious insect. 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 2019): Maize will be in the growing and harvesting stages. Therefore, there is a high risk of FAW amplification during the forecasting period.

Context: FAW was reported in 2017. More than 19 000 ha of maize, millet and sorghum crops were devastated, causing approximately US$ 1.8 million in damages, according to official reports.

BENIN

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: Benin was among the first countries to be affected by FAW in April 2016. Actions to monitor and manage the pest are ongoing through various projects.

BOTSWANA

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Foot-and-mouth disease, serotype O, is likely to occur in the country through introduction from a neighbouring country.

Context: FMD, serotype O outbreaks have occurred in Zambia since March 2018. The last FMD, serotype O outbreak was reported in Zambia in April 2019. These events are of concern because the disease may spread into the southern African region, which has never been affected by this particular serotype before. *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 disruptive animal disease for livestock trade.*

BURKINA FASO

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in western African countries (such as Burkina Faso, Chad, Côte d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Mali, the Niger, Nigeria, Mauritania, Senegal and Sierra Leone). The virus observed seems to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. Exceptionally, in recent years, FMD has also been observed in small ruminants (in Senegal, Mali and Mauritania), reflecting an unusual trend and likely new strains or subtypes circulating in the subregion. *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 disruptive animal disease for livestock trade.*

BURUNDI

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Maize will be in the growing stage. Therefore, there will be a moderate risk of FAW amplification during the forecasting period.

Context: FAW presence has been confirmed in all 17 provinces of the country; however, data on the incidence and severity of the damage are not available yet.

CAMEROON

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: The presence of FAW was detected in maize farms in the western region of Cameroon, in December 2015. FAW has been recorded in the ten regions of Cameroon. Initial yield losses due to *Spodoptera frugiperda* in Cameroon are estimated at 0.3–0.8 million tons, for a value of US$ 0.1–0.8 billion.

Threat category: Plant pests and diseases

Threat name: Banana bunchy top disease (BBTD)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): BBTD is likely to spread.

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

CENTRAL AFRICAN REPUBLIC

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: High

Forecast (October-December 2019): The potential risk of RVF occurrence is considered high, given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: During the past three months above-average and heavy rainfall and flash floods occurred in the region particularly during the end of August and early September as well as in early October 2019. The precipitation forecasts predict above-average rains for the coming period (October-December 2019) for Chad, Central African Republic, southern Sudan and the whole eastern Africa region. In August 2019, the first confirmed case ever of RVF in humans was reported in Bangui, Central African Republic. Chad, Kenya, the Sudan, South Sudan and Central African Republic could be considered at high risk of RVF occurrence. *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.*

CHAD

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (October-December 2019): Small-scale breeding will end and no significant developments are likely.

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

CHAD

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in western African countries (such as Burkina Faso, Chad, Côte d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Mali, the Niger, Nigeria, Mauritania, Senegal and Sierra Leone). The virus observed appears to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. *Exceptionally, in recent years, FMD has also been observed in small ruminants (Senegal, Mali, Mauritania), reflecting an unusual trend and likely new strains or subtypes circulating in the subregion. 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 disruptive animal disease for livestock trade.*

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: High

Forecast (October-December 2019): The potential risk of RVF occurrence is considered high, given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: During the past three months above-average and heavy rainfall and flash floods occurred in the region particularly during the end of August and early September as well as in early October 2019. The precipitation forecasts predict above-average rains for the coming period (October-December 2019) for Chad, Central African Republic, southern Sudan and the whole eastern Africa region. Chad, Kenya, the Sudan, South Sudan and Central African Republic could be considered at high risk of RVF occurrence. *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.*

COMOROS

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: In Comoros, an FMD, serotype O outbreak occurred in March 2019. The disease may have spread from the neighbouring United Republic of Tanzania (where it is endemic). This event is of concern because the disease can spread within Comoros itself or into neighbouring countries, such as Mozambique or Madagascar, through movement of animals. *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 disruptive animal disease for livestock trade.*

CONGO

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): Maize will be in the growing and harvesting stages during November and December. Therefore, there will be a moderate risk of FAW amplification during the forecasting period.

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 in sugar cane. Currently, the Government does not have a complete mapping of pest infestations, nor statistics on production losses. Smallholder farmers, experimental farms in agricultural centres and large private farms have been affected.

CÔTE D'IVOIRE

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: FAW prevalence in the country has been assessed and some regions may have not been infested by FAW yet. However, FAW is highly likely to spread to the entire country.

CÔTE D'IVOIRE

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in western African countries (such as Burkina Faso, Chad, Côte d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Mali, the Niger, Nigeria, Mauritania, Senegal and Sierra Leone). The virus observed appears to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. Exceptionally, in recent years, FMD has also been observed in small ruminants (in Senegal, Mali, Mauritania), reflecting an unusual trend and likely new strains or subtypes circulating in the subregion. *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 disruptive animal disease for livestock trade.*

Threat category: Plant pests and diseases

Threat name: Swollen shoot virus disease

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Spread of Swollen shoot virus disease of cocoa is very likely.

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

DEMOCRATIC REPUBLIC OF THE CONGO

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): Maize will be in the growing stage. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: FAW was first reported in the country in December 2016. Actions to manage the pest are ongoing.

DJIBOUTI

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): FAW is likely to be introduced into the country from neighbouring Ethiopia. Nevertheless, its spread will be limited because of the arid conditions prevailing and the limited availability of its preferred host (maize).

Context: The pest is suspected to be present; however, this has not been confirmed.

EGYPT

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): FAW may continue to spread as many of FAW's preferred host plants are cultivated in Egypt all year around, which increases the likelihood of dispersal.

Context: FAW has been reported in Upper Egypt in May 2019 on maize fields and continues to move north. If FAW reaches the delta, it could cause significant losses to maize unless strict monitoring and management actions are taken.

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are expected to increase towards December.

Context: H5N1 HPAI is endemic in Egypt. H5N8 HPAI has been present in the country since November 2016. HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AI viruses can affect humans.

ETHIOPIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): 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. Therefore, during the forecast period, FAW infestation is expected to be high.

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

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Continued breeding will cause locust numbers to increase in the Afar Regional state and in the eastern regions of the country. Locusts could appear in the Ogaden and move southwards.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population may be affected by this voracious insect. 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: Moderate

Forecast (October-December 2019): Outbreaks of wheat yellow and stem rust diseases are possible.

Context: These diseases are recurrent constraints. Epidemics are possible due to the presence of heavy inoculum loads from the previous season. The severity is forecasted as moderate; however, it may escalate if higher level of rainfalls are experienced. Wheat rusts infect mostly the leaves, reducing the photosynthesis area and resulting in a reduced number of, and shrivelled, 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: Low

Forecast (October-December 2019): FAW will be minimal and is envisaged to entail insignificant damage to the maize yield during the forecast period, because the maize will be in its maturity and harvesting stages.

Context: The presence of FAW was confirmed in all regions in the country in 2018. The great efforts made by the government and communities to manage the pest resulted in a decline in 2019, compared to 2018.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Breeding will cause locust numbers to increase, gregarize and form groups on the Red Sea coast.

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

ESWATINI

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): Maize will be in the growing stage. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: FAW was first detected in Big Bend and Siphofaneni in eastern Eswatini. Subsequent detection have been recorded in Lomahasha, Nkambeni and Mkhuzweni in the northeastern part of Eswatini. Isolated and one-off cases have been recorded in central and western Eswatini in young maize fields. The NPPO has intensified delimiting surveys in areas where the pest has been detected, that is, the eastern and central parts of the country.

GABON

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a moderate risk of FAW amplification during the forecasting period.

Context: In Gabon, FAW was first observed in 2017 in the provinces of Estuaire and Haut-Ogooué. Following these first observations, official surveys were carried out in the 9 provinces of Gabon mainly in maize crops, but also in rice, sugarcane and vegetable crops, to determine the extent of the outbreak. Survey results confirmed the presence of FAW in the 9 provinces of Gabon (in order of decreasing incidence: Woleu-Ntem, Ogooué Ivindo, Estuaire, Moyen Ogooué, Ngounié, Haut Ogooué, Nyanga, Ogooué Maritime, Ogooué Lolo). The pest was mainly found in maize crops, but it was also observed in sugarcane in the province of Nyanga. A national action plan has been elaborated to manage FAW in Gabon.

Threat category: Plant pests and diseases

Threat name: Banana bunchy top disease (BBTD)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): BBTD is likely to occur due to previous presence.

Context: The disease is currently present in the northern part of the country and has already affected banana production in recent years. BBTD is transmitted through infected cuttings or aphids and causes stunting and a bunchy appearance. If any fruit is produced, 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 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: Exceptionally, in recent years, FMD has also been observed in small ruminants (in Senegal, Mali, Mauritania), reflecting an unusual trend and likely new strains or subtypes circulating in the subregion. FMD, serotype O has been circulating since July 2018 in western African countries (such as Burkina Faso, Chad, Côte d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Mali, the Niger, Nigeria, Mauritania, Senegal and Sierra Leone). The virus observed appears to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. *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 disruptive animal disease for livestock trade.*

GHANA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): Maize will be in the growing and harvesting stages during November and December. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: FAW was first spotted in the Yilo Krobo district in the Eastern region of Ghana in 2016. Reports indicate that the country has lost US$ 64 million due to FAW infestation, which covered 20 000 ha of farmland in 2018 alone.

GHANA

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in western African countries (such as Burkina Faso, Chad, Côte d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Mali, the Niger, Nigeria, Mauritania, Senegal and Sierra Leone). The virus observed appears to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. *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 disruptive animal disease for livestock trade.*

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (October-December 2019): TiLV has not been reported. However, it may be introduced and spread through live fish movements of infected hosts.

Context: TiLV occurs when the water temperature is between 22°C and 32°C; it has also been observed in farms with large-sized fish and a high stocking density. In Ghana, high water temperatures occur from October to December.

GUINEA

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in western African countries (such as Burkina Faso, Chad, Côte d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Mali, the Niger, Nigeria, Mauritania, Senegal and Sierra Leone). The virus observed appears to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. Exceptionally, in recent years, FMD has also been observed in small ruminants (in Senegal, Mali, Mauritania), reflecting an unusual trend and likely new strains or subtypes circulating in the subregion. *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 disruptive 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 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in western African countries (such as Burkina Faso, Chad, Côte d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Mali, the Niger, Nigeria, Mauritania, Senegal and Sierra Leone). The virus observed seems to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. Exceptionally, in recent years, FMD has also been observed in small ruminant (in Senegal, Mali, Mauritania), reflecting an unusual trend and likely new strains or subtypes circulating in the subregion. *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 disruptive animal disease for livestock trade.*

KENYA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): FAW could increase and spread during the growing stage in December, in the short and long rain areas.

Context: FAW has been reported in 43 counties. Generally, FAW infestations in 2019 are expected to be lower compared to those occurring during the same season last year, because of enhanced preparedness resulting from farmer trainings, monitoring and improved FAW management practices for early action.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (October-December 2019): There is a very low risk of a few small swarms arriving in the northeast part of the country, from the neighbouring areas of Ethiopia and Somalia.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population may be affected by this voracious insect. 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 2019): The potential risk of RVF occurrence is considered high, given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: During the past three months above-average and heavy rainfall and flash floods occurred in the region particularly during the end of August and early September as well as in early October 2019. The precipitation forecasts predict above-average rains for the coming period (October-December 2019) for Chad, Central African Republic, southern Sudan and the whole eastern Africa region. Chad, Kenya, the Sudan, South Sudan and Central African Republic could be considered at high risk of RVF occurrence. *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. The other countries in the region can be considered at moderate risk.*

Threat category: Plant pests and diseases

Threat name: Wheat rust

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Outbreaks of wheat yellow and stem rust diseases are possible.

Context: These diseases have been present in the country for years. Epidemics are possible due to the presence of heavy inoculum loads from the previous season. The severity is forecasted as moderate; however, it may escalate if higher level of rainfalls are experienced. Wheat rusts infect mostly the leaves, reducing the photosynthesis area and resulting in a reduced number of, and shrivelled, grains. Regular surveys and timely response are essential for management.

Threat category: Plant pests and diseases

Threat name: Cassava brown streak disease (CBSD)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Spread of CBSD is likely.

Context: The disease is present in the northern part of the country on a limited scale. The disease can cause brownish rots in tubers, rendering them inedible, which leads to a severe loss of economic value. Farmers may be unaware that cassava crops are infected until they harvest and see the tuber lesions, as leaves may appear asymptomatic. The virus is transmitted through infected cuttings and whiteflies. Use of virus-free planting materials and the adoption of 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 2019): Spread of CMD is likely.

Context: The disease is present in the northern part of the country on a limited scale. CMD is considered one of the most damaging diseases of cassava in Africa. It is caused by a virus that causes chlorosis and distortions of the leaves, resulting in yield reductions. It is transmitted by infected cuttings and whiteflies.

LIBYA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): There is moderate possibility of FAW introduction over the next three months.

Context: FAW has not been reported in Libya yet. Egypt has reported the pest, which was able to cross the natural barrier of the Sahara Desert. Therefore, North African countries are at risk of FAW introduction.

LIBYA

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD serotype O strain occurred again in the country in April 2019, after the serotype had not been reported since 2014. *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 disruptive animal disease for livestock trade.*

MADAGASCAR

Threat category: Locusts

Threat name: Migratory Locust

Likelihood of occurrence: High

Forecast (October-December 2019): With the onset of the 2019/2020 rainy season in autumn, locust numbers may seriously increase.

Context: Madagascar is prone to frequent Migratory Locust 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. According to the national bulletins, the situation deteriorated during spring, when abundant precipitation created favourable conditions for locust development. Dense populations infested over 350 000 ha in April, forming swarms and hopper bands.

Threat category: Locusts

Threat name: Red Locust

Likelihood of occurrence: Low

Forecast (October-December 2019): Adults that have survived the dry and cool season will breed (unique generation of breeding of the 2019/2020 rainy season) and numbers will increase accordingly.

Context: The Red Locust produces much less frequent outbreaks than the Malagasy Migratory Locust.

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Foot-and-mouth disease, serotype O, is likely to occur in the country through introduction from a neighbouring country.

Context: In Comoros, an FMD, serotype O outbreak occurred in March 2019. The disease may have spread from the neighbouring United Republic of Tanzania (where it is endemic). This event is of concern because the disease can spread within Comoros itself or into neighbouring countries, such as Mozambique or Madagascar, through movement of animals. *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 disruptive animal disease for livestock trade.*

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Low

Forecast (October-December 2019): The potential risk of RVF outbreaks is considered low, according to the FAO RVF Monitoring/Early Warning System.

Context: The precipitation forecasts predict from normal to below-normal rains for the coming period (October-December 2019) for the whole southern Africa region, except for the northern Mozambique. Small localized risk areas for vector amplification are also predicted in central south Africa and south-west Madagascar. Here the risk could be considered low. *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.*

MALAWI

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: In November 2017, FAW was confirmed in Malawi. By December 2017, it had destroyed the crops of almost 140 000 farming families. This led to the Government declaring 20 of the country's 28 districts as disaster areas, following invasion by FAW.

MALAWI

Threat category: Locusts

Threat name: Red Locust

Likelihood of occurrence: Low

Forecast (October-December 2019): Scattered locust populations and low-density swarms were detected over 3 000 ha. The risks of developing large swarms is low; however, there is a risk of swarm invasion from the neighbouring United Republic of Tanzania.

Context: Red Locust plagues pose a major threat to agriculture in Southern Africa. Failure to control locust outbreaks during the early stages of development can result in highly mobile swarms, which invade agricultural areas and can cause major crop damage.

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country in non-vaccinated areas.

Context: FMD serotype O outbreaks have occurred in Zambia since April 2018. The last FMD, serotype O outbreak in Zambia was reported in February 2019. These events are of concern because the disease may spread into the southern Africa region, which has never been affected by this particular serotype before. *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 disruptive animal disease for livestock trade.*

Threat category: Animal and zoonotic diseases

Threat name: *Peste des petits ruminants* (PPR)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): *Peste des petits ruminants* (PPR) outbreaks are likely to occur through possible introduction from neighbouring countries.

Context: To date, no outbreaks of PPR have been officially reported in the country. PPR outbreaks continue to occur in the neighbouring United Republic 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 that is caused by a morbillivirus and is considered to be one of the most damaging livestock diseases in Africa.*

Threat category: Forest pests and diseases

Threat name: Red gum lerp psyllid

Likelihood of occurrence: High

Forecast (October-December 2019): Red gum lerp psyllid is highly likely to spread in eucalyptus plantations.

Context: The combination of climate change, with the general decline of forest conditions, and the occurrence of Red gum lerp psyllid continues to damage plantations and small woodlots.

Threat category: Forest pests and diseases

Threat name: Blue gum chalcid

Likelihood of occurrence: High

Forecast (October-December 2019): Outbreaks of the Blue gum chalcid insect are highly likely to continue to occur in eucalyptus nurseries and plantations.

Context: Blue gum chalcid continues to cause severe damages in nurseries and young eucalyptus plantations.

MALI

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (October-December 2019): Small-scale breeding will end and low numbers of adults are likely to persist in the Adrar des Iforas.

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

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The potential risk of RVF occurrence is considered moderate, given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: In September, torrential rains in Mali and Senegal damaged infrastructure and crops over many local areas. Above-normal rains is predicted for October 2019 maintaining the flood in these areas. The precipitation forecasts for November and December 2019 predict normal rains in the region. A low to moderate potential risk of RVF occurrence can be considered along the Senegal River between Mauritania and Senegal, in east-central Senegal, in larger areas in central Mali, in south-eastern Mauritania and in small, localized, areas in the Niger. *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.*

MALI

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in western African countries (such as Burkina Faso, Chad, Côte d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Mali, the Niger, Nigeria, Mauritania, Senegal and Sierra Leone).
The virus observed appears to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. *Exceptionally, in recent years, FMD has also been observed in small ruminants (Senegal, Mali, Mauritania), reflecting an unusual trend and likely new strains or subtypes circulating in the subregion. 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 disruptive animal disease for livestock trade.*

MAURITANIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2019): There is low possibility of FAW introduction to the country.

Context: FAW has not been reported in Mauritania yet.
Egypt has reported the pest, which was able to cross the natural barrier of the Sahara Desert. Therefore, North African countries are at risk of FAW introduction.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Small-scale breeding will end in the south and low numbers of locusts will move to the northeast, where limited breeding could occur; this would cause locust numbers to increase slightly.

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

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The potential risk of RVF occurrence is considered moderate, given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: In September, torrential rains in Mali and Senegal damaged infrastructure and crops over many local areas. Above-normal rains is predicted for October 2019 maintaining the flood in these areas. The precipitation forecasts for November and December 2019 predict normal rains in the region. A low to moderate potential risk of RVF occurrence can be considered along the Senegal River between Mauritania and Senegal, in east-central Senegal, in larger areas in central Mali, in south-eastern Mauritania and in small, localized, areas in the Niger. *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.*

MOROCCO

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2019): There is low possibility of FAW introduction to the country.

Context: FAW has not been reported in Morroco yet. Egypt has reported the pest, which was able to cross the natural barrier of the Sahara Desert. Therefore, North African countries are at risk of FAW introduction.

MOZAMBIQUE

Threat category: Locusts

Threat name: Red Locust

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Low- to medium-density locust concentrations may develop into large swarms, which could escape from the breeding areas.

Context: Red Locust plagues pose 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.

MOZAMBIQUE

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Foot-and-mouth disease, serotype O, is likely to occur in the country through introduction from a neighbouring country.

Context: In Comoros, an FMD, serotype O outbreak occurred in March 2019. The disease may have spread from the neighbouring United Republic of Tanzania (where it is endemic). This event is of concern because the disease can spread within Comoros itself or into neighbouring countries, such as Mozambique or Madagascar, through movement of animals. *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 disruptive animal disease for livestock trade.*

Threat category: Animal and zoonotic diseases

Threat name: *Peste des petits ruminants* (PPR)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): *Peste des petits ruminants* (PPR) outbreaks are likely to occur through possible introduction from neighbouring countries.

Context: To date, no outbreaks of PPR have been officially reported in the country. PPR outbreaks continue to occur in the neighbouring United Republic 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 to be 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 2019): The potential risk of RVF outbreaks is considered moderate, according to the FAO RVF Monitoring/Early Warning System.

Context: The precipitation forecasts predict from normal to below-normal rains for the coming period (October-December 2019) for the whole southern Africa region, except for the northern Mozambique. The FAO RVF Monitoring/Early Warning tool highlights a large area at risk of RVF vector amplification in north and center Mozambique. The latter was an area heavily hit by the cyclone Idai in March 2019. Extensive and protracted flooding and retain of water may have increased the vegetation cover in the area, thus enhancing the suitability for vector amplification. These areas could be considered at moderate risk of RVF occurrence. *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: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Spread of Fusarium wilt disease TR4 on banana is likely.

Context: The most recent race of the fungus causing Banana fusarium wilt disease (Tropical Race 4) has affected two farms in Nampula province. The fungus is soilborne and cannot be eradicated once it becomes established in the soil. The disease attacks banana plants of all ages, initially appearing with a yellowing of the leaves, then causing 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. The disease can remain viable in soil for decades and containment and management are challenging. Thus, prevention of spread is crucial.

Threat category: Forest pests and diseases

Threat name: Red gum lerp psyllid

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Red gum lerp psyllid outbreaks are likely to continue to occur in eucalyptus plantations.

Context: Monitoring of pest spread is in progress.

NAMIBIA

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Foot-and-mouth disease, serotype O, is likely to occur in the country through introduction from a neighbouring country.

Context: FMD, serotype O outbreaks have occurred in Zambia since March 2018. The last FMD, serotype O outbreak was reported in Zambia in April 2019. These events are of concern because the disease may spread into the southern African region, which has never been affected by this particular serotype before. *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 disruptive animal disease for livestock trade.*

NIGER

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (October-December 2019): Small-scale breeding will end in Tamesna and central pasture areas, and low numbers of locusts may persist in the Air Mountains.

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

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The potential risk of RVF occurrence is considered moderate, given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: In September, torrential rains in Mali and Senegal damaged infrastructure and crops over many local areas. Above-normal rains is predicted for October 2019 maintaining the flood in these areas. The precipitation forecasts for November and December 2019 predict normal rains in the region. A low to moderate potential risk of RVF occurrence can be considered along the Senegal River between Mauritania and Senegal, in east-central Senegal, in larger areas in central Mali, in south-eastern Mauritania and in small, localized, areas in the Niger. *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: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in western African countries (such as Burkina Faso, Chad, Côte d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Mali, the Niger, Nigeria, Mauritania, Senegal and Sierra Leone).
The virus observed appears to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. *Exceptionally, in recent years, FMD has also been observed in small ruminants (Senegal, Mali, Mauritania), reflecting an unusual trend and likely new strains or subtypes circulating in the subregion. 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 disruptive animal disease for livestock trade.*

NIGERIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: Capacities for FAW management have been strengthened through the implementation of various projects. However, more efforts will be required as the country is one of the most important producers of maize in the region.

NIGERIA

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (October-December 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: The 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 domestic birds across 26 states. The last 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, 18 outbreaks of H5N8 HPAI were reported between November 2016 and April 2019 (Bauchi, Edio, Kano, Nassarawa, Ogun and Plateau States). HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AI viruses can affect humans.

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in western African countries (such as Burkina Faso, Chad, Côte d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Mali, the Niger, Nigeria, Mauritania, Senegal and Sierra Leone).
The virus observed seems to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. *Exceptionally, in recent years, FMD has also been observed in small ruminants (Senegal, Mali, Mauritania), reflecting an unusual trend and likely new strains or subtypes circulating in the subregion. 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 disruptive animal disease for livestock trade.*

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (October-December 2019): TiLV has not been reported. However, it may be introduced and spread through live movements of infected hosts.

Context: TiLV occurs when the water temperature is between 22°C and 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: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): FAW may spread and increase with the onset of the maize season A.

Context: In March 2017, during field inspections in Rwanda, a number of maize and sorghum plants were found to be infested with FAW larvae. It was estimated that FAW impacted approximately 17 521 ha on a total of over 60 000 ha of maize during season B last year. FAW has infested all 30 districts of the country.

Threat category: Forest pests and diseases

Threat name: Red gum lerp psyllid

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Red gum lerp psyllid outbreaks are likely to continue to occur in eucalyptus plantations.

Context: The insect pest Red gum lerp psyllid has been damaging eucalyptus plantations since 2015 in Rwanda.
A survey to quantify the spread of the pest is being organized and approaches to manage the pest using biological control are under way.

Threat category: Forest pests and diseases

Threat name: Bronze bug

Likelihood of occurrence: High

Forecast (October-December 2019): The Bronze bug insect pest is highly likely to spread in eucalyptus plantations.

Context: The Bronze bug insect pest damages eucalyptus plantations. An assessment to quantify the spread of the pest is in progress.

SENEGAL

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in western African countries (such as Burkina Faso, Chad, Côte d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Mali, the Niger, Nigeria, Mauritania, Senegal and Sierra Leone). The virus observed appears to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. Exceptionally, in recent years, FMD has also been observed in small ruminants (in Senegal, Mali, Mauritania), reflecting an unusual trend and likely new strains or subtypes circulating in the subregion. *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 disruptive animal disease for livestock trade.*

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The potential risk of RVF occurrence is considered moderate, given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: In September, torrential rains in Mali and Senegal damaged infrastructure and crops over many local areas. Above-normal rains is predicted for October 2019 maintaining floods in these areas. The precipitation forecasts for November and December 2019 predict normal rains in the region. A low to moderate potential risk of RVF occurrence can be considered along the Senegal River between Mauritania and Senegal, in east-central Senegal, in larger areas in central Mali, in south-eastern Mauritania and in small, localized, areas in the Niger. *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.*

SIERRA LEONE

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in western African countries (such as Burkina Faso, Chad, Côte d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Mali, the Niger, Nigeria, Mauritania, Senegal and Sierra Leone). The virus observed appears to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. Exceptionally, in recent years, FMD has also observed in small ruminants (in Senegal, Mali and Mauritania), reflecting an unusual trend and likely new strains or subtypes circulating in the subregion. *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 disruptive animal disease for livestock trade.*

SOMALIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): FAW may spread and increase with the onset of the maize season.

Context: The first time FAW was seen in Somalia was end 2017. A major infestation occurred in maize, especially in the south and in northwest Somalia. FAW is now fully established across the country; farmers have neither adequate knowledge nor resources to manage the pest in their crops.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Small-scale breeding may occur on the northern plateau and is expected to commence on the northwest coast, causing locust numbers to increase slightly. This may be supplemented by groups and small swarms arriving from Yemen.

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

SOUTH AFRICA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: FAW larvae were detected in the Settlers area in mid-January 2017. Subsequently, FAW moths were detected in several areas in the Western Cape between June and August 2018. FAW is currently present in all provinces of South Africa. The level of FAW infestation varies locally, in terms of the climate and host availability.

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (October-December 2019): H5N8 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are likely to occur; however, a seasonal decline is expected.

Context: In June 2017, H5N8 HPAI virus was reported 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 August 2019. HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AI viruses can affect humans.

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Low

Forecast (October-December 2019): The potential risk of RVF outbreaks is considered low, according to the FAO RVF Monitoring/Early Warning System.

Context: The precipitation forecasts predict from normal to below-normal rains for the coming period (October-December 2019) for the whole southern Africa region, except for the northern Mozambique. Small localized risk areas for vector amplification are also predicted in central south Africa and south-west Madagascar. Here the risk could be considered low. *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: Blue gum chalcid

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Blue gum chalcid outbreaks are likely to continue to occur in eucalyptus nurseries and young plantations.

Context: The application of biological control agents to reduce the pest population is in progress.

SOUTH SUDAN

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: FAW was first reported in 2017 and the pest has now spread across the entire country. FAW presence has been reported in Magwi, Eastern Equatoria. The severity of the data reported from the Greater Equatoria and Bahr el Ghazal regions indicate that yield losses in maize could range between 20 to 50 percent. The losses in sorghum are expected to be lower, at approximately 10 to 30 percent, due to the greater resistance of the major varieties to the pest in 2018 season.

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: High

Forecast (October-December 2019): The potential risk of RVF occurrence is considered high, given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: During the past three months above-average and heavy rainfall and flash floods occurred in the region particularly during the end of August and early September as well as in early October 2019. The precipitation forecasts predict above-average rains for the coming period (October-December 2019) for Chad, Central African Republic, southern Sudan and the whole eastern Africa region. Chad, Kenya, the Sudan, South Sudan and Central African Republic could be considered at high risk of RVF occurrence. *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.*

SUDAN

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): The climate in the Sudan allows for continuous planting of FAW host plants, which increases the possibility of the pest spreading and causing damage.

Context: FAW was officially reported in the Sudan in 2017.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Summer breeding wil end in the interior. The locusts will move to the the Red Sea coastal plains and breed on a small scale. Additional locusts from Eritrea may appear on the coast.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population may be affected by this voracious insect. 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 2019): The potential risk of RVF occurrence is considered high, given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: During the past three months above-average and heavy rainfall and flash floods occurred in the region particularly during the end of August and early September as well as in early October 2019. The precipitation forecasts predict above-average rains for the coming period (October-December 2019) for Chad, Central African Republic, southern Sudan and the whole eastern Africa region. In early October 2019, media reported suspected cases of RVF in humans and animals in Red Sea state (north-eastern Sudan) and cases of hemorrhagic fever in humans in Kassala (eastern Sudan) and North Darfur states (western Sudan). Chad, Kenya, the Sudan, South Sudan and Central African Republic could be considered at high risk of RVF occurrence. *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.*

TOGO

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: A project funded by the African Development Bank will start soon and will focus on FAW monitoring, surveillance and management.

TUNISIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2019): There is low possibility of FAW introduction to the country.

Context: FAW has not been reported in Tunisia yet. Egypt has reported the pest, which was able to cross the natural barrier of the Sahara Desert. Therefore, North African countries are at risk of FAW introduction.

UGANDA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Maize will be in the growing stage. Therefore, there will be a moderate risk of FAW amplification during the forecasting period.

Context: FAW is present in all districts of Uganda, causing yield losses between 15 and 75 percent. An estimated 450 000 metric tonnes of maize, equivalent to US$ 192 million, was lost during the first cropping season of 2017, directly affecting 3.6 million people (9 percent of the population).

UGANDA

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The potential risk of RVF occurrence is considered moderate, given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: During the past three months above-average and heavy rainfall and flash floods occurred in the region particularly during the end of August and early September as well as in early October. The precipitation forecasts predict above-average rains for the coming period (October-December 2019) for Chad, Central African Republic, southern Sudan and the whole eastern Africa region. Northern Uganda could be considered at moderate risk of RVF due to the predicted suitability for RVF vector amplification as well as animal movement of potential infected animals. *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: Cassava mosaic disease (CMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Spread of Cassava mosaic disease (CMD) is likely.

Context: The disease is already affecting cassava production in the country. CMD is considered one of the most damaging diseases of cassava in Africa. It is caused by a virus that causes chlorosis and distortions of the leaves, resulting in yield reductions. It is transmitted by infected cuttings and whiteflies.

Threat category: Plant pests and diseases

Threat name: Cassava brown streak disease (CBSD)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Spread of CBSD is likely.

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

Threat category: Forest pests and diseases

Threat name: Blue gum chalcid

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Blue gum chalcid is likely to spread in eucalyptus nurseries and plantations.

Context: The Blue gum chalcid insect currently causes severe damage in eucalyptus nurseries, woodlots and plantations. Management options for the pest are being provided to farmers.

UNITED REPUBLIC OF TANZANIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): Maize will be in the growing stage. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: FAW invades the United Republic of Tanzania in 2017. By the beginning of 2018, FAW had been reported in Rukwa, Kagera, Pwani, Geita, Simiyu, Mwanza, Morogoro, Kilimanjaro and Njombe regions.

Threat category: Locusts

Threat name: Red Locust

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Ongoing vegetation burning will further concentrate existing adult groups and swarms, which, if not controlled, are likely to escape breeding areas and invade nearby farms.

Context: Red Locust plagues pose 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.

UNITED REPUBLIC OF TANZANIA

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The potential risk of RVF occurrence is considered moderate, given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: During the past three months above-average and heavy rainfall and flash floods occurred in the region particularly during the end of August and early September as well as in early October. The precipitation forecasts predict above-average rains for the coming period (October-December 2019) for Chad, Central African Republic, southern Sudan and the whole eastern Africa region. Northern United Republic of Tanzania could be considered at moderate risk of RVF due to the predicted suitability for RVF vector amplification as well as animal movement of potential infected animals. *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: Cassava brown streak disease (CBSD)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Spread of CBSD is likely.

Context: The disease is already present in the country. The disease can cause brownish rots in tubers, rendering them inedible, which leads to a severe loss of economic value. Farmers may be unaware that cassava crops are infected until they harvest and see the tuber lesions, as leaves may appear asymptomatic. The virus is transmitted through infected cuttings and whiteflies. Use of virus-free planting materials and the adoption of 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 2019): Spread of Cassava mosaic disease (CMD) is likely.

Context: The disease is already affecting cassava production in the country. CMD is considered one of the most damaging diseases of cassava in Africa. It is caused by a virus that causes chlorosis and distortions of the leaves, resulting in yield reductions. It is transmitted by infected cuttings and whiteflies.

Threat category: Aquatic diseases

Threat name: Epizootic ulcerative syndrome (EUS)

Likelihood of occurrence: Low

Forecast (October-December 2019): EUS is likely to occur in the United Republic of Tanzania due to the confirmed presence of the disease in the neighbouring Democratic Republic of the Congo and Zambia.

Context: Water temperatures in October–December 2019 will range from 24°C to 29°C, which are partially suitable for the development of the oomycete fungus responsible for the disease.

Threat category: Forest pests and diseases

Threat name: Blue gum chalcid

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Blue gum chalcid is likely to spread in eucalyptus nurseries and plantations.

Context: Damage due to Blue gum chalcid continues in eucalyptus nurseries, woodlots and plantations.

ZAMBIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Maize will be in the growing stage at the end of the forecasting period. Therefore, there will be a moderate risk of FAW amplification.

Context: In November and early December 2016, Zambia experienced an outbreak of FAW that affected districts in almost all provinces. Once the pest was identified, the President of the Republic of Zambia declared the outbreak to be a national disaster.

Threat category: Locusts

Threat name: Red Locust

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Ongoing vegetation burning will contribute to adult grouping and swarm formation on unburnt grass patches.

Context: Red Locust plagues pose 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: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O outbreaks have occurred in Zambia since March 2018. The last FMD, serotype O outbreak was reported in Zambia in April 2019. These events are of concern because the disease may spread into the southern African region, which has never been affected by this particular serotype before. *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 disruptive animal disease for livestock trade.*

Threat category: Animal and zoonotic diseases

Threat name: *Peste des petits ruminants* (PPR)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): *Peste des petits ruminants* (PPR) outbreaks are likely to re-emerge through possible introduction from neighbouring countries.

Context: The last antibody PPR detection in the country occurred in December 2017. PPR outbreaks continue to occur in the neighbouring United Republic 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 to be one of the most damaging livestock diseases in Africa.*

Threat category: Plant pests and diseases

Threat name: Cassava mosaic disease (CMD)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Spread of CMD and Cassava Brown streak virus is possible.

Context: CMD poses a major challenge to cassava production in the country. CMD is considered one of the most damaging diseases of cassava in Africa. It is caused by a virus that causes chlorosis and distortions of the leaves, reducing yields. In addition, Cassava brown streak virus has been detected recently and may escalate. Both viruses are transmitted by infected cuttings and whiteflies. Use of virus free planting materials in sowing is critical.

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (October-December 2019): TiLV has not been reported. However, it may be introduced and spread through live movements of infected hosts.

Context: TiLV occurs when the water temperature is between 22°C and 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.

Threat category: Aquatic diseases

Threat name: Epizootic ulcerative syndrome (EUS)

Likelihood of occurrence: Low

Forecast (October-December 2019): Further spread of EUS to other parts of the country is possible, although unlikely, through heavy rainfall, flooding, poor biosecurity, and movement of infected fish or birds.

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

Threat category: Forest pests and diseases

Threat name: Blue gum chalcid

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Spread of the Blue gum chalcid insect pest is likely to continue to occur in eucalyptus nurseries and plantations.

Context: Zambia has initiated pest management activities based on silvicultural practices, breeding programmes and quarantine measures to reduce the insect populations. Introduction of biological control agents to reduce the Blue gum chalcid population is in progress.

Threat category: Forest pests and diseases

Threat name: Red gum lerp psyllid

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Spread of Red gum lerp psyllid is likely to continue in eucalyptus plantations.

Context: Pest management activities based on silvicultural practices are in progress.

ZIMBABWE

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Foot-and-mouth disease, serotype O, is likely to occur in the country through introduction from a neighbouring country.

Context: FMD, serotype O outbreaks have occurred in Zambia since March 2018. The last FMD, serotype O outbreak was reported in Zambia in April 2019. These events are of concern because the disease may spread into the southern African region, which has never been affected by this particular serotype before. *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 disruptive animal disease for livestock trade.*

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (October-December 2019): TiLV has not been reported. However, it may be introduced and spread through live movements of infected hosts.

Context: TiLV occurs when the water temperature is between 22°C and 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.

Threat category: Forest pests and diseases

Threat name: Blue gum chalcid

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Spread of Blue gum chalcid is likely to occur in eucalyptus nurseries, woodlots and plantations.

Context: Pest management activities based on the application of biological control agents are in progress to reduce Blue gum chalcid populations.

Threat category: Forest pests and diseases

Threat name: Bronze bug

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Bronze bug spread is likely to continue to occur in eucalyptus plantations.

Context: Pest management activities are in progress.

Threat category: Forest pests and diseases

Threat name: Red gum lerp psyllid

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Spread of Red gum lerp psyllid is likely to occur in eucalyptus plantations.

Context: Pest management activities based on silvicultural practices are in progress.

AMERICAS

COLOMBIA

Threat category: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Spread of Fusarium wilt disease on banana is possible.

Context: The most recent race of the causal fungus of the disease (Tropical Race 4) has been present in the northern region of La Guajira and other locations in the north of the country in August 2019; these were the first reports in the continent. Banana fusarium wilt disease is soilborne and cannot be eradicated once it becomes established in the soil. The disease attacks banana plants of all ages, initially appearing with a yellowing of the leaves, then causing 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. The disease can remain viable in soil for decades and containment and management are challenging. Thus, prevention of spread is crucial.

GUATEMALA

Threat category: Forest pests and diseases

Threat name: Bark beetles

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Bark beetle damage in pine plantations is likely to continue.

Context: Silvicultural practices to reduce the pest populations are in progress. Training of foresters on prevention and management practices is in progress.

HONDURAS

Threat category: Forest pests and diseases

Threat name: Bark beetles

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Bark beetle outbreaks causing heavy losses in pine plantations are likely to occur, and will continue to be reported.

Context: Bark beetles affect approximately 500 000 ha of conifer forests. Training of foresters on prevention and management practices is in progress.

MEXICO

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): H7N3 High pathogenic avian influenza (HPAI) outbreaks are expected to increase towards December.

Context: H7N3 HPAI has been reported sporadically in Mexico since 2012. In 2019, since April, 26 H7N3 HPAI outbreaks have been reported, affecting domestic birds in the central-southern part of the country. Due to the approaching cold season, additional outbreaks are likely to be reported. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AI viruses can affect humans.*

MEXICO

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (October-December 2019): TiLV outbreaks were first observed in July 2018. The disease may spread through live movements of infected hosts.

Context: TiLV occurs when the water temperature is between 22°C and 32°C; it has also been observed in farms with large-sized fish and a high stocking density. TiLV is already present in Mexico. It was first observed in July 2018.

NICARAGUA

Threat category: Forest pests and diseases

Threat name: Bark beetles

Likelihood of occurrence: High

Forecast (October-December 2019): It is highly likely that Bark beetle will continue to cause damage in pine plantations.

Context: Pest management activities based on silvicultural practices are in progress.

PERU

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (October-December 2019): TiLV is likely to occur.

Context: TiLV occurs when the water temperature is between 22°C and 32 °C; it has also been observed in farms with large-sized fish and a high stocking density. TiLV is already present in the country. It was first observed in November 2017. A second outbreak was reported in December 2017.

UNITED STATES OF AMERICA

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (October-December 2019): All clinically ill fish were depopulated. Exposed fish in the same tanks were either depopulated or sent to terminal market.

Context: TiLV occurs when the water temperature is between 22°C and 32 °C; it has also been observed in farms with large-sized fish and a high stocking density. TiLV is already present in the country. It was first observed in November 2018.

ASIA

BANGLADESH

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2019): There will be a low risk of FAW amplification during the forecasting period due to the absence of the main FAW hosts.

Context: The Bangladesh Agricultural Research Council confirmed FAW infestations in the Bogura and Chuadanga districts on maize and cabbage on December 2018. FAW infestations have been detected in the maize fields of 36 subdistricts of 19 districts. As per the report of the Department of Agricultural Extension, the severely infested districts are: Rajshahi, Chapai Nawabgonj, Naogaon, Bogra, Pabna, Sirajgonj, Rangpur, Gaibandha, Kurigram, Lalmonirhat, Nilphamari, Jinidaha, Chuadanga, Jessore, Khulna, Sulhet, Barishal, and Manikgonj.

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (October-December 2019): H5N1 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: The last events of H5N1 HPAI in Bangladesh occurred in May 2018 in domestic birds, and in December 2018 in wild crows. HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AI viruses can affect humans.

Threat category: Animal and zoonotic diseases

Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: High

Forecast (October-December 2019): Lumpy skin disease (LSD) outbreaks are likely to occur.

Context: In September 2019, LSD was reported for the first time ever in Bangladesh, in Chittagong district. This was also the first time the disease was reported in a southern Asian country. LSD is a severe disease, transmitted by vectors, that affects mainly cattle, causing important meat and milk production losses.

CAMBODIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): There will be a moderate risk of FAW amplification during the forecasting period.

Context: As of 11 June, 11 142 ha of corn crop have been destroyed (2 544 ha in Pailin province, 3 033 ha in Battambang, 4 715 ha in Banteay Meanchey and 850 ha in Tboung Khmum province).

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2019): African swine fever (ASF) outbreaks are very likely to continue to occur.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018, and then in Viet Nam in February 2019. ASF was first reported in domestic swine in Cambodia on 3 April 2019. As of 20 September 2019, 13 outbreaks have been reported in five of the country's 25 provinces. The first ASF outbreaks also occurred in the Lao People's Democratic Republic, on 20 June 2019, and Myanmar, on 14 August 2019. Because of the value-chain links of swine and their products between the countries in the region (for example through associated routes, or Transport Associated Routes (TARs), illegal imports of food, and movement of people), there is a high risk of ASF spread towards East and Southeast Asia. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No effective treatment or vaccine is currently available.*

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are expected to increase towards December.

Context: In March 2019, H5N6 HPAI was first observed in Cambodia. In 2018, seven outbreaks of H5N1 HPAI were reported in six different provinces; the latest occurred in August 2018. HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AI viruses can affect humans.

CHINA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2019): Infestations are expected to decline in northern areas as temperatures become cold and FAW adults migrate southwards to warmer tropical areas.

Context: FAW was first reported in China in January 2019. It spread from Yunnan Province to the north. FAW has been found on over 10 000 km^2 of farmland across 25 provinces in China. The official reports stated that FAW has affected over 15 million *mu* (1 million ha). It has not been detected in the northeastern territories. To date, the corn area in the northeastern part of the country has not experienced any losses.

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2019): African swine fever (ASF) outbreaks are very likely to continue to occur.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018. As of 20 September 2019, 157 ASF outbreaks have been reported in 32 of the country's 34 provinces/administrative divisions. In addition, in early November 2018, the disease was also detected in wild boar in Jilin province, close to the borders with the Democratic People's Republic of Korea, and in Heilongjiang province. This enhances the likelihood of spread of ASF to neighbouring countries due to wild boar movement, in addition to the risks posed by illegal imports of possibly contaminated pork products from China. An African Swine Fever Contingency Plan and Emergency Response Level II is under implementation in the country. Further spread of the disease within the region would have devastating consequences for animal health, food safety, and food security. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No effective treatment or vaccine is currently available.*

Threat category: Animal and zoonotic diseases

Threat name: *Peste des petits ruminants* (PPR)

Likelihood of occurrence: Low

Forecast (October-December 2019): *Peste des petits ruminants* (PPR) outbreaks are unlikely to continue to occur in the country.

Context: PPR is reported yearly in China. In particular, between January and June 2018, the disease occurred in the northeastern 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 to be one of the most damaging livestock diseases in Asia.

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): H5 and H7 HPAI and LPAI virus outbreaks in poultry, as well as cases in humans (although sporadic), are expected to increase towards December.

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 domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AI viruses can affect humans.

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (October-December 2019): TiLV has not been reported in China. However, 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 and 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: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2019): Any unreported infestations will decline as temperatures become cold.

Context: FAW has not been officially reported in the country yet.

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 2019): African swine fever (ASF) outbreaks are very likely to continue to occur.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018. The disease was first reported in domestic swine in the Democratic People's Republic of Korea (DPRK) on 23 May 2019, in Chagang-Do province. Since then, no other ASF events were reported in the country. Because of the value-chain links of swine and their products between the countries in the region (for example, through associated routes, or TARs, illegal imports of food, and movement of people), there is a high risk of further ASF spread in East and Southeast Asia, and in particular to the Republic of Korea. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No effective treatment or vaccine is currently available.*

GAZA STRIP

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Foot-and-mouth disease (FMD), serotype O, is likely to occur.

Context: FMD, serotype O, was last reported in the region in August 2019, 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 disruptive animal disease for livestock trade.

GEORGIA

Threat category: Forest pests and diseases

Threat name: Boxwood blight

Likelihood of occurrence: Low

Forecast (October-December 2019): Boxwood blight (caused by pathogen *Calonectria pseudonaviculata*) will continue to be present, although its spread will be limited due to winter temperatures and lack of rain.

Context: Monitoring of the disease spread is in progress.

Threat category: Forest pests and diseases

Threat name: Boxwood moth

Likelihood of occurrence: Low

Forecast (October-December 2019): Boxwood moth (*Cydalima perspectalis*) will have limited spread due to winter temperatures.

Context: As part of an Integrated Pest Management programme, the use of biopesticide Bacillus thuringiensis var. kurstaki (BtK) and pheromone trapping is in progress to protect the native boxwood species.

JAPAN

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2019): Infestations will decline as temperatures become cold.

Context: In July 2019, FAW larvae were found on for the first time on a field in southwestern Japan (Minamikyushu, Kagoshima). Later, larvae were found on 53 fields growing field corn and sweetcorn in the prefecture.

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2019): African swine fever (ASF) is very likely to occur, through possible introduction from affected countries in the region.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018. On 15 January 2019, the disease was first reported in neighbouring Mongolia; on 19 February in Viet Nam; on 22 March in Cambodia; on 20 June, in the Lao People's Democratic Republic; on 14 August in Myanmar; on 9 September, in the Philippines; and on 17 September, in the Republic of Korea. Because of the value-chain links of swine and their products between the countries in the region (for example through associated routes, or Transport Associated Routes (TARs), illegal imports of food, and movement of people), there is a high risk of spread of the disease towards East and Southeast Asia. Further spread of ASF within the region 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 uncertain. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No effective treatment or vaccine is currently available.*

JORDAN

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Foot-and-mouth disease (FMD), serotype O, outbreaks are likely to continue to occur.

Context: FMD, serotype O, was last reported in the region in August 2019, 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 disruptive animal disease for livestock trade.

INDIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2019): There will be a low risk of FAW amplification during the forecasting period on maize (*Rabi*) and sorghum (*Rabi*).

Context: FAW was first detected in the Indian subcontinent in mid-May 2018, in maize fields in Karnataka. On 30 July 2018, the Indian Council of Agricultural Research issued a warning that the pest, *Spodoptera frugiperda*, had reached the subcontinent. To date, it has been detected in approximately 70 percent of maize crops in Chikkaballapur in the southern Karnataka state. Reports suggest that it has also spread to Tamil Nadu and Telangana.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (October-December 2019): Summer breeding will end in Rajasthan, where undetected and uncontrolled locusts may form groups and small swarms that will move westwards.

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

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): H5N1 Highly pathogenic avian influenza (HPAI) outbreaks are expected to increase towards December.

Context: The last recorded event of H5N1 HPAI in wild crows occurred in March 2019. Since November 2018, 21 H5N1 HPAI outbreaks have been reported in wild and domestic birds. HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AI viruses can affect humans.

Threat category: Animal and zoonotic diseases

Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: High

Forecast (October-December 2019): Lumpy skin disease (LSD) outbreaks are likely to occur through possible introduction from affected countries in the region.

Context: In September 2019, LSD was reported for the first time ever in Bangladesh; this was also the first time the disease was reported in a southern Asian country. The disease may spread In India or other neighbouring countries through movement of infected animals or trade. LSD is a severe disease, transmitted by vectors, that affects mainly cattle, causing important meat and milk production losses.

Threat category: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Spread of Fusarium wilt disease on banana is likely.

Context: The most recent race of fungus causing the Banana fusarium wilt disease (Tropical Race 4) was recently reported in the country and can spread further. Banana fusarium wilt disease is soilborne and cannot be eradicated once it becomes established in the soil. The disease attacks banana plants of all ages, initially appearing with a yellowing of the leaves, then causing 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. The disease can remain viable in soil for decades and containment and management are challenging. Thus, prevention of spread is crucial.

INDONESIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2019): There will be a low risk of FAW amplification and spread during the forecasting period.

Context: FAW was first detected in Indonesia in West Sumatra, in March 2019. Within four months, the pest had already spread to 12 provinces in Indonesia (Sumatra, Java and some parts of Kalimantan).

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): African swine fever (ASF) is likely to occur through possible introduction from affected countries in the region.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018. On 15 January 2019, the disease was first reported in neighbouring Mongolia; on 19 February in Viet Nam; on 22 March in Cambodia; on 20 June, in the Lao People's Democratic Republic; on 14 August in Myanmar; on 9 September, in the Philippines; and on 17 September, in the Republic of Korea. Because of the value-chain links of swine and their products between the countries in the region (for example through associated routes, or TARs, illegal imports of food, and movement of people), there is a high risk of spread of the disease towards East and Southeast Asia. In Indonesia, the risk is moderate because the swine population is low, given that it is a predominantly Muslim country. Further spread of ASF within the region 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 uncertain. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No treatment nor vaccine is currently available.*

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are expected to increase towards December.

Context: The country is considered endemic for H5N1 HPAI. HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AI 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 2019): Foot-and-mouth disease (FMD), serotype O, outbreaks are likely to continue to occur.

Context: FMD, serotype O, outbreaks occur sporadically in the country. FMD was last reported in the country in August 2019. 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: *Peste des petits ruminants* (PPR)

Likelihood of occurrence: Low

Forecast (October-December 2019): *Peste des petits ruminants* (PPR) outbreaks are unlikely to continue to occur in the country.

Context: In November 2018, a PPR outbreak occurred in the Northern district, one year after the last reported outbreak. The disease continued to be reported until July 2019.
The country is endemic for the disease; however, vaccination is not compulsory. PPR is a highly contagious disease affecting sheep and goats. It is caused by a morbillivirus and is considered to be one of the most damaging livestock diseases in the Middle East.

IRAN (ISLAMIC REPUBLIC OF)

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (October-December 2019): Adult groups and small swarms may arrive in the southeast from the Indo-Pakistan border; however, breeding is unlikely until temperatures warm up in the spring.

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

IRAN (ISLAMIC REPUBLIC OF)

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (October-December 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: The last H5N1 and H5N6 HPAI event officially reported in the country occurred in January 2018. The H5N8 HPAI virus, which has been spreading globally since November 2016, following wild bird migratory routes, has been reported in wild and domestic birds in eight governorates in the country. The last reporting of this serotype dates back to April 2019. HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AI viruses can affect humans.

Threat category: Forest pests and diseases

Threat name: Boxwood blight

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Boxwood blight will continue to be present, although its spread will be limited due to winter temperatures and lack of rain.

Context: Boxwood blight was first reported 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.

Threat category: Forest pests and diseases

Threat name: Boxwood moth

Likelihood of occurrence: Low

Forecast (October-December 2019): Boxwood moth will have limited activities during the forecast period due to low temperatures.

Context: The first introduction of boxwood moth was reported in August 2016. Native boxwood forests are newly under threat by Boxwood moth, which is highly destructive. Early actions such as pheromone trapping for monitoring and treatments using the biopesticide *Bacillus thuringiensis* var. *kurstaki* (Btk) are required to reduce further spread. FAO is organizing a visit from Georgia to Iran to share experiences on Btk application and pheromone trappings.

Threat category: Forest pests and diseases

Threat name: Charcoal disease

Likelihood of occurrence: Low

Forecast (October-December 2019): Oak charcoal disease (pathogen *Biscogniauxia mediterranea*) will have limited activity during the forecast period.

Context: The decline of Oak charcoal disease has been reported since 2012 in the Zagros region of the country. It has a negative impact on the livelihoods of nomadic people and watershed management. Operations to minimize the impact of the charcoal disease and abiotic stresses are in progress.

IRAQ

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (October-December 2019): H5N8 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: H5N8 HPAI, which has been spreading globally since November 2016, following wild bird migratory routes, was last reported in the country in March 2019. HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AI viruses can affect humans.

LAO PEOPLE'S DEMOCRATIC REPUBLIC

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2019): African swine fever (ASF) outbreaks are very likely to continue to occur.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018. It was then reported in Viet Nam in February 2019, and in Cambodia on 3 April 2019. The first ASF outbreaks was reported in Lao People's Democratic Republic on 20 June 2019 in Salavan province. As of 20 September 2019, the country as reported a total of 94 outbreaks in 15 of its 18 provinces. Because of the value-chain links of swine and their products between the countries in the region (for example through associated routes, or TARs, illegal imports of food, and movement of people), there is a high risk of ASF spread towards East and Southeast Asia. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No effective treatment or vaccine is currently available.*

LAO PEOPLE'S DEMOCRATIC REPUBLIC

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): H5N1 Highly pathogenic avian influenza (HPAI) outbreaks are expected to increase towards December.

Context: H5N1 outbreaks have been reported in the country in the past few years. The last H5N1 HPAI in the country was reported in October 2018. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2019): There will be a low risk of FAW amplification during the forecasting period.

Context: A survey first found FAW in early 2019 in Sendin Village, Naxaithong District, Vientiane, and an outbreak in Paklai District, Sayaboury Province. The survey also found FAW damage in other areas, such as Vientiane Province, Oudomxay, Xiengkhouang, Borikhamxay and Savannakhet. The total area of maize production damaged was estimated at over 3 300 ha.

Threat category: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Spread of Fusarium wilt disease on banana is likely.

Context: The most recent race of fungus causing the Banana fusarium wilt disease (Tropical Race 4) was recently reported in the country and can spread further. Banana fusarium wilt disease is soilborne and cannot be eradicated once it becomes established in the soil. The disease attacks banana plants of all ages, initially appearing with a yellowing of the leaves, then causing 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. The disease can remain viable in soil for decades and containment and management are challenging. Thus, prevention of spread is crucial.

LEBANON

Threat category: Forest pests and diseases

Threat name: Dry cone syndrome

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Dry cone syndrome is likely to continue causing damage to pine plantations (*Pinus pinea*).

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

Threat category: Forest pests and diseases

Threat name: Western conifer seed bug

Likelihood of occurrence: Low

Forecast (October-December 2019): Western conifer seed bug is likely have limited activities due to the lower temperatures.

Context: Monitoring of the pest population using traps is in progress.

MALAYSIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2019): There will be a low risk of spread of FAW during the forecasting period on rice crop.

Context: FAW was reported in Malaysia at the beginning of 2019.

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): African swine fever (ASF) is likely to occur through possible introduction from affected countries in the region.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018. On 15 January 2019, the disease was first reported in neighbouring Mongolia; on 19 February in Viet Nam; on 22 March in Cambodia; on 20 June, in the Lao People's Democratic Republic; on 14 August in Myanmar; on 9 September, in the Philippines; and on 17 September, in the Republic of Korea. Because of the value-chain links of swine and their products between the countries in the region (for example through associated routes, or TARs, illegal imports of food, and movement of people), there is a high risk of spread of the disease towards East and Southeast Asia. In Malaysia, the risk is moderate because the swine population is low, given that it is predominately a Muslim country. Further spread of ASF within the region 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 uncertain. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No treatment or vaccine is currently available.*

MALAYSIA

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (October-December 2019): During the reporting period, the production cycle of tilapia will be active.

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 and 32°C; 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 2019): African swine fever (ASF) outbreaks are very likely to continue to occur.

Context: In Asia, ASF was first reported in China, in domestic pigs, in August 2018. The affected area included the autonomous region of Inner Mongolia in China, which borders with Mongolia. In January 2019, the first outbreaks of ASF in Mongolia were reported. Since then, 11 ASF outbreaks were confirmed in seven out of the country's 21 regions. There is no information on the surveillance of wild boar, while the extensive presence of wild boars in infected areas is well known. It is questionable whether the virus is present in wild boar populations in the country. On 27 March 2019, country authorities declared that the ASF epidemic in the country had come to an end. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No effective treatment or vaccine is currently available.*

MYANMAR

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): There will be a moderate risk of FAW amplification during the forecasting period on the second season of maize and wheat.

Context: FAW has invaded maize fields in the country since the first week of January 2019, according to the Ministry of Agriculture, Livestock and Irrigation. FAW, confirmed in Ayeyarwady region, then spread to nine states/regions within a short period of the same year. Approximately 4 046 ha (10 000 acres) have been affected in Ayeyarwady.

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2019): African swine fever (ASF) outbreaks are very likely to continue to occur.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018. On 14 August 2019, ASF was first reported in Myanmar. Since then, and as of 20 September 2019, a total of three ASF outbreaks were reported in Shan State only. Because of the value-chain links of swine and their products between the countries in the region (for example through associated routes, or TARs, illegal imports of food, and movement of people), there is a high risk of spread of the disease towards East and Southeast Asia. Further spread of ASF within the region 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 uncertain. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No effective treatment or vaccine is currently available.*

Threat category: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Spread of Fusarium wilt disease on banana is likely.

Context: The most recent race of fungus causing the Banana fusarium wilt disease (Tropical Race 4) was recently reported in the country and can spread further. Banana fusarium wilt disease is soilborne and cannot be eradicated once it becomes established in the soil. The disease attacks banana plants of all ages, initially appearing with a yellowing of the leaves, then causing 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. The disease can remain viable in soil for decades and containment and management are challenging. Thus, prevention of spread is crucial.

NEPAL

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2019): There will be a low risk of FAW amplification during the forecasting period.

Context: FAW has recently been reported in the country. It is thought that the pest first entered between April and May 2019. FAW has destroyed maize crops at Sunkoshi Rural Municipality in Sindhuli.

NEPAL

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (October-December 2019): H5N1 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: H5N1 HPAI was last reported in the country in September 2019 in domestic birds and, for the first time, in a human. HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AI viruses can affect humans.

OMAN

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): FAW is likely to be introduced to the country.

Context: FAW has not been reported in Oman yet. The pest has been reported in Yemen since 2018, and is widely distributed. The current crisis in Yemen is weakening official controls, and the pest is likely to be introduced into Yemen's neighbouring countries such as Oman and Saudi Arabia, given the pest's high capabilities of flying.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (October-December 2019): There is a very low risk of a few small swarms arriving from the India/Pakistan border.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population may be affected by this voracious insect. 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: High

Forecast (October-December 2019): Summer breeding will end and any undetected and uncontrolled locusts will form groups and small swarms that will move west to Baluchistan. This will be supplemented by similar populations from India. However, breeding will not occur until temperatures warm up in the spring.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population may be affected by this voracious insect.
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 2019): Spread of Fusarium wilt disease on banana is likely.

Context: A new race of the fungus causing the disease (Tropical Race 4) has been reported in one location in the country and can spread further. Banana fusarium wilt disease is soilborne and cannot be eradicated once it becomes established in the soil. The disease attacks banana plants of all ages, initially appearing with a yellowing of the leaves, then causing 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. The disease can remain viable in soil for decades and containment and management are challenging. Thus, prevention of spread is crucial.

PHILIPPINES

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2019): There will be a low risk of FAW amplification on maize (second season).

Context: By June 2019, the local government of Mabinay in Negros Oriental declared that FAW had attacked 28 of the mountainous town's 32 *barangays*.

PHILIPPINES

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2019): African swine fever (ASF) is likely to occur through possible introduction from affected countries in the region.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018. On 9 September, it was reported for the first time in the Philippines. In the Philippines, as of 20 September 2019, seven ASF outbreaks have been reported in Rizal province only. Because of the value-chain links of swine and their products between the countries in the region (for example through associated routes, or TARs, illegal imports of food, and movement of people), there is a high risk of spread of the disease towards East and Southeast Asia. Further spread of ASF within the region 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 uncertain. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No effective treatment nor vaccine is currently available.*

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): During the forecasting period, the production cycle of tilapia will be active.

Context: TiLV occurs when the water temperature is between 22°C and 32°C; it has also been observed in farms with large-sized fish and a high stocking density. TiLV is already present in the country. It was first observed in May 2017. A second outbreak was reported in July 2019. Monitoring and active surveillance systems have been established.

SAUDI ARABIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (October-December 2019): FAW is likely to be introduced to the country.

Context: FAW has not been reported in Saudi Arabia yet. The pest has been reported in Yemen since 2018, and is widely distributed. The current crisis in Yemen is weakening official controls, and the pest is likely to be introduced into Yemen's neighbouring countries such as Oman and Saudi Arabia, given the pest's high capabilities of flying.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: High

Forecast (October-December 2019): Breeding will continue on the southern Red Sea coast and extend northwards, causing locusts to form groups and perhaps small bands and swarms. This could be supplemented by additional locusts coming from Yemen.

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

SINGAPORE

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): There will be a high risk of FAW introduction from Thailand and Viet Nam.

Context: FAW has not been reported in the country yet.

SRI LANKA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): There will be a moderate risk of FAW amplification during the forecasting period on maize and rice (Main *Maha*).

Context: FAW has infested maize mainly in Anuradhapura, Monaragala and Ampara districts, and the pest has been detected in almost all districts in the country, in farm patches. The total maize-cultivated land extent infected by FAW in these three districts are of 61 010 ha and 34 856 ha. Further, FAW has been reported to have spread to crops such as rice, tomato, millet, green gram and some grass varieties.
Of 82 000 ha cultivated in Sri Lanka, 43 037 ha has been reported to be infected by FAW. The total estimated crop loss in the country is of 10–25 percent.

THAILAND

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2019): There will be a low risk of FAW amplification during the forecasting period.

Context: The Department of Agriculture of Thailand has received a report that confirms FAW presence in samples collected in December 2018 from maize plantations in subdistricts of Kanchanaburi and Tak Provinces, along the border with Myanmar. FAW has been detected in more than 50 of Thailand's 76 provinces, and is concentrated in six western provinces with large maize areas.

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2019): African swine fever (ASF) is very likely to occur through possible introduction from affected countries in the region.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018. On 15 January 2019, the disease was first reported in neighbouring Mongolia; on 19 February in Viet Nam; on 22 March in Cambodia; on 20 June, in the Lao People's Democratic Republic; on 14 August in Myanmar; on 9 September, in the Philippines; and on 17 September, in the Republic of Korea. Because of the value-chain links of swine and their products between the countries in the region (for example through associated routes, or TARs, illegal imports of food, and movement of people), there is a high risk of spread of the disease towards East and Southeast Asia. Further spread of ASF within the region 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 uncertain. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No effective treatment or vaccine is currently available.*

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): 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 occurs when the water temperature is between 22°C and 32°C (as experienced for example in Israel); it has also been observed in farms with large-sized fish and a high stocking density. TiLV is already present in the country. Monitoring and active surveillance systems have been established.

TIMOR-LESTE

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2019): African swine fever (ASF) outbreaks are very likely to continue to occur.

Context: After ASF was reported for the first time in Asia in China, in August 2018, on 27 September 2019 ASF was reported for the first time in Timor-Leste. Because of the value-chain links of swine and their products between the countries in the region (for example, through associated routes, or TARs, illegal imports of food, and movement of people), there is a high risk of spread of the disease towards East and Southeast Asia. Further spread of ASF within the region 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 uncertain. ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No effective treatment nor vaccine is currently available.

TURKEY

Threat category: Forest pests and diseases

Threat name: Chestnut gall wasp

Likelihood of occurrence: Low

Forecast (October-December 2019): The Chestnut gall wasp population will have lesser activity in chestnut trees due to pest control activities.

Context: Pest management activities based on the application of biological control agents are in progress to reduce the populations of the insect pest.

REPUBLIC OF KOREA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2019): Infestations will decline as temperatures become cold. There is a very low risk of FAW remaining on winter wheat and barley.

Context: Suspected FAW larvae were first detected in four corn fields on Jeju island on 14 June 2019. They were identified as *Spodoptera frugiperda* by DNA barcoding on 16 June 2019. This is the first detection of FAW in the Republic of Korea.

REPUBLIC OF KOREA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2019): African swine fever (ASF) outbreaks are very likely to continue to occur.

Context: After ASF was reported for the first time in Asia in China, in August 2018, and in the Democratic People's Republic of Korea on 23 May 2019, on 17 September 2019, ASF was reported for the first time in the Republic of Korea, near the North Korean border. As of 7 October 2019, a total of 14 ASF events were confirmed in one administrative division of the country. Because of the value-chain links of swine and their products between the countries in the region (for example, through associated routes, or Transport Associated Routes (TARs), illegal imports of food, and movement of people), there is a high risk of spread of the disease towards East and Southeast Asia. Further spread of ASF within the region 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 uncertain. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No effective treatment nor vaccine is currently available.*

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): H5N6 Highly pathogenic avian influenza (HPAI) outbreaks are expected to increase towards December.

Context: H5N6 HPAI outbreaks have been reported in the country in the past few years. A new reassortant 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 H5N6 HPAI in the Republic of Korea was reported in March 2018, while the virus was last reported in the region in August 2019, in Viet Nam. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AI viruses can affect humans.*

UZBEKISTAN

Threat category: Locusts

Threat name: Migratory Locust

Likelihood of occurrence: Low

Forecast (October-December 2019): Natural disappearance of the few remaining adult populations should occur; the eggs laid by adults of the first and, possibly, the second generation will remain 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 is one of the three locust pests present in Central Asia and in the country.

VIET NAM

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (October-December 2019): There will be a low risk of FAW amplification during the forecasting period due to the absence of the main FAW hosts.

Context: In early March 2019, Viet Nam submitted specimens collected in border areas to the Centre for Agriculture and Bioscience International for molecular identification of the species. It was later confirmed as FAW.

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2019): African swine fever (ASF) outbreaks are very likely to continue to occur.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018.The disease was then first reported in domestic pigs in Viet Nam in February 2019. As of 20 September 2019, more than 6 000 outbreaks have been reported in the 63 provinces/cities of the country. An Emergency Response Action Plan for African Swine Fever is under implementation in the country. Due to the value-chain links of swine and their products between the countries in the region (for example through associated routes, or TARs, illegal imports of food, and movement of people), there is a high risk of spread of the disease towards East and Southeast Asia. Further spread of ASF within the region 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 uncertain. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No effective treatment nor vaccine is currently available.*

REPUBLIC OF KOREA

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are expected to increase towards December.

Context: H5N1 and H5N6 HPAI outbreaks have been reported in the country in the past few years. A new reassortant 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 H5N6 HPAI in the country was recorded in August 2019. HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AI viruses can affect humans.

Threat category: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Spread of Fusarium wilt disease on banana is likely.

Context: The most recent race of fungus causing the Banana fusarium wilt disease (Tropical Race 4) was recently reported in the country and can spread further. Banana fusarium wilt disease is soilborne and cannot be eradicated once it becomes established in the soil. The disease attacks banana plants of all ages, initially appearing with a yellowing of the leaves, then causing 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. The disease can remain viable in soil for decades and containment and management are challenging. Thus, prevention of 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 2019): Foot-and-mouth disease (FMD), serotype O, outbreaks are likely to continue to occur.

Context: FMD, serotype O, was last reported in the region in August 2019, in Israel. The last occurrence in the West Bank was recorded in April 2019; however, the serotype was not noted. 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: High

Forecast (October-December 2019): FAW is likely to spread in the country and attack many host plants.

Context: FAW was officially reported in Yemen in 2018. It continues to attack many host plants and spread to all host-growing areas.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: High

Forecast (October-December 2019): Breeding will end in the interior and groups and small swarms will move to coastal areas to breed, causing locusts to increase and form groups, bands and small swarms.

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

EUROPE

ALBANIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Low

Forecast (October-December 2019): African swine fever (ASF) outbreaks may occur as the disease is in the region.

Context: ASF has not been reported in the country. However, it was confirmed in August 2019 in Serbia, thus increasing the risk for the region. However, the domestic pig and wild boar population is low. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

Threat category: Animal and zoonotic diseases

Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Low

Forecast (October-December 2019): Lumpy skin disease (LSD) outbreaks are unlikely to occur because of unfavourable weather conditions.

Context: Observed for the first time in June 2016, LSD has caused almost 850 outbreaks, affecting 32 counties. Throughout 2017, outbreaks continued to be detected but were not officially reported. An emergency vaccination campaign has been implemented, and regular vaccination campaigns are carried out. LSD is a severe disease, transmitted by vectors, which affects mainly cattle, causing important meat and milk production losses.

Threat category: Forest pests and diseases

Threat name: Pine processionary moth

Likelihood of occurrence: Moderate

Forecast (October-December 2019): It is likely that the larval stage will be active throughout the colder periods, causing defoliation of needles.

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

BELARUS

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): African swine fever (ASF) outbreaks are likely to occur.

Context: ASF was last officially reported in the country in 2013. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

BELGIUM

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: In September 2018, two dead wild boars were found positive to ASF in Étalle (Luxembourg province). As of 2 September 2019, 827 wild boars have been found to be infected in Luxembourg province only. This represented the first introduction of the disease into the country, and the first introduction of genotype 2 into Western Europe during the current epidemic. Wild boar population density is the most important factor in the spread of the disease. The disease may become endemic only in wild boar, even in the absence of pigs. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

BOSNIA AND HERZEGOVINA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): African swine fever (ASF) outbreaks are likely to occur through possible virus introduction from neighbouring countries.

Context: ASF has not been reported in the country. However, it was confirmed in August 2019 in Serbia, thus increasing the risk for the region. Introduction (entry) through contaminated food products is assessed to be the highest risk factor. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

BULGARIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: ASF was first reported in the country in August 2018. Since then, additional events have been reported in wild boar (last events: August 2019). *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

BULGARIA

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): H5N8 Highly pathogenic avian influenza (HPAI) outbreaks are expected to increase towards December.

Context: H5N8 HPAI was first reported in Bulgaria in domestic birds in February 2018. Since then, more than 30 events have been reported in domestic birds only. The most recent event occurred in April 2019. HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AI viruses can affect humans.

CROATIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): African swine fever (ASF) outbreaks are likely to occur through possible virus introduction from neighbouring countries.

Context: ASF has not been reported in the country. However, it was confirmed in August 2019 in Serbia, thus increasing the risk for the region. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

CZECHIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): African swine fever (ASF) outbreaks are likely to occur through possible introduction from neighbouring countries.

Context: ASF was first reported in the country in July 2017. On February 2019, Czechia was the first country in the European Union to be officially declared free from ASF, after it had been infected in recent years. As no outbreak has been found in Czechia since April 2018, the country received the support of the European Union Member States in lifting all restrictions in the country. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

DENMARK

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (October-December 2019): H5N6 Highly pathogenic avian influenza (HPAI) outbreaks are expected to occur at low levels.

Context:H5N6 HPAI first occurred in Denmark in wild birds in February 2018. Since then, 35 events have been reported in wild birds only. The most recent event occurred in January 2019. HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AIviruses can affect humans.

ESTONIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: Since the first introduction of ASF into the country in September 2014, the disease continued to be regularly reported in wild and domestic pigs. The disease is considered endemic in the country and disease reports are provided only on a six-monthly basis. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

FRANCE

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2019): African swine fever (ASF) outbreaks are likely to occur through possible introduction from neighbouring countries.

Context: In September 2018, two dead wild boars were found positive to ASF in Étalle (Luxembourg province) where it continues to be reported. This represented the first introduction of the disease into the country, and the first introduction of genotype 2 into Western Europe during the current epidemic. Wild boar population density is the most important 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. In particular, the French territory close to infected areas in Belgium presents a high density of wild boars. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are available.*

FRANCE

Threat category: Plant pests and diseases

Threat name: Xylella fastidiosa

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Xylella olive decline spread is possible.

Context: Olive decline caused by Xylella fastidiosa has been reported recently in two sites on the Mediterranean coast. The bacterium is transmitted by insects. Immediate eradication and quarantine practices are critical to prevent spread.

GERMANY

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2019): African swine fever (ASF) outbreaks are likely to occur through possible introduction from neighbouring countries.

Context: In September 2018, two dead wild boars were found positive to ASF in Étalle (Luxembourg province) where it continues to be reported. This represented the first introduction of the disease into Western Europe, and the first introduction of genotype 2 during the current epidemic. Wild boar population density is the most important 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. In particular, the French territory close to infected areas in Belgium presents a high density of wild boars. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

GREECE

Threat category: Animal and zoonotic diseases

Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Low

Forecast (October-December 2019): Lumpy skin disease (LSD) outbreaks are unlikely to occur because of unfavourable weather conditions.

Context: The last observed outbreak of LSD in Greece related to a second wave of infection that occurred in late November 2016. Subsequently, two new outbreaks occurred in regions previously unaffected by the disease: in February 2017, in Kerkyra, an Ionian island, and in August 2017, in Thessalia region. No new outbreaks were observed after these events. An emergency vaccination campaign has been implemented and regular vaccination campaigns are carried out. LSD is a severe disease, transmitted by vectors, that affects mainly cattle, causing important meat and milk production losses.

HUNGARY

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): 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 August 2019. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are available.*

KOSOVO*

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): African swine fever (ASF) outbreaks are likely to occur through possible virus introduction from neighbouring countries.

Context: ASF has not been reported in the country. However, it was confirmed in August 2019 in Serbia, thus increasing the risk for the region. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

Threat category: Animal and zoonotic diseases

Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Low

Forecast (October-December 2019): LSD outbreaks are unlikely to occur because of the weather conditions during the forecast period are unfavourable to the vectors.

Context: In June 2016, LSD was first observed in a backyard farm in Pcinja district, in neighbouring Serbia. Since then, 223 outbreaks were officially reported, the last of which was observed in October 2016. An emergency vaccination campaign has been implemented. LSD is a severe disease, transmitted by vectors, that affects mainly cattle, causing important meat and milk production losses.

ITALY

Threat category: Plant pests and diseases

Threat name: *Xylella fastidiosa*

Likelihood of occurrence: Moderate

Forecast (October-December 2019): Spread of *Xylella* olive decline is possible.

Context: Olive decline caused by *Xylella fastidiosa* has caused significant damage to olives in the Puglia region. The bacterium is transmitted by insects. Immediate eradication and quarantine practices are critical to prevent spread.

** References to Kosovo shall be understood to be in the context of UN Security Council Resolution 1244 (1999).*

LATVIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): 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 August 2019. *ASF is a contagious viral disease of swine, both domestic and wild, that causes 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 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: Since the first ASF introduction into the country in January 2014, the disease continued to be regularly reported in wild and domestic pigs. The disease is considered endemic in the country and disease reports are provided only on a six-monthly basis. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

LUXEMBOURG

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2019): African swine fever (ASF) outbreaks are likely to occur through possible virus introduction from neighbouring countries.

Context: On 13 September 2018, two dead wild boars were found to be positive to ASF in Étalle (Luxembourg province) in neighbouring Belgium. ASF continues to be reported in Luxembourg province only. This represented the first introduction of the disease into Western Europe. Spread of the disease in Western European countries, which have never experienced ASF before, would have devastating consequences for the entire pig sector. Wild boar population density is the most significant 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. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

MONTENEGRO

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): African swine fever (ASF) outbreaks are likely to occur through possible virus introduction from neighbouring countries.

Context: ASF has not been reported in the country. However, it was confirmed in August 2019 in Serbia, thus increasing the risk for the region. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

Threat category: Animal and zoonotic diseases

Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Low

Forecast (October-December 2019): Lumpy skin disease (LSD) outbreaks are unlikely to occur because of unfavourable weather conditions.

Context: The disease was first observed in April 2016. Since then, LSD has spread throughout the country, causing at least 60 outbreaks in seven municipalities. The last observed outbreak occurred in October 2017. An emergency vaccination campaign has been implemented and regular vaccination campaigns are carried out, LSD is a severe disease, transmitted by vectors, that affects mainly cattle, causing important meat and milk production losses.

POLAND

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): 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 contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

SERBIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: ASF was first confirmed in domestic pigs, close to the capital Belgrade, in August 2019. Entry of the disease may have occurred before this date. Presence of the disease in wild boar cannot be ruled out. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

SERBIA

Threat category: Animal and zoonotic diseases

Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Low

Forecast (October-December 2019): Lumpy skin disease (LSD) outbreaks are unlikely to occur because of unfavourable weather conditions.

Context: In June 2016, LSD was first observed in a backyard farm in Pcinja district. Since then, 223 outbreaks were officially reported in 12 districts. The last observed outbreak occurred in October 2016; since then, no new outbreaks have been reported. An emergency vaccination campaign has been implemented and regular vaccination campaigns are carried out. LSD is a severe disease, transmitted by vectors, that affects mainly cattle, causing important meat and milk production losses.

SLOVAKIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: ASF was first confirmed into the country on 23 July 2019. Since then, ASF has been reported both in wild and domestic pigs in Kosice region (last event: August 2019). *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

REPUBLIC OF MOLDOVA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: Since ASF was first introduced into the country in November 2016, it has been continually reported (most recently in August 2019), both in wild and domestic pigs. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

ROMANIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): 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 contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

REPUBLIC OF NORTH MACEDONIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (October-December 2019): African swine fever (ASF) outbreaks are likely to occur through possible virus introduction from neighboring countries.

Context:ASF has not been reported in the country. However, ASF has become endemic in Europe in some countries. The disease is present in Bulgaria and Serbia. Informal and uncontrolled animal movements and poor biosecurity conditions in pig farms at the borders pose a risk of disease introduction. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

Threat category: Animal and zoonotic diseases

Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Low

Forecast (October-December 2019): Lumpy skin disease (LSD) outbreaks are unlikely to occur because of unfavourable weather conditions.

Context: Observed for the first time in July 2016, LSD caused almost 170 outbreaks, affecting 21 municipalities. After the outbreak in September 2016, two outbreaks were observed in northern municipalities of the country in February and April 2017. No new outbreaks were observed after those events. An emergency vaccination campaign has been implemented, and regular vaccination campaigns are carried out. LSD is a severe disease, transmitted by vectors, that affects mainly cattle, causing important meat and milk production losses.

RUSSIAN FEDERATION

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): 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 August 2019. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available.*

Threat category: Animal and zoonotic diseases

Threat name: *Peste des petits ruminants* (PPR)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): *Peste des petits ruminants* (PPR) outbreaks are likely to occur because of possible introduction from neighbouring countries.

Context: The country has never experienced PPR, although the disease is occurring in China, in the northeastern provinces, and in Western Mongolia, close to the borders with the Russian Federation. *PPR is a highly contagious disease affecting sheep and goats. It is caused by a morbillivirus and is considered to be one of the most damaging livestock diseases in Asia.*

Threat category: Animal and zoonotic diseases

Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Low

Forecast (October-December 2019): *Lumpy skin disease (LSD) outbreaks are unlikely to occur because of unfavourable weather conditions.*

Context: After its re-emergence in May 2016 in the country, LSD has spread north-, east- and westwards, affecting 20 administrative subjects and causing almost 500 outbreaks. Several outbreaks were reported in July and August 2018, and, most recently in August 2019. LSD is a severe disease transmitted by vectors, that affects mainly cattle, causing important meat and milk production losses.

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (October-December 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are expected to occur at low levels.

Context:H5N8 HPAI first occurred in the Russian Federation in domestic birds in July 2018. In addition, several H5 HPAI events have been reported in the country, most recently in January 2019. HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some AI viruses can affect humans.

UKRAINE

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (October-December 2019): 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 August 2019. *ASF is a contagious viral disease of swine, both domestic and wild, that causes high mortality. No vaccines are currently available*.

OCEANIA

AUSTRALIA

Threat category: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Low

Forecast (October-December 2019): Spread of Fusarium wilt disease on banana is possible.

Context: The most recent 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 soilborne and cannot be eradicated once it becomes established in the soil. The disease attacks banana plants of all ages, initially appearing with a yellowing of the leaves, then causing 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. The disease can remain viable in soil for decades and containment and management are challenging. Thus, prevention of 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 an FCC threat into a country, across border or to a specific area for the upcoming three months.
Likelihood of occurrence	Chances of an FCC threat to happen for the upcoming three months.
Likelihood of spread	Chances of geographical spread of an FCC threat within a country beyond its original introduction for the upcoming three months.
Likelihood of re-emergence/amplification	Chances of re-emergence/amplification (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 and animals) within an infected farm to a 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
  - 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/food-chain-crisis/how-we-work/plant-protection/fallarmyworm/en/

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

THREATS TO FOOD SECURITY

FAO Crop Prospects and Food Situation – Quarterly Global Report – No.3, September 2019

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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