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Alerts on threats to the food chain
affecting food security in countries and regions

NOTE TO THE READER

The purpose of the FCC (Food Chain Crisis) Early Warning Bulletin is to inform FAO and other international organizations, countries, scientific experts, and decision makers on the forecast of threats to animal and plant health and food safety having a potential high impact on food and nutrition security for the three months ahead. These threats are transboundary animal and plant pests and diseases including forest pests and aquatic diseases, and food safety threats.

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

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

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FCC FORECASTING METHODOLOGY

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

FAO Food Chain Crisis-Intelligence and Coordination Unit (FCC-ICU) has developed an integrated forecasting approach to assess the likelihood of occurrence of threats to the food chain (FCC threat) for the upcoming three months. Based on this approach and upon availability of FAO data, a number of forecast events are presented at country level. Data are collected, analyzed, and further presented in a table format in the quarterly FCC Early Warning Bulletin (see country table, p.14).

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

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

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

Table 1. Crossing table of likelihood of introduction and likelihood of spread (Parameter 1)

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

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

Table 2. FCC Likelihood scale

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

GLOBAL OVERVIEW

During the period October-December 2016, Food Chain Crisis (FCC) threats are expected to occur in the regions of Africa, America, Asia, and Europe.

The dynamics of the FCC threats depend on a number of risk factors/drivers including agro-ecological factors (e.g. intensive farming systems, deforestation, overgrazing, etc.), climatic changes (e.g. droughts, heavy rains, heat waves, the El Niño-Southern Oscillation (ENSO), changes in vegetation cover, etc.), human behavior (e.g. cultural practices, conflicts and civil insecurity, trade, etc.) and natural disasters.

FCC threats, as forecasted for the period of October-December 2016, will be either persisting within a country or possibly spreading to neighboring countries, or will be latent and will re-emerge/amplify at a certain time.

FCC Threats

As of September 2016, FCC threats forecasted for the upcoming three-month period October-December 2016, comprise 31 different animal and plant pests and diseases, aquatic diseases, and forest pests and diseases:

- **Animal and zoonotic diseases:** African swine fever, Foot-and-mouth disease, Highly pathogenic avian influenza, Lumpy skin disease, Middle East respiratory syndrome coronavirus, peste des petits ruminants and Rift Valley fever.
- **Aquatic diseases:** Acute hepatopancreatic necrosis disease *Enterocytozoon hepatopenaei*, Epizootic ulcerative syndrome.
- **Locusts:** Desert Locust, Italian Locust, Migratory Locust, Moroccan Locust.
- **Plant diseases:** Banana bunchy top disease, Banana fusarium wilt disease, Banana *Xanthomonas* wilt disease, Cassava mosaic disease, Wheat stem rust disease.
- **Forest pests and diseases:** Bark beetles, Blue gum chalcid, Boxwood blight, Boxwood moth, Bronze bug, Chestnut gall wasp, Dry cone syndrome, Pine processionary moth, Red gum lerp psyllid, Oak charcoal disease, Western conifer seed bug.

Other regional/global threats

Zika virus

Since 2015 and as of September 2016, 71 countries and territories reported evidence of vector-borne Zika virus transmission. Countries in the Western Pacific Region continue to report new cases as seen in Singapore, Philippines, Malaysia and Viet Nam. Thailand, in the South-East Asia Region, has also recently reported Zika cases. It is not clear whether the apparent recent increase in the number of reported Zika cases is due to an actual increase in incidence or whether this is the result of enhanced surveillance, testing or awareness.

More information is available at: <http://www.who.int/emergencies/zika-virus/situation-report>

GLOBAL OVERVIEW

El Niño and La Niña current situation and forecasting

During early September 2016, the tropical Pacific Ocean and atmospheric variables indicate weak La Niña or neutral conditions. The collection of ENSO prediction models indicate sea surface temperature retreating from currently near-La Niña levels towards cool-neutral through 2016 fall into winter.

This situation could slightly increase the chance of above average rainfall in some areas that have been affected by El Niño associated drought.

El Niño is a naturally occurring phenomenon characterized by the abnormal warming of sea surface temperature in the central and eastern equatorial Pacific Ocean. On average, it occurs every two to seven years and can last up to 18 months. El Niño has extensive consequences for global weather and climate patterns; in some regions it can lead to reduced rainfall and drought, while other regions experience heavy rains and flooding.

La Niña is the cooling of sea surface temperatures in the tropical Pacific, which occurs roughly every three to five years, lasting from six to 24 months. After an El Niño episode, the chances of La Niña to follow are higher.

On average half of the El Niño events are followed by a La Niña episode. La Niña generally affects global climate patterns in the opposite way El Niño does. The intensity of the La Niña climatic phenomenon generally peaks between October and January.

La Niña phenomena generally affects the same regions that are affected by El Niño, with opposed climatic consequences.

REGIONAL OVERVIEW

AFRICA

In Africa, a total number of 59 FCC events have been forecasted including animal and aquatic diseases, locusts, plant pests and diseases, and forest pests and diseases. The likelihood of occurrence vary from Nil¹ to High.

From these, the following FCC events have significant regional implications:

Animal and aquatic diseases

➤ Further spread of **H5N1 Highly pathogenic avian influenza (H5N1 HPAI)** in poultry is expected in West Africa where, since its incursion in December 2014 in Nigeria, the virus has spread in West Africa into six countries (Burkina Faso, Cote d'Ivoire, Ghana, Niger, Nigeria, Togo) and into Cameroon in Central Africa. The last incursion was reported in Togo in August 2016. In Nigeria, where, since its introduction, the virus has been reported in 26 states in the country, the disease has become endemic. Cote d'Ivoire and Ghana, continue to report outbreaks in some areas of the countries. Niger reported a new incursion of the virus in February 2016 after 10 months since the previous introduction which occurred in April 2015. Burkina Faso notified its last outbreak in July 2015.

In Central Africa, further spread of H5N1 HPAI along poultry value chains is expected to occur in Cameroon, where virus incursion has been reported in late May 2016 and where further spread is expected. Since then, outbreaks in poultry have been reported in Cameroon in Central, South, West and Adamaoua regions.

In Egypt, H5N1 HPAI outbreaks continue to be reported in poultry, with sporadic occurrence of human cases associated with exposure to infected poultry. As for seasonal patterns, the number of outbreaks have decreased during the summer months. An increase of cases is expected to occur starting October 2016. The circulation of H5N1 HPAI and of other low pathogenic avian influenza virus (e.g. H9N2), continue to be a possible source of avian influenza virus introduction and further spread in neighboring countries in the region (e.g. Libya, Algeria and Tunisia).

➤ In Western Africa, **Rift Valley fever (RVF)** is actively circulating in Niger, where, since the beginning of August 2016 has caused infections in humans and animals in Abalak and in Tchintabaraden districts of Tahoua region. As of September 2016, 78 human cases, including 26 deaths, have been detected in several villages of the affected areas. Abortion and deaths were observed in livestock (small ruminants mainly). The Government, with the support of national and international partnership, is leading the multidisciplinary response.

1 Nil refers to the forecast of Locust which is continuously under FAO monitoring

REGIONAL OVERVIEW

Noteworthy, between 23 and 25 September, a big annual animal and human mass gathering, *la Cure Salée*, gathered millions of cattle and small ruminants from many parts of Niger and from neighbouring countries (mainly from Burkina Faso, Mali and Nigeria) into the current affected area. The virus is likely to continue circulating and spread in the affected area and within Niger, and incursions might be observed in neighbouring countries, due to movement of animals, including camels, returning home after having been present in the infected part of Niger.

➤ In Eastern Africa, Rodrigues and Mauritius islands reported their first **Foot-and-mouth disease (FMD)** incursion, which was observed in July 2016 in Rodrigues Island. FMD virus disease has caused over 150 outbreaks in one month in the island, and has been introduced in Mauritius via informal movement of live animals. The virus has been identified as Serotype O, Topotype ME-SA, similar to those isolated in southern Asia (e.g. Nepal). Vaccination campaigns are ongoing in both islands, possibly mitigating the risk of further spread within the affected island and incursion into neighboring islands and in the African continent.

Zimbabwe is facing an FMD epidemics caused by a SAT2 virus type since January 2015. Recently, ongoing outbreaks have been reported in Matabeleland South, Midlands and Matabeleland North Provinces, affecting also villages at the border with Zambia. Lack of adequate vaccinations programs and movement control is worsening the situation in the country and can increase the likelihood of introduction of the virus into neighboring countries, e.g. Zambia.

➤ **Epizootic ulcerative syndrome (EUS)** may possibly spread to other parts of Western Africa due to a number of risk factors such as heavy rainfall, flooding, poor biosecurity, movement of infected fish and birds. In addition, movements of fish (cross border and domestic) for aquaculture and ornamental fish trade are proven pathways. In some countries outbreaks of EUS occur first in wild fish, and then spread to fish ponds. Recent incursion of the disease in Zambia and Zimbabwe indicate that the disease is likely to further spread in both countries.

Locusts

➤ In Eastern Africa, **Desert Locust** small hopper bands and swarms are likely to form in eastern Ethiopia and northwestern Somalia. This could be supplemented by a moderate risk of additional small swarms arriving from Yemen.

➤ In Eastern Africa, **Red Locust** situation could deteriorate in Mozambique, the United Republic of Tanzania and Zambia and neighboring countries as breeding will start with the onset of the rainy season.

➤ In Madagascar, the first generation of breeding of the **Migratory Locust** (2016/2017 campaign) will start with the onset of the rainy season; careful monitoring and limited control operations will be required.

➤ In Western Africa, there is a low to moderate risk that **Desert Locust** groups will form and appear in western and northwestern Mauritania as vegetation dries out in October 2016 that could lead to an outbreak.

REGIONAL OVERVIEW

Plant pests and diseases

➤ In Central Africa (Cameroon and Gabon), **Banana bunchy top disease** occurred and its damage might intensify.

Forest pests and diseases

➤ In Southern Africa, the likelihood of occurrence of outbreaks of the insect pest **Red gum lerp psyllid** in Eucalyptus forests is still high in Malawi, Mozambique, South Africa, and Zimbabwe.

➤ The insect pests **Blue gum chalcid** and **Bronze bug** are still a threat for Eucalyptus forests in Zambia and Zimbabwe. Both pests are also reported in Malawi and outbreaks are likely.

REGIONAL OVERVIEW

AMERICAS

In the Americas, a total number of 16 FCC events have been forecasted including aquatic diseases, forest pests and diseases. The likelihood of occurrence vary from low to High.

From these, the following FCC events have significant regional implications:

Aquatic diseases

- Potential spread of **Acute hepatopancreatic necrosis disease (AHPND)** in shrimps (*Penaeus vannamei*) to Central America from live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock from infected countries through trade and live aquatic animal movement as well as infected live shrimps.
- Potential spread of ***Enterocytozoon hepatopenaei* (EHP)** from infected countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feeds for broodstock.

Forest pests and diseases

- In the dry corridor of Central America pine forests of Honduras, Guatemala and Nicaragua, are experiencing severe infestation of **Bark beetles** in particular the *Dendroctonus frontalis* species. Pine species *Pinus caribaea*, *Pinus oocarpa* and *Pinus patula* within natural forests and plantations stressed by prolonged drought triggered by El Niño and weakened due to poor forest management practises, have become most vulnerable to the beetle attacks.

REGIONAL OVERVIEW

ASIA

In Asia, a total number of 61 FCC events have been forecasted including animal and aquatic diseases, locusts, and forest pests and diseases. The likelihood of occurrence vary from Nil¹ to High. From these, the following FCC events have significant regional implications:

Animal and aquatic diseases

- **H5 Highly pathogenic avian influenza (HPAI)** viruses are expected to continue circulating and possibly spread to previously unaffected countries in Eastern and Southeast Asia. Possible occurrence of H5N1 HPAI outbreaks in Iraq and possible spread into neighboring country. Since its incursion in Iraq and Lebanon in late 2015 and beginning of 2016, the virus has continued circulating through poultry value chains in Iraq, with outbreaks officially reported up to July 2016.
- Possible incursion of **Peste des petits ruminants (PPR)** from endemic countries, to non-endemic countries in countries in Eastern Europe and Central Asia. This has lately occurred in Mongolia, where PPR has been detected for the first time in August 2016. This new incursion, if not promptly controlled, might pave the way for virus spread within the country and into neighboring countries such as Kazakhstan and the Russian Federation.
- Potential spread of **Lumpy Skin disease (LSD)** within the affected areas in the Middle East and Eastern Europe (i.e. the Russian Federation), to areas in the Caucasus and Central Asia facilitated by animal movements. Upcoming adverse weather conditions for the vectors might reduce the likelihood of new incursions or further spread in affected countries in Europe.
- Potential spread of **Acute hepatopancreatic necrosis disease (AHPND)** in shrimp species *Penaeus monodon* and *Penaeus vannamei* to other parts of Asia from infected countries from live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock as well as infected live shrimps.
- Possible further spread of **Enterocytozoon hepatopenaei (EHP)** to other parts of Asia from infected countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feeds for broodstock.

Locusts

- Another generation of **Desert Locust** breeding will cause more hopper bands and swarms to form in the interior and southern coastal areas of Yemen that could spread to the Red Sea coast and adjacent areas of Saudi Arabia and the Horn of Africa.

2 Nil refers to the forecast of Locust which is continuously under FAO monitoring

REGIONAL OVERVIEW

➤ In Western Asia, adult populations of the three locust pests, **Italian**, **Migratory** and **Moroccan Locusts** will disappear in all Caucasian and Central Asian countries and egg-pods will stay in the ground until hatching during next spring.

Forest pests and diseases

➤ Dieback of boxwood trees (*Buxus hyrcana*), IUCN threatened species, caused by **Boxwood blight** (pathogen *Calonectria pseudonaviculata*) continues to be reported in the Caspian forest of the Islamic Republic of Iran. The recent introduction of boxwood moth (*Cydalima pesrpectalis*) is likely to cause severe defoliation in October 2016 before winter season.

➤ Severe defoliation of boxwood trees (*Buxus colchica*), IUCN threatened species, caused by **Boxwood moth** (*Cydalima pesrpectalis*) and **Boxwood blight** (pathogen *Calonectria Pseudonaviculata*) continues to be reported in Georgia.

➤ **Boxwood moth** and **Boxwood blight** are causing diebacks of native boxwood species in Georgia and surrounding regions.

➤ **Chestnut gall wasp** is causing heavy damages to chestnut trees and threatening livelihoods of local communities in Turkey.

➤ **Dry cone syndrome** and **Western conifer bug** are causing severe losses in pine nut harvest in Lebanon. During winter period the pest activities are likely to decline temporarily.

REGIONAL OVERVIEW

EUROPE

In Europe, a total number of 19 FCC events have been forecasted including animal diseases and forest pests. The likelihood of occurrence varies from Low to High.

From these, the following FCC events have significant regional implications:

Animal diseases

➤ **African swine fever (ASF)** outbreaks and transmission is likely to continue in the affected countries (Russian Federation, Ukraine, Poland, Estonia, Lithuania and Latvia) where the virus is becoming endemic in wild boar populations and is sporadically transmitted to domestic pigs through feeding and other infected material. Since August 2016, ASF has reached new areas within the affected countries, especially in Russian Federation and Ukraine. This increases the possibility of incursion into neighboring countries (e.g. Romania, Belarus, and Republic of Moldova) via live animals and animal products movement along pig value chains and transmission between seasons through infected carcasses of dead wild boars overwintering.

➤ Possible further spread of **Lumpy skin disease (LSD)** within the affected countries and possible incursion into new countries in Europe and Central Asia. This likelihood is partially mitigated by the applied vaccination campaign and the upcoming adverse weather conditions for the vectors. Since its re-emergence in northern Greece in early April 2016, and in southern Russian Federation in May 2016, LSD has been spreading in two fronts. From Greece it has spread northward, with incursion and further spread in Bulgaria, Former Yugoslav Republic (FYR) of Macedonia, Serbia, Montenegro and Albania. In Russian Federation, the disease has spread from the south to the north, east and westwards within the country, affecting 15 administrative divisions. LSD incursion was reported in Kazakhstan, close to the western border with Russian Federation.

Locusts

➤ Adult populations of the three locust pests **Italian, Migratory and Moroccan Locusts** will disappear in all Caucasian and Central Asian countries and egg-pods will stay in the ground until hatching during next spring.

Forest pests and diseases

➤ **Pine processionary moth** continues to cause heavy damages to pine forests in Albania.

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More detailed information on FCC threats forecasts at country level is available under the FCC threats forecasting at country level section.





















FCC THREATS FORECASTING AT COUNTRY LEVEL

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

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

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

Legend

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

High: an event is highly likely to occur




Moderate: an event is likely to occur





Low: an event is unlikely to occur




Nil: an event is very unlikely to occur








FCC THREATS FORECASTING AT COUNTRY LEVEL





AFRICA







Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
Algeria	Desert Locust	Moderate	 Small-scale breeding in the south will cause locust numbers to increase slightly.		
Benin	Avian influenza (AI)	High	 Incursion of H5N1 Highly pathogenic avian influenza (HPAI) from neighbouring countries amplified by inadequate capacity to detect and control the infection in poultry.	H5N1 HPAI virus has been circulating in seven countries in West and Central Africa since December 2014. The virus has never been reported in Benin so far.	
Burkina Faso	Rift Valley Fever (RVF)	Moderate	 Incursion of Rift Valley fever and other transboundary animal diseases (TADs) from neighboring affected areas of Niger through animal movement.	RVF is actively circulating in the northwestern part of Niger since the beginning of August 2016 where the virus has been detected in humans and animals. Noteworthy, between 23 and 25 September, a big annual animal and human mass gathering, “ <i>la Cure Salée</i> ”, gathered millions of cattle and small ruminants from many parts of Niger and neighbouring countries (mainly Burkina Faso, Mali and Nigeria) in the current affected area.	Food security conditions remain difficult in several regions, especially in Oudalan and Soum provinces, mostly due to rainfall and cereal production deficits in 2015. The country also continues to host a large number of refugees from Mali (over 33 000 Malian refugees are estimated to be living in the country). About 233 300 people are estimated to be in need of food assistance according to the last “ <i>Cadre Harmonisé</i> ” analysis.






Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
Cameroon	Avian influenza (AI)	Moderate	 Occurrence of further H5N1 highly pathogenic avian influenza (HPAI) outbreaks in poultry and possible incursion from neighbouring countries where the virus is still actively circulating.	H5N1 HPAI has been detected in Cameroon in late May 2016. Since then, outbreaks in poultry have been reported in Central, South and West regions. The last outbreak was detected beginning of June 2016.	The number of refugees from the Central African Republic, who mainly entered East, Adamaoua and North regions, was estimated at 274 000 in June 2016. About 66 000 refugees from Nigeria have entered the Far North and North regions since May 2013. In February 2016, the number of food insecure people was estimated at 2.4 million, more than twice the level in June 2015. The most affected area is the Far North Region. In the Far North Region, insecurity along the borders with Nigeria has led to the internal displacement of 150 000 persons.
	Banana bunchy top disease (BBTD)	Moderate	 Spread of Banana bunchy top disease (BBTD) which is currently present in the southern part of the country.	BBTD has already impacted banana production in recent years in the country.	
Central African Republic	Epizootic ulcerative syndrome (EUS)	High	 Suspected Epizootic ulcerative syndrome (EUS) outbreak in central and southern areas of the country.	EUS is suspected in the central and southern areas of the country. If the disease is confirmed, the outbreak will have a serious impact on the livelihoods and food security of thousands of persons who depend on fisheries in the Central African Republic.	As of September 2016, 1.787 million of people are estimated to be in need of humanitarian assistance.
Chad	Desert Locust	Moderate	 Small groups are likely to form in the northeast.		Large caseload of refugees continue to put additional pressure on local food supplies. Over 1 million of people are estimated to be in need of food assistance. The widespread conflict, which caused large-scale displacements, the loss and depletion




Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
					of households' productive assets and input shortages continue to weigh on 2016 production prospects.
Côte d'Ivoire	Avian influenza (AI)	Moderate	 Occurrence of further H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry and possible incursion from neighbouring countries where the virus is still actively circulating.	After its incursion in Nigeria in December 2014, H5N1 HPAI has been detected in Côte d'Ivoire in April 2015 and the virus has been detected recently in Abidjan. Outbreaks are currently reported in five West African countries and in Cameroon. Inadequate control measures in these countries can further facilitate regional spread.	
Democratic Republic of the Congo	Epizootic ulcerative syndrome (EUS)	High	 Further spread of Epizootic ulcerative syndrome (EUS) to other parts of the country and potentially to other parts of Africa through for example heavy rainfall, flooding, poor biosecurity, movement of infected fish and possibly birds.	Several fish species were positively confirmed through PCR (polymerase chain reaction) laboratory and histology testing.	An estimated 5.9 million people are in need of urgent humanitarian assistance in Eastern and Southern conflict-affected provinces (June 2016).
Djibouti	Desert Locust	Low	 Threat from Yemen, northwestern Somalia, eastern Ethiopia.		Inadequate pasture availability due to consecutive unfavorable rainy seasons. About 227 000 people are severely food insecure, mainly in pastoral southeastern areas and in the Obock region.


Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
Egypt	Avian influenza (AI)	Moderate	 Occurrence of further H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry and possible occurrence of sporadic human infection. An increase in the number of event reported is expected starting from November as for seasonal pattern.	H5N1 HPAI is endemic in Egypt. Outbreaks in poultry are reported every month with a marked seasonal pattern. Other influenza viruses circulating in poultry in the country are H5 LPAI and H9N2 LPAI. H5N1 and H9N2 human cases are sporadically reported.	
	Desert Locust	Low	 No significant developments likely.		
Eritrea	Wheat rust	Low	 Wheat yellow and stem rust inoculum may cause epidemic in the country.	Wheat yellow and stem rust inoculum are already present in the country for years.	Vulnerability to food insecurity due to El Niño-related drought and economic constraint.
	Desert Locust	Moderate	 Small-scale breeding will cause locust numbers to increase slightly on the Red Sea coast.		
Ethiopia	Wheat rust	Low	 Wheat yellow and stem rust inoculum may cause epidemic in the country.	Wheat yellow and stem rust inoculum are already present in the country for years.	Lingering effects of the 2015 severe drought on livestock and crop production. About 9.7 million people are severely food insecure, mainly in eastern areas of Oromia, Amhara and Tigray regions as well as in Afar and northern Somali regions.
	Desert Locust	Moderate	 Small hopper bands and swarms likely to form in the eastern part of the country; threat from Yemen.		
Gabon	Banana bunchy top disease (BBTD)	Moderate	 Spread of Banana bunchy top disease (BBTD) which is currently present.	BBTD has already impacted banana production in recent years in the country.	




Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
Ghana	Avian influenza (AI)	Moderate	 Occurrence of further H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry due to further spread of the virus within the country or due to new incursion from neighbouring countries where the virus is still actively circulating.	After its incursion in Nigeria in December 2014, H5N1 has been detected in Ghana in March 2015. Since then, in Ghana, the virus has caused over 50 outbreaks in five different regions with the last reported outbreaks observed in July 2016. Since December 2014 H5N1 incursion has been reported in seven countries in West and central Africa.	
Kenya	Banana <i>Xanthomonas</i> wilt (BXW)	Moderate	 Banana <i>Xanthomonas</i> wilt (BXW) has reoccurred in western part of the country and is likely to spread.	The disease has affected bananas in the past and was reduced. Recently, it has been reported again and might expand.	About 640 000 people are severely food insecure, mainly located in northeastern and southeastern pastoral areas, following poor rains during March to May 2016 negatively impacting herds and grazing resources.
Libya	Desert Locust	Nil	 No significant developments likely.		
Madagascar	Migratory Locust	Moderate	 First generation of breeding of the 2016-2017 locust season.	No crop damage due to locusts expected.	Prolonged dryness in southern regions cause a successive annual reduction in the agricultural output, resulting in severe food insecurity in these areas. At the national level, rice production is forecast to remain below average, but marginally up on last year's reduced level.








Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
Malawi	Red gum lerp psyllid	Moderate	 Occurrence of outbreaks of the insect Red gum lerp psyllid in Eucalyptus plantations.	The combination of climate change with the general decline of forest conditions and the occurrence of Red gum lerp psyllid continue to damage plantations and small wood lots.	The number of people requiring human assistance is estimated at 6.5 million. Maize production in 2016 decreased by one-third compared to the five-year average, resulting in tighter supplies and higher prices.
	Blue gum chalcid	Moderate	 Occurrence of outbreaks of the insect Blue gum chalcid in Eucalyptus plantations.	Blue gum chalcid continues to cause severe damages in nurseries and young Eucalyptus plantations.	
	Red Locust	Low	 Breeding will start with the onset of the rainy season.	Locust situation improving as a result of control operations.	
	Migratory Locust	Moderate	 On-going breeding.		
Mali	Desert Locust	Moderate	 Small groups are likely to form in summer breeding areas in the west and north.		An estimated 39 182 people have been internally displaced in the country mostly residing in Timbuktu, the most affected region. About 115 000 people, located mostly in Timbuktu, Mopti and Bamako regions, are estimated to be in Phase 3: “Crisis” and above, according to the last “Cadre Harmonisé” analysis.
	Rift Valley Fever (RVF)	Moderate	 Incursion of RVF from neighboring affected areas of Niger through animal movement.	RVF is actively circulating in the north-western part of Niger since the beginning of August 2016, where the virus has been detected in humans and animals. Noteworthy, between 23 and 25 September, a big annual animal and human mass gathering, <i>la Cure Salée</i> , gathered millions of cattle and small ruminants from many parts of Niger and neighbouring countries (mainly Mali, Burkina Faso and Nigeria) in the current affected area.	






Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
Mauritania	Desert Locust	High	 An outbreak is expected to develop in the northwest of the country by mid-October that may lead to hopper band and swarm formation.		About 49 700 Malian refugees remain in southeastern Mauritania in the Mbeera camp. Over 149 000 people are estimated to be in Phase 3: “Crisis” and above, according to the last “Cadre Harmonisé” analysis.
Mauritius	Foot-and-mouth disease (FMD)	High	 Further spread of Foot-and-mouth disease (FMD) outbreaks.	Mauritius is experiencing its first FMD incursion. First observed in Rodrigues Island in July 2016, in August the virus has spread to Mauritius, driven by illegal introduction of live animals. The FMD virus has been identified as Serotype O, Topotype ME-SA FMD virus. The ongoing vaccination campaign might mitigate the spread.	
Morocco	Desert Locust	Moderate	 Adult groups may appear in the extreme south and breed.		
Mozambique	Banana fusarium wilt disease	Moderate	 Further spread of Banana fusarium wilt disease.	The disease is already present in two farms in the country since 2013. Banana Fusarium Wilt disease is a soil-borne disease that cannot be eradicated once established in a plantation. Prevention of the spread is crucial.	Drought conditions resulted in lower cereal outputs in southern provinces and in parts of central provinces, while higher prices are adversely impacting food access. Approximately 2 million people are food insecure.
	Red gum lerp psyllid	Moderate	 Spread of the insect pest Red gum lerp psyllid in Eucalyptus plantations within the country.	Capacity building for introduction of biological control agents for the management of pest is ongoing.	





Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
	Acute hepatopancreatic necrosis disease (AHPND)	Low	 Introduction of (AHPND) from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.	Mozambique has the shrimp species susceptible to AHPND. Strong awareness on shrimp diseases is present in the country.	
	Red Locust	Moderate	 Breeding will start with the onset of the rainy season and the situation could further deteriorate.		
Niger	Avian influenza (AI)	Moderate	 Occurrence of further H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry and possible incursion from neighbouring countries where the virus is still actively circulating.	After its incursion in Nigeria in December 2014, H5N1 HPAI has been detected in the country in two isolated outbreaks, lastly in February 2016 in Tillaberi region. Since December 2014, H5N1 incursion has been reported in seven countries in West and central Africa. Inadequate control measures in these countries can further facilitate regional spread.	More than 657 000 people are estimated to be in Phase 3: “Crisis” and above according to the last “Cadre Harmonisé” analysis. Approximately 60 000 Malian refugees are estimated to be living in the country. Almost 114 000 people in the southeast Diffa region have been displaced due to fear of attacks.





Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
	Rift Valley Fever (RVF)	High	 Further Rift Valley fever (RVF) spread in animal population in the already affected areas and possible further spread within the country. Further occurrence of RVF human cases, possibly mitigated by the ongoing awareness campaign.	Rift Valley fever (RVF) was officially reported by the Veterinary Services in Niger to OIE last 19 September 2016, following the unexplained deaths among humans along with abortion and deaths in livestock (small ruminants mainly) occurring since August 2016 in Tahoua district, in the northwestern part of Niger bordering Mali. Up to 29 September 2016, RVF has caused over 78 human cases, including 26 deaths in several villages of Tahoua and Abalak districts. A multisectoral national plan has been developed by the Ministries of Health and Agriculture / Livestock. Noteworthy, between 23 and 25 September, a big annual animal and human mass gathering, <i>la Cure Salée</i> , gathered millions of cattle and small ruminants from many parts of Niger and neighbouring countries (mainly Mali, Burkina Faso and Nigeria) in the current affected area, raising concerns of further transmission and spread among participants and their animals.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
Nigeria	Avian influenza (AI)	High	 Further spread of H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry.	H5N1 HPAI virus has been circulating in West Africa since December 2014 with Nigeria being the most affected country with over 500 outbreaks reported in poultry in 26 States. Given the current epidemiological situation and the lack of effective control measures, H5N1 HPAI can be considered endemic in Nigeria. Since December 2014, H5N1 incursion have been reported in seven countries in West and central Africa.	Approximately 2.2 million people have been internally displaced due to the continuing conflict in northern parts of the country. About 3.4 million people, located mostly in Borno and Yobe, are estimated to be in need of food assistance according to the last “Cadre Harmonisé” analysis.
	Rift Valley Fever (RVF)	Moderate	 Incursion of Rift Valley fever (RVF) from neighboring affected areas of Niger through animal movement.	RVF is actively circulating in the northwestern part of Niger since the beginning of August where the virus have been detected in human and animals. Noteworthy, between 23 and 25C September, a big annual animal and human mass gathering, <i>la Cure Salée</i> , gathered millions of cattle and small ruminants from many parts of Niger and from neighbouring countries (mainly from Mali, Burkina Faso and Nigeria) into the current affected area.	
Rwanda	Bronze bug	Moderate	 Further spread of the insect pest Bronze bug in	The insect pest Bronze bug is currently damaging Eucalyptus plantations.	The country is reporting dieback of Eucalyptus trees.





Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
			Eucalyptus plantations within the country.		
Senegal	Desert Locust	Nil	 No significant developments likely.		
Somalia	Desert Locust	Moderate	 Small hopper bands and swarms likely to form in the northwestern part of the country; threat from Yemen.		About 953 000 people are estimated to be in need of emergency assistance.
South Africa	Banana bunchy top disease (BBTD)	Low	 Possible spread of Banana bunchy top disease (BBTD) from an initially infested farm in Kwa Zulu coastal area.	The disease was reported for the first time in Kwa Zulu Natal on the south-east coast of the country in June 2016.	
	Red gum lerp psyllid	Low	 Spread of the insect pest Red gum lerp psyllid in Eucalyptus plantations within the country.	The introduction of biological control agents to reduce the pest population is in progress.	
	Blue gum chalcid	Moderate	 Occurrence of outbreaks of the insect pest Blue gum chalcid in Eucalyptus plantations.	The introduction of biological control agents to reduce the pest population is in progress.	
Sudan	Desert Locust	Moderate	 Small groups are likely to form in summer breeding areas in the interior. Adult will appear and breed on the Red Sea coast.		An estimated 4.4 million people are in need of humanitarian assistance, mainly IDPs in conflict affected areas and pastoral communities.
Togo	Avian influenza (AI)	High	 Occurrence of further H5N1 highly pathogenic avian influenza (HPAI) outbreaks in poultry and possible incursion from	H5N1 HPAI virus has been detected in Togo in August 2016 in circulating in two semi-modern farm in the Maritime region, located at the border with Ghana	






Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
			neighbouring countries where the virus is still actively circulating.	and with Benin, respectively. Since December 2014, starting from Nigeria, the virus has been detected in six countries in West Africa and in Cameroon. Inadequate control measures in these countries can further facilitate regional spread.	
Tunisia	Desert Locust	Nil	 No significant developments likely.		
	Peste des petits ruminants (PPR)	Low	 Occurrence of further Peste de petits ruminants (PPR) outbreaks fostered by the lack of adequate vaccination campaign.	In July and August 2016, Peste des petits ruminants (PPR) outbreaks were detected in three governorates in the northern part of the country. The occurrence of PPR in Tunisia reflects the difficulties and challenges in the country to implement an adequate vaccination strategy to control PPR.	
Uganda	Blue gum chalcid	Moderate	 Outbreaks of the insect pest Blue gum chalcid will continue to occur in Eucalyptus plantations.	The insect Blue gum chalcid is currently causing severe damages in Eucalyptus plantations.	About 393 000 people in Karamoja region are estimated to be severely food insecure following consecutive unfavorable rainy seasons.
United Republic of Tanzania	Blue gum chalcid	Moderate	 Occurrence of outbreaks of insect pest Blue gum chalcid in Eucalyptus plantations and woodlots.	Damage continues in Eucalyptus plantations due to Blue gum chalcid.	
	Red Locust	Moderate	 Breeding will start with the onset of the rainy season and the situation could further deteriorate.		





Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
Zambia	Blue gum chalcid	Moderate	 Occurrence of outbreaks of the insect pest Blue gum chalcid in Eucalyptus plantations.	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.	
	Red gum lerp psyllid	Moderate	 Occurrence of outbreaks of the insect pest Red gum lerp psyllid in Eucalyptus plantations.	Zambia has initiated pest management activities based on silvicultural practices, breeding programmes and quarantine measures to reduce the insect populations.	
	Epizootic ulcerative syndrome (EUS)	Moderate	 Further spread of Epizootic ulcerative syndrome to other parts of the country and potentially to other parts of Africa through for example heavy rainfall, flooding, poor biosecurity, movement of infected fish and possibly birds.	Water temperature ranges from 18-25 C from March to November. The causative oomycete grows best between 20-30 C. Based on active surveillance done during July, FAO was informed that new locations for EUS in Northern Zambia were observed in the Chambishi river system/fishery in Mungwi district.	
	Red Locust	Moderate	 Breeding will start with the onset of the rainy season and the situation could further deteriorate.		



Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
Zimbabwe	Red gum lerp psyllid	High	 Outbreaks of the insect pest Red gum lerp psyllid will continue to be reported in Eucalyptus plantations.	Pest management efforts using biological control are in progress.	An estimated 33 percent of the rural population require assistance during the October-December 2016 period. This number is projected to increase to 44 percent, approximately 4 million people, during the peak of the lean period (January–March 2017). The El Niño-induced drought resulted in 2016 in a severe decrease of cereal production and in the loss of livestock.
	Blue gum chalcid	High	 Outbreaks of the insect pest Blue gum chalcid will continue to be reported in Eucalyptus plantations.	Pest management activities based on application of biological control agent are in progress to reduce Blue gum chalcid populations.	
	Bronze bug	Moderate	 Outbreaks of the insect pest Bronze bug in Eucalyptus plantations.	Pest management activities are in progress.	
	Epizootic ulcerative syndrome (EUS)	High	 High likelihood due to close proximity to Zambia which is the most severely affected country in southern Africa.	Water temperature during the period between May to September ranges from 18 to 25 C. The causative oomycete grows best between 20-30 C. Wild fish population vulnerable. First occurrence of EUS in the country reported to OIE on 18 August 2016. Outbreak locations: Mashonaland East (Nyaitenga, Mutoko) and Midlands (Shangani North, Gweru).	

AMERICAS


Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Country/Area	Threat disease
Colombia	Acute hepatopancreatic necrosis disease (AHPND)	Low	 Introduction of Acute hepatopancreatic necrosis disease from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.		
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Low	 Introduction of <i>Enterocytozoon hepatopenaei</i> (EHP) from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock.		
Guatemala	Bark beetles	High	 Occurrence of outbreaks of Bark beetle in pine plantations.		
	Acute hepatopancreatic necrosis disease (AHPND)	Low	 Introduction of Acute hepatopancreatic necrosis disease from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.		



Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Country/Area	Threat disease
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Low	 Introduction from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feeds for broodstock.		
Honduras	Bark beetles	High	 Outbreaks of Bark beetle will continue to be reported causing heavy losses in pine plantations.		
	Acute hepatopancreatic necrosis disease (AHPND)	Low	 Introduction of Acute hepatopancreatic necrosis disease (AHPND) from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.		
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Low	 Introduction of <i>Enterocytozoon hepatopenaei</i> (EHP) from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock.		
Nicaragua	Bark beetles	High	 Occurrence of outbreaks of Bark beetle in pine plantations.		






Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Country/Area	Threat disease
	Acute hepatopancreatic necrosis disease (AHPND)	Low	 Introduction of Acute hepatopancreatic necrosis disease (AHPND) from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.		
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Low	 Introduction of <i>Enterocytozoon hepatopenaei</i> (EHP) from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock.		
Panama	Acute hepatopancreatic necrosis disease (AHPND)	Low	 Introduction of Acute hepatopancreatic necrosis disease (AHPND) from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.		
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Low	 Introduction of <i>Enterocytozoon hepatopenaei</i> (EHP) from other countries through trade of live animals		






Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Country/Area	Threat disease
			(e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock.		
Peru	Acute hepatopancreatic necrosis disease (AHPND)	Low	 Introduction of Acute hepatopancreatic necrosis disease from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.		
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Low	 Introduction of <i>Enterocytozoon hepatopenaei</i> (EHP) from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock.		





ASIA




Country/Area	Threat disease	Likelihood of occurrence	Forecast for October–December 2016	Details	Country context
Afghanistan	Italian Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		Some 2.1 million people are classified as very severely food insecure. Over 700 000 people are internally displaced, mostly in Helmand Province. About 1.7 million people are targeted with food assistance.
	Moroccan Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		





Country/Area	Threat disease	Likelihood of occurrence	Forecast for October–December 2016	Details	Country context
Armenia	Lumpy skin disease (LSD)	Moderate	 Re-emergence of Lumpy skin disease (LSD) in the already affected area and possible spread within the country.	At the beginning of December 2015, Armenia observed its first LSD outbreak in the southernmost province of the country. Since then no additional outbreaks were officially reported. LSD has re-emerged in southern Russian Federation and is currently widely spreading. Also the disease is endemic in the Islamic Republic of Iran and Turkey since 2014.	
	Italian Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		
Azerbaijan	Boxwood blight	Moderate	 The presence of <i>Buxus</i> trees in bordering countries affected by boxwood blight, indicate that the disease is likely to be introduced into Azerbaijan and spread within the country.	The native <i>Buxus hyrcana</i> forests are likely to be severely affected by boxwood blight.	
	Lumpy skin disease (LSD)	Moderate	 Incursion of Lumpy skin disease (LSD) from neighbouring countries.	LSD outbreaks were detected in Azerbaijan in July 2014, adjacent to the border with the Islamic Republic of Iran. In May 2015 LSD has re-emerged in southern Russian Federation and is currently widely spreading. Since 2012, LSD has spread in Western Asia and from there towards Southern and Eastern Europe: in	






Country/Area	Threat disease	Likelihood of occurrence	Forecast for October–December 2016	Details	Country context
				the Islamic Republic of Iran, Azerbaijan, Cyprus, Kuwait in 2014, in Saudi Arabia, Russian Federation in 2015 and in Kazakhstan in 2016.	
	Italian Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		
	Moroccan Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		
Cambodia	Cassava mosaic disease (CMD)	Moderate	 Spread of Cassava mosaic disease (CMD).	CMD has been recorded for the first time in the north east part of the country in 2015 and may expand.	
China	Avian influenza (AI)	Moderate	 Occurrence of Avian Influenza outbreaks in poultry due to several H5 Highly pathogenic avian influenza and low pathogenic avian influenza viruses circulating in the country. Further occurrence of sporadic avian influenza human cases due to H5 HPAI and to H7N9 LPAI virus. In both cases, an increased number of outbreaks is expected starting from November 2016.	Several serotypes of HPAI and LPAI AI viruses are circulating and being detected in China and outbreaks in poultry and human cases have been occurring in the first months of the year, but with a lower intensity comparing to previous years. The occurrence of outbreaks in poultry and of human cases usually follows a seasonal pattern, with an increase in the outbreaks observed starting from November.	
Georgia	Boxwood moth	High	 Outbreaks of Boxwood moth continues to cause	Pest management activities such as treatment with bio pesticide BtK	








Country/Area	Threat disease	Likelihood of occurrence	Forecast for October–December 2016	Details	Country context
			dieback of native boxwood species.	and pheromone trapping are in progress to protect the native boxwood species.	
	Boxwood blight	High	 Occurrence of Boxwood blight disease (caused by pathogen <i>Calonectria pseudonaviculata</i>) continue to cause dieback of native boxwood species.	Monitoring of the disease spread is in progress. Pest management activities based on silviculture practices have been initiated.	
	Lumpy skin disease (LSD)	Moderate	 Incursion and spread of Lumpy skin disease (LSD) from neighbouring countries, reinforced by the presence of favourable weather conditions for the vectors.	LSD outbreaks has never been reported in Georgia. In May 2015 LSD has re-emerged in southern Russian Federation and is currently widely spreading. Since 2012, LSD has spread in Western Asia and from there towards Southern and Eastern Europe: in the Islamic Republic of Iran, Azerbaijan, Cyprus, Kuwait in 2014, in Saudi Arabia, Russian Federation in 2015 and in Kazakhstan in 2016.	
	Italian Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		
	Moroccan Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		
India	Desert Locust	Low	 No significant developments likely.		






Country/Area	Threat disease	Likelihood of occurrence	Forecast for October–December 2016	Details	Country context
	Acute hepatopancreatic necrosis disease (AHPND)	Low	 Introduction of Acute hepatopancreatic necrosis disease (AHPND) from affected countries through trade and movement of infected broodstock and post-larvae, and other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.	Good surveillance and biosecurity measures are in place in the country as well as strong awareness on shrimp diseases.	
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Low	 Introduction of <i>Enterocytozoon hepatopenaei</i> (EHP) from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock.	Good surveillance and biosecurity measures are in place in the country as well as strong awareness on shrimp diseases.	
Indonesia	Avian influenza (AI)	Moderate	 Occurrence of H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry and of human cases.	H5N1 HPAI is endemic in Indonesia where it has been regularly detected since 2003. Outbreaks in animals show a seasonal pattern with the seasonal pick usually observed during the winter.	
	Acute hepatopancreatic necrosis disease (AHPND)	Moderate	 Introduction of Acute hepatopancreatic necrosis disease (AHPND) from affected countries through trade and movement of infected broodstock and post-larvae, and other live aquatic animals such	Surveillance for AHPND as well as strong awareness on shrimp diseases are in place in the country. Many small-scale producers are present.	






Country/Area	Threat disease	Likelihood of occurrence	Forecast for October–December 2016	Details	Country context
			as polychaetes, clams, oysters, etc. used as feed for broodstock.		
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Moderate	 Introduction of <i>Enterocytozoon hepatopenaei</i> (EHP) from other countries through live animals (e.g. live polychaetes, clams, oysters, etc.) used as feeds for broodstock.		
Iran (Islamic Republic of)	Oak charcoal disease	Low	 Oak charcoal disease (pathogen <i>Biscogniauxia mediterranea</i>) continues to cause decline of oak forest in Zagros due to the abiotic stresses. During winter months, disease symptoms are likely to decline.	The decline of oak charcoal disease has a negative impact on the livelihood of nomad people and watershed management. Operations to minimize the impact of the charcoal disease and abiotic stresses are in progress.	
	Boxwood moth	High	 The Boxwood moth (<i>Cydalima porspectalis</i>) is likely to have one more generation before winter and could cause massive defoliations. Pest activities likely to be lessened during the winter months.	The first introduction of the disease was reported in August 2016. The native boxwood forests are under new threat of Boxwood moth which is highly destructive. Early actions such as pheromone trapping for monitoring and treatments using bio pesticide BtK is required to reduce further spread.	





Country/Area	Threat disease	Likelihood of occurrence	Forecast for October–December 2016	Details	Country context
	Avian influenza (AI)	Moderate	 Incursion of H5N1 Highly pathogenic avian influenza (HPAI) from Iraq and possible further spread.	Since December 2015 H5N1 HPAI outbreaks have been observed in the neighbour Iraq with outbreaks reported up to July in Wasit and Diyala governorates, bordering Islamic republic of Iran.	
	Desert Locust	Nil	 No significant developments likely.		
	Acute hepatopancreatic necrosis disease (AHPND)	Low	 Introduction of Acute hepatopancreatic necrosis disease (AHPND) from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.	Good surveillance and biosecurity measures are in place in the country. Strong awareness on shrimp diseases is present in the country.	
Iraq	Avian influenza (AI)	Moderate	 Further spread of H5N1 Highly pathogenic avian influenza (HPAI) in the country.	Since December 2015, Iraq officially reported several H5N1 HPAI outbreaks in commercial and backyard flocks in six governorates across the country. Last episodes were reported in July 2016, when the virus was circulating in several farms in Wasit, Baghdad and Diyala governorates.	Over 2 million people have been displaced since January 2014. Some 1.8 million beneficiaries are receiving food assistance. Reduced internal trade and access to stocks in conflict areas.








Country/Area	Threat disease	Likelihood of occurrence	Forecast for October–December 2016	Details	Country context
	Acute hepatopancreatic necrosis disease (AHPND)	Moderate	 Introduction of Acute hepatopancreatic necrosis disease (AHPND) from affected countries through trade and movement of infected broodstock and post-larvae, and other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.		
Kazakhstan	Lumpy skin disease (LSD)	Moderate	 Occurrence of further Lumpy skin disease (LSD) outbreaks in the affected area and possible re-introduction from the neighbouring Russian Federation.	The first LSD incursion in the country was observed in July 2016, in the West Kazakhstan region at the border with the Russian Federation where, since May 2016, LSD has re-emerged and has been widely spreading affecting 14 regions in the southern part of the country.	
	Peste des petits ruminants (PPR)	Low	 Incursion of Peste de petits ruminants (PPR) from Mongolia and possible further spread within the country.	Pest de petites ruminants (PPR) has been reported in Mongolia in August 2016 in the Khovd and Uvs provinces. PPR has never been reported in Mongolia before and animals are not vaccinated.	
	Italian Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		
	Migratory Locust	Nil	 Egg-laying followed by natural disappearance of adults; egg-pods in the ground until next spring.		


Country/Area	Threat disease	Likelihood of occurrence	Forecast for October–December 2016	Details	Country context
	Moroccan Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		
Kyrgyzstan	Italian Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		
	Moroccan Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		
Lebanon	Dry cone syndrome	High	 Dry cone syndrome is highly likely to continue causing damages to pine plantations (<i>Pinus pinea</i>).	Heavy yield losses continue to impact rural livelihoods. The yield reduction of pine nuts is reported throughout the country.	
	Western conifer seed bug	Low	 Outbreaks of Western conifer seed bug is continuing to cause damage to pine plantations (<i>Pinus pinea</i>). Pest activities likely to be lessened during the winter months.	Heavy yield losses continue to impact rural livelihoods. The yield reduction of pine nuts is reported throughout the country.	
Mongolia	Foot-and-mouth disease (FMD)	Moderate	 Occurrence of further Foot-and-mouth disease (FMD) outbreaks fostered by the lack of effective control measures.	In 16 July 2016, a FMD outbreak (serotype A) was detected in a cattle farm in Sumber soum, Govi-Sumber province. Further disease spread might be expected, fostered by the lack of vaccination	
	Peste des petits ruminants (PPR)	High	 Further occurrence of Peste des petits ruminants (PPR) in animals in the affected areas and further spread within the country.	In August 2016, Mongolia reported its first PPR incursion. Outbreaks were officially notified in the Khovd and Uvs province. In	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for October–December 2016	Details	Country context
				Mongolia, susceptible animals are still not vaccinated.	
	Sheep and goat pox (SGP)	Low	 Further occurrence of Sheep and goat pox (SGP) in the eastern part of the country possibly mitigated by the vaccination campaign implemented.	In January 2015, SGP outbreak was reported in sheep in Mongolia for the first time since February 2013. After that. In January 2016 the number of reported outbreaks has dramatically increased and the virus had spread into new areas. Vaccination campaigns have been implemented in affected area reducing dramatically the spread of the disease.	
Oman	Desert Locust	Low	 Low threat from Yemen.		
Pakistan	Banana fusarium wilt disease	Low	 Further spread of Banana fusarium wilt disease.	The disease was reported for the first time in January 2016 from one farm. Banana fusarium wilt disease is a soil-borne disease that cannot be eradicated once established in a plantation. Therefore, prevention of the spread is crucial.	
	Desert Locust	Low	 No significant developments likely.		
Philippines	Acute hepatopancreatic necrosis disease (AHPND)	Moderate	 Further spread of Acute hepatopancreatic necrosis disease (AHPND) to other parts of the country.	Strong awareness on AHPND is in place in the country. National action plan on AHPND is in preparation.	


Country/Area	Threat disease	Likelihood of occurrence	Forecast for October–December 2016	Details	Country context
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Moderate	 Introduction of <i>Enterocytozoon hepatopenaei</i> (EHP) from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feeds for broodstock.		
Saudi Arabia	Desert Locust	Moderate	 Moderate threat from Yemen; breeding will cause locust numbers to increase on Red Sea coast where groups and bands may form.		
Sri Lanka	Acute hepatopancreatic necrosis disease (AHPND)	Moderate	 Acute hepatopancreatic necrosis disease (AHPND) from affected countries through trade of aquatic animals (infected broodstock, post-larvae and other live aquatic animals such as polychaetes, clams, oysters, etc) used as feed for broodstock.	Strong awareness on AHPND is in place in the country. National action plan on AHPND is in preparation.	
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Low	 Introduction of <i>Enterocytozoon hepatopenaei</i> (EHP) from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feeds for broodstock.		
Syrian Arab Republic	Avian influenza (AI)	Low	 Occurrence of H5N1 Highly pathogenic avian	Considering the recent detection of H5N1 HPAI in eastern Lebanon, adjacent to the border with Syrian	Agricultural production is significantly affected by conflicts. About 13.5 million people are in need




Country/Area	Threat disease	Likelihood of occurrence	Forecast for October–December 2016	Details	Country context
			influenza (HPAI) outbreaks in poultry.	Arab Republic, and H5N1 HPAI outbreaks being detected up to July in Iraq, the circulation of the virus in Syrian Arab Republic is probable.	of humanitarian assistance. Although some international food assistance is being provided, Syrian refugees are also putting strain on other host humanities in neighbouring countries. The World Food Programme (WFP) plans to reach 4.5 million people within the country with food assistance and 2 million people in neighbouring countries.
Tajikistan	Italian Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		
	Moroccan Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		
Turkey	Chestnut gall wasp	Moderate	 Chestnut gall wasp continues to spread across the country in Chestnut trees.	Pest management activities based on application of biological control agent are in progress to reduce the populations of the insect pest.	
	Avian influenza (AI)	Moderate	 Incursion of H5N1 Highly pathogenic avian influenza (HPAI) from Iraq and possible further spread.	Between December 2015 and July 2016, several H5N1 HPAI outbreaks were observed in six governorates in Iraq. The first outbreak was detected in the Kurdistan region at the border with Turkey. Virus incursion from Iraq could be facilitated by the presence of shared borders, connecting roadways and anecdotal evidence of smuggling	





Country/Area	Threat disease	Likelihood of occurrence	Forecast for October–December 2016	Details	Country context
				between the Kurdish border and Turkey and the potential surplus poultry in the Kurdish region that has been potentially exported to Turkey.	
	Lumpy skin disease (LSD)	Moderate	 Spread of Lumpy skin disease (LSD) within the country, reinforced by the favourable weather conditions for the vectors.	First detected in October 2013, LSD has spread rapidly in the country and is currently considered endemic.	
Turkmenistan	Italian Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		
	Moroccan Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		
Uzbekistan	Italian Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		
	Migratory Locust	Nil	 Egg-laying followed by natural disappearance of adults; egg-pods in the ground until next spring.		
	Moroccan Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		
Viet Nam	Avian influenza (AI)	Moderate	 Occurrence of further Highly pathogenic avian influenza (HPAI) outbreaks.	Both H5N1 and H5N6 HPAI outbreaks were reported in the country in the first half of 2016. Historically outbreaks in poultry	





Country/Area	Threat disease	Likelihood of occurrence	Forecast for October–December 2016	Details	Country context
				occur throughout the year and increase by end of the year.	
Yemen	Desert Locust	High	 Another generation of breeding will cause hopper bands and swarms to form in interior and on southern coast with movement to Red Sea coast and threat to Saudi Arabia and the Horn of Africa.	Survey and control response are severely limited by insecurity.	Around 21.2 million people (82 percent of the population), require some kind of humanitarian assistance. According to the IPC analysis of June 2016, out of the 14.12 million food insecure people (9.4 percent higher than the previous year), about 7 million were in IPC Phase: 4 “Emergency”, while 7.1 million were in IPC Phase: 3 “Crisis”. Torrential rains in July 2016 resulted in floods and landslides.





EUROPE





Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
Albania	Pine processionary moth	Moderate	 Outbreaks of Pine processionary moth will continue to be reported in black pine plantations. Heavy damages are likely to occur in October-November 2016 before the overwintering stage.	About 80 000 ha of Albania’s black pine forests is affected by pine processionary moth. Various levels of infestation are found in the north and the south of the country.	



Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
	Lumpy Skin Disease	High	 Occurrence of further Lumpy skin disease (LSD) outbreaks.	Following its re-emergence of the disease in Greece at the beginning of April 2016, and its spread in Bulgaria, Serbia and The Former Yugoslav Republic (FYR) of Macedonia, Albania reported its first LSD incursion on June 28, 2016. Since then, 150 outbreaks occurred in 19 out of 36 counties of the country. Vaccination campaign has started, but information on its progress is not available.	
Belarus	African swine fever (ASF)	Moderate	 Incursion of African swine fever (ASF) outbreaks from neighbouring countries and spread in the country.	Since its incursion in Europe in early 2014, ASF has become endemic in some countries bordering Belarus. No vaccine is available to control the disease.	
Bulgaria	Lumpy skin disease (LSD)	Moderate	 Occurrence of further Lumpy skin disease (LSD) outbreak. The possibility is lowered by mitigation measures (i.e. vaccination).	Following the re-emergence of the disease at the beginning of April in Greece, Bulgaria reported its first LSD incursion on 12 April. Since then, the disease have caused over 155 outbreaks in over 11 provinces in Southern and subsequently Northern Bulgaria. Emerging vaccination campaign has been implemented in the entire territory.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
Estonia	African swine fever (ASF)	High	 Occurrence of African swine fever (ASF) outbreaks.	Since the ASF incursion in the country in early 2014, the presence of the virus continues to be reported in domestic pigs and wild boars in the country. No vaccine is available to control the disease.	
Greece	Lumpy skin disease (LSD)	Moderate	 Further spread of Lumpy skin disease (LSD) in the already affected area and possible spread within the. The possibility is lowered due to mitigation measures (i.e. vaccination).	Since the last outbreak of LSD in December 2015, the disease has re-emerged in Serres Regional Unit (RU), and since then in four additional RUs.	
Latvia	African swine fever (ASF)	High	 Occurrence of African swine fever (ASF) outbreaks.	Since the ASF incursion in the country in early 2014, the presence of the virus continues to be reported in domestic pigs and wild boars in the country. No vaccine is available to control the disease.	
Lithuania	African swine fever (ASF)	High	 Occurrence of African swine fever (ASF) outbreaks.	Since the ASF incursion in the country in early 2014, the presence of the virus continues to be reported in domestic pigs and wild boars in the country. No vaccine is available to control the disease.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
Montenegro	Lumpy skin disease (LSD)	Moderate	 Further spread of Lumpy Skin Disease in the already affected area and possible spread within the country.	On July 21, 2016, the first LSD incursion in the country was observed in a backyard farm in Gusinje, Plav municipality. Since then, the disease has caused 97 outbreaks. Emerging vaccination campaign has started.	
Poland	African swine fever (ASF)	Moderate	 Occurrence of African swine fever (ASF) outbreaks in the northeastern part of the country.	Since the ASF incursion in the country in early 2014, the presence of the virus continues to be reported in domestic pigs and wild boars in the country. No vaccine is available to control the disease.	
Republic of Moldova	African swine fever (ASF)	Moderate	 Incursion of African swine fever (ASF) outbreaks from neighbouring countries and spread in the country.	Since its incursion in Europe in early 2014, the presence of the virus continues to be reported in the Balkan countries, Ukraine and to a lower extent in Poland. In Ukraine, outbreaks were recently reported in backyard pig farms at the western border with Moldova. No vaccine is available to control the disease	
Romania	Lumpy skin disease (LSD)	Moderate	 Incursion of Lumpy skin disease (LSD) from neighbouring countries were the virus is actively circulating and further spread within the country. The possibility is lowered by the vaccination campaign conducted in the	Since its re-emergence in northern Greece in early April 2016, LSD has been spreading northward, with incursion and further spread in Bulgaria, Former Yugoslav Republic (FYR) of Macedonia, Serbia, Montenegro and Albania. Emerging vaccination campaigns	


Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
			neighbouring affected countries.	have been implemented in the affected countries.	
	African swine fever (ASF)	Moderate	 Incursion of African swine fever (ASF) outbreaks from neighbouring countries and spread in the country.	Since its incursion in Europe in early 2014, ASF the presence of the virus continues to be reported in the Balkan countries, Ukraine and to a lower extent in Poland. In Ukraine, outbreaks were recently reported in backyard pig farms at the northern border with Romania. No vaccine is available to control the disease.	
Russian Federation	Lumpy skin disease (LSD)	High	 Occurrence of further Lumpy skin disease (LSD) outbreaks in the already affected area and possible spread within the countries.	In May 2016, Lumpy skin disease has re-emerged in Dagestan and since then has affected 13 other administrative divisions, spreading north, east, and lastly westwards.	
	African swine fever (ASF)	Moderate	 Occurrence of African swine fever (ASF) outbreaks and spread into new area within the country.	Since the ASF incursion in the country in early 2014, the presence of the virus continues to be reported in domestic pigs and wild boars in the country. No vaccine is available to control the disease.	
	Sheep and goat pox (SGP)	Moderate	 Further occurrence of Sheep and goat pox (SGP) in the affected area and possible spread within the country.	In mid-August, a new Sheep and goat pox incursion was detected in Yaroslavska Oblast. Sporadic incursion and further spread of the disease occurred sporadically in the Russian Federation.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
	Peste des petits ruminants (PPR)	Low	 Incursion of Peste des petits ruminants (PPR) from Mongolia and possible further spread within the country.	Peste des petits ruminants (PPR) has been reported in Mongolia in August 2016 in the Khovd and Uvs Province. PPR has never been reported in Mongolia before and animals are not vaccinated.	
	Anthrax	Moderate	 Occurrence of further Anthrax outbreaks in the north of the country, and possible occurrence of human cases.	Starting from mid-July, massive anthrax outbreaks affected reindeer herds in the Yamalo-Nenets Autonomous Okrug, in the northern part of the country, causing the loss of over 3500 animals and cases among exposed humans. The event represents the re-emergence of the disease since its last occurrence in 1941. It is thought that the causes were the abnormally high temperatures experienced in the district that thawed permafrost leading to anthrax spores being shifted to upper soil layers. Emergency vaccination of animals and awareness campaign among farmers are ongoing.	
	Italian Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		
	Migratory Locust	Nil	 Egg-laying followed by natural disappearance of adults;		

Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
			egg-pods in the ground until next spring.		
	Moroccan Locust	Nil	 Natural disappearance of adult populations; egg-pods in the ground until next spring.		
Serbia	Lumpy skin disease (LSD)	Moderate	 Occurrence of further Lumpy skin disease (LSD) outbreaks. The possibility is lowered due to the mitigation measures in place (i.e. vaccination).	Following LSD re-emergence in Greece in April 2016, and the virus incursion in Bulgaria and in the former Yugoslav Republic of Macedonia, in June 2016, Serbia reported its first LSD incursion. Since then LSD has spread, affecting 11 districts. Emerging vaccination campaign has been implemented in the entire territory.	
The former Yugoslav Republic of Macedonia	Lumpy skin disease (LSD)	Moderate	 Occurrence of further Lumpy skin disease (LSD) outbreaks. The possibility is lowered due to the mitigation measures in place (i.e. vaccination).	Following the re-emergence of the disease at the beginning of April 2016 in Greece, the former Yugoslav Republic of Macedonia reported its first LSD incursion in April 2016. Since then, over 20 outbreaks occurred in 17 municipalities. Emerging vaccination campaign has been implemented in the entire territory.	
Ukraine	Lumpy skin disease (LSD)	Moderate	 Incursion of Lumpy skin disease (LSD) from the Russian Federation, where the disease is widely spreading.	Since its re-emergence in May 2016, LSD has been spreading within the Russian Federation affecting 14 administrative unites.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for October – December 2016	Details	Country context
				In August 2016, LSD was detected in Voronezh Oblast bordering Ukraine, where susceptible animals are not vaccinated.	
	African swine fever (ASF)	Moderate	 Occurrence of African swine fever (ASF) outbreaks and further spread within the country.	Since the ASF incursion in the country in early 2014 the presence of the virus continues to be reported in domestic pigs and wild boars in the country, with new areas being recently affected at the border with Moldavia and Romania. No vaccine is available to control the disease.	

OCEANIA

Country/Area	Threat disease	Likelihood of occurrence	Forecast for October - December 2016	Details	Country context
Samoa	Banana bunchy top disease (BBTD)	Moderate	 Further spread of Banana bunchy top disease (BBTD).	The disease is already present in the country.	

FCC TERMINOLOGY

FCC threat	Food chain crisis (FCC) threats are transboundary animal and plant pests and diseases, including forest pests and aquatic diseases, and food safety threats, that can affect any step of the food chain with a potential high impact on food and nutrition security. FCC threats may reach epidemic proportions by spreading within a country and to a number of countries necessitating control/management cooperation between several countries
Forecasting	Ability to predict future condition or occurrence of an FCC threat for the upcoming three months.
Likelihood of introduction	Chances of introduction of a FCC threat into a country, across border or to a specific area for the upcoming three months.
Likelihood of occurrence	Chances of a FCC threat to happen for the upcoming three months.
Likelihood of spread	Chances of geographical spread of a FCC threat within a country beyond its original introduction or the upcoming three months.
Likelihood of re-emergence/ amplification	Chances of re-emergence/amplification (e.g. increase, breeding, etc.) of a threat already existing within a country.

INFORMATION SOURCES

Transboundary Animal Diseases

- Early Mortality Syndrome/Acute hepatopancreatic necrosis disease (EMS/AHPND)FAO. 2013. Report of the FAO/MARD Technical Workshop on Early Mortality Syndrome (EMS) or Acute Hepatopancreatic Necrosis Syndrome (AHPNS) of Cultured Shrimp (available at <http://www.fao.org/docrep/018/i3422e/i3422e00.htm>)
- ECDC - Communicable disease threats report (CDTR) available at http://ecdc.europa.eu/en/publications/surveillance_reports/Communicable-Disease-Threats-Report/Pages/default.aspx
- 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) (<http://empres-i.fao.org/eipws3g/>)
- Global Early Warning System (GLEWS) at FAO
- OIE World Animal Health Information Database (WAHID) Interface http://www.oie.int/wahis_2/public/wahid.php/Wahidhome/Home

Desert Locust

- FAO Desert Locust Information Service (DLIS) www.fao.org/ag/locusts

Migratory Locust in Madagascar

- Bulletins of the Locust Watch Unit (available at <http://www.fao.org/emergencies/crisis/madagascar-locust/en/>)
- Locust Situation Updates available at <http://www.fao.org/ag/locusts/en/info/info/index.html>

Locusts (three species) in Caucasus and Central Asia

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

Wheat rust disease

- Global wheat rust monitoring system

Threats to Food Security

- FAO Crop Prospects and Food Situation, No. 3, September 2016 available at <http://www.fao.org/3/a-i6100e.pdf>

Other regional/global threats

- WHO Zika situation report, 22 September 2016 available at <http://www.who.int/emergencies/zika-virus/situation-report/22-september-2016/en/>
- El Niño and La Niña. 2016. [FAO Website] (available at <http://www.fao.org/emergencies/crisis/el-nino/en/>)

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