Food and Agriculture Organization
of the United Nations

Food Chain Crisis
Early Warning Bulletin

January-March 2017
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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 coordinates and produces 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, page 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

OVERVIEW OF THE FORECAST PERIOD JANUARY-MARCH 2017

During the period January-March 2017, Food Chain Crisis (FCC) threats are expected to occur in the regions of Africa, America, Asia, and Europe where they will be either persisting within a country, or possibly spreading to neighboring countries, or will be latent and re-emerge/amplify at a certain time.

Out of the 29 animal and plant pests and diseases, aquatic diseases, and forest pests and diseases monitored in January 2017, 22 represent a threat to the food chain during the forecast period January –March 2017 in one or more regions:

- **Animal and zoonotic diseases:** African swine fever, Highly pathogenic avian influenza, Rift Valley fever and Sheep and goat pox.

- **Aquatic diseases**: Acute hepatopancreatic necrosis disease, *Enterozytozoon hepatopenaei*, Epizootic ulcerative syndrome.

- **Locusts**: Desert Locust, Migratory Locust, Red Locust.

- **Plant diseases**: Banana bunchy top disease, Banana fusarium wilt disease, Wheat 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, Western conifer seed bug.

The dynamics and the likelihood of occurrence 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.

OVERVIEW OF THE FORECAST PERIOD JANUARY-MARCH 2017

AFRICA

In Africa, a total number of 55 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 Nil[1] to High. From these, the following FCC events have significant regional implications:

Animal and aquatic diseases

- Countries in northern Africa are located in a migratory corridor for wild birds going to Africa from Europe during winter migration. For this reason, incursions of the **H5N8 Highly pathogenic avian influenza (HPAI)** might occur in the next months. Initially detected in southern Russian Federation in June 2016, the H5N8 HPAI virus has been spreading globally, following wild birds' migratory routes. It is currently circulating across Europe, in the Islamic Republic of Iran and in Israel. In late November 2016, it was detected in wild bird found dead in northern Egypt and Tunisia. In addition, in Egypt the number of H5N1 HPAI outbreaks in poultry is expected to increase as per seasonal pattern.

- Since its incursion in Nigeria in December 2014, **H5N1 Highly pathogenic avian influenza (H5N1 HPAI)** has spread in West Africa into six countries (Burkina Faso, Cote d'Ivoire, Ghana, Niger and Togo) and into Cameroon in Central Africa. The virus continues circulating in the region, particularly in Nigeria and Ghana because of lack of mechanisms and policies on compensation. An intensification of H5N1 HPAI virus circulation in the already affected country or new incursions still might occur actively.

- In West Africa, **Rift Valley fever (RVF)** virus is still actively detected in Niger, where, since the beginning of August 2016, over 350 suspected human cases (including 33 deaths) were recorded in over 90 villages across several departments of Tahoua region. In the same region, herders have been heavily impacted due to abortions in animals and drop in milk production and in the value of livestock production, although information in livestock is scattered, laboratory analysis also confirmed the circulation of RVF virus in Gao region in neighbouring Mali.

- **Epizootic ulcerative syndrome (EUS)** may possibly spread to other parts of West 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 indicates that the disease is likely to further spread in both countries. The Democratic Republic of the Congo (DRC) experienced the first heavy mortalities due to the disease in December 2014 and continued until March 2015. It is highly likely that the disease will occur over the same period in 2017.

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

OVERVIEW OF THE FORECAST PERIOD JANUARY-MARCH 2017

Locusts

- In East Africa, a **Desert Locust** outbreak is in progress and will continue on the Red Sea coast in Eritrea.

- In southeastern Africa, the breeding of large parental populations of **Red Locust** is in progress. Hatching followed by development of hopper bands will take place during the forecast period.

- In West Africa, a **Desert Locust** outbreak is in progress and will continue in northwest and north Mauritania and adjacent areas of southern Morocco.

- In Madagascar, the current **Migratory Locust** situation is unknown. The second generation of breeding will take place during the forecast period.

Plant pests and diseases

- In Central Africa, **Banana bunchy top disease** is present in localized parts and might intensify.

- **Inoculum** of **Yellow rust** and **Stem rust** are present in East Africa where outbreaks might occur in irrigated areas.

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, and Zimbabwe.

- The insect pests **Blue gum chalcid** and **Bronze bug** are still a threat for Eucalyptus forests in Zambia and Zimbabwe. In Zimbabwe, Bronze bug is still damaging eucalyptus woodlots.

OVERVIEW OF THE FORECAST PERIOD JANUARY-MARCH 2017

AMERICAS

In the Americas, a total number of 15 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 practices, have become most vulnerable to the beetle attacks.

OVERVIEW OF THE FORECAST PERIOD JANUARY-MARCH 2017

ASIA

In Asia, a total number of 57 FCC events have been forecasted including animal and aquatic diseases, locusts, and forest pests and diseases. The likelihood of occurrence vary from Nil[1] 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 spreading to previously unaffected countries in Southeast and Eastern Asia. Of particular concern is the current spread of H5N6 HPAI in Republic of Korea and Japan. In October 2016, a new H5N8 HPAI spreading globally, has reached India, following wild bird migratory routes where it spread in six states. Its incursion in neighboring countries is possible.

In the Middle East, **H5N8 Highly pathogenic avian influenza (HPAI)** incursions were detected in poultry farms in the Islamic Republic of Iran and in Israel. Further spread of the disease in the already affected countries and incursions in neighboring countries might occur in the first months of the year. Detected in southern Russian Federation in June 2016, the virus has been spreading globally following wild bird migratory routes.

Since last incursion in January 2015, **Sheep and goat pox** is still spreading in Mongolia, with new areas affected in the eastern part of the country.

Foot-and-mouth Serotype O virus is currently circulating in Zabaykalsky Krai at the southern Russian Federation border with China and Mongolia. Despite the applied control measures, additional outbreaks are expected while the vaccination campaign is being completed. Possible incursion in neighbouring countries such as China and Mongolia might occur.

Lumpy skin disease (LSD) occurrence in Caucasus region in the first months of the year is strongly reduced by the cold weather conditions unfavorable in winter for vectors.

Potential spread of **Acute hepatopancreatic necrosis disease (AHPND)** in shrimp species *Penaeus monodon* and P*enaeus 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.

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

OVERVIEW OF THE FORECAST PERIOD JANUARY-MARCH 2017

Locusts

In Central Asia, only eggpods of the three locust pests, **Italian, Migratory** and **Moroccan locusts** are currently present in the ground. No development is expected during the forecast period.

In the Caucasus, only eggpods of two locust pests, **Italian** and **Moroccan locusts** are currently present in the ground. No development are expected during the forecast period.

Plant pests and diseases

Banana fusarium wilt disease is present especially in the southeastern parts of Asia and in Pakistan. It might spread and widen its impact.

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 spring 2017.

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. Biological control measures are in progress to control the pest.

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.

OTHER THREATS[1]:

Red Palm Weevil (RPW) is a key pest of palms originating from south and southeast Asian countries that has significantly expanded its geographical and host range during the last three decades. In the Near East and North Africa region, RPW is currently causing widespread damage to date palm *Phoenix dactylifera* and the Canary Island palm *Phoenix canariensis*, having both agricultural impacts on the palm production. This is having a negative impact on the livelihoods of farmers, and on the environment.

1 Threats that are not forecasted in the FCC Forecasting at country level section.

OVERVIEW OF THE FORECAST PERIOD JANUARY-MARCH 2017

EUROPE

In Europe, a total number of 12 FCC events have been forecasted including animal diseases, Locusts and forest pests. The likelihood of occurrence varies from Low to High. From these, the following FCC events have significant regional implications:

Animal diseases

- **H5N8 Highly pathogenic avian influenza (HPAI)** will further spread in the already affected countries and into new countries. Detected in early June 2016 in wild birds in Tyva (Russian Federation (RUS)), H5N8 HPAI has been spreading globally following wild bird migration routes. Since mid-October 2016, the virus struck in Eastern Europe with detection in wild birds found dead in Hungary, Poland and Croatia. In the following weeks, HPAI incursions were reported in Switzerland, Austria, Germany, Denmark, the Netherlands, Finland, Sweden, Ukraine, France, Romania, Serbia, Greece, Bulgaria, Slovenia and United Kingdom of Great Britain and Ireland. While in some countries preventive measures limited virus spillover into the poultry sector, in Hungary, Bulgaria and France the virus is severely affecting the poultry value chain.

- **African swine fever (ASF)** outbreaks and transmission is likely to continue in the affected countries (Estonia, Latvia, Lithuania, Poland, Russian Federation, and Ukraine) 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 the Russian Federation and Ukraine. This increases the possibility of incursion into neighbouring countries (e.g. Belarus, Republic of Moldova and Romania) via live animals and animal products movement along pig value chains and transmission between seasons through infected carcasses of dead wild boars overwintering.

- The applied vaccination campaigns and the adverse weather conditions for the vectors in the first months of the year strongly mitigate the possibility of **Lumpy skin disease (LSD)** occurrence within the affected countries (i.e. Albania, Bulgaria, FYR of Macedonia, Greece, Montenegro, Russian Federation, and Serbia) and risk of incursion in neighbouring countries (e.g. Bosnia and Herzegovina, Croatia, Ukraine, and Romania).

Locusts

- In the Russian Federation, only egg-pods of the three locust pests (**Italian, Migratory** and **Moroccan locusts**) are currently present in the ground. No development expected during the forecast period.

Forest pests and diseases

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

More detailed information on FCC threats forecasts at country level is available under the FCC threats forecasting at country level section **(see page 15).**

SHORT TAKE ON THE GLOBAL BURDEN OF FOODBORNE DISEASES

Unsafe food containing harmful bacteria, viruses, parasites or chemical substances, causes more than 200 diseases in humans – ranging from diarrhoea to cancers.

The burden of foodborne diseases is significant throughout the world. This was demonstrated by a WHO study published in 2015, which presented the first-ever estimates of the incidence of mortality from and burden (in terms of DALYs[1]) due to 31 foodborne hazards (bacteria, viruses, parasites, toxins and chemicals) at global and regional levels[2].

Every year, an estimated 600 million – almost 1 in 10 people in the world – fall ill after eating contaminated food and 420 000 die, resulting in the loss of 33 million healthy life years. The global burden of foodborne disease was estimated to be of the same order as that due to the major infectious diseases HIV/AIDS, malaria and tuberculosis (TB).

Children under 5 years of age carry 40 percent of the foodborne disease burden, with 125 000 deaths every year.

The most frequent causes of foodborne illness, according to the report, are diarrhoeal disease agents, particularly *Norovirus* and *Campylobacter* spp. Non-typhoidal *Salmonella* spp. are the major causes of deaths.

Diarrhoeal disease agents, according to the report, account for 54 percent of the global burden, the most important being non-typhoidal *Salmonella* spp., but *Norovirus*, *Campylobacter* spp., enteropathogenic *E. coli*, enterotoxigenic *E. coli*, *Vibrio cholerae* and *Shigella* spp. also contribute substantially. Non-diarrhoeal hazards contributing substantially to the global burden include *Salmonella* Typhi, *Taenia solium*, hepatitis A virus and *Paragonimus* spp.

Of the group of foodborne chemical hazards considered, aflatoxin is the most important, followed by dioxin.

The study reveals considerable regional and sub-regional differences. Even though the burden is generally much higher in developing countries, foodborne diseases also have a significant impact in developed countries.

Burden of foodborne disease data can help guide the development and implementation of food safety policies and strengthening of food control systems including surveillance systems and early warning and response operations.

1 Disability-Adjusted Life Year (DALY): one DALY can be thought of as one lost year of "healthy" life, and the burden of disease can be thought of as a measurement of the gap between current health status and an ideal situation where everyone lives into old age, free of disease and disability. http://www.who.int/healthinfo/global_burden_disease/GBD_report_2004update_full.pdf

2 Havelaar AH, Kirk MD, Torgerson PR, Gibb HJ, Hald T, Lake RJ, *et al.* (2015) World Health Organization Global Estimates and Regional Comparisons of the Burden of Foodborne Disease in 2010.

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

Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
Algeria	Avian influenza (AI)	Moderate	Occurrence of H7N1 highly pathogenic avian influenza (HPAI) outbreaks in poultry and incursion of other H5 HPAI viruses.	In October 2016, HPAI H7N1 was detected for the first time in Algeria. Over 1,000 migratory birds from several species were found dead in a wetland area located in El Menia, Ghardaia province.	
	Desert Locust	Moderate	Small-scale breeding in Sahara.	Locusts are expected to appear in southwest and breeding will cause locust numbers to increase.	
Benin	Avian influenza (AI)	Moderate	Incursion of H5N1 Highly pathogenic avian influenza (HPAI) or other H5 HPAI viruses and possible further spread within the country.	Benin has not experienced H5N1 HPAI incursion so far, however H5N1 HPAI virus has been circulating in seven countries in West and Central Africa since December 2014. Since October 2016 a H5N8 HPAI virus is spreading globally following bird migratory routes. In November 2016 this H5N8 HPAI virus was detected in Nigeria in an outbreak in Kano State.	

AFRICA

Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
Cameroon	Avian influenza (AI)	Moderate	Occurrence of H5N1 or other H5 Highly pathogenic avian influenza (HPAI) outbreaks in poultry due to further spread of the virus within the country or due to new incursions.	H5N1 HPAI has been detected in Cameroon in late May 2016 and up to June 2016; outbreaks in poultry were reported in Central, South and West regions. Recently, a H5N8 HPAI virus spread globally following bird migratory routes. In November 2016 this H5N8 HPAI virus was detected in Nigeria in an outbreak in Kano State.	The number of refugees from the Central African Republic, who mainly entered East, Adamaoua and North regions, was estimated in October at 274 000. In addition, about 86 000 refugees from Nigeria have entered the Far North and North regions since May 2013. Insecurity along the borders with Nigeria also led to the internal displacement of 200 000 individuals. The number of food insecure people is currently estimated at 2.6 million, more than twice the level in June 2015.
	Banana bunchy top disease (BBTD)	Moderate	Spread of Banana bunchy top disease is possible from initial outbreak areas.	The disease is already present in some areas in the country.	

AFRICA

Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
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 CAR.	The Internally Displaced Person (IDP) caseload, which declined earlier in 2016 following a relative improvement of the security situation in some areas of the country, increased by about 36 000 in October, and was estimated at about 421 000. About 2 million people are in need of urgent assistance as a result of three consecutive years of reduced harvests and food access constraints due to market disruptions and declining purchasing power.
Chad	Desert Locust	Nil	 No significant developments.		Large caseload of refugees continue to put additional pressure on local food supplies.

AFRICA

Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
					About 456 000 people are estimated to be in need of food assistance according to the latest "Cadre Harmonisé" analysis.
Côte d'Ivoire	Avian influenza (AI)	Moderate	 Occurrence of H5N1 or other H5 Highly pathogenic avian influenza (HPAI) outbreaks in poultry due to further spread of the virus within the country or due to new incursions of the virus.	After its incursion in Nigeria in December 2014, H5N1 HPAI was reported in Côte d'Ivoire in April 2015. Recently, a H5N8 HPAI virus threat spread globally following bird migratory routes. In November 2016, this H5N8 HPAI virus was detected in Nigeria in an outbreak in Kano State.	
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.	The country experienced the first heavy mortalities in fish in December 2014 and continued until March 2015. Fish belonging to the families of *Clariidae, Channidae* and *Protopridae* are of greatest concern regarding the spread of EUS, as fish of these families represent important food commodities in DRC. They also represent air-breathing fish, and marketable fish are transported to and from markets live,	

AFRICA

Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
				thus making an effective pathway for pathogen transfer.	
Djibouti	Desert Locust	Low	Low numbers of adults may appear adjacent to northwest Somalia.		
Egypt	Avian influenza (AI)	High	Increase in H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry as per seasonal pattern and possible spread of H5N8 HPAI. Possible occurrence of sporadic Avian Influenza (AI) human infection.	H5N1 HPAI is endemic in Egypt. Outbreaks in poultry are reported every month with a marked seasonal winter pattern. Recently, H5N8 HPAI was detected in wild birds in Dumyat governorate. Other influenza viruses circulating in poultry in the country are H5 Low pathogenic avian influenza (LPAI) and H9N2 LPAI. H5N1 and H9N2 human cases are sporadically reported.	
	Desert Locust	Moderate	Small-scale breeding in southeast.	Locust numbers will increase slightly in the southeast.	
Eritrea	Desert Locust	High	Outbreak breeding on Red Sea coast.	Groups and small bands of locusts are likely to form, some may move into Sudan.	Economic constraints have increased the population's vulnerability to food insecurity.

AFRICA

Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
Ethiopia	Wheat rust	Moderate	Wheat yellow and stem rust inoculum might cause outbreaks in irrigated areas.	Wheat yellow and stem rust inoculum are already present in the country for years.	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	Low	Low numbers of adults may appear adjacent to northwest Somalia.		
Gabon	Banana bunchy top disease (BBTD)	Moderate	Spread of Banana bunchy top disease is possible from initial outbreak areas in the south.	The disease is already present in the country.	
Ghana	Avian influenza (AI)	Moderate	Occurrence of H5N1 or other H5 Highly pathogenic avian influenza (HPAI) outbreaks in poultry due to further spread of the virus within the country or due to new incursions.	After its incursion in West Africa/Nigeria in December 2014, H5N1 has spread in Ghana in March 2015 and in other five countries in West and Central Africa. In Ghana, the virus has caused over 60 outbreaks in five different regions with the last reported outbreaks observed in October 2016. Recently, a H5N8 HPAI virus threat spread globally following bird migratory routes.	
Libya	Desert Locust	Low	Low numbers of adults may appear and breed in southwest.		The number of people in need of food assistance is estimated at 0.4 million,

AFRICA

Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
					with refugees, asylum seekers and internally displaced among the most vulnerable. Food shortages are reported mostly in the south and east where basic food items. Access to subsidized food among the affected population is limited.
Madagascar	Migratory Locust	Moderate	 Second generation of breeding; the magnitude (location and number) is unknown.		Drought conditions in southern regions caused a sharp decrease in the 2016 cereal harvest from an already below-average 2015 output, resulting in severe food insecurity conditions; approximately 850 000 people require humanitarian assistance in Androy, Anosy and Astimo Andrefana. Higher food prices have
	Red Locust	Low	 Unique annual generation of breeding in progress followed by adult emergence.		

AFRICA

Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
					also exacerbated the situation.
Malawi	Red Locust	Moderate	 Hatching followed by development of hopper bands.		An estimated 6.5 million people are in need of humanitarian assistance, on account of the sharply reduced maize harvest in 2016 and higher food prices.
	Red gum lerp psyllid	High	 The spread of the insect pest Red gum lerp psyllid in Eucalyptus plantations will continue.	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.	
	Blue gum chalcid	High	 Outbreaks of the insect Blue gum chalcid are very likely to occur in Eucalyptus plantations.	Blue gum chalcid continues to cause severe damages in nurseries and young Eucalyptus plantations.	
Mali	Rift Valley fever (RVF)	Moderate	 Further circulation of Rift Valley fever (RVF) virus in animals and possible occurrence of human cases.	After the detection of the RVF in Niger and rumours of abortion in animal in northwestern Mali, in Gao region, the circulation of the virus was confirmed.	An estimated 37 000 people have been internally displaced in the country mostly residing in Timbuktu, the most affected region.
	Desert Locust	Low	 Low numbers of adults are likely to persist in northeast.		

AFRICA

Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
					About 177 000 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.
Mauritania	Desert Locust	High	 Outbreak breeding in northwest and north.	Locust numbers will increase and groups, bands and a few small swarms are expected to form.	About 42 000 Malian refugees remain in southeastern Mauritania in the Mbeera camp. Over 119 000 people are estimated to be in Phase 3: "Crisis" and above, according to the last "Cadre Harmonisé" analysis.
Mauritius	Foot-and-mouth disease (FMD)	Low	 Further spread of Foot-and-mouth disease (FMD) outbreaks, moderated by the ongoing vaccination campaign.	Mauritius has experienced the first FMD incursion in July 2016 driven by illegal introduction of live animals in Rodrigues island. The virus has rapidly spread in the two islands. To control	

AFRICA

Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
				FMD, a vaccination campaign has started with the first booster vaccination already finalized in November 2016.	
Morocco	Desert Locust	Moderate	 Breeding in Western Sahara.	Locust numbers will increase and groups, bands and a few small swarms are expected to form with movement further north to Atlas Mountains.	
Mozambique	Red Locust	Moderate	 Hatching followed by development of hopper bands.		Drought conditions resulted in lower cereal outputs in southern provinces and in parts of central provinces, while higher prices are adversely impacting food access. Nearly 2 million people are food insecure and require humanitarian assistance.
	Banana fusarium wilt disease	Moderate	 Spread of Banana fusarium wilt disease TR4.	The disease has affected two farms in Nampula province and might spread. Considering that there is no control method of the disease, containment and prevention of spread are key.	
	Red gum lerp psyllid	Moderate	 The insect pest Red gum lerp psyllid is likely to spread in Eucalyptus plantations.	Monitoring of pest spread is in progress	
	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	Mozambique has the shrimp species susceptible to AHPND. Strong awareness on shrimp diseases is present in the country.	

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
			animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.		
Niger	Avian influenza (AI)	Low	Occurrence of H5N1 or other H5 Highly pathogenic avian influenza (HPAI) outbreaks in poultry due to further spread of the virus within the country or due to new incursions.	After its incursion in West Africa in Nigeria in December 2014, H5N1 HPAI was detected in Niger in two isolated outbreaks, lastly in February 2016 in Tillaberi region. Recently, a H5N8 HPAI virus spread globally following bird migratory routes. In November 2016, this H5N8 HPAI virus was detected in Nigeria in an outbreak in Kano State.	More than 833 000 people are estimated to be in Phase 3: "Crisis" and above according to the last "Cadre Harmonisé" analysis. Approximately 61 000 Malian refugees are estimated to be living in the country. Almost 327 000 people, mostly in the southeast Diffa Region have been displaced due to fear of attacks.
	Rift Valley fever (RVF)	Moderate	Further spread of Rift Valley fever (RVF) in animals and possible occurrence of human cases.	RVF has been actively circulating in the north-western part of Niger where the virus has been detected in human and animals since the beginning of August 2016. Human cases are still recorded weekly. Over 350-suspected human cases (including 33 deaths) were recorded in over 90 villages across several departments of Tahoua region. Information in animals is scattered, although herders have been impacted	

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
				due to animal abortions, drop in milk production and in animal market value.	
	Desert Locust	Low	Low numbers of adults likely to persist in north.		
Nigeria	Avian influenza (AI)	High	Occurrence of H5N1 or other H5 Highly pathogenic avian influenza (HPAI) outbreaks in poultry due to further spread of the virus within the country or due to new incursions.	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. The virus is still circulating and the situation might be further worsened by the co-circulation of other H5 HPAI viruses. Since October 2016, a H5N8 HPAI virus has been spreading globally and in November 2016 it was detected in Kano State from a poultry farm comprised of exotic cockerels, pigeons, waterfowl, mallard ducks, geese and turkeys.	More than 8 million people are estimated to be food insecure, of which a significant number are in need of emergency food assistance, according to the latest "Cadre Harmonisé" analysis. Despite the generally favourable crop prospects in the key-producing regions of the north, the sharp depreciation of the Naira, coupled with persisting civil conflict in northern states has continued to disrupt market activities and

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
					keep prices at near record highs.
Rwanda	Blue gum chalcid	Moderate	Further spread of the insect pest Blue gum chalcid in Eucalyptus plantations.	The insect pest Blue gum chalcid is continuing to damage Eucalyptus plantations.	
Senegal	Desert Locust	Nil	No significant developments.		
Somalia	Desert Locust	Low	Small-scale breeding on northwest coast.		About 1.1 million people are estimated to be in need of emergency assistance.
South Africa	Red gum lerp psyllid	Low	Spread of the insect pest Red gum lerp psyllid are unlikely to occur in Eucalyptus plantations within the country.	The introduction of biological control agents to reduce the pest population is in progress.	
	Blue gum chalcid	Moderate	Outbreaks of insect pest Blue gum chalcid are likely to occur in Eucalyptus nurseries and young plantations.	The introduction of biological control agents to reduce the pest population is in progress.	
Sudan	Desert Locust	Moderate	Breeding on Red Sea coast.	Locust numbers will increase on the coast, supplemented by adults arriving from Eritrea.	An estimated 3.6 million people are in need of humanitarian assistance, mainly IDPs and host

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
					communities in conflict affected areas.
Togo	Avian influenza (AI)	Low	Occurrence of H5N1 or other H5 Highly pathogenic avian influenza (HPAI) outbreaks in poultry due to further spread of the virus within the country or due to new incursions.	Following the H5N1 HPAI virus incursion and widely spread in Nigeria in 2014 and subsequently in five additional countries in the area, the virus was detected in Togo in August 2016 in two commercial poultry farms at the border with Ghana. Recently, a H5N8 HPAI virus spread globally following bird migratory routes. In November 2016, this virus was detected in Nigeria in an outbreak in Kano State.	
Tunisia	Peste des petits ruminants (PPR)	Low	Occurrence of further Peste des petits ruminants (PPR) outbreaks fostered by the lack of adequate vaccination campaign and animal population immune coverage.	PPR outbreaks were detected in several governorates during the second half of 2016.	
	Desert Locust	Nil	No significant developments.		

AFRICA

Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
Uganda	Blue gum chalcid	Moderate	Outbreaks of the insect pest Blue gum chalcid will continue to occur in Eucalyptus nurseries and plantations.	The insect Blue gum chalcid is currently causing severe damages in Eucalyptus nurseries, woodlots and plantations.	
United Republic of Tanzania	Red Locust	Moderate	Hatching followed by development of hopper bands.		
	Blue gum chalcid	Moderate	Outbreaks of insect pest Blue gum chalcid are likely to occur in Eucalyptus plantations and woodlots.	Damage continues in Eucalyptus nurseries, woodlots and plantations due to Blue gum chalcid.	
Zambia	Red Locust	Moderate	Hatching followed by development of hopper bands.		
	Blue gum chalcid	Moderate	Outbreaks of the insect pest Blue gum chalcid are likely to occur in Eucalyptus woodlots and 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	Outbreaks of the insect pest Red gum lerp psyllid are	Pest management activities based on silvicultural practises are in progress.	

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
			likely to occur in Eucalyptus plantations.		
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 activities based on silvicultural practises are in progress.	An estimated 33 percent (approximately 3 million people) of the rural population are food insecure, and this number is projected to rise to 44 percent (4.07 million people) during the peak of the lean period between January and March 2017, approximately 44 percent higher than the corresponding period in the first quarter of 2016. The worsening food security situation reflects the impact of the El Niño-induced drought that caused a sharp reduction
	Blue gum chalcid	High	 Outbreaks of the insect pest Blue gum chalcid will continue to be reported in Eucalyptus nurseries, woodlots and 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 are likely to occur in Eucalyptus plantations.	Pest management activities are in progress.	

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
					in the 2016 agricultural output.

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
Colombia	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.	Strong awareness on shrimp disease is present in the country.	
	Enterocytozoon hepatopenaei (EHP)	Low	Introduction of *Enterocytozoon hepatopenaei* (EHP) from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock.	Strong awareness on EHP is present in the country.	
Guatemala	Bark beetles	Moderate	Occurrence of outbreaks of Bark beetles in pine plantations.	Silvicultural practices to reduce the pest populations is in progress.	

AMERICAS

Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
	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.	Strong awareness on AHPND is in place in the country. National action plan on AHPND is in preparation.	
	Enterocytozoon hepatopenaei (EHP)	Low	Introduction of *Enterocytozoon hepatopenaei* (EHP) from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feeds for broodstock.	Strong awareness on EHP is in place in the country.	
Honduras	Bark beetles	Moderate	Outbreaks of Bark beetles are likely to continue to be reported causing heavy losses in pine plantations.	A severe outbreak of Bark beetles is affecting about 500 000 ha of conifer forests in the country.	
	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,	Strong awareness on AHPND is in place in the country. National action plan on AHPND is in preparation.	

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
			oysters, etc. used as feed for broodstock.		
	Enterocytozoon hepatopenaei (EHP)	Low	Introduction of *Enterocytozoon hepatopenaei* (EHP)) from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock.	Strong awareness on EHP is in place in the country.	
Nicaragua	Bark beetles	High	Outbreaks of Bark beetle are very likely to occur in pine plantations.	Pest management activities based on silvicultural practices are in progress.	
	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.	Strong awareness on AHPND is in place in the country. National action plan on AHPND are in preparation.	Drought conditions resulted in lower cereal outputs in southern provinces and in parts of central provinces, while higher prices are adversely impacting food access. Nearly 2 million people are food insecure and require humanitarian assistance.
	Enterocytozoon hepatopenaei (EHP)	Low	Introduction of *Enterocytozoon hepatopenaei* (EHP) from other countries through trade of live animals (e.g.	Strong awareness on EHP is in place in the country.	

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
			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.	Strong awareness on AHPND; national action plan on AHPND in preparation.	
	Enterocytozoon hepatopenaei (EHP)	Low	Introduction of *Enterocytozoon hepatopenaei* (EHP) from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock.	Strong awareness on EHP is in place in the country.	
Peru	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.	Strong awareness on AHPND is in place in the country. National action plan on AHPND is in preparation.	

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
	Enterocytozoon hepatopenaei (EHP)	Low	 Introduction of *Enterocytozoon hepatopenaei* (EHP) from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock.	Strong awareness on EHP is in place in the country.	

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
Afghanistan	Italian Locust	Nil	 Hatching unlikely before the end of the forecast period.		According to the IPC analysis of April 2016, 8.4 million people are classified in an acute food insecurity crisis and emergency situation. The most food insecure population are in Ghor, Badakhshan, Nuristan and Nangarhar provinces.
	Moroccan Locust	Low	 Hatching should start in March 2017.		
Armenia	Italian Locust	Nil	 Hatching will start after the forecast period.		
Azerbaijan	Italian Locust	Low	 Hatching will start after the forecast period.		

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
	Moroccan Locust	Low	 Hatching should start by the end of the forecast period.		
China	Avian influenza (AI)	Moderate	 Occurrence of Avian Influenza (AI) outbreaks in poultry due to several H5 Highly pathogenic avian influenza (HPAI) 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 Low pathogenic avian influenza (LPAI) virus. In both cases, an increase number of events is expected as for seasonal pattern.	Several serotypes of HPAI and LPAI AI viruses are circulating and being detected in China. 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 2016.	
Gaza Strip	Avian influenza (AI)	High	 Incursion of H5N8 Highly pathogenic avian influenza (HPAI) and possible further spread within the country.	Currently a H5N8 HPAI virus is spreading globally following bird migratory routes. First detected in southern Russian Federation in June 2016, and since mid-October 2016 the virus was detected in wild and domestic birds in Southern Asia, eastern and northern Europe and the Middle East, including neighbouring Israel.	

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
Georgia	Lumpy Skin Disease (LSD)	Low	 Occurrence of further Lumpy skin disease (LSD) outbreaks in the affected area and possible re-introduction from the Russian Federation. The possibility is mitigated by the control measures in place (i.e. vaccination) and by the current unfavourable climate condition for the vectors.	At the beginning of November 2016, Georgia reported its first LSD official incursion in the villages of Gioia and Ghebi placed 17 km apart, in Oni district, Racha-Lechkhum Kvemo Svaneti Region, at the border with Russian Federation.	
	Italian Locust	Nil	 Hatching will start after the forecast period.		
	Moroccan Locust	Nil	 Hatching will start after the forecast period.		
	Boxwood moth	High	 New outbreaks of Boxwood moth are very likley to cause dieback of native boxwood species in spring.	As part of IPM, use of bio pesticide BtK and pheramone trapping are in progress to protect the native boxwood species.	
	Boxwood blight	Moderate	 Boxwood blight disease (caused by the pathogen *Calonectria pseudonaviculata*) continues to occur. However, the spread is low due to winter temperatures and lack of rain.	Monitoring of the disease spread is in progress.	
India	Desert Locust	Nil	 No significant developments.		
	Acute hepatopancreatic	Low	 Introduction of Acute hepatopancreatic necrosis disease (AHPND) from affected countries	Good surveillance and biosecurity measures is in place. Strong awareness	

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
	necrosis disease (AHPND)		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.	on shrimp diseases is present in the country.	
	Enterocytozoon hepatopenaei (EHP)	Low	 Introduction of *Enterocytozoon hepatopenaei* (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 in place. Strong awareness on shrimp diseases is present in the country.	
Indonesia	Avian influenza (AI)	High	 Occurrence of H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry.	H5N1 HPAI is endemic in Indonesia where it has beenregularly detected since 2003. Outbreaks in animals show a seasonal pattern with the seasonal peak 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: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.	Surveillance for AHPND as well as strong awareness on shrimp diseases is in place in the country. Many small-scale producers are present.	

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
	Enterocytozoon hepatopenaei (EHP)	Moderate	 Introduction of *Enterocytozoon hepatopenaei* (EHP) from other countries through live animals (e.g. live polychaetes, clams, oysters, etc.) used as feeds for broodstock.		
Iran (Islamic Republic of)	Avian influenza (AI)	Moderate	 Further H5N8 Highly pathogenic avian influenza (HPAI) spread within the country.	The H5N8 HPAI virus currently spreading globally following wild birds migratory routes have been detected in November 2016 in Tehran governorate where it affected several large poultry farms and spread to five provinces. First detected in southern Russian Federation in June 2016, since mid-October 2016 the virus has been detected in wild and domestic birds in southern Asia, eastern and northern Europe and the Middle East.	
	Desert Locust	Low	 Locusts may appear in southeast and breed on a small scale.		
	Oak charcoal disease	Low	 Oak charcoal disease (caused by the pathogen *Biscogniauxia mediterranea*) continues to cause decline of oak forest in Zagros due to the abiotic stresses. During winter months	Oak charcoal disease has a negative impact on the livelihood of nomadic people and watershed management. Operations to minimize the impact of the charcoal disease and abiotic stresses are in progress.	

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
			disease symptoms are likely to decline.		
	Boxwood moth	High	 The Boxwood moth (caused by the pathogen *Cydalima pesrspectalis*) is very likely to spread in early spring and likely to cause massive defoliations.	The first introduction 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.	
	Boxwood blight	High	 Occurrence of Boxwood blight disease (caused by the pathogen *Calonectria pseudonaviculata*) continues to cause dieback of native box wood species. However, the spread is low due to winter temperatures and lack of rain.	Pest management activities in selected areas are in progress.	
	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.	

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
Iraq	Acute hepatopancreatic necrosis disease (AHPND)	Moderate	 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.		Over 2 million people have been displaced since January 2014. Some 1.8 million beneficiaries (IDPs, non-displaced food insecure in conflict areas and food insecure host families) are receiving food assistance.
Israel	Avian influenza (AI)	Moderate	 Further H5N8 Highly pathogenic avian influenza (HPAI) spread of outbreaks within the country.	Within the current H5N8 HPAI global wave, the virus was first detected in Israel in November 2016 in a commercial chicken farms in the northern districts. Since then, the virus has spread within the countries affecting wild birds and causing outbreaks in several poultry farms.	
Japan	Avian influenza (AI)	Moderate	 Further occurrence and spread of H5N6 Highly pathogenic avian influenza (HPAI) within the country.	In mid-November 2016, the first H5N6 HPAI virus incursion was detected in wild birds in Akita. Since then, the virus has spread in five Prefectures and affected several large commercial poultry farms.	
Kazakhstan	Italian Locust	Nil	 Hatching will start after the forecast period.		
	Migratory Locust	Nil	 Hatching will start after the forecast period.		

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
	Moroccan Locust	Nil	Hatching will start after the forecast period.		
Kyrgyzstan	Italian Locust	Nil	Hatching will start after the forecast period.		
	Moroccan Locust	Nil	Hatching will start after the forecast period.		
Lao People's Democratic Republic	Yellow Bamboo Locust	Nil	Hatching will start after the forecast period.		
Lebanon	Dry cone syndrome	Moderate	Dry cone syndrome is continuing to cause damages to pine plantations (*Pinus pinea*).	Heavy yield losses continue to impact rural livelihoods. The yield reduction of pine nuts is reported throughout the country. Silvicultural practices to strengthen the trees are in progress.	
	Western conifer seed bug	Moderate	Outbreaks of Western conifer seed bug is continuing to cause damage to pine plantations (*Pinus pinea*). Pest activities likely to be lessened during the winter months.	Monitoring of pest population using traps is in progress.	
Mongolia	Sheep and goat pox (SGP)	High	Further occurrence of Sheep and goat pox (SGP) in the eastern part of the country possibly mitigated by the vaccination campaign implemented.	Since the last incursion in January 2015, SGP has widely spread in Mongolia, with outbreaks detected in	

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
				10 sums[1], some of which were only affected recently. Vaccination campaigns have been implemented in affected areas reducing dramatically the spread of the disease, but the winter may increase the disease occurrence as it was observed in 2016.	
Oman	Desert Locust	Low	 Locusts may appear in northern coast and interior and breed on a small scale.		
Pakistan	Banana fusarium wilt disease	Low	 Spread of Banana fusarium wilt disease TR4.	The disease was detected in one farm. Since there is no control method, containment and prevention of spread is key.	As of October 2016 an estimated 1.3 million Afghan refugees remain displaced in northern Pakistan, due to recurrent insecurity. In Tharparkar District and the surrounding areas of Sindh Province, the drought-affected cereal production and the loss of livestock for the third consecutive year has aggravated food insecurity and caused acute malnutrition.

[1] Secondary administrative division in Mongolia.

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
	Desert Locust	Low	 Locusts may appear in southwest and breed on a small scale.		As of October 2016 an estimated 1.3 million Afghan refugees remain displaced in northern Pakistan, due to recurrent insecurity. In Tharparkar District and the surrounding areas of Sindh Province, the drought-affected cereal production and the loss of livestock for the third consecutive year has aggravated food insecurity and caused acute malnutrition.
Philippines	Banana fusarium wilt disease	Moderate	 Spread of Banana fusarium wilt disease TR4.	The disease is present and has impacted bananas in Mindanao island. Since there is no control method, containment and prevention of spread is key.	
	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.	

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
	Enterocytozoon hepatopenaei (EHP)	Moderate	Introduction of *Enterocytozoon hepatopenaei* (EHP) from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feeds for broodstock.		
Republic of Korea	Avian influenza (AI)	High	Further spread of H5N6 Highly pathogenic avian influenza (HPAI) outbreaks in the country.	In the Republic of Korea, the first H5N6 HPAI incursion was detected in wild birds in South Chungcheong Province. Since then, the virus has spread in six provinces and massively affected poultry farms. Over 30 million chickens and ducks have already been slaughtered.	
Saudi Arabia	Desert Locust	Moderate	Breeding on Red Sea coast.	Locust numbers will increase on the coast, supplemented by adults arriving from Yemen.	
Sri Lanka	Acute hepatopancreatic necrosis disease (AHPND)	Moderate	Introduction of 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.	

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
	Enterocytozoon hepatopenaei (EHP)	Low	Introduction of *Enterocytozoon hepatopenaei* (EHP) from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feeds for broodstock.		
Tajikistan	Italian Locust	Nil	Hatching will start after the forecast period.		
	Moroccan Locust	Nil	Hatching will start after the forecast period.		
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.	
Turkmenistan	Italian Locust	Nil	Hatching will start after the forecast period.		
	Moroccan Locust	Nil	Hatching should start in March 2017.		
Uzbekistan	Italian Locust	Nil	Hatching will start after the forecast period.		
	Migratory Locust	Nil	Hatching will start after the forecast period.		
	Moroccan Locust	Nil	Hatching will start after the forecast period.		

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Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
Viet Nam	Avian influenza (AI)	Moderate	 Occurrence of H5 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 occur throughout the year and increase by end of the year.	
West Bank	Avian influenza (AI)	High	 Incursion of H5N8 Highly pathogenic avian influenza (HPAI) and possible further spread within the country.	Currently a H5N8 HPAI virus is spreading globally following bird migratory routes. First detected in southern Russian Federation in June 2016, since mid-October 2016 the virus was detected in wild and domestic birds in southern Asia, eastern and northern Europe and the Middle East, including in neighbouring.	
Yemen	Desert Locust	Moderate	 Breeding on Red Sea coast.	Locust numbers will increase on the coast.	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". The current numbers are likely to be higher. A below-average cereal

ASIA

Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
					harvest expected in 2016 but abundant rainfall had positive effects on livestock production.

EUROPE

Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
Albania	Pine processionary moth	Moderate	A new generation of Pine processionary moth is likely to cause severe defoliation of pine forests.	Mechanical removal of nests are in progress to manage the pest populations.	
Belarus	African swine fever (ASF)	Moderate	Incursion of African swine fever (ASF) outbreaks from neighbouring countries and spread within the country.	Since its incursion in Europe in early 2014, ASF has become endemic in some countries bordering Belarus, including recently also Ukraine, Poland and Lithuania. Informal and uncontrolled animal movement and poor biosecurity condition in pig farms at borders are crucial for disease incursion.	
Hungary	Avian influenza (AI)	High	Further spread of H5N8 Highly pathogenic avian influenza (HPAI) and further occurrence of outbreaks in poultry.	Hungary has been affected by the ongoing H5N8 HPAI wave. Since its incursion in Csongrad county in October 2016, the virus has spread in five counties causing over 200 outbreaks in small and large poultry farms in the	

EUROPE

Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
				south-eastern part of the country. First detected in southern Russian Federation in June 2016, since mid-October 2016, the virus has been spreading globally following bird migratory routes.	
Republic of Moldova	African swine fever (ASF)	Moderate	Occurrence of further African swine fever (ASF) outbreaks and possible incursion from neighbouring countries.	The Republic of Moldova reported its first ASF incursion in late September 2016 in Donduseni district, close to the northern border with Ukraine. Since the first incursion of ASF in Europe in early 2014, the presence of the virus continues to be reported in backyard farms close to the border with Ukraine, and the northern and eastern border of the Republic of Moldova.	
Romania	African swine fever (ASF)	Moderate	Incursion of African swine fever (ASF) outbreaks from neighbouring countries and spread in the country.	Outbreaks of ASF are occurring in small holdings in Ukraine close to the southern border with Romania.	
Russian Federation	African swine fever (ASF)	Moderate	Occurrence of African swine fever (ASF) outbreaks and spread into new areas within the country.	Informal and uncontrolled animal movement and poor biosecurity condition in pig farms is the main risk factor for disease introduction into farms and for wider geographic spread.	

EUROPE

Countries	Threat disease	Likelihood of occurrence	Forecast for January-March 2017	Details	Country context
	Foot-and-mouth disease (FMD)	Low	Occurrence of Foot-and-mouth disease (FMD) outbreaks.	Since late November FMD Serotype O incursion was detected in Zabaykalsky Krai, at the border with China. Several farms have been already affected. Despite the applied control measures, additional outbreaks are expected to occur while the vaccination campaign is being completed.	
	Lumpy Skin Disease (LSD)	Low	Occurrence of further Lumpy skin disease (LSD) outbreaks in the already affected area and possible spread within the countries. The possibility is mitigated by the current unfavorable climate condition for the vectors.	After its re-emergence in May 2016 in Dagestan, LSD has spread north, east, and westwards, affecting 18 administrative subjects and causing almost 250 outbreaks. Its spread has decreased due to unfavourable weather condition for the vector.	
	Italian Locust	Nil	Hatching will start after the forecast period.		
	Migratory Locust	Nil	Hatching will start after the forecast period.		
	Moroccan Locust	Nil	Hatching will start after the forecast period.		
Ukraine	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, with new areas being affected in 2016.	

FCC TERMINOLGY

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

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. 4, December 2016 available at http://www.fao.org/3/a-i6558e.pdf

Other regional/global threats

- El Niño and La Niña. 2016. [FAO Website] (available at http://www.fao.org/emergencies/crisis/el-nino/en/)

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