

**LOCUST CRISIS**



**MADAGASCAR**

## **Response to the locust plague**

**Three-year Programme  
2013–2016**



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## Introduction

**Madagascar is currently facing a locust plague that could affect the livelihoods and food and nutrition security of 13 million people.** The current Malagasy Migratory Locust plague started in April 2012 and will have a dramatic impact on agricultural production and the availability of pasture resources for livestock. Rice, and other crops, are at risk of considerable damage by the locust plague, which can have a wider impact on domestic supply and cereal prices<sup>1</sup>.

Madagascar is prone to frequent natural disasters that have a significant effect on the livelihoods of the most vulnerable rural populations. Since 2009, the combined effect of droughts and cyclones, as well as political instability, has worsened the living conditions of thousands of households, mainly in the southwestern part of the country where more than 80 percent of the population lives below the poverty line.

The information available in February 2013<sup>2</sup> confirms the seriousness of the locust crisis in the southwestern and western areas of Madagascar. In the southwest, which is the core of the locust plague, cyclone Haruna, which struck Madagascar on 22 and 23 February 2013 has worsened the situation, not only causing considerable damage<sup>3</sup> but also improving the locust breeding conditions for a longer period than usual<sup>4</sup>. A combination of historical data, experience gained during the past decades and recent information from field assessments show that, in the absence of a locust campaign in 2012/13, at least 1.5 million hectares could be infested by locusts in two thirds of the country by September 2013.

Migratory Locust adults can multiply rapidly and form highly mobile groups and swarms. Depending on its size and density, a locust swarm can consume up to 100 000 tonnes, per day, of green vegetation, including crops. Given that the locust-affected regions<sup>5</sup> account for 50 percent of the total agricultural land under rice cultivation and more than 60 percent of the total rice production<sup>6</sup>, the potential damage that large mobile swarms can inflict on cropland and pastures is tremendous.

In view of the deteriorating situation, the Ministry of Agriculture of Madagascar declared, on 27 November 2012, a state of locust alert and public disaster for the whole country. In December 2012, the Ministry of Agriculture requested technical and financial assistance from the Food and Agriculture Organization of the United Nations (FAO) to address the current locust plague, ensure the mobilization of funds as well as the coordination and implementation of an emergency response.

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1 The rice crop is the most important crop in the majority of the communes of the country, both in terms of area and value production. Source: FAO EX-ACT available at:

<http://www.fao.org/tc/exact/ex-act-applications/on-policies/rice-in-madagascar/en/>

2 As per a field mission carried out by the Director of the Plant Protection Directorate and data gathered by the Locust Watch Unit. Source: Plant Protection Directorate.

3 Early aerial assessments indicate that two-third of the rice fields are flooded in southwestern coastal areas.

4 Locusts lay eggs in moist soil and heavy rains brought by cyclone Haruna have increased water reserves in the soil, leading to favourable conditions for the breeding and development of locusts over a longer period of time than is normally the case.

5 Thirteen of Madagascar's 22 regions are affected by the Migratory Locust, namely: Menabe, Melaky, Bongolava, Vakinankaratra, Haute Matsiatra, Itasy, Sofia, Boeny, Betsiboka, Atsimo Andrefana, Anosy, Androy and Ihorombe. Source: Plant Protection Directorate.

6 Average over the five-year period 2007-2011. Source: DSEC/Service de la Statistique Agricole, Madagascar.

Given the magnitude and geographical scope of the locust plague, FAO estimates that a sustained three year effort comprising three successive locust campaigns (2013–2016) totalling USD 41.5 million will be required. Of this amount, USD 22.4 million is required by June 2013 to launch the first large-scale locust campaign (2013/14).

Experience in Madagascar has shown that the successful implementation of a locust campaign (from September of year 1 to May/June of the following year) requires that all funds be available for that campaign in June of year 1. It is particularly relevant to note that the 2010/11 locust campaign, implemented in response to a locust outbreak in 2010, received only 50 percent of the USD 14.5 million it required, which resulted in the need for a second campaign estimated at USD 7 million in 2011/12 – itself also only 26 percent funded. As a consequence, uncontrolled locust populations developed and spread, and the financial resources required to address the current plague have increased. Immediate action is required to avoid a repeat of the last locust plague in Madagascar that lasted three years from 1997 to 2000 and cost the Government and the international humanitarian community USD 60 million to treat more than 4 million hectares.

The present document sets out a three-year emergency response programme to combat the locust plague.



## Programme objective and approach

In response to the locust plague, an emergency Programme has been jointly prepared by FAO and the Ministry of Agriculture of Madagascar. The overall objective is to **safeguard the food security of rural populations in Madagascar**.

Considering the importance and geographic extent of the infested and contaminated areas, it is estimated that at least three successive locust control campaigns are now necessary to return to a locust recession<sup>7</sup> situation, as follows:

- Locust Campaign 1: fight against the plague<sup>8</sup>, from September 2013 to September 2014 (1.5 million hectares to be treated)
- Locust Campaign 2: measures to support the anticipated decline, from October 2014 to September 2015 (500 000 hectares to be treated)
- Locust Campaign 3: towards recession and capacity building of the National Locust Centre, from October 2015 to June 2016 (150 000 hectares to be treated).

The three-year Programme in response to the locust plague has five components:

1. Capacity for monitoring and analysis of the locust situation strengthened
2. Locust control capacity strengthened
3. Human health preserved and the environment protected
4. Implementation and coordination of the Programme (Including the National Locust Emergency Plan)
5. Assessment of the effectiveness of locust campaigns and the impact of the locust crisis on crops and pastures.



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<sup>7</sup> A recession is a period without widespread and heavy infestations by locust swarms. The locust populations are usually present in the outbreak area only.

<sup>8</sup> A locust plague is a period of one or more years of widespread and heavy infestations, the majority of which occur as bands or swarms. The whole invasion area, far beyond the outbreak one, is infested.



## Programme budget

The total budget for the implementation of the three-year Programme exceeds USD 41 million. Table 1 provides the summary budget by component and by locust campaign.

Table 1 – Programme budget (in USD million)				
SUMMARY	CAMPAIGN 1 (2013-2014)	CAMPAIGN 2 (2014-2015)	CAMPAIGN 3 (2015-2016)	Total
Component 1: Capacity for monitoring and analysis of the locust situation strengthened	3.90	2.10	1.10	<b>7.10</b>
Component 2: Locust control capacity strengthened	15.20	10.80	1.80	<b>27.80</b>
Component 3: Human health preserved and environment protected	0.70	0.22	0.16	<b>1.08</b>
Component 4: Implementation and coordination of the Programme	2.50	2.10	0.80	<b>5.40</b>
Component 5: Assessment of the effectiveness of locust campaigns and the impact of the locust crisis on crops and pastures	0.05	0.05	0.05	<b>0.15</b>
<b>TOTAL</b>	<b>22.35</b>	<b>15.27</b>	<b>3.91</b>	<b>41.53</b>

For all three campaigns, any lack of funding (partial or late disbursement) will result in an increase of the infested areas and consequently the surface area to be treated, an increase in the duration of the plague, an increase in the likely impact on crops and pastures, and on the food security of populations as well as the environment and an increase in the financial costs.

It is essential that all required funds, at least for the 2013/14 locust campaign i.e. **USD 22.4 million**, are available **by June 2013** in order to successfully implement the curative campaign.

Should this funding not be available or partially or late, the country could be affected by a plague for an even longer period with a tremendous impact on the livelihood of the Malagasy populations and increased economic, social and environmental costs.

However, only the long-term commitment of the Government and of technical and financial partners can help counter the reoccurrence of locust crises in Madagascar, which are neither a seasonal event nor inevitable. The National Locust Centre must therefore be reformed in order to be able to implement an effective and sustainable preventive control strategy as soon as the plague ends (including the annual funding of its operations, and human resource management, and the maintenance and replacement of the equipment required for monitoring and controlling locusts).

## Components and activities of the three-year Programme

The three-year Programme consists of five components, whose main activities are as follows:

### **Component 1: Capacity for monitoring and analysis of the locust situation strengthened**

#### **Activity 1.1 Strengthening of human capacity in data collection and analysis and information management**

A “Locust Watch Unit” will be established as early as February 2013 within the Plant Protection Directorate of the Ministry of Agriculture to gather data on locust and weather situations as well as on damage to crops and pastures, to be inserted into a database and used. The information thus made available – the cornerstone of any rational management of locust issues – will be essential in guiding the survey and control operations from September 2013 onwards. Technical assistance from locust experts for the establishment and supervision of this Locust Watch Unit before and throughout the three-year Programme will be essential in this regard. Training sessions in data collection, entry and analysis and information management will also be provided from 2013 to 2016; at the end of the Programme, the objective will be to establish/restore an effective monitoring and warning system.

#### **Activity 1.2 Support to survey operations**

In Madagascar, aerial survey operations are essential. They will have to be carried out continuously during the three locust campaigns, from September 2013 to March 2016. Aerial operations will have to begin in September 2013 to assess the nature and size of the adult populations surviving from the last locust generation of 2012/13 rainy season<sup>9</sup> having survived the winter, from June to September, to identify their geographical distribution (extensive survey) and to locate targets for control operations (intensive survey). In the context of the current locust plague and the anticipated decline, it is expected that a total of about 500 flying hours will be undertaken in 2013/14, 350 hours in 2014/15 and 250 hours in 2015/16. The operating costs of aerial bases<sup>10</sup> and ground survey teams will be covered by this component, which will also include the acquisition of survey, camping, communication, global positioning equipment, computers, 4x4 vehicles and motorbikes.

### **Component 2: Locust control capacity strengthened**

#### **Activity 2.1 Human capacity building for locust control**

The strengthening of human capacity will include training (or refresher training, given the training sessions already conducted since 2010) to be provided in 2013 on campaign and airbase management, input management, aerial control and calibration of sprayers and the use of biopesticides. Specific technical assistance will be required for the instalment of an input management software and the use of biopesticides.

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9 From October 2012 to May 2013.

10 Pro rata calculation of flight time devoted to surveillance operations as against total surveillance/control flight time.

## Activity 2.2 Support to locust control operations

Support to locust control operations will mainly concern aerial operations although the strengthening of ground operations is also being considered.

The strategy adopted to tackle the locust plague includes full cover treatments using conventional pesticides (used against adult-winged locusts), barrier treatments with insect growth regulators (for the rapid protection of large areas contaminated by hopper<sup>11</sup> bands) and treatments with a biopesticide (full coverage or barriers) for spraying needed in environmentally sensitive areas. The quantities of pesticides (litre or kg) to be acquired and areas to be treated or protected (in hectares) are outlined in Table 2.

Table 2 – Hectares to be treated/protected and quantities of pesticides required								
SUMMARY	Campaign 1		Campaign 2		Campaign 3		Total	
	Quantities	Hectares treated/protected						
Conventional pesticides: full cover (litres)	550 000	550 000	150 000	150 000	40 000	40 000	740 000	740 000
Insect Growth Regulators: barriers (litres)	150 000	900 000	55 000	330 000	17 000	102 000	222 000	1 332 000
Biopesticides (kg)	1 500	30 000	1 000	20 000	500	10 000	3 000	60 000
<b>TOTAL</b>		<b>1 500 000</b>		<b>500 000</b>		<b>150 000</b>		<b>2 150 000</b>

Given the number of hectares to be treated/protected and the extent of the territory involved, three aerial bases (each with one helicopter) will need to be established, as follows:

- 1<sup>st</sup> Locust Campaign (2013/14):
  - 1 825 flying hours (control operations);
  - Three aerial bases from September 2013 to June 2014 (outbreak area, great-west and mid-west, Mahajanga Basin) and one mobile base from July to September 2014.
- 2<sup>nd</sup> Locust Campaign (2014/15):
  - 560 flying hours (control operations);
  - Three aerial bases from October to December 2014, two bases from January to June 2015 and one base from July to September 2015.
- 3<sup>rd</sup> Locust Campaign (2015/16):
  - 160 flying hours (control operations);
  - One aerial base from October 2015 to March 2016.

<sup>11</sup> A wingless locust not yet able to fly and breed. The hoppers develop in five successive hopper instars, whose duration is of 30 days during the rainy season, and up to 60 days during the dry one.

The operating costs of the aerial bases, as well as those related to ground control operations will be covered by this component.

Support to control operations will also result in the acquisition of equipment, including sprayers (ground control), personal protective equipment, camping, communication, global positioning equipment and computers (including input management software); the purchase of 4x4 vehicles and of three trucks will also be required for the aerial bases and transport of pesticides.

### **Component 3: Human health preserved and environment protected**

#### ***Activity 3.1 Strengthening of human capacity for human health preservation of and protection of the environment***

Technical assistance will be provided and training delivered on monitoring the impact of treatment on human health and the environment (2013 and 2014), the use of a drum-crusher (2013), pesticide management/incrementation of the pesticide stockpile management system (PSMS) in 2013 and 2014 and the revision of the environmental specifications in 2013.

#### ***Activity 3.2 Support impact monitoring (of treatment) on human health and the environment***

This support will comprise the acquisition of monitoring equipment (cholinesterase kits and other small equipment) and the operating costs for teams monitoring both the impact of treatment on human health and the environment and the management of empty pesticide drums.

#### ***Activity 3.3 Construction of the pesticide storage facility (Tuléar)***

The construction of the pesticide storage facility (Tuléar), originally scheduled for 2011, will be completed, as the land has already been identified and plans prepared.

### **Component 4: Implementation and coordination of the Programme**

#### ***Activity 4.1 Implementation of the National Locust Emergency Plan***

The National Locust Emergency Plan, developed by national stakeholders at a workshop held in October 2012 and currently being finalized, will be implemented in order to manage the locust crisis. This will include the establishment and operating costs of the National Coordination Unit within the Ministry of Agriculture, in Antananarivo, and of a Regional Coordination Unit, in Tuléar, from September 2013. It should be noted that the work on the development of the Locust Risk Management Plan will continue and the Locust Risk Prevention Plan will be prepared within this framework (2013).

#### ***Activity 4.2 Coordination of the three-year Programme***

Effective coordination of the Programme will be critical to its success. It is envisaged to recruit a Campaign Coordinator and a logistician, both based in Madagascar, and to provide support to the FAO Representation in Madagascar for field operations and to FAO Headquarters for the supervision and the technical and operational coordination of the Programme.

## **Component 5: Assessment of the effectiveness of locust campaigns and the impact of the locust crisis on crops and pastures**

### **Activity 5.1 Assessment of the effectiveness of locust campaigns**

Each locust campaign, at its conclusion, will be assessed for the efficiency of its implementation as well as effectiveness, and lessons learned will be incorporated in the subsequent campaign. Therefore, the results of the assessment of the 2013/14 locust control campaign are expected to improve the efficiency and efficacy of the 2014/15 campaign. At the end of each of the three locust campaigns, an assessment of their implementation and effectiveness will be conducted, and lessons learned will be incorporated in the subsequent campaign.

### **Activity 5.2 Assessment of the impact of the locust crisis**

An impact assessment of the locust crisis on crops and pastures will be conducted and a summary will be made available at the end of each campaign. The figures obtained will serve as a basis for determining the support to be provided to farming households whose livelihoods have been affected by the locust crisis.



## Support for farming households affected by the locust crisis

Thirteen<sup>5</sup> out of the country's 22 regions, in the southwestern and the western part of Madagascar are, or will probably be affected by the locust plague before the end of the current rainy season (April to June 2013). The ongoing locust plague could endanger the livelihoods and food and nutrition security for as much as 60 percent of the total (national) population<sup>12</sup>. This represents 13 million people out of which about 9 million depend on agriculture for their subsistence in particular rice cultivation.

Madagascar's economy is based upon rice production<sup>1</sup>. Rice, as well as other crops, are at risk of considerable damage by the locust plague. The locust-affected regions account for 50 percent of the total agricultural land under rice cultivation and more than 60 percent of the total rice production<sup>6</sup>. In addition, cyclone Haruna has caused considerable damage in the southwest; early aerial assessments indicate that two-third of the rice fields are flooded in southwestern coastal areas.

Most famers also own livestock, including cattle and small ruminants. As a result of the ongoing locust plague, pasture conditions are also likely to have deteriorated, with adverse consequences on livestock health and productivity.

Depending on the extent of damage to crops and pastures, and the resulting impact on farmers' livelihoods and coping capacities, immediate support for the rehabilitation of households affected by the locust plague will include the distribution of agricultural inputs such as seeds and livestock feed as well as the provision of technical advice and support to farmers. In addition, encouraging farmers to diversify crop production, expansion of storage facilities, training in improved agricultural practices and stronger disaster preparedness measures such as prepositioning quality seeds in the event of a disaster, will help vulnerable Malagasy families not only recover from the locust crisis but also improve their ability to withstand future shocks and natural disasters. A programme to support the recovery of farming livelihoods affected by the locust plague will be developed based on an assessment of damage to crops and pasture<sup>13</sup>.

It should be noted that the forthcoming locust campaigns, from 2013 to 2016, are expected to contribute to safeguarding the food security of rural populations of Madagascar. However, should the expected outcomes not be achieved (due to lack of adequate funding or late availability of funds), a further deterioration in food insecurity is likely.

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<sup>12</sup> Thirteen million people in the 13 regions, over a total national population of 22.5 million.

<sup>13</sup> The damage assessment is expected to be completed by May 2013.



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The Three-year Programme in response to the locust plague in Madagascar will be implemented through the FCC.

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