# Early Warning Systems for Desert Locusts – a West Africa Pilot Project

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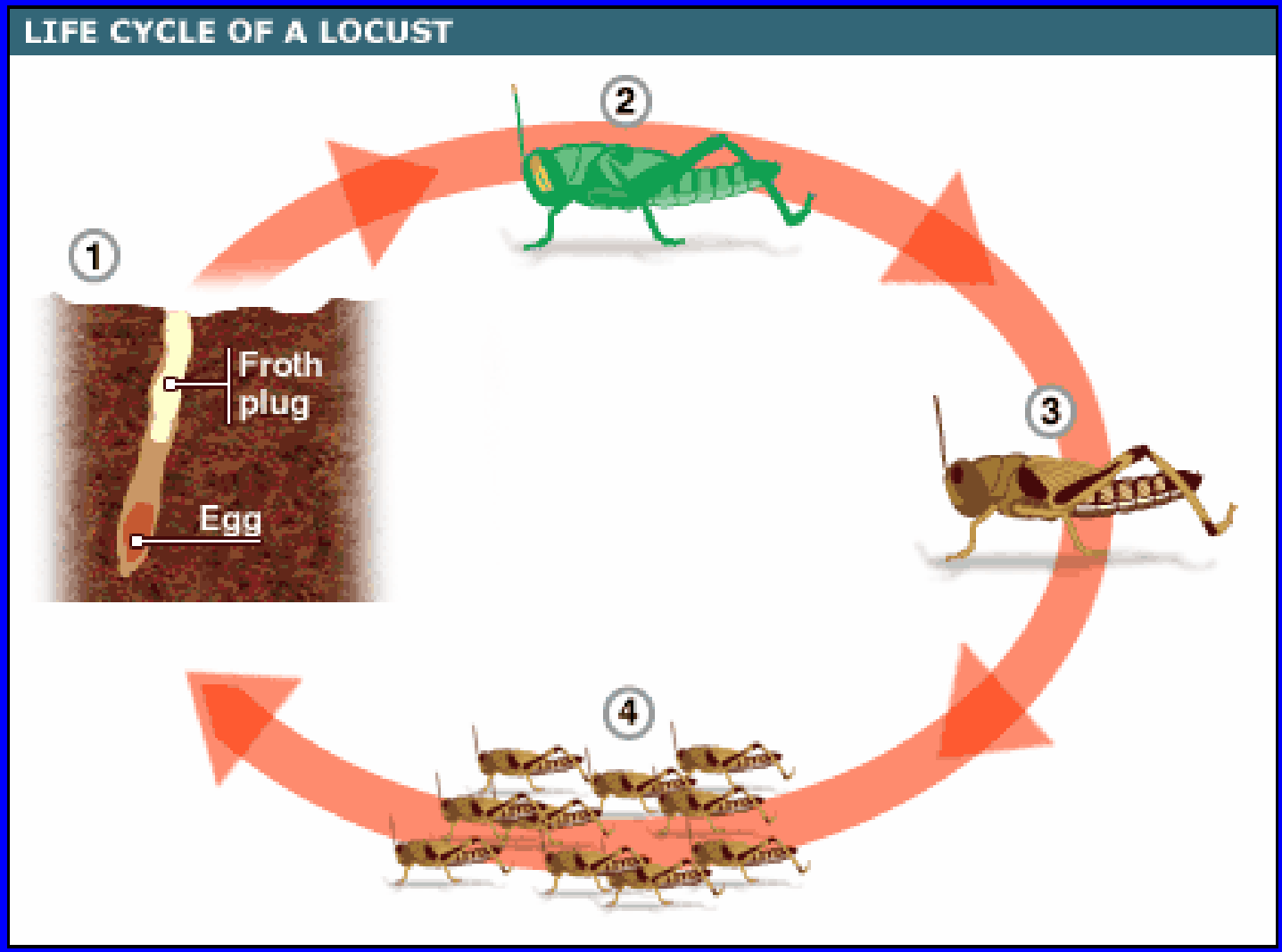
# Presentation

- Introduction to Locusts
- Meteorological requirements for different life phases of locusts
- Objectives of the West African Pilot Project
- Operational Tools
- Conclusions

# What are locusts ?

- Locusts are part of a large group of insects commonly called grasshoppers
- They differ from grasshoppers because they have the ability to change their behaviour and can migrate over large distances (upto 130 km a day)

# Locust life cycle



# Locust swarms

- Swarms can vary from less than one square km to several hundred square kilometers.
- There can be 40 to 80 million locust adults in each square km of swarm

# Locusts can eat a lot

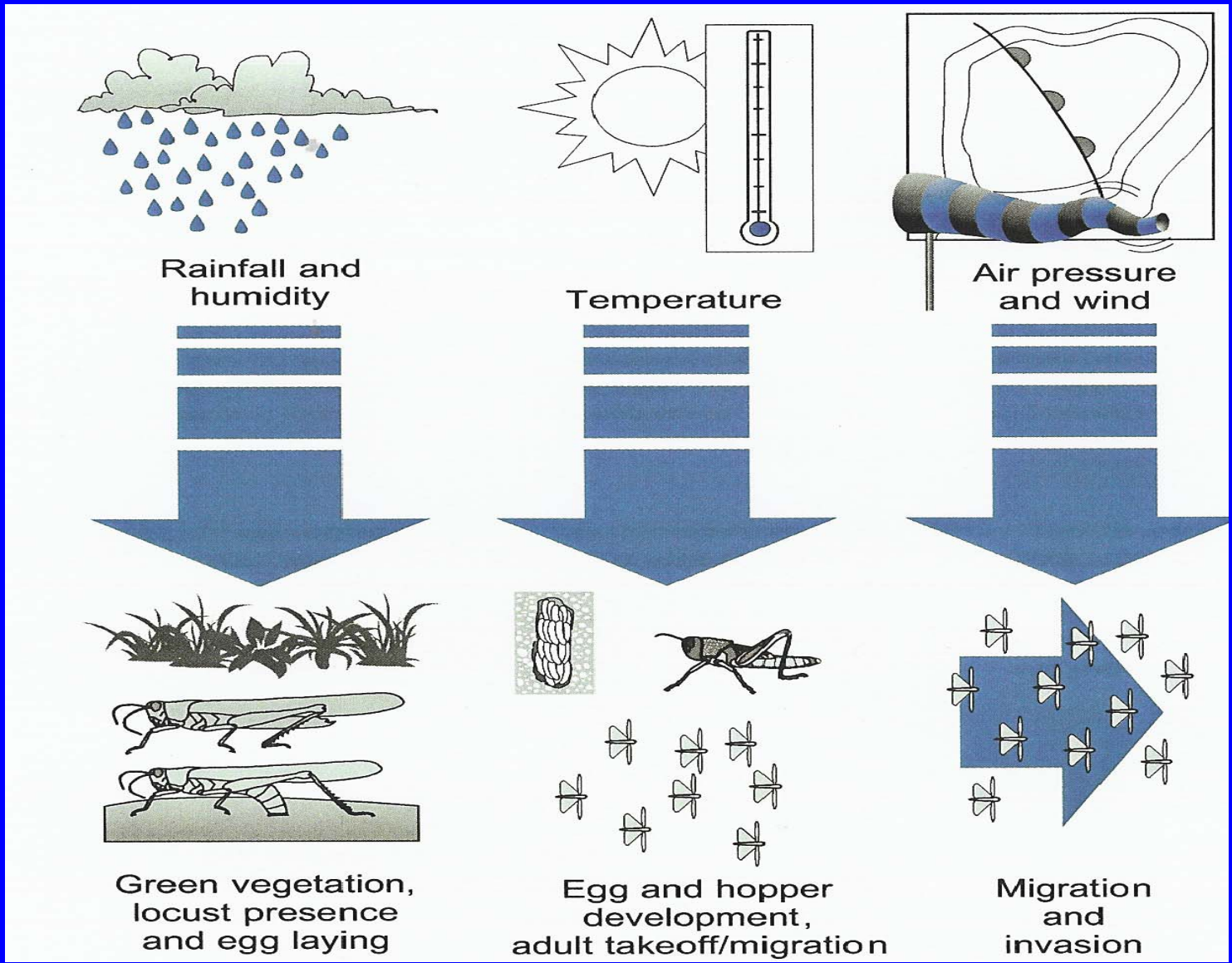
- A very small part of an average swarm (about one tonne) eats the same amount of food in one day as about

  10 elephants

  25 camels

  2,500 people

# All the different phases of locust life cycle require ideal meteorological conditions



# Climatic characteristics during peak infestation

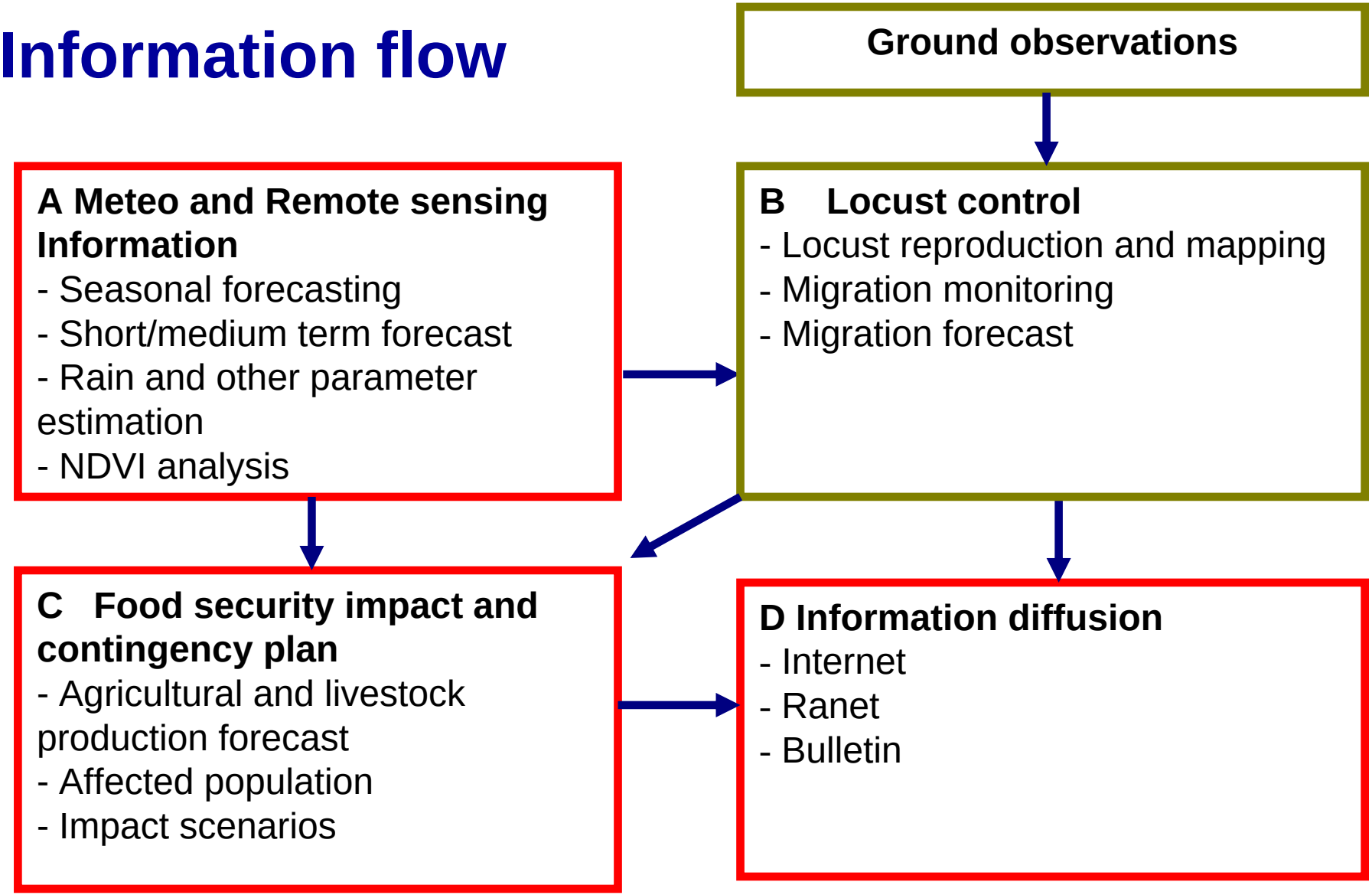
- Positive rainfall anomalies in the desert zones in spring
- High rainfall amounts at the beginning and at the end of the cropping season in sub-Saharan Africa
- High rainfall amounts in Spring in North Africa
- Favourable wind direction and persistence

# Main objective of the West African Pilot Project

- Development of more effective and efficient operational tools and information for monitoring and predicting locust development and migration

- Build the capacity of the National Services in planning control operations.

# Information flow



# Technological Advances for Producing Operational Tools

- Large amount of meteorological information available through Internet eg., the products of Numerical Weather Prediction Models (NWPs), reanalysis and satellite data.

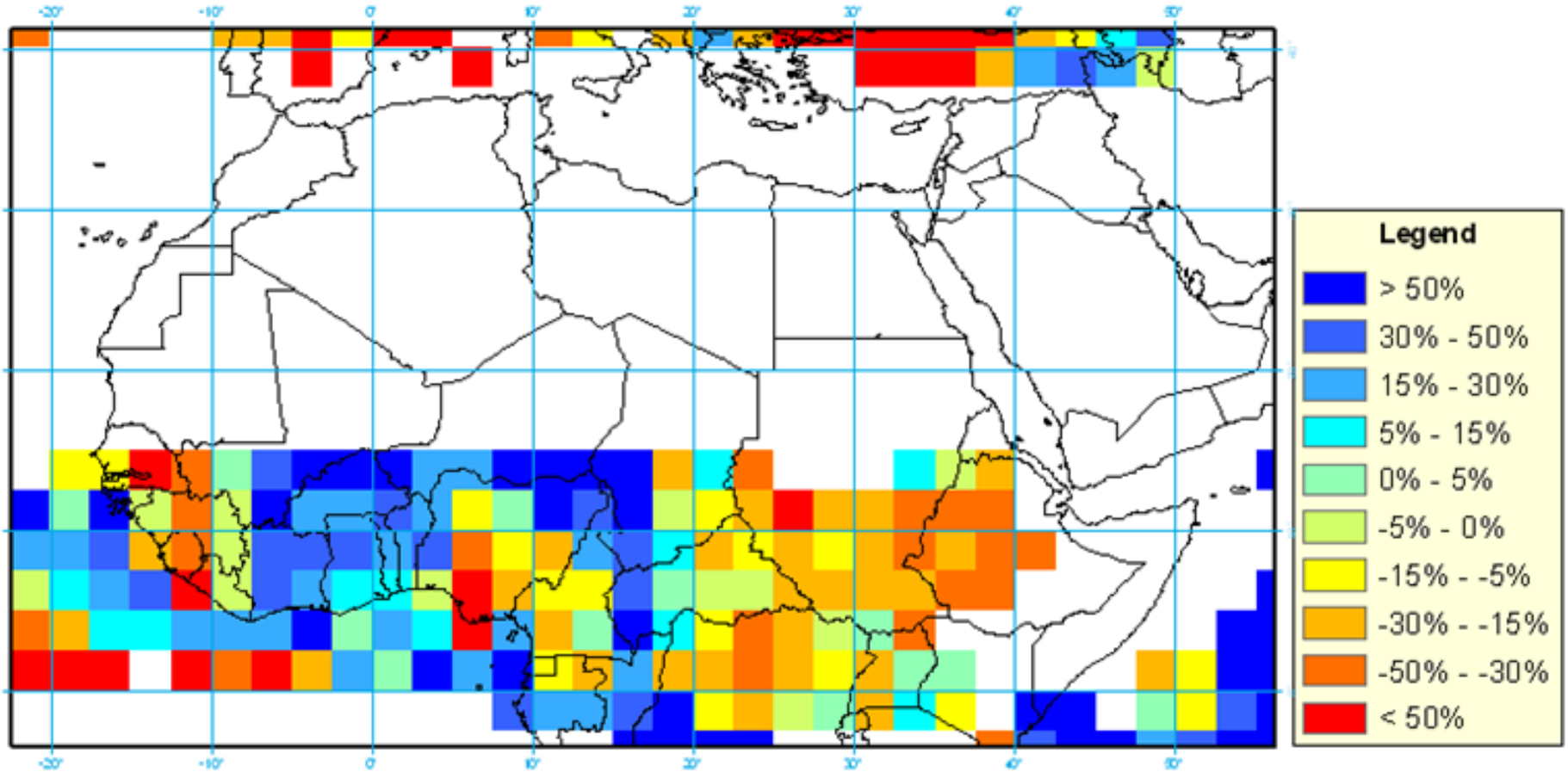
- These allow the preparation of specific tools through Local Area Models (LAM) and GIS to improve the monitoring and forecasting of locusts.

- Improvements in seasonal forecasting (two months in advance) to provide operational products

# Time scales of analysis and operational tools envisaged

- Statistical seasonal forecasting issued every month for the next three months
- Seven day rainfall forecasts based on GFS statistical downscaling at a resolution of 8x8 km
- Daily rainfall estimates from MSG (Meteosat Second Generation) at a resolution of 3x3 km
- Assessment of the geographical extent and severity of locust infestation from MODIS (Moderate Resolution Imaging Spectral Radiometer) NDVI data

# Seasonal rainfall forecast

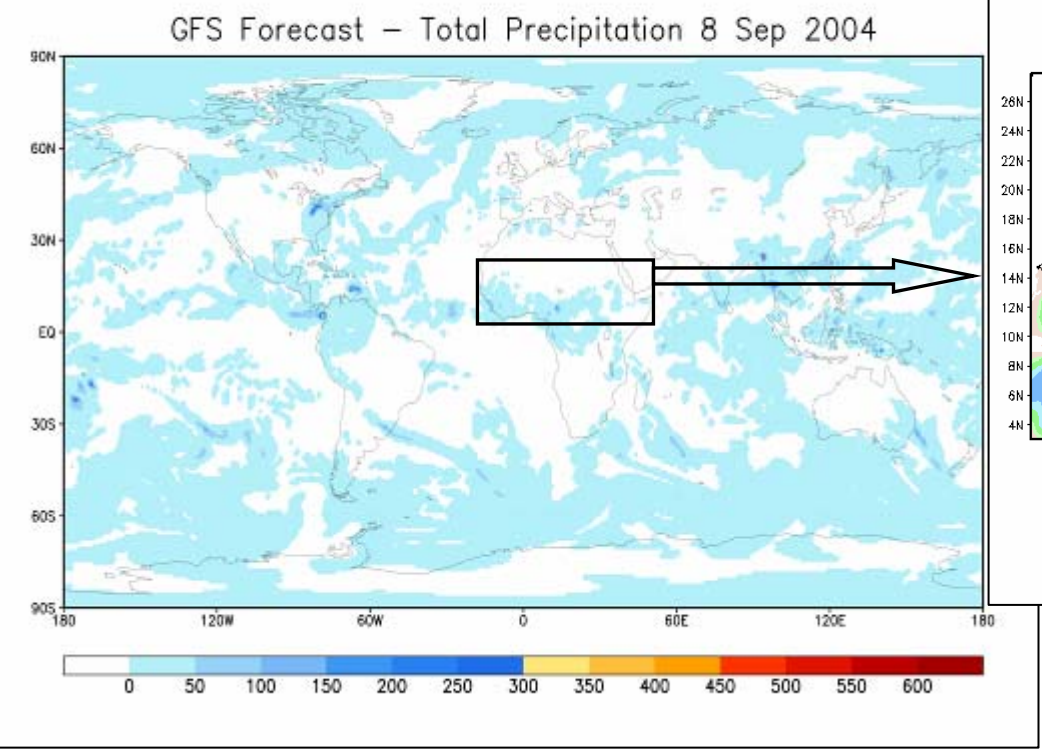



Precipitation percentage anomaly for June 2005
issued March 2005

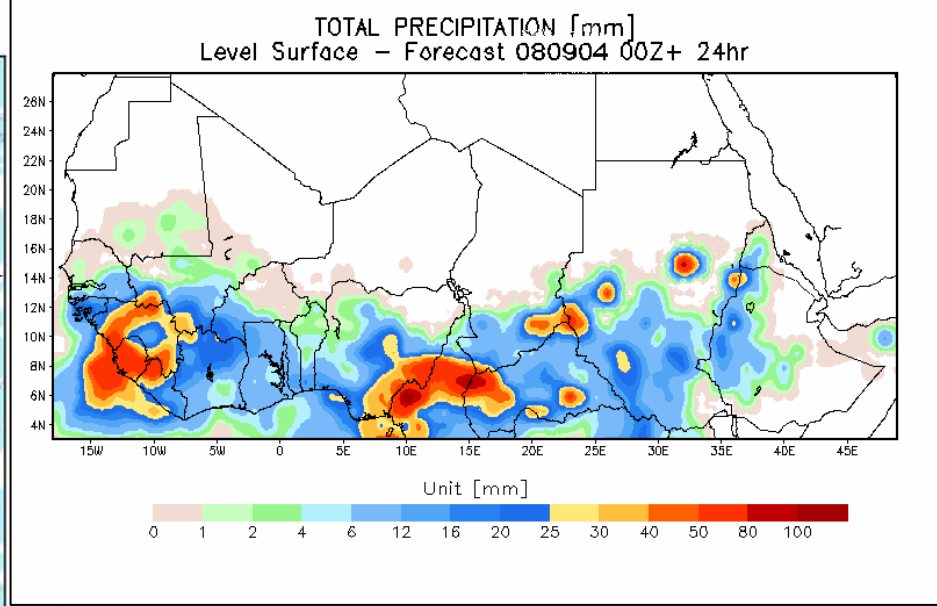
raifall mask: < 30mm

# Short/medium term forecast

## Statistical Downscaling of Global Forecast System

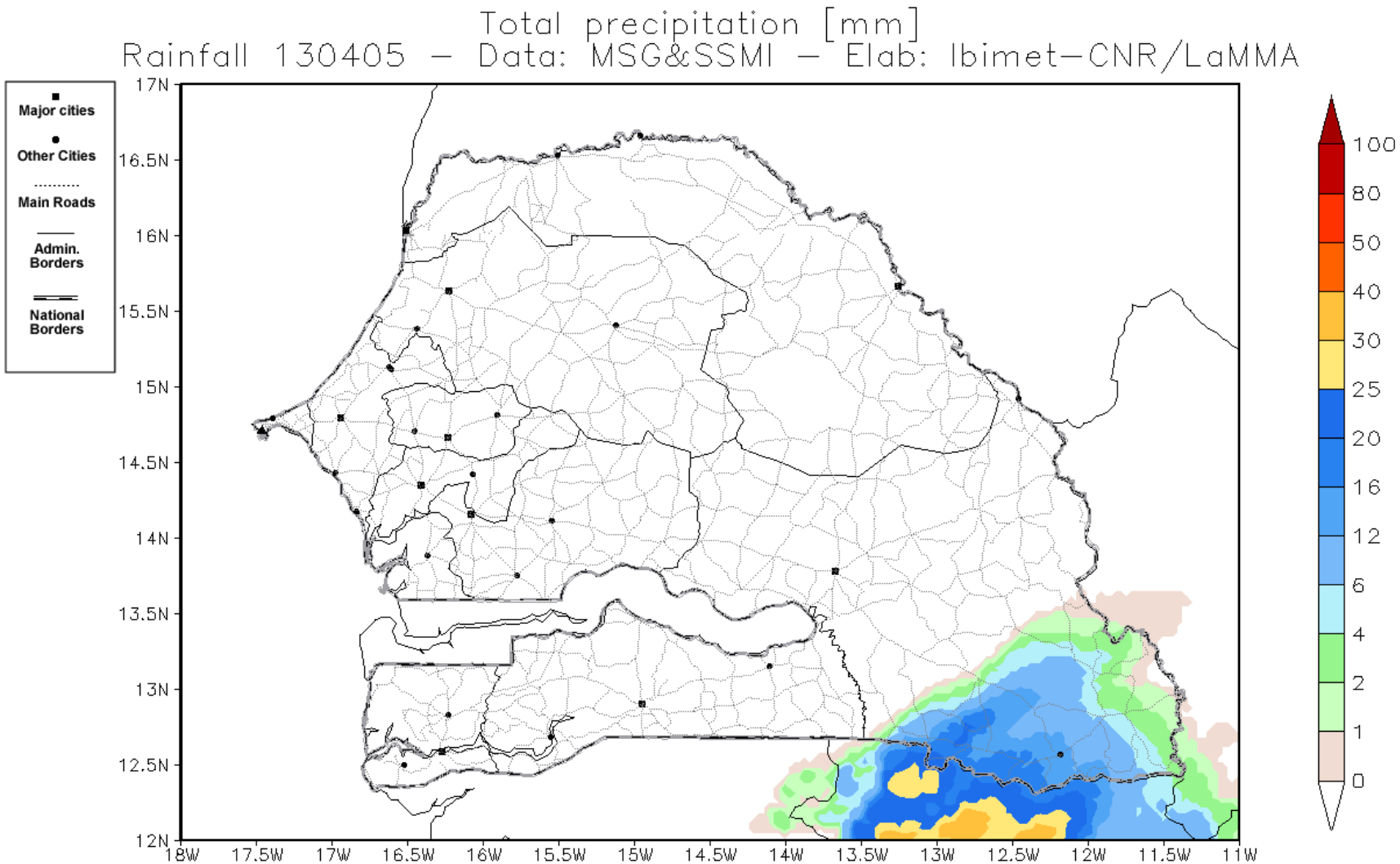



**Timing:** 00 - 180Hrs
**Resolution:** 1°
**Spatial dimension:** Global




**Timing:** 00 - 180Hrs
**Resolution:** 0.1°
**Spatial dimension :** 18W 49E/3N 28N

# Rain estimation by MSG



# Technology transfer

- All the information will be produced in an appropriate user-oriented format and will be diffused through internet based bulletins.

- Regional Training Workshops will be organized to demonstrate the value of the operational tools and information developed in the pilot project for monitoring and predicting locust development and migration

# Invasions du Criquet pèlerin en 2004 au Senegal

- Les criquets ont envahi le Sénégal de Juillet à Octobre 2004, à l'approche des récoltes
- De nombreux essaims long de 20 km, et large de 5 km capables de dévorer plusieurs milliers de tonnes en une journée ont envahi la partie nord et centre du pays
- 679 communes sénégalaises étaient envahies dont 417 dans la région de St Louis. 164 sites de ponte ont été identifiées à travers le pays
- 13 unités terrestres ainsi que quatre avions ont été mobilités pour circonscrire les essaims au nord et centre du pays et épargner ainsi en partie le grenier agricole du pays
- Conditions météorologiques existantes au Sénégal (Humidité, vent, pluviométrie) étaient favorables à leur développement

# Importance du Projet pour Senegal

- Elaboration de produits météorologiques spécifiques pour la lutte préventive et curative contre les invasions de criquets

- Meilleure collaboration entre les différentes structures nationale et sous régionales impliquées dans la lutte contre les criquets avec un renforcement des capacités

- Mise en place d'un système d'alerte précoce efficace et une meilleure circulation de l'information au niveau national et sous régional

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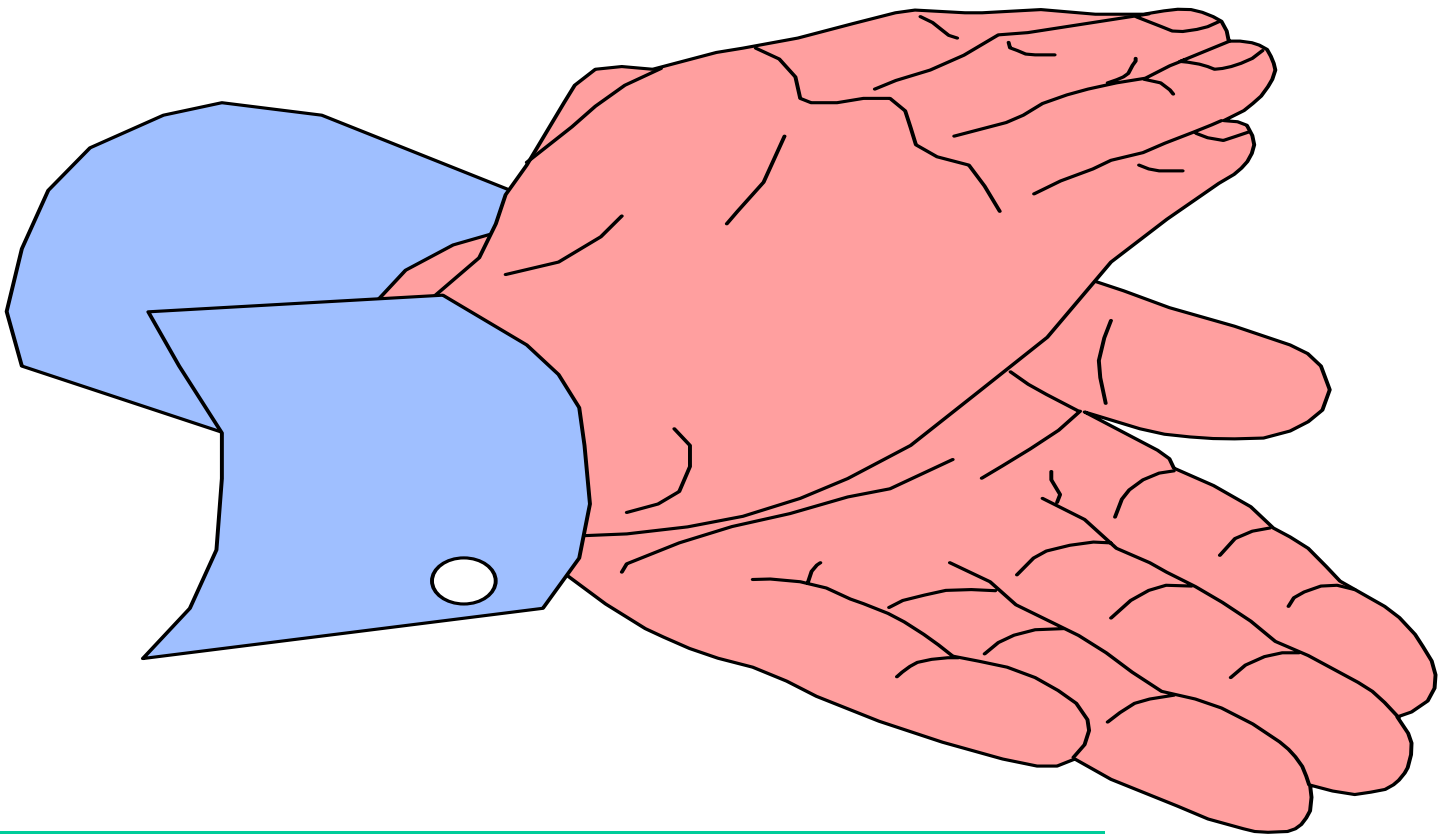
# Conclusions

- All the different phases in the life cycle of locusts and the migration of locust swarms require ideal meteorological conditions. Hence meteorological information is crucial for locust monitoring and control.

- Comprehensive and accurate meteorological information on both temporal and spatial scales can assist with efficient management of locust monitoring and control.

- NWP and trajectory models offer good possibilities for improving forecasts of locust migration.

# Thank you very much for your attention



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