# Report of Monitoring and Assessment of Desert Locust in Africa and Asia

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## Desert Locust Monitoring and Loss Assessment in Somalia and Ethiopia

Integrated with multi-source Earth Observation data, e.g. meteorological data, field data, and remote sensing data (such as GF series in China, MODIS and Landsat series in US, Sentinel series in EU), and self-developed models and algorithms for Desert Locust monitoring and forecasting, the research team constructed the 'Vegetation pests and diseases monitoring and forecasting system', which could regularly release thematical maps and reports on Desert Locust.

This report focuses on the dynamic update of desert locust monitoring and loss assessment in Somalia and Ethiopia. The results showed that, in December 2021, the desert locusts in Somalia were mainly distributed in the north and south, with a total of 201.1 thousand hectares of vegetation damage area. The newly added damaged vegetation area was 65.2 thousand hectares, including 0.8 thousand hectares of grassland, and 64.4 thousand hectares of the shrub. The desert locust swarms in Somalia were significantly reduced compared with December 2020. Desert locusts in Ethiopia were mainly distributed in the south, with a total vegetation damage area of 96.7 thousand hectares. The newly added damaged vegetation area was 45.7 thousand hectares, including 9.7 thousand hectares of cropland, 4.1 thousand hectares of grassland, and 31.9 thousand hectares of the shrub. The desert locust swarms in Ethiopia were significantly reduced compared with December 2020. In January 2022, locust swarms in northeast Somalia and southern Ethiopia will continue to lay eggs, hatch and mature, and it is expected that the number of locusts in these two countries will further increase. January 2022 is an important crop growing time for Somalia, and an important harvest time for Ethiopia. It is still necessary to continue to pay attention to the dynamics of the desert locust disaster in Somalia and Ethiopia to prevent repeated losses to its agricultural and pasture production. The specific research results are as follows.

## ■ 1. Desert Locust Monitoring and Loss Assessment in Somalia

I In early December 2021, the number of locusts in northeastern Somalia was significantly decreased due to the control operations. In mid-to-late December 2021, locust swarms in the northeast continued to spawn and mature, and some locust swarms moved south to southern Ethiopia and southern Somalia. The monitoring results show that in December, desert locusts in Somalia harmed about 201.1 thousand hectares of vegetation area (Figure 1). Compared with December 2020, the desert locust swarms in Somalia were significantly reduced.

The research results show that desert locusts in Somalia harmed about 65.2 thousand hectares of newly added vegetation area, including 0.8 thousand hectares of grassland and 64.4 thousand hectares of shrub, accounting for 0.02% and 0.1% of the total grassland and shrub in Somalia, respectively. The affected areas were mainly located in the north and south of Somalia. Among them, Bari in the northeast had the newly added largest affected area as 54.0 thousand hectares, followed by Mudug in the south affected with 8.5 thousand hectares and Togdheer in the northwest affected with 1.2 thousand hectares, then North-West, Awdal, and Sool in the northwest, Sanaag in the north, and Nugaal in the northeast were less affected with 0.5, 0.4, 0.4, 0.1 and 0.1 thousand hectares respectively.

Comprehensive analysis shows that, in January 2022, as ground control continues, the desert locust swarms in Somalia will be significantly reduced compared with January 2021. Forecasts show that locusts in northeastern Somalia will continue to lay eggs, reproduce, and mature, and the number of locusts is expected to increase slightly. January 2022 is an important crop growing time for Somalia. It is still necessary to continue to pay attention to the dynamics of the desert locust disasters and carry out timely ground investigations and control actions to prevent the desert locusts from repeatedly causing damage to Somalia's agricultural production and food security.

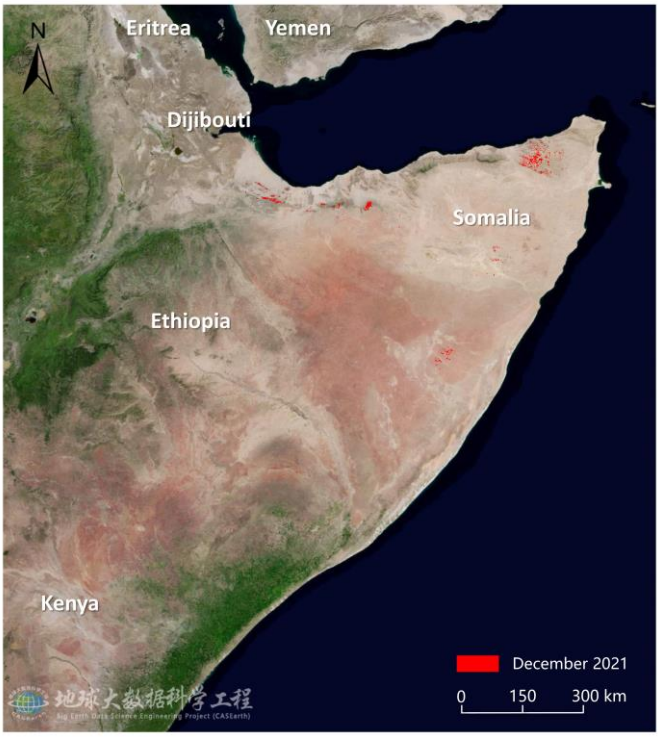


**Figure 1** Monitoring of Desert Locust damage in Somalia (December 2021)

## 2. Desert Locust Monitoring and Loss Assessment in Ethiopia

In early December 2021, locust swarms in southern Ethiopia continued to spawn and mature on the border between Ethiopia and Kenya, resulting in a further increase in the number of locusts in southern Ethiopia. In mid-to-late December 2021, affected by ground control operations, the number of locusts in southern Ethiopia decreased. At the same time, affected by the monsoon, some locust swarms in northeast Somalia spread southward to southern Ethiopia. The monitoring results show that in December, desert locusts in Ethiopia harmed about 96.7 thousand hectares of vegetation area (Figure 2). Compared with December 2020, the desert locust swarms in Ethiopia were significantly reduced.

The research shows that, in December 2021, desert locusts in Ethiopia newly harmed about a total of 45.7 thousand hectares of newly added vegetation area, including 9.7 thousand hectares of cropland, 4.1 thousand hectares of grassland, and 31.9 thousand hectares of shrub, accounting for 0.04%, 0.02% and 0.04% of the total cropland, grassland, and shrub in Ethiopia, respectively. The affected areas were mainly located in the south of Ethiopia. Among them, Southern and Oromia had the newly added affected areas as 26.9 and 18.8 thousand hectares.

This study also used Sentinel-2 satellite remote sensing data to monitor the desert locust damage in the severely affected vegetation areas in southern Ethiopia (Figure 3). The data acquisition time is December 2021, and the spatial resolution is 10 m. The study area is in southern Ethiopia, 46.8 kilometers away from Asile in the northwest and 35.5 kilometers away from Sabarei in the southwest. The vegetation types include cropland, grassland, and shrub, with a total area of 25.90 thousand hectares, including 2.80 thousand hectares of cropland, 5.01 thousand hectares of grassland, and 18.09 thousand hectares of shrub. The monitoring results showed that the damaged area of vegetation in the study area was 3.13 thousand hectares, accounting for 12.1% of the total study area. Among them, shrub was the largest damaged area with 1.74 thousand hectares, followed by cropland with 1.30 thousand hectares, and grassland was affected as 0.09 thousand hectares, accounting for 9.6%, 46.5%, and 1.8% of the total area of shrub, cropland, and grassland in the study area, respectively. The results of the study show that desert locusts still threaten the vegetation of Ethiopia. and continuous monitoring of the locust situation is needed to ensure Ethiopia's agricultural production and food security.

Comprehensive analysis shows that, in January 2022, as ground control continues, the desert locust swarms in Ethiopia will be significantly reduced compared with January 2021. Forecasts show that locust swarms in southern Ethiopia will continue to mature, reproduce, and lay eggs, and the number of locusts is expected to increase slightly. January 2022 is an important harvest time for Ethiopia. It is still necessary to continue to pay attention to the dynamics of the desert locust disasters and carry out timely ground investigations and control actions to prevent the desert locusts from repeatedly causing damage to Ethiopia’s agricultural production and food security.

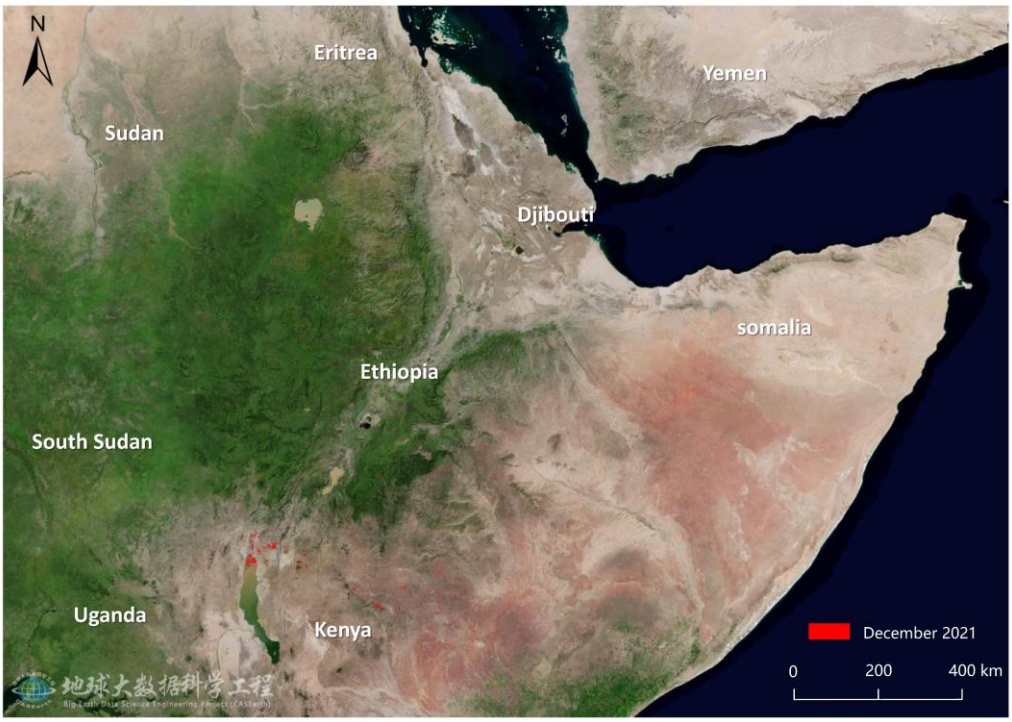


**Figure 2** Monitoring of Desert Locust damage in Ethiopia (December 2021)

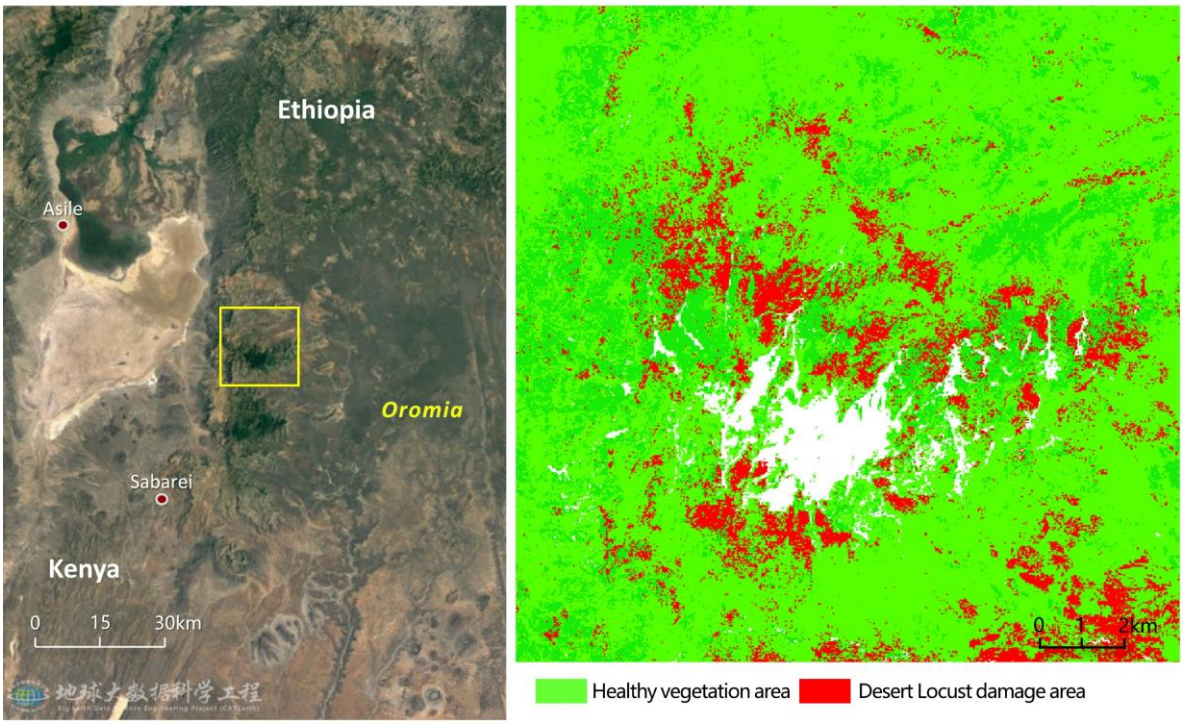


**Figure 3** Monitoring of Desert Locust damage in the key damage area of Ethiopia based on Sentinel-2 images (December 2021)

**This report was released by Professor Wenjiang Huang's and Associate Professor Yingying Dong's research team in Aerospace Information Research Institute, Chinese Academy of Sciences.**


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