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

Mid February 2021

Desert Locust monitoring and loss assessment in Ethiopia

Overview

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 updates of desert locust monitoring and loss assessment in Ethiopia from November 2020 to January 2021. The results showed that from November 2020 to January 2021, desert locusts in Ethiopia were mainly distributed in the east and south. Compared with October, the newly damaged vegetation area was 2373.6 thousand hectares, including 449.7 thousand hectares of cropland, 608.0 thousand hectares of grassland, and 1315.9 thousand hectares of

Content

Overview	1
Monitoring and assessment of Desert Locust in Ethiopia	2
Contact us	6

shrub. From February and March 2021, locusts in southern Ethiopia will continue to lay eggs, hatch, and mature, and locusts in the north will spread northward to the Red Sea coast. Locust swarms in northwest Somalia will continue to migrate to eastern Ethiopia. It is expected that the number of locust swarms in Ethiopia will further increase. The following two months coincide with the important crop planting season in Ethiopia. If not properly controlled, locusts will bring a major threat to agricultural and pasture production. It is necessary to continue the monitoring and early warning of the intercontinental desert locust plague and organize joint prevention and control in multiple countries, ensuring the safety of agricultural and pasture production and regional stability.

Monitoring and assessment of Desert Locust in Ethiopia

In November 2020, due to ground control actions, the number of locusts in northwestern Ethiopia significantly decreased. However, as the locusts in the east continued to mature, the number of locusts in the east increased. The locust swarms were mainly located in the east and north of Somali. The results showed that in November 2020, desert locusts in Ethiopia harmed about 976.0 thousand hectares of vegetation area, with an increase of 863.9 thousand hectares (including 36.1 thousand hectares of cropland, 210.1 thousand hectares of grassland, and 617.7 thousand hectares of shrub) (Figure 1). In early and mid-December, the eastern locust swarms continued to breed locally, and the number of locusts further increased. In late December, the locust swarms in the east spread southwest to the southwest along the Shebel River to Oromiya and SNNPR. The monitoring results showed that, in December 2020, desert locusts in Ethiopia harmed about 1051.7 thousand hectares of vegetation area, with an increase of 810.8 thousand hectares (including 246.5 thousand hectares of cropland, 215.2 thousand hectares of grassland, and 349.1 thousand hectares of shrub) (Figure 2). In early January 2021, locust swarms in eastern Ethiopia continued to spread to the south; in mid-to-late January, locust swarms in northwestern Somalia migrated to northwestern Ethiopia to Afar and Amhara and gradually spread to Tigray. The monitoring results showed that, in January 2021, desert locusts in Ethiopia harmed about 931.7 thousand hectares of vegetation area, with an increase of 698.9

thousand hectares (including 167.1 thousand hectares of cropland, 182.7 thousand hectares of grassland, and 349.1 thousand hectares of shrub) (Figure 3).

The results showed that, compared with October, from November 2020 to January 2021, desert locusts in Ethiopia newly harmed about a total of 2373.6 thousand hectares of vegetation area, including 449.7 thousand hectares of cropland, 608.0 thousand hectares of grassland, and 1315.9 thousand hectares of shrub, accounting for 1.9%, 3.5% and 1.8% of the total cropland, grassland, and shrub in Ethiopia, respectively. The affected areas were mainly located in the east and south of Ethiopia. Eastern Somali region was the largest affected area (with an affected area of 1239.7 thousand hectares), followed by the southern Oromia region (with an affected area of 786.1 thousand hectares), and again SNNPR (with an affected area of 320.6 thousand hectares). Tigray, Alpha, and Amhara states in the northwest have relatively small damage area, with 21.4, 5.6, 0.2 thousand hectares, respectively.

This study also used Sentinel-2 satellite remote sensing data to monitor the desert locust disaster in the severely affected vegetation areas on Ethiopia's southern border (Figure 4). The data acquisition time is January 2021, and the spatial resolution is 10m. The study area is located in the southern region of Oromia State, about 70 kilometers southeast from Mega and 140 kilometers northeast from Finchawa. The vegetation types include grassland, shrub, and cropland, with 173.9 thousand hectares, including 1.7 thousand hectares of cropland, 73.0 thousand hectares of grassland, and 99.2 thousand hectares of shrub. The monitoring results showed that the

damaged area of vegetation in the study area was 22.3 thousand hectares, accounting for 12.8% of the study area's total area. Among them, the damaged area of shrubs was 12.2 thousand hectares, the damaged area of grassland was 9.6 thousand hectares, and the damaged area of farmland was 0.5 thousand hectares, accounting for 12.3%, 13.2%, and 29.4% of the total area of shrub, grassland and cropland in the study area. The results show that desert locusts still threaten the vegetation in Ethiopia, and continuous monitoring of the locust situation is needed to ensure agricultural production and food security in Ethiopia.

Comprehensive analysis shows that, in February and March 2021, affected by rainfall,

locust swarms in southern Ethiopia will continue to mature and reproduce and lay eggs. Simultaneously, locust swarms in the north will continue to spread to the Red Sea coast, and locust swarms in northwestern Somalia will continue to migrate to eastern Ethiopia. It is expected that the number of locust swarms in Ethiopia will further increase. The following two months coincide with the vital crop planting season in Ethiopia. If not properly controlled, locusts will bring a major threat to agricultural and pasture production. Ground surveys and control actions are required to ensure the safety of agricultural and pasture production.

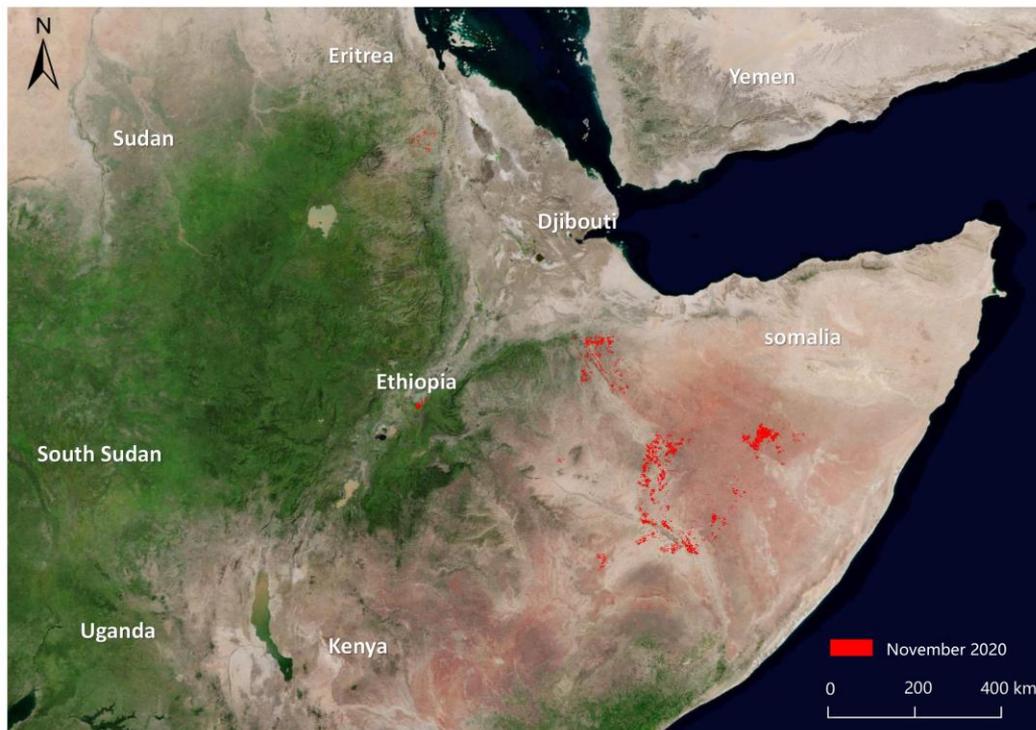


Figure 1 Monitoring of Desert Locust damage in Ethiopia (November 2020)

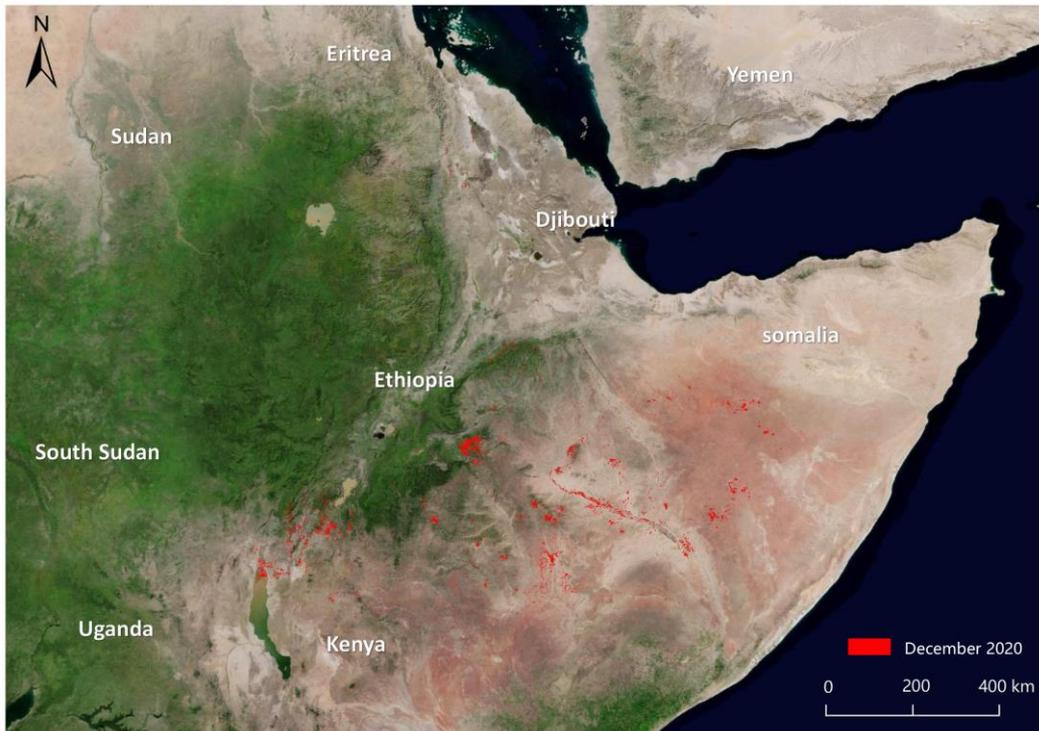


Figure 2 Monitoring of Desert Locust damage in Ethiopia (December 2020)

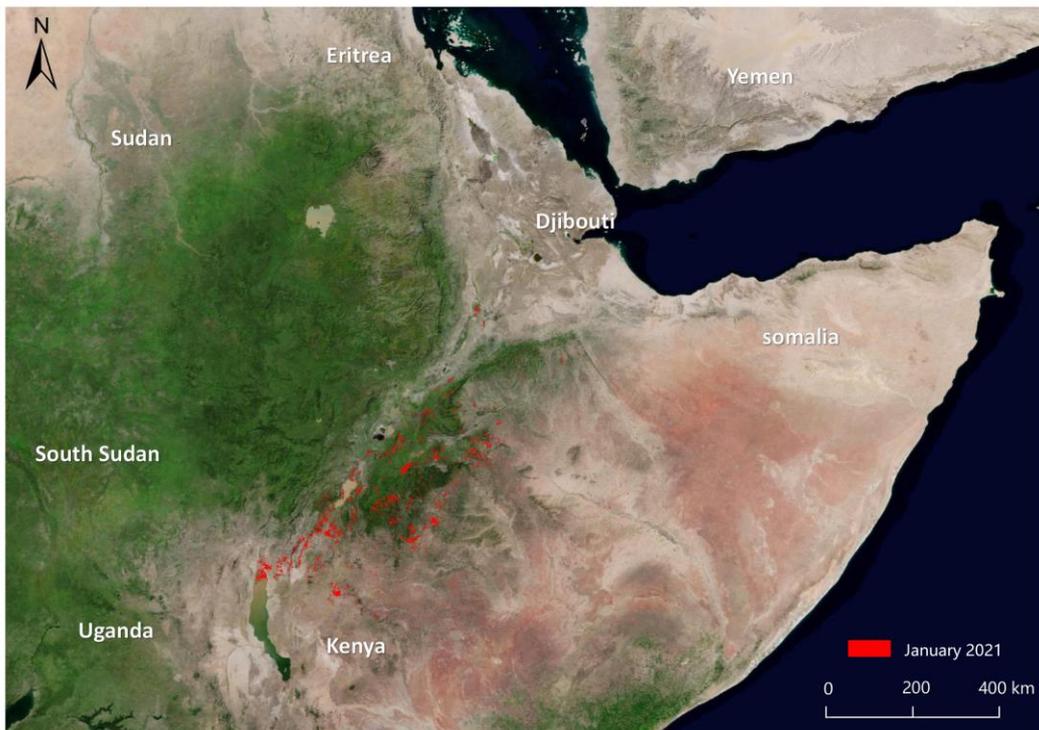


Figure 3 Monitoring of Desert Locust damage in Ethiopia (January 2021)

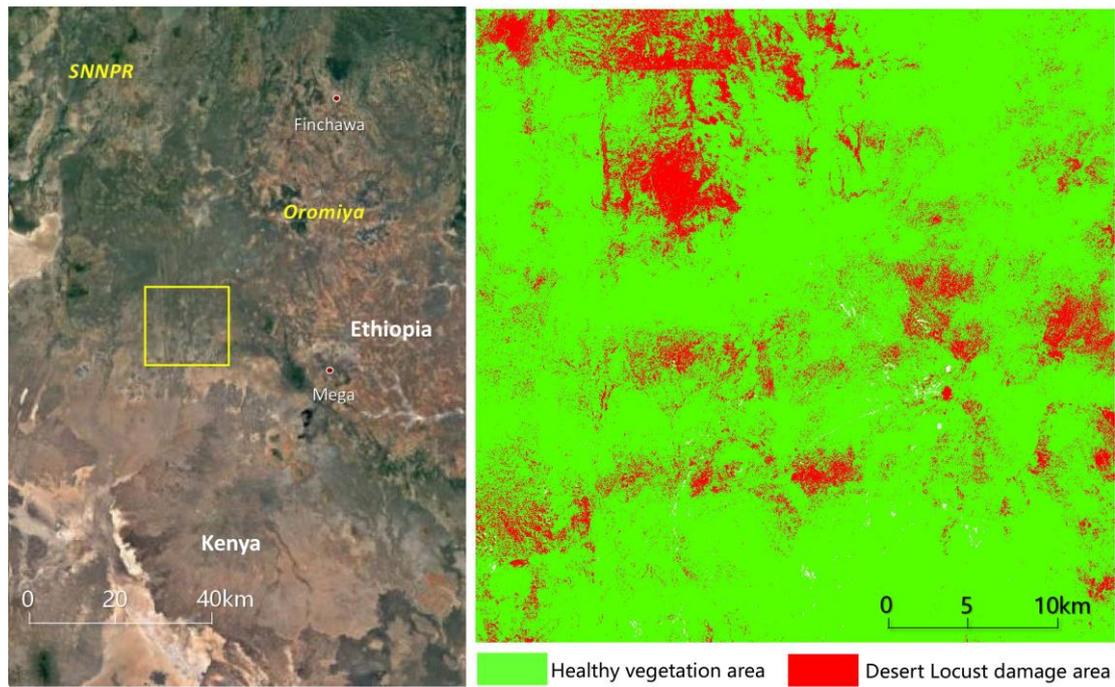


Figure 4 Monitoring of Desert Locust damage in the key damage area of Ethiopia based on Sentinel-2 images (January 2021)

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The Vegetation Pests and Diseases Monitoring and Forecasting system are available under:
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Mission statements: As the science and knowledge service, the Sino-UK Crop Pest and Disease Forecasting & Management Joint Laboratory is to support independent evidence for crop monitoring.

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