



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

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Desert Locust Monitoring and Loss Assessment in 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 Ethiopia from January to February 2022. The results showed that, from January to February 2022, the desert locusts in Ethiopia were mainly distributed in the east and south. In January 2022, the total damaged vegetation area was 21.9 thousand hectares, compared with December 2021, desert locust in Ethiopia newly harmed about a total of 7.9 thousand hectares of vegetation area, including 0.3 thousand hectares of cropland, 0.9 thousand hectares of grassland, and 6.7 thousand hectares of shrub. In February 2022, the total damaged vegetation area was 17.7 thousand hectares, compared with January 2022, desert locust in Ethiopia newly harmed about a total of 8.7 thousand hectares of vegetation area, including 0.3 thousand hectares of cropland, 0.3 thousand hectares of grassland, and 8.1 thousand hectares of shrub. Compared with the same period last year, the population of desert locust swarms was significantly reduced. Further reductions in locust swarms are expected in March and April as locusts migrate from east to south into Oromia and Southern due to dry weather conditions. The next two months are important planting seasons for crops in Ethiopia. It is still necessary to continue to pay attention to the dynamics of the desert locust disaster in Ethiopia to prevent repeated losses to its agricultural and pasture production. The specific research results are as follows.

In early January 2022, locust swarms from northern Somalia moved to southern Ethiopia,



resulting in an increase in the population of locusts in southern Ethiopia; In mid-to-late January 2022, affected by ground control, the number of locusts in Ethiopia decreased significantly, and locust swarms were mainly located in eastern Somali and southern Oromia. The monitoring results show that in January, desert locust in Ethiopia harmed about 21.9 thousand hectares of vegetation area, compared with December 2021, desert locust in Ethiopia newly harmed about a total of 7.9 thousand hectares of vegetation area, including 0.3 thousand hectares of cropland, 0.9 thousand hectares of grassland, and 6.7 thousand hectares of shrub (Figure 1). In early and middle of February 2022, the number of locusts in Ethiopia was reduced due to ground control operations. In mid-February 2022, some locusts in Somali spread southwest from Dollo to Korahe. In late February 2022, locusts in eastern Somali spread southwards to southern Oromia. The monitoring results show that in February, desert locust in Ethiopia harmed about 17.7 thousand hectares of vegetation area, compared with January 2022, desert locust in Ethiopia newly harmed about a total of 8.7 thousand hectares of vegetation area, including 0.3 thousand hectares of cropland, 0.3 thousand hectares of grassland, and 8.1 thousand hectares of shrub (Figure 2).

The research results show that, compared with December 2021, from January to February 2022, desert locust in Ethiopia newly harmed about a total of 16.6 thousand hectares of vegetation area, including 0.6 thousand hectares of cropland, 1.2 thousand hectares of grassland, and 14.8 thousand hectares of shrub, accounting for 0.03‰, 0.07‰, and 0.02% of the total area of cropland, grassland, and shrub in Ethiopia, respectively. The affected areas are mainly located in the eastern and southern parts of Ethiopia. Among them, Oromia in the south had the largest newly damaged area as 9.5 thousand hectares, followed by Somali in the eastern had the newly damaged area as 7.1 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 eastern Ethiopia (Figure 3). The data acquisition time is February 2022, and the spatial resolution is 10 m. The study area is in Somali of Ethiopia, 28.6 kilometers away from Kebri Dehar in the northwest and 61.3 kilometers away from Hanan in the south. The vegetation types include cropland, grassland, and shrub, with a total area of 26.18 thousand hectares, including 2.99 thousand hectares of cropland, 6.36 thousand hectares of grassland, and 16.83 thousand hectares of shrub. The monitoring results showed that the damaged area of vegetation in the study area was 0.48 thousand hectares, accounting for 1.8% of the total study area. Among them, shrub was the worst affected, with the damage area of 0.39 thousand hectares, followed by grassland with 0.07 thousand hectares, and cropland with 0.02 thousand hectares, accounting for 2.3%, 1.0%, and 0.8% of the total area of shrub, grassland, and cropland 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, from March to April 2022, as ground control continues, the scale and number of desert locust swarms in Ethiopia will be significantly reduced compared to the same period last year. The forecast results show that from March to April, affected by dry weather conditions, desert locust swarms in Ethiopia will continue to spread south to Oromia and Southern, and the number of locusts will further decrease compared with February. March and April 2022 are important planting seasons for crops in 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.

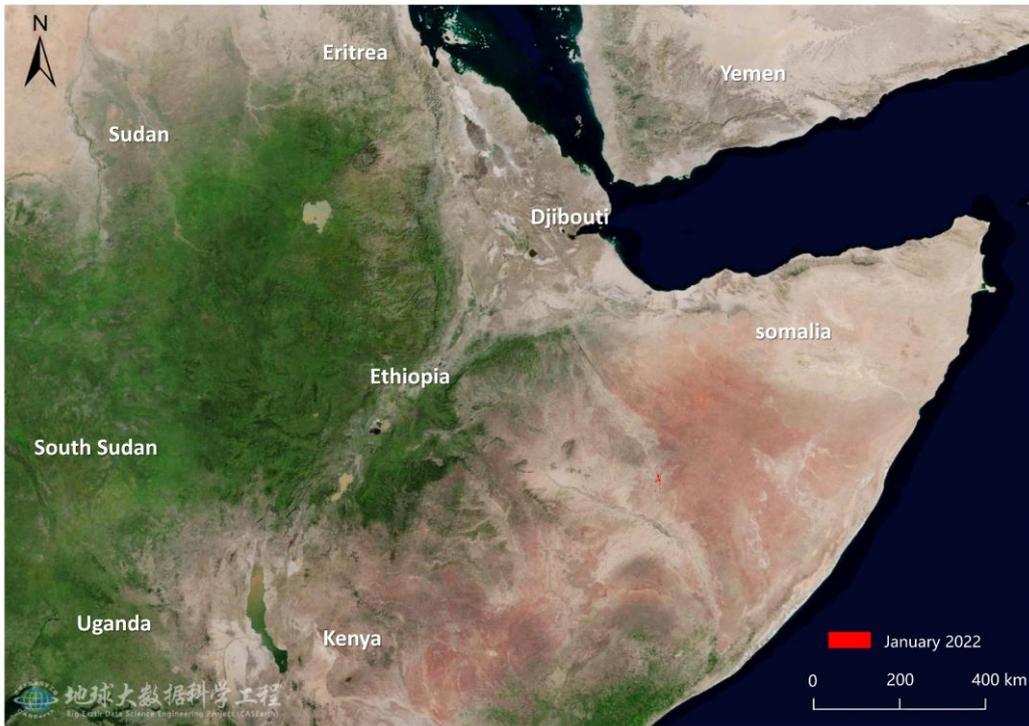


Figure 1 Monitoring of Desert Locust damage in Ethiopia (January 2022)

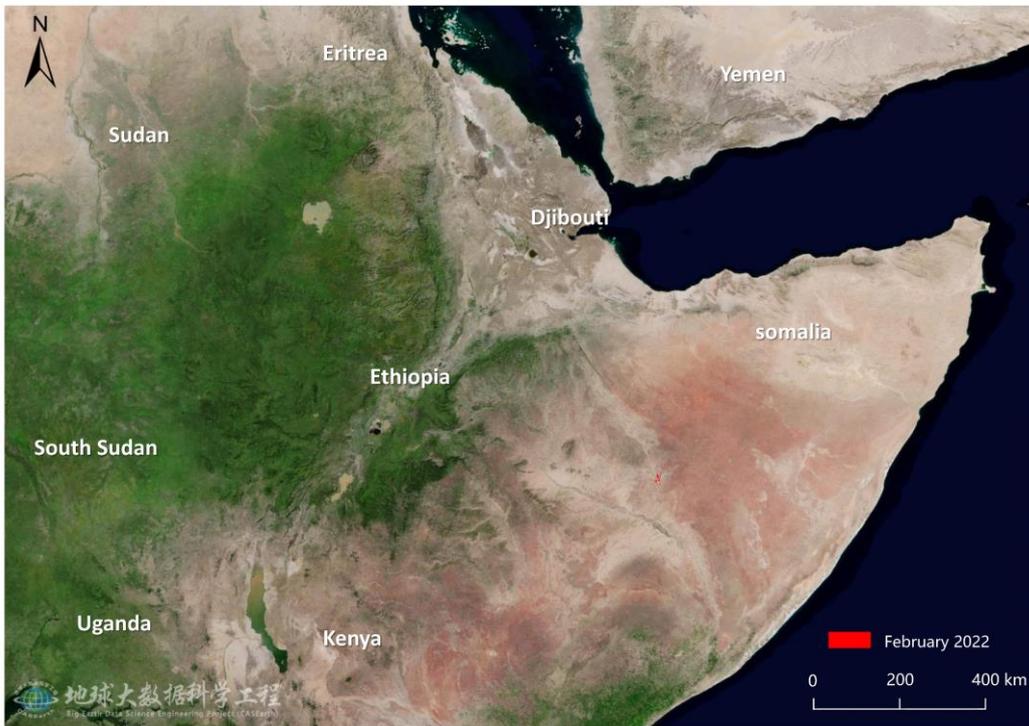


Figure 2 Monitoring of Desert Locust damage in Ethiopia (February 2022)

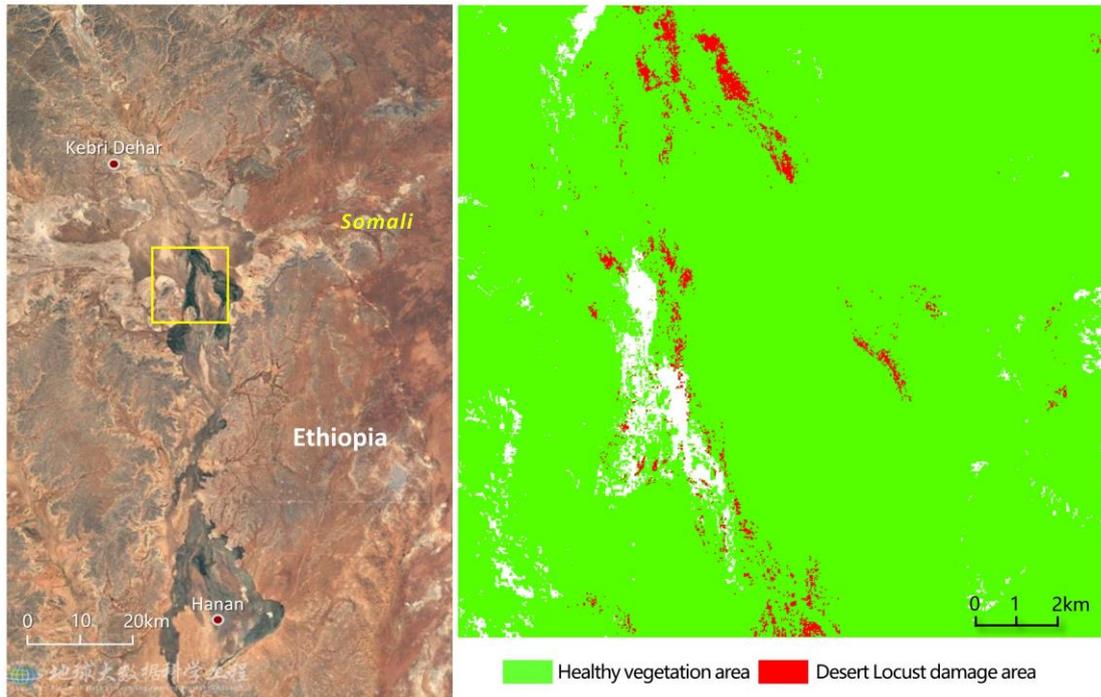


Figure 3 Monitoring of Desert Locust damage in the key damage area of Ethiopia based on Sentinel-2 images (February 2022)

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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