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

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Desert Locust Monitoring and Loss Assessment in Eritrea, Ethiopia, and Somalia (August, 2023)

Integrated with multi-source Earth Observation data, e.g. meteorological data, field data, and remote sensing data (such as MODIS in the US, etc), 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 updates of desert locust monitoring and loss assessment in Eritrea, Ethiopia, and Somalia. The remote sensing monitoring results showed that, in August 2023, the desert locusts were mainly distributed in central Eritrea, northern and northeastern Ethiopia, and northwestern Somalia. The total damaged vegetation areas in Eritrea, Ethiopia, and Somalia were 5.6, 14.8, and 9.5 thousand hectares, respectively. It is expected that in the next two months, Eritrea will continually experience below-normal precipitation levels, which are unfavorable for the survival of desert locusts, resulting in a lower population of locusts in the central region. Meanwhile, in northwestern Somalia, drought conditions will persist, while in the Afar region of northeastern Ethiopia, rainfall is expected to gradually increase, creating suitable conditions for the survival and reproduction of desert locusts. Therefore, some locust swarms within Somalia will migrate northwest to the Afar region, resulting in a decrease in the number of desert locusts within Somalia. Both native and migratory locusts in the Afar region will mature and reproduce, leading to further increases in the number of locusts within Ethiopia. This period is the main growing season for crops in Eritrea, as well as the main growing and harvesting seasons for crops in Ethiopia. It is also the main growing and planting seasons for crops in Somalia. It is still necessary to

pay continuous attention to the dynamics of the desert locust disaster to prevent losses to agricultural and pasture production. The specific research results are as follows.

■ 1. Desert Locust Monitoring and Loss Assessment in Eritrea

In August 2023, due to control operations, there was a decrease in the number of desert locusts within Eritrea. The monitoring results showed that in August, the total damaged vegetation area was 5.6 thousand hectares in Eritrea, including 1.0 thousand hectares of cropland, 2.4 thousand hectares of grassland, and 2.2 thousand hectares of shrub (Figure 1), accounting for 0.23%, 0.05%, and 0.17% of the total area of the cropland, grassland, and shrub, respectively. Semien keih Bahri had the largest area of vegetation affected, with 2.7 thousand hectares. Followed by Debub, with 2.5 thousand hectares of vegetation affected. The affected areas of vegetation in Maekel and Anseba provinces were 0.3 and 0.1 thousand hectares, respectively.

Fig.1 Monitoring of Desert Locust damage in Eritrea (August 2023)

■ 2. Desert Locust Monitoring and Loss Assessment in Ethiopia

In August 2023, Ethiopia experienced increased rainfall due to tropical cyclone, providing favorable conditions for locust egg-laying and reproduction. Additionally, desert locusts from Eritrea migrated to northern Ethiopia and continued to move southeastward into the Somali region, resulting in a slight increase in the number of locusts in that area. The remote sensing monitoring results showed that in August, desert locusts were mainly distributed in the highlands of northeastern Tigray and the lowlands of the East African Rift Valley. The total damaged vegetation area was 14.8 thousand hectares in Ethiopia, including 3.5 thousand hectares of cropland, 4.2 thousand hectares of grassland, and 7.1 thousand hectares of shrub (Figure 2), accounting for 0.02%, 0.06‰, and 0.04% of the total area of the cropland,

grassland, and shrub, respectively. Afar had the largest area of vegetation affected, with 6.5 thousand hectares. Followed by Tigray, with 4.9 thousand hectares of vegetation affected. The affected areas of vegetation in Amhara, Somali, and Oromiya provinces were 1.9, 1.4, and 0.1 thousand hectares, respectively.

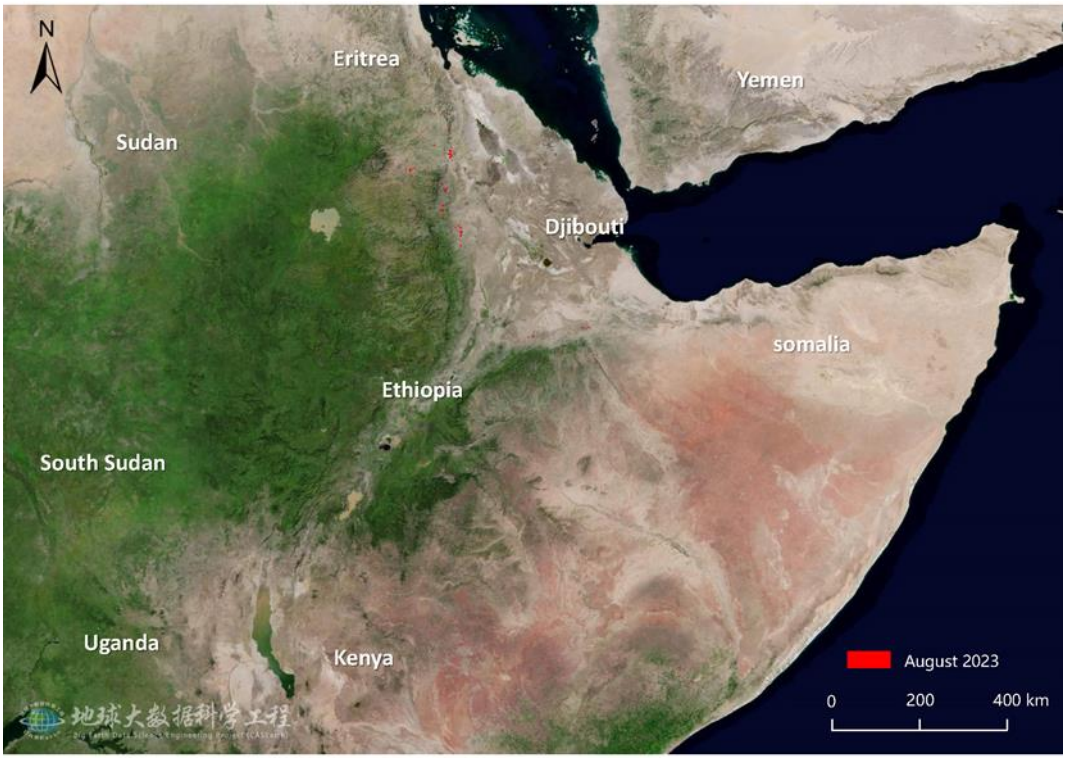

Fig.2 Monitoring of Desert Locust damage in Ethiopia (August 2023)

■ 3. Desert Locust Monitoring and Loss Assessment in Somalia

In mid-August 2023, northwestern Somalia was affected by a tropical cyclone, leading to increased rainfall, which was conducive to the native locust egg-laying and reproduction. Simultaneously, influenced by the migration of swarms from Eritrea, the number of locusts in northwestern Somalia increased. The remote sensing monitoring results showed that desert locusts were mainly distributed in North-West and Awdal Provinces. In August, the total damaged vegetation area was 9.5 thousand hectares in Somalia, including 0.7 thousand hectares of grassland, and 8.8 thousand hectares of shrub (Figure 3), accounting for 0.03‰ and 0.04% of the total area of the grassland and shrub, respectively. North-West had the largest area of vegetation affected, with 8.0 thousand hectares. Followed by Awdal, with 1.5 thousand hectares of vegetation affected.

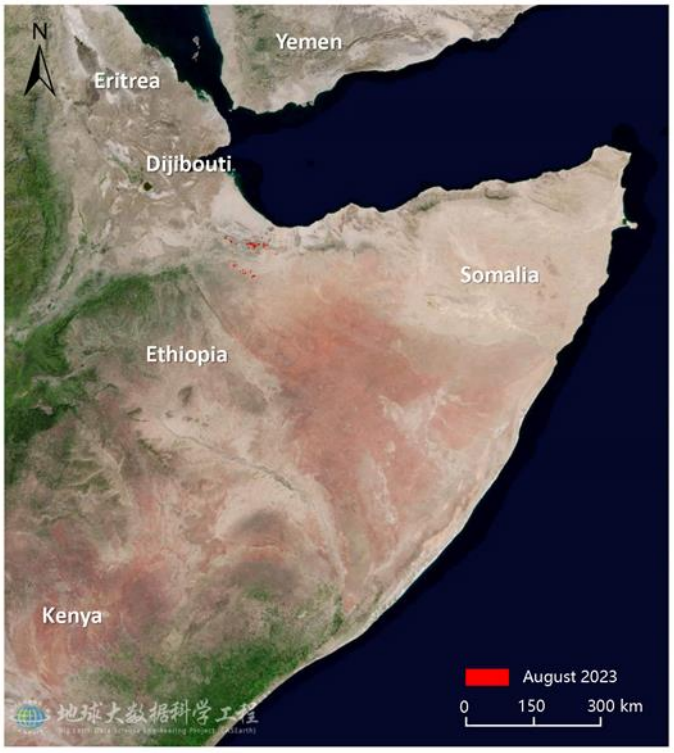

Fig. 3 Monitoring of Desert Locust damage in Somalia (August 2023)

The comprehensive analysis shows that, in the next two months, Eritrea and Somalia are expected to less precipitation than usual for the same period, and the dry meteorological conditions are unfavorable for the survival of desert locusts. In contrast, Afar region in Ethiopia will be influenced by tropical cyclones, resulting in abundant rainfall that stimulates vegetation growth, which provides favorable conditions for locust egg-laying and reproduction. As a result, the number of locusts is expected to further increase in Ethiopia. It is still necessary to continue to pay attention to the dynamics of the desert locust disaster in Eritrea, Ethiopia, and Somalia to prevent repeated losses to agricultural and pasture production.

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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