



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

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Desert Locust Monitoring and Loss Assessment in Yemen, Saudi Arabi, and Indo-Pakistan Border (July, 2023)

Integrated with multi-source Earth Observation data, e.g. meteorological data, field data, and remote sensing data (such as MODIS in the US, and Sentinel series in EU, 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 dynamics of desert locust monitoring and loss assessment in Yemen, Saudi Arabia, and Indo-Pakistan border. The remote sensing monitoring results showed that, in July 2023, the desert locusts were mainly distributed in western and inland regions of Yemen, the western coastal areas and inland regions of Saudi Arabia, as well as the Indo-Pakistan border. The total damaged vegetation areas in Yemen, Saudi Arabia, and Indo-Pakistan border were 30.2, 9.4, and 12.7 thousand hectares, respectively. It is expected that in the next two months, Saudi Arabia will experience high temperatures and dry conditions that are unfavorable for the survival of desert locusts. Meanwhile, in Yemen, there will be precipitation and abundant vegetation. Therefore, the swarms within Saudi Arabia are expected to migrate southwards, flying to the western and southern coastal regions of Yemen to lay eggs and reproduce. This will result in an increase in the number of locusts within Yemen. Due to the tropical cyclones, vegetation along Indo-Pakistan will increase, providing favorable conditions for the survival of locusts, leading to an increase in the number of locusts. This period is the important growing and harvest season for crops in Yemen, as well as the important planting and growing season for crops in Saudi Arabia. It is also the main growing and harvesting season for crops in India and Pakistan. 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 Yemen

In July 2023, due to the influence of rainfall and the invasion of desert locusts from Saudi Arabia, there had been an increase in the number of desert locusts within Yemen. The monitoring results showed that in July, the total damaged vegetation area was 30.2 thousand hectares in Yemen, including 2.8 thousand hectares of cropland, 6.8 thousand hectares of grassland, and 20.6 thousand hectares of shrub (Figure 1), accounting for 0.3%, 2.3%, and 0.5% of the total area of the cropland, grassland, and shrub, respectively. Compared with June 2023, the newly damaged vegetation area was 29.7 thousand hectares, including 2.8 thousand hectares of cropland, 6.5 thousand hectares of grassland, and 20.4 thousand hectares of shrub. Al Mahrah province had the largest area of vegetation affected, with 13.7 thousand hectares. Followed by San'a' province, with 8.9 thousand hectares of vegetation affected. The affected areas of vegetation in Sa'dah, Al Jawf, and Shabwah provinces were 5.7, 1.6, and 0.3 thousand hectares, respectively.

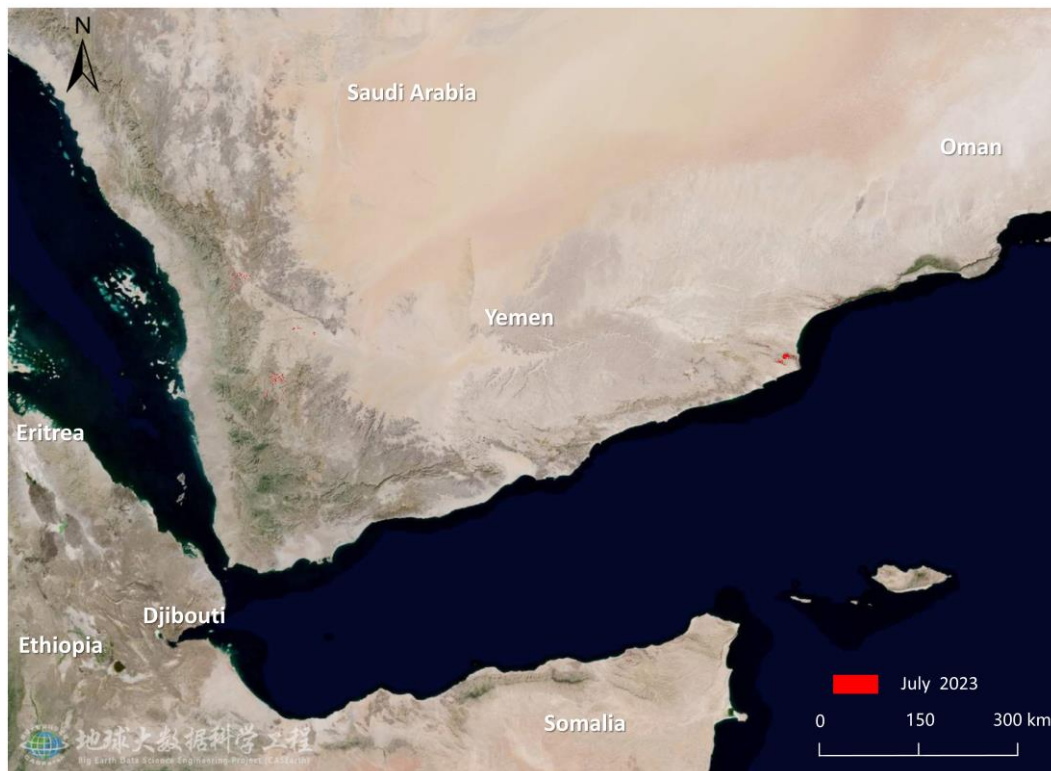


Fig. 1 Monitoring of Desert Locust damage in Yemen (July 2023)

■ 2. Desert Locust Monitoring and Loss Assessment in Saudi Arabia

In July 2023, due to control operations, the number of desert locusts within Saudi Arabia decreased. The remote sensing monitoring results showed that in July, the total damaged vegetation area in Saudi Arabia was 9.4 thousand hectares, including 2.4 thousand hectares of cropland, 2.6 thousand hectares of grassland, and 4.4 thousand hectares of shrub (Figure 2), accounting for 0.1%, 0.7%, and 0.2% of the total area of the cropland, grassland, and

shrub in Saudi Arabia, respectively. Compared with June 2023, the newly damaged vegetation area was 7.4 thousand hectares, including 2.4 thousand hectares of cropland, 2.2 thousand hectares of grassland, and 2.8 thousand hectares of shrub. Makkah province had the largest area of vegetation affected, with 3.7 thousand hectares. Followed by Ar Riyāḍ province, with 3.0 thousand hectares of vegetation affected. The affected areas of vegetation in Al Madīnah, Asīr, and Al Bāhah provinces were 1.3, 1.1, and 0.3 thousand hectares, respectively.

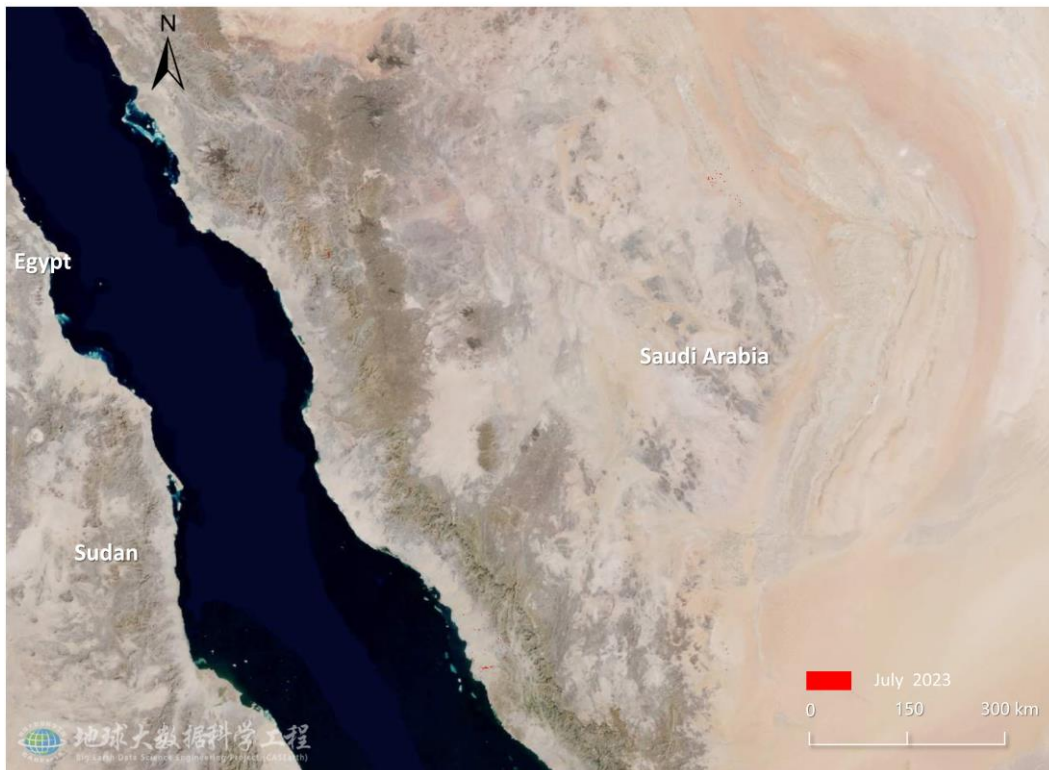


Fig.2 Monitoring of Desert Locust damage in Saudi Arabia (July 2023)

■ 3. Desert Locust Monitoring and Loss Assessment in Indo-Pakistan border

In July 2023, influenced by tropical cyclones, there was rainfall along the Indo-Pakistan border, providing favorable conditions for the survival of desert locusts, leading to an increase in the number of locusts along the Indo-Pakistan border. The remote sensing monitoring results showed that the desert locusts were mainly distributed in localized areas of northwestern Rājasthān in India, as well as in northern Sindh and southern Punjab in Pakistan. The total damaged vegetation area was 12.7 thousand hectares in the Indo-Pakistan border, including 3.7 thousand hectares of cropland, 8.8 thousand hectares of grassland, and 0.2 thousand hectares of shrub (Figure 3). Sindh province in Pakistan had the largest area of vegetation affected, with 6.0 thousand hectares. Followed by Rājasthān province in India, with 5.0 thousand hectares of vegetation affected. The affected area of vegetation in Punjab province, Pakistan, was 1.7 thousand hectares.

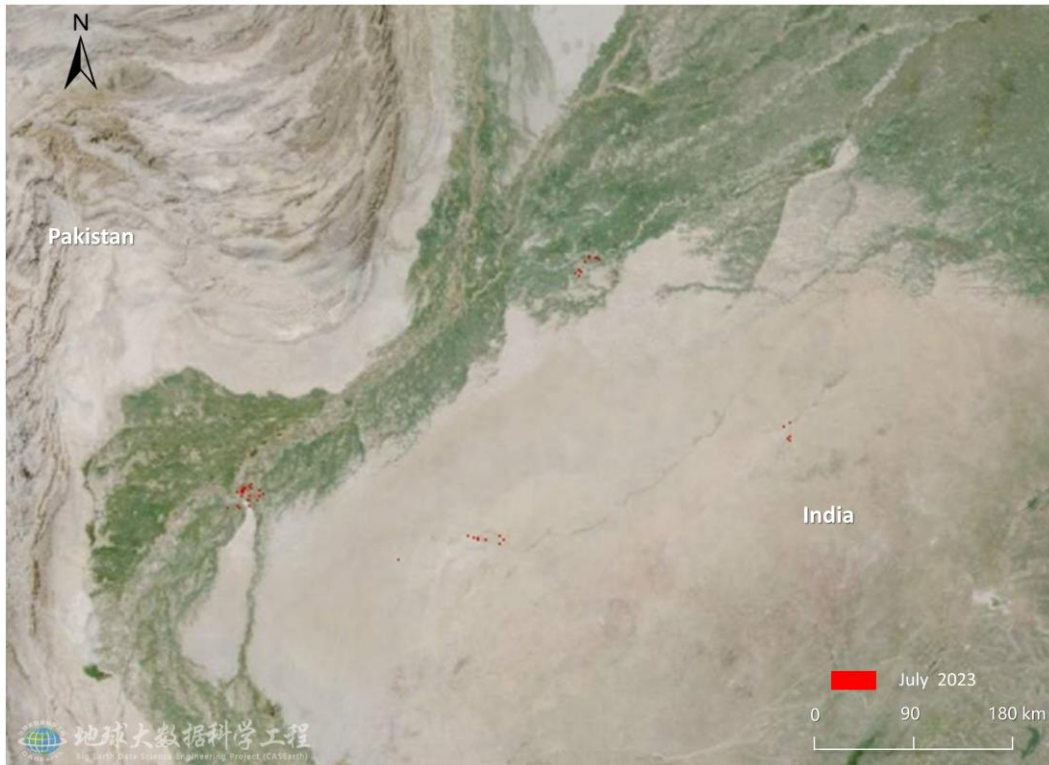


Fig. 3 Monitoring of Desert Locust damage in Indo-Pakistan border (July 2023)

The comprehensive analysis shows that, in the next two months, Saudi Arabia will experience dry and less rainy conditions, which are unfavorable for the survival of desert locusts. Therefore, the locusts are expected to migrate southwards to Yemen, where conditions are suitable for egg-laying and reproduction. This will lead to a further reduction in the number of locusts within Saudi Arabia and an increase in the number of locusts within Yemen. Due to the impact of tropical cyclones, vegetation on the Indo-Pakistan border will increase. This will provide favorable conditions for locust egg-laying and reproduction, leading to a further increase in the number of locusts. It is still necessary to continue to pay attention to the dynamics of the desert locust disaster in Yemen, Saudi Arabia, India, and Pakistan 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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