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

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Desert Locust Monitoring and Loss Assessment in Yemen (October, 2022)

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), 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. The remote sensing monitoring results showed that, in October 2022, the desert locusts were mainly distributed in western Yemen. The total damaged vegetation area was 78.2 thousand hectares. Compared with September 2022, the newly damaged vegetation area was 59.5 thousand hectares. Affected by a small amount of precipitation, the environment of winter breeding areas along the Red Sea coast of Yemen is favorable for the survival and reproduction of the desert locust. It is expected that, from November to December, the number of desert locusts in this region will increase slightly. This period is an important harvest season for crops in Yemen. It is still necessary to continue to pay attention to the dynamics of the desert locust disaster in Yemen to prevent repeated losses to its agricultural and pasture production. The specific research results are as follows.

In October 2022, the desert locusts were mainly distributed on the west coast of the Red Sea and southern Hadramawt. The total damaged vegetation area was 78.2 thousand hectares, including 15.8 thousand hectares of cropland, 9.3 thousand hectares of grassland, and 53.1 thousand hectares of shrub (Figure 1), accounting for 2.08%, 3.24%, and 1.33% of the total area of cropland, grassland and shrub in Yemen, respectively. Among them, Al-

Hudaydah province had the largest damage area of 37.1 thousand hectares. Second, the affected areas of Amrān and Hajjah were 12.4 thousand hectares and 11.3 thousand hectares, respectively. Next, the affected areas of Al-Mahwīt and Hadramawt were 6.9 and 6.7 thousand hectares, respectively. The total affected area of Ta'izz, Ibb, Dhamār, Raimah and San'ā was 3.8 thousand hectares.

This study also used Sentinel-2 satellite remote sensing data to monitor the desert locust damage in the severely affected areas in Western Yemen (Figure 2). The study area is in southern Al Hudaydah, 26.5 kilometers from Bayt al-Faqīh in the north and 11.3 kilometers from Hays District in the south. The vegetation types include cropland, grassland, and shrub, with a total area of 55.66 thousand hectares. The monitoring results showed that the damaged area of vegetation in the study area was 4.51 thousand hectares, accounting for 8.1 % of the total study area. Among them, the damaged area of cropland was 1.60 thousand hectares, grassland was 1.25 thousand hectares, and shrub was 1.66 thousand hectares, accounting for 9.0%, 14.3%, and 5.7% of the total area of cropland, grassland and shrub in the study area, respectively.

The comprehensive analysis shows that rainfall in the Red Sea coast of Yemen provides favorable conditions for the survival and reproduction of desert locusts. From November to December 2022, the number of locusts in this region will further increase with their oviposition and reproduction. This period is an important harvest season for crops in Yemen, and continuous monitoring of locust dynamics is needed to ensure agricultural production and food security in Yemen.

Fig. 1 Monitoring of Desert Locust damage in Yemen (October 2022)

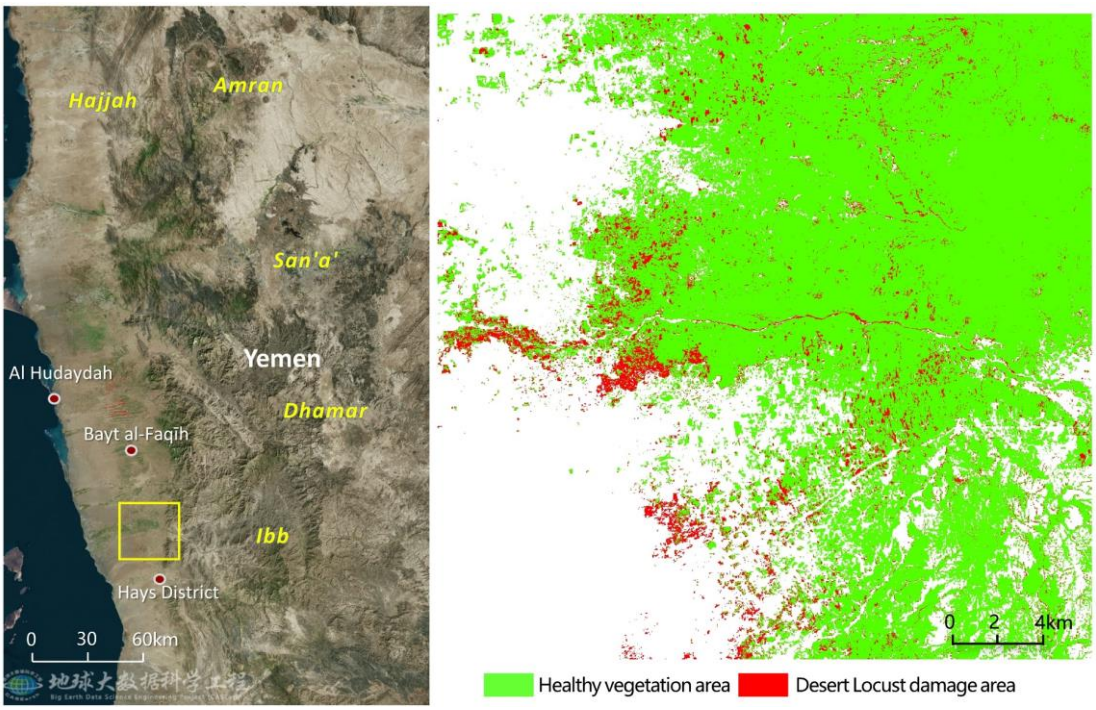

Fig. 2 Monitoring of Desert Locust damage in the key damage area of Yemen based on Sentinel-2 images (October 2022)

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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