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

Early May 2020

Desert Locust monitoring and loss assessment in Pakistan and Somalia

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 damage monitoring of the Desert Locust in Pakistan and Somalia. The result showed that by the end of April 2020, Desert Locust in Pakistan harmed about 431.9 thousand hectares of vegetation area (including 233.0 thousand hectares cropland and 198.9 thousand hectares grassland), mainly distributed in North-central Punjab, northern Baluchistan, southern Khyber-Pakhtunkhwa, central Federally Administered Tribal Areas and Western Sind in Pakistan. Desert Locust in Somalia harmed about 392.1 thousand hectares of vegetation

Content

area in April (including 1.4 thousand hectares cropland, 136.4 thousand hectares grassland and 254.3 thousand hectares shrub), mainly distributed in Jubbada Hoose, Gedo, Bakool and Bay states in southern Somalia, Awdal, Woqooyi Galbeed and Gogdheer states in the northwest and Mudug state in the Middle. At present, locusts in Somalia and Pakistan are constantly breeding and spreading. The period from May to July coincides with the important growing season or harvesting season of wheat, corn and other crops in the two countries. If not properly controlled, locusts will bring major threats to agricultural and pasture production and national economy and people's livelihood. 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, as well as regional stability.

Monitoring and assessment of Desert Locust in Pakistan

In early April 2020, the Desert Locusts in Pakistan, mostly immature swarms, were mainly located in the southwest of Baluchistan province. In the early-mid April, the locust hoppers appeared at the border of Sind and Punjab, the central and northern Punjab and the southern Khyber-Pakhtunkhwa. The locusts developed into mature swarms in the southwest Baluchistan. In late April, Desert Locusts continued multiplying, with mature locusts appearing in Punjab, Federally Administered Tribal Areas and central and southern Sind. Locusts began spreading across the Indo-Pakistan border into India. Our results showed that by the end of April 2020, the Desert Locusts had affected 431.9 thousand hectares of vegetation area in Pakistan, including 233.0 thousand hectares cropland and 198.9 thousand hectares grassland. Damaged areas are mainly located in the northern and central Punjab (damaged area is about 252.9 thousand hectares), the northern Baluchistan (damaged area is about 77.6 thousand hectares), the northern Federally Administered Tribal Areas (damaged area is about 52.8 thousand hectares) and the southern Khyber-Pakhtunkhwa (damaged area is about 40.0 thousand hectares). In addition, Sind was also damaged by a small area of locusts, about 8.6 thousand hectares (Fig. 1).

The comprehensive analysis showed that, in May 2020, locusts in Pakistan will continue to breeding, and locusts in spring breeding areas in southwestern Baluchistan, central Punjab, southern Iran and northern Oman will move to summer breeding areas in Indo-Pakistan border and gradually spread into western India. Swarms of summer breeding areas in Somalia in the horn of Africa are expected to migrate towards the Indo-Pakistan border across the Arabian Sea during June and July. At present, a large number of locusts in Pakistan have matured and begun lying eggs. May to July is the growing season or harvesting season of wheat, corn and rice in Pakistan. If the locusts couldn't not be controlled effectively, the locust plague will continue, which may bring a heavy blow to the agricultural and pasture production in Pakistan.
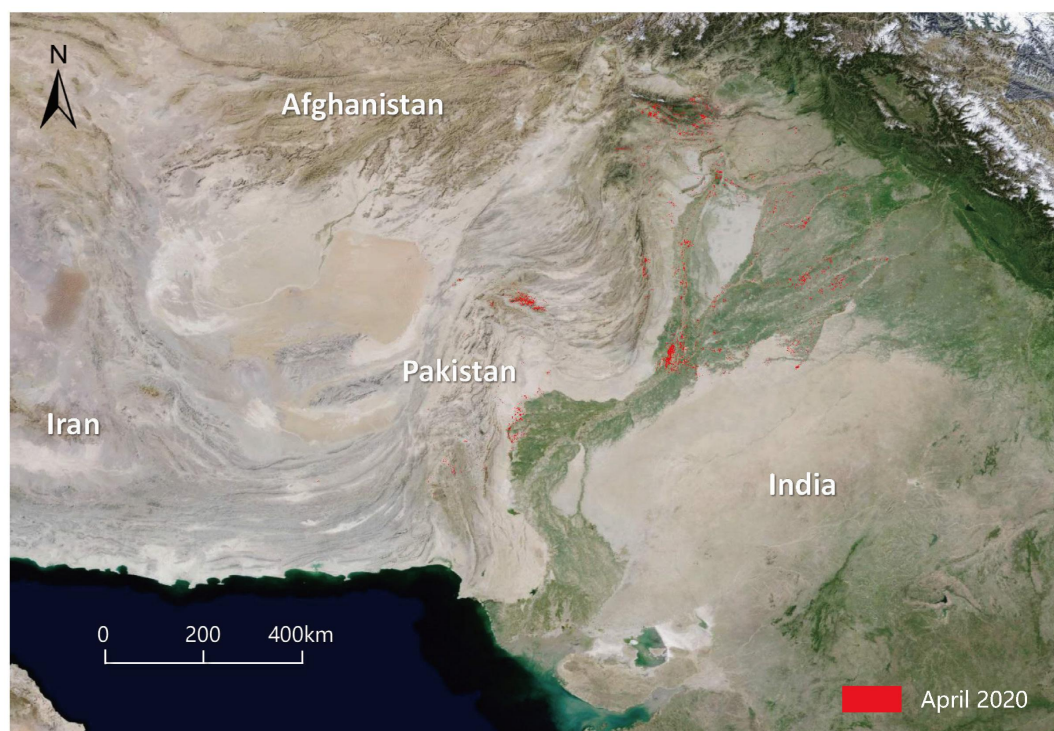
Figure1 *Monitoring of Desert Locust damage in Pakistan (April 2020)*

Monitoring and assessment of Desert Locust in Somalia

In late March 2020, abundant rainfall provided suitable conditions for locusts breeding in Somalia. In early April, the number of locusts in Somalia continued breeding and forming swarms. Locusts mainly located in Awdal, Woqooyi Galbeed in the northwest, Nugaal, Galguduud, Musug in the middle and Bay in the south of Somalia. In early-mid April, the locusts in Somalia continued laying eggs and hatching. The number of locusts and damage area kept increasing. At the end of April, swarms of locusts started appearing in Sanaag with a tendency of spreading to Bari. Our results showed that by the end of April 2020, the locusts had affected 392.1 thousand hectares of vegetation area in Somalia, including 1.4 thousand hectares cropland, 136.4 thousand hectares grassland and 254.3 thousand hectares shrub. Damaged areas are mainly located in the western Jubbada Hoose (damaged area is about 140.1 thousand hectares), the northern Bay (damaged area is about 80.4 thousand hectares), the western and southern Bakool (damaged area is about 66.0 thousand hectares), the northern Gedo (damaged area is about 39.0 thousand hectares), the southern Woqooyi Galbeed (damaged area is about 29.2 thousand hectares), the western Mudug (damaged area is about 12.9 thousand hectares), the western and southern Togdheer (damaged area is about 9.8 thousand hectares), the southern Awdal (damaged area is about 4.7 thousand hectares), the central Hiiraan (damaged area is about 3.3 thousand hectares), the central and western Sool (damaged area is about 2.6 thousand hectares), the western Galguduud (damaged area is about 2.1 thousand hectares) and the southern Nugaal (damaged area is about 1.2 thousand hectares). In addition, the

southern Sanaag and western Jubbada Dhexe were also damaged by a small area of locusts, about 0.8 thousand hectares (Fig. 2).

In this study, Planet data with a spatial resolution of 3 m in February 2019 and February 2020 were also used to monitor the Desert Locusts damage in the heavily affected vegetation areas in the northern Somalia. The study area is located in the northern Bay, about 17 km to the northwest of Goof Gaduud, and about 16 km to the southeast of Baidoa. The vegetation types are mainly shrub and grassland with a little area of cropland, and the total area is 17.2 thousand hectares. The monitoring results showed that the affected area of vegetation in the study area was 2.2 thousand hectares, accounting for 12.5% of the total area of the study area. Among them, the shrubs affected the most area at 1.3 thousand hectares, and the grassland damaged area was 0.9 thousand hectares, accounting for 9.8% and 20.8% of the total area of shrubs and

grasslands in the study area, respectively. The results show that desert locusts can cause great loss to vegetation, and its outbreaks will seriously affect the agricultural and pastoral production and food security in Somalia (Fig. 3).

The comprehensive analysis showed that, in May 2020, locusts in Somalia will continue to hatch. Locusts from eastern and southern Ethiopia and southern Yemen are expected to migrate to northern and central Somalia from May to June. As the locusts continue to mature and spawn, new swarms are expected to form in Somalia from late June to July and migrate to the Indo-Pakistan border along with the southwest monsoon. May to July is the key growing season and harvesting season of corn and other crops in Somalia. The situation of desert locust control and prevention is still severe, which requires continuous monitoring and multinational joint prevention and control to ensure local agricultural and animal husbandry production and food security.
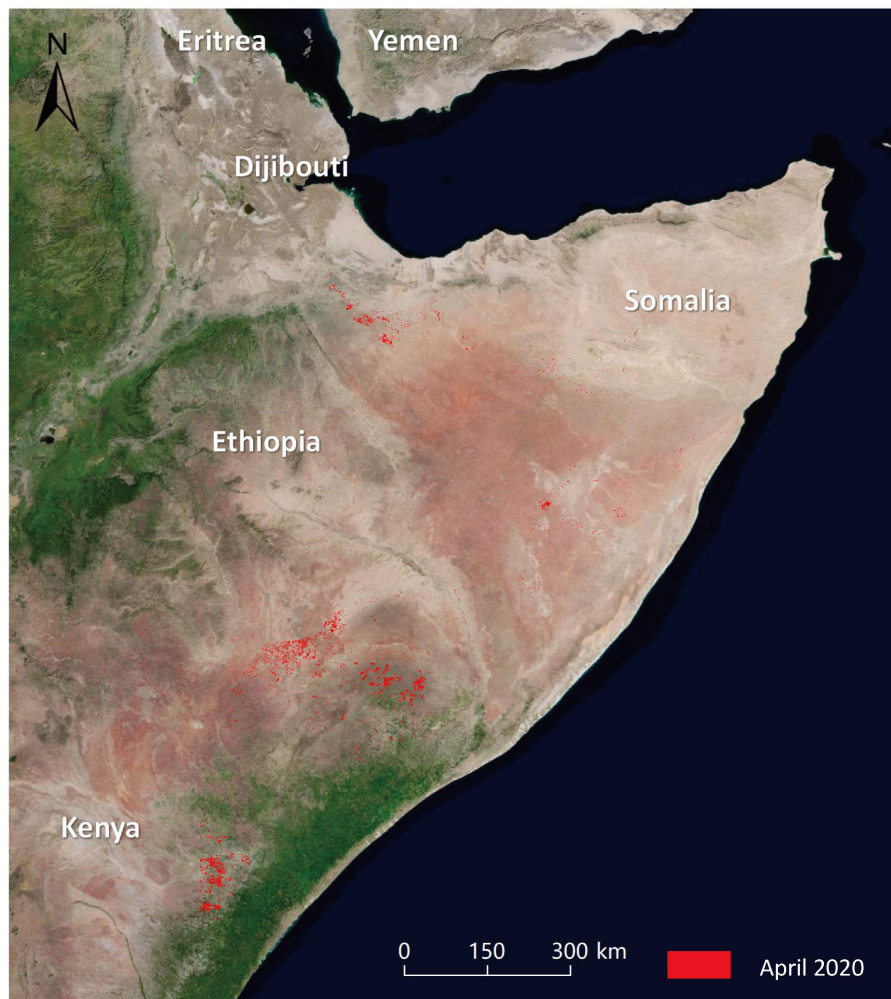
Figure 2 Monitoring of Desert Locust damage in Somalia (April 2020)

Note: The remote sensing images are false-color composite images of Planet.

Healthy vegetation area

Desert Locust damage area
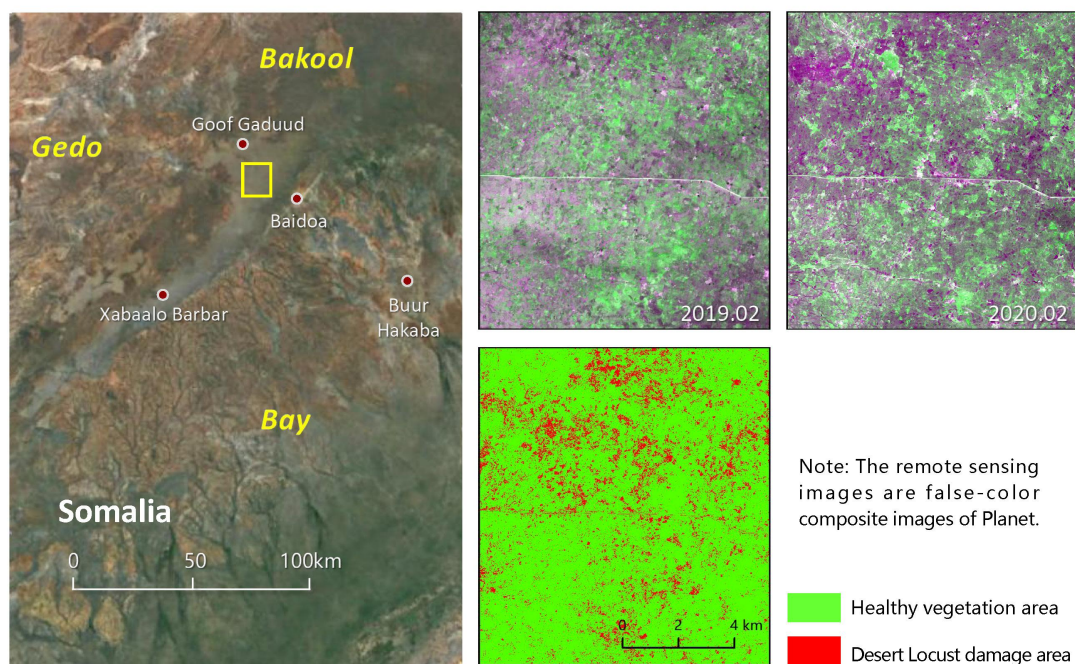
Figure 3 Monitoring of Desert locust damage in key areas of Somalia based on Planet images

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