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

Late March 2020

Assessment of Desert Locust migration and loss in Kenya and Ethiopia

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.

Researchers continued to conduct research on remote sensing dynamic monitoring of Desert Locust in Asian and African countries. This report focuses on the locust plagues in Kenya and Ethiopia. The results showed that, by early to mid-March 2020, 21 counties in Kenya had been harmed since desert locusts invaded northeastern Kenya on December 28, 2019. The vegetation damaged area has reached 2745.3 thousand hectares, including 934.1 thousand hectares of cropland, 985.2 thousand hectares of grassland, and 826 thousand hectares of shrub.

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From February to mid-March 2020, the Desert Locusts in Ethiopia have harmed 2062.3 thousand hectares of local pasture and cropland, including 1094.3 thousand hectares cropland, 291.3 thousand hectares grassland and 676.7 thousand hectares shrub. Desert locust endangered areas are mainly in Oromiya and Southern Nations Nationalities and People Region (SNNPR) in central Ethiopia. At present, Ethiopia and Kenya have entered the spring breeding season. Multi-generational breeding of locust will lead to a surge in populations over the next three months, which coincides with the planting season or growing season of crops, such as corn. If not properly controlled, Desert Locusts will pose a major threat to the food security of Ethiopia and Kenya. It is necessary

to carry out the monitoring and early warning of Desert Locust plague continuously and dynamically, and organize joint prevention and control in multiple countries, to ensure the safe of agricultural and pasture production and regional stability.

Monitoring and assessment of Desert Locust in Kenya

From October to November 2019, east African countries have experienced exceptionally heavy rains attributed to the Indian ocean dipole – a climate phenomenon in which the western part of Indian ocean near the east African coast was warmer than the eastern part. Suitable temperature and sufficient rainfall continued to increase green vegetation, which provided ideal conditions for desert locust breeding. On December 28, locust swarms in Ogaden in eastern Ethiopia and central Somalia invaded Mandera in northeastern Kenya.

In January 2020, locust swarms in Ethiopia and Somalia were constantly migrating to the northeast of Kenya. The swarms in Mandela spread south to Wajir and Garissa, west along the Ethiopian border (Moyale and Marsabit) and southwest into central areas north of Mt Kenya (Isiolo, Samburu, Meru and most recently Laikipia). And locust swarms moved north of Mt. Kenya westwards to the southern Rift Valley near Kapedo on the border of Baringo and Turkana. As of the 28th, desert locusts had spread to 13 counties in northern, central, and southwestern Kenya. Pastures and cropland had been severely damaged, with an area of approximately 934.1 thousand hectares (220.4 thousand hectares of cropland, 279.9 thousand hectares of grassland, and 433.8

thousand hectares of shrub). In February, the locust swarms in northern and central Kenya continued to mature and lay eggs, and the number of locusts continued to increase. The swarms kept moving south to Kajiado and west to West Pocket in the Rift Valley Province, and reached the Tanzania border and the Uganda border on the 7th and 9th, respectively, and reached Kericho in southwestern Kenya on the 17th. Meantime, the swarms appeared in the coast of Lake Turkana of northern Kenya. By the end of February, 21 counties in Kenya had been affected by locust plagues, with an additional area of approximately 985.2 thousand hectares (233.3 thousand hectares of cropland, 287 thousand hectares of grassland, and 464.9 thousand hectares of shrub). Aerial and ground locust control operations are ongoing, and FAO estimated that Kenya has treated at least 15 thousand hectares in February. In early to mid-March, locust continued to breed, the number of locusts has been increasing, and the first generation of mature locust populations was forming. The swarms in Marsabit, Turkana, Mandela, Wajir, Isiolo, and Sambu are further concentrated, with an increasing of damaged area about 826 thousand hectares (199.9 thousand hectares of cropland, 252.3 thousand hectares of grassland, and 373.8 thousand hectares of shrub) this month (Figures 1 and 2).

Our results showed that from the end of December 2019 to the early-mid March, Desert Locust has caused the damage of 2745.3 thousand hectares in Kenya with 934.1 thousand hectares of cropland, 985.2 thousand hectares of grassland, and 826 thousand hectares of shrub, accounting for 12.4%, 4.2% and 3.6% of the total cropland, grassland and

shrub in Kenya. Among them, Rift Valley Province has the largest damage area of 1325.2 thousand hectares, mainly distributed in Turkana, West Pockets, Samburu, Laikipia, Baringo, Kericho and Kakuma. Then is the Eastern Province, with an area of 1163.2 thousand hectares, mainly distributed in Marsabit, Isiolo, Meru, Embu and Kitui. The central province suffered an area of 141.5 thousand hectares, mainly distributed in Nyeri and Kirini. The affected area of Baringo Province is 71.5 thousand hectares, mainly distributed in Tana River County. The affected area of North Rift Province is 14.7 thousand hectares, distributed in Mandera, Wajir and Garissa. The affected area of Nairobi Special Zone is 14.3 thousand hectares. The affected area of Nyanza Province is 12.6 thousand hectares, mainly distributed in Kisumu. Part of the western province is also affected, with an area of 2.3 thousand hectares. Since 70% of Kenya's population are agricultural and pastoral, this locust plague has caused a huge impact on local agriculture and animal husbandry production. It is the worst locust infestation in Kenya in 70 years, which seriously threatens national livelihood and regional stability.

Comprehensive analysis showed that, from March to April 2020, desert locusts in northern and central Kenya will continue to breed in spring. It is expected that the swarms will continue to invade northeastern Uganda westward or migrate northwestward to South Sudan. The swarms have a lower risk of invading Tanzania from Kenya due to the south wind. From April to June, Desert locusts are expected to migrate to summer breeding areas in central Sudan and northern Ethiopia. At present, a large number of locusts in Kenya

have laid eggs on the ground and kept hatching. A new round of spring breeding has begun. If the locust couldn't be controlled effectively, the plague will continue, which may hit Kenya's agricultural and livestock production hard.

Monitoring and assessment of Desert Locust in Ethiopia

In February 2020, locusts in Harar (East Harerge) and Somali (Jijiga, Warder, Kebedehar, Gode) and southern Oromiya were migrating to the central Rift Valley from south and north, coupled with the continuous breeding and hatching of local locusts, the damage continued to increase. In early to mid-March, with the new generation of locusts in spring, the locust population in the Rift Valley continued to increase, and the area of damage was further expanded. An area of 928.5 thousand hectares were increased (537.4 thousand hectares of cropland, 47.7 thousand hectares grassland, and 343.4 thousand hectares of shrub), mainly distributed in the south region of Amhara and Afar, and rift valleys of Oromiya and SNNPR (Figure 3).

The results showed that from February to early-mid March 2020, the desert locusts in Ethiopia endangered the area of vegetation in the country by a total of 2062.3 thousand hectares, of which 1094.3 thousand hectares of cropland, 291.3 thousand hectares of grassland, and 676.7 thousand hectares of shrub, respectively, accounted for 5.4%, 2.0% and 1.1% of Ethiopia's cropland, grassland and shrub. Among them, Oromiya has the largest area of damage, with a total of 1506.3 thousand hectares, including 728.4 thousand hectares of cropland, 212.7 thousand hectares

of grassland, and 565.2 thousand hectares of shrub. The southern ethnic states are the second most affected, with a total of 499.6 thousand hectares, including 360.3 thousand hectares of cropland, 67.8 thousand hectares of grassland, and 71.5 thousand hectares of shrub. 44.6 thousand hectares of land was affected in Afar, of which 1.5 thousand hectares of cropland, 9.1 thousand hectares of grassland, and 34 thousand hectares of shrub. Amhara's damaged area is 11.8 thousand hectares, of which 4.1 thousand hectares of cropland, 1.7 thousand hectares of grassland, and 6 thousand hectares of scrub. In Ethiopia, 80% population are the agricultural and pastoral population. The locust plague has caused a huge impact on the local agricultural and pastoral production, which seriously threatened the local agricultural and pastoral

safety and national livelihood. The domestic disaster situation is severe.

Comprehensive analysis showed that the locusts located in central Ethiopia will continue its spring breeding from March to April in 2020. At the same time, the swarms in northern Somalia will cross the border and reach Somali in eastern Ethiopia. It is expected that the swarm will migrate to the summer breeding areas of Amhara, Afar and Djibouti between April and June, while the swarms in Somali are expected to migrate with the Indian Ocean southwest monsoon to the Indo-Pakistan border in June. At present, locusts in Ethiopia have begun a new round of spring breeding. The situation of desert locust control is still severe. Continuous monitoring and multi-country joint prevention and control are needed to ensure local agricultural and animal husbandry production and food security.

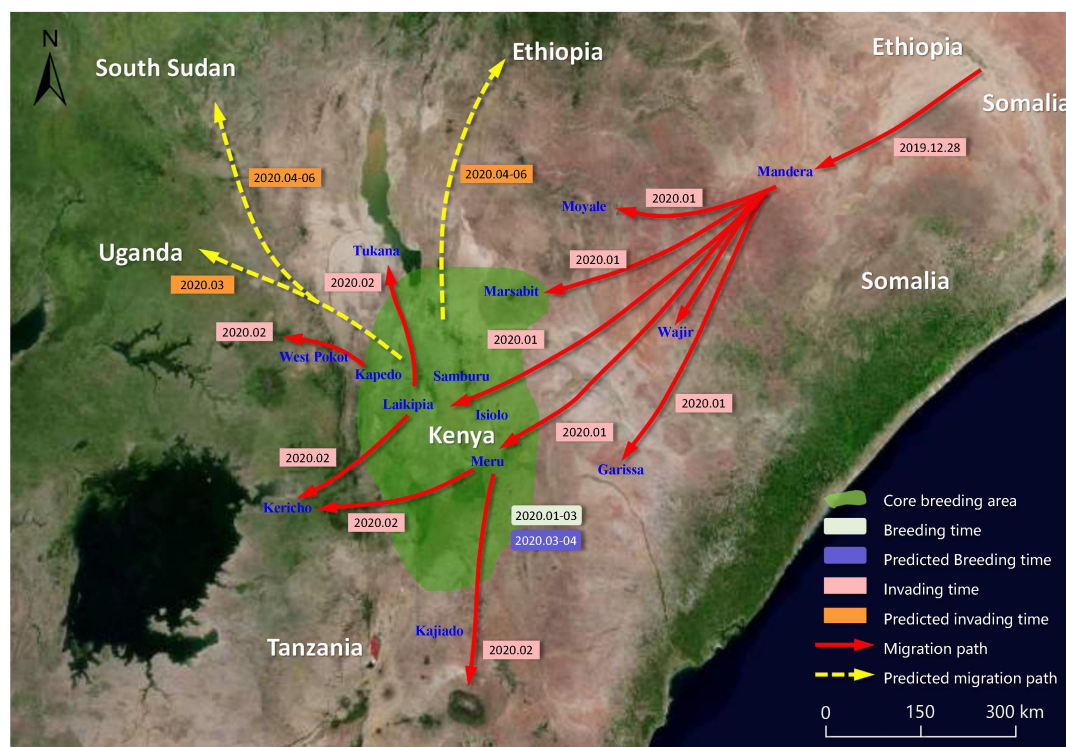


Figure 1 Migration path of Desert Locust in Kenya in 2020

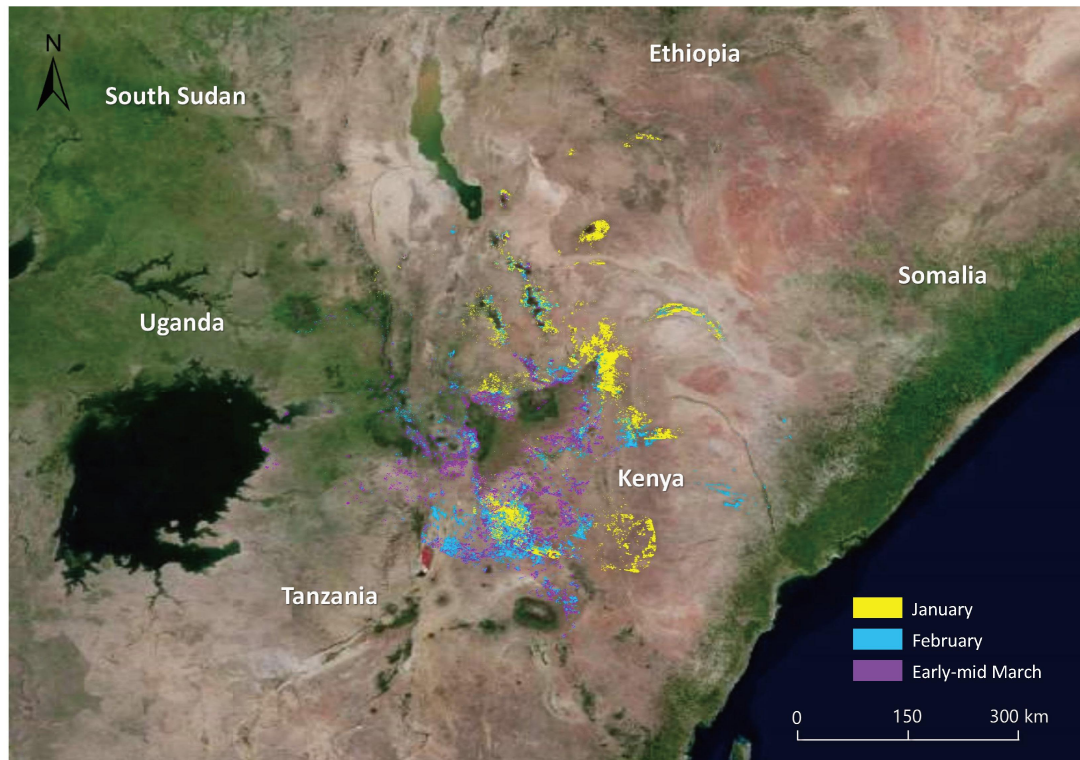


Figure 2 Monitoring of Desert Locust damage in Kenya (January to Early-mid March 2020)

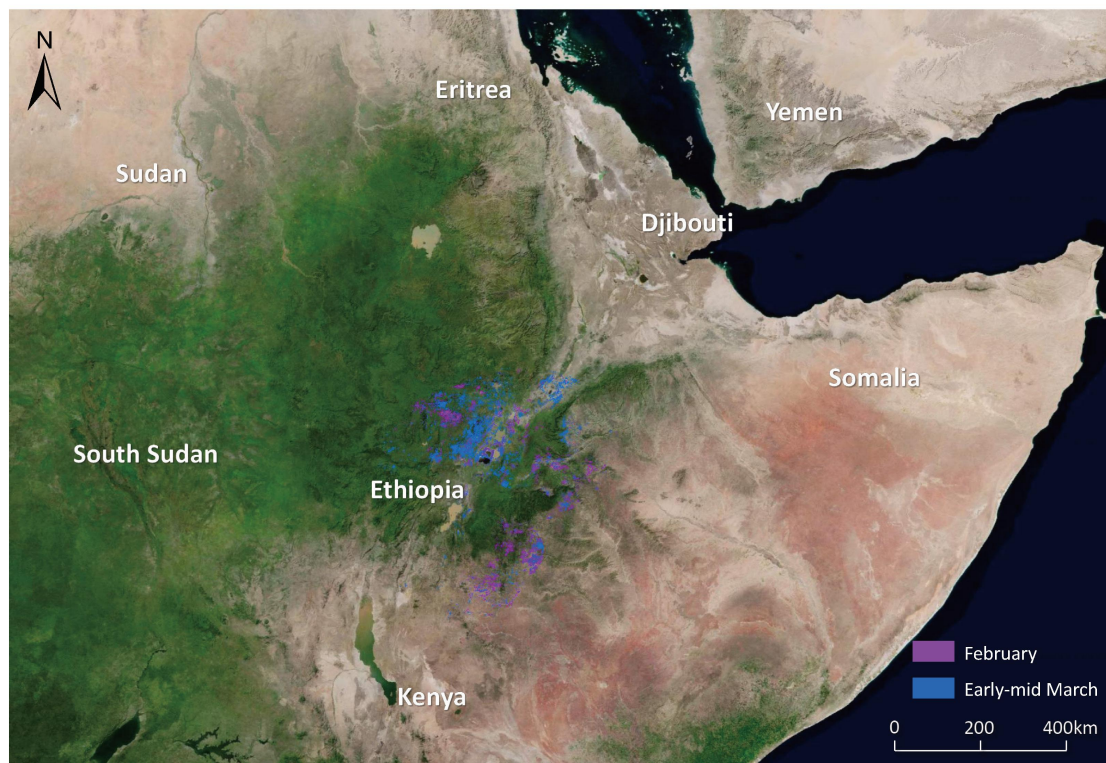


Figure 3 Monitoring of Desert Locust damage in Ethiopia (February to Early-mid March 2020)

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Forecasting system are available under:
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Mission statements: As the science and knowledge service, the Sino-UK Crop Pest and Disease Forecasting & Management Joint Laboratory is to support independent evidence for crop monitoring.

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