



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

[2023] NO.02 Total 41  
February 2023

Aerospace Information Research Institute, Chinese Academy of Sciences  
Big Earth Data Science Engineering Project (CASEarth)  
Key laboratory of Digital Earth Science, Chinese Academy of Sciences  
National Engineering Research Center for Agro-Ecological Big Data Analysis & Application  
State Key Laboratory of Remote Sensing Science  
China Biodiversity Conservation and Green Development Foundation  
Sino-UK Crop Pest and Disease Forecasting & Management Joint Laboratory  
Key Lab of Aviation Plant Protection, Ministry of Agriculture and Rural Affairs, P.R. China

## Desert Locust Monitoring and Loss Assessment in Yemen (January, 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 SDGSAT-1 in China, 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. The remote sensing monitoring results showed that, in January 2023, the desert locusts were mainly distributed on the west coast of the Red Sea in western Yemen. The total damaged vegetation area in Yemen was 53.7 thousand hectares. It is expected that in the next month, there will be less rainfall in western Yemen, which will limit the breeding and egg-laying of desert locusts. The number of locusts in western Yemen will decrease. The important planting season for crops in Yemen will begin in March 2023. It is necessary to continue to pay attention to the dynamics of the desert locust disaster in Yemen to prevent losses to its agricultural and pasture production. The specific research results are as follows.

In January 2023, the reduction of rainfall in western Yemen was not favorable for the survival and reproduction of desert locusts, causing a slight decrease in the number of locusts. The monitoring results showed that in January, the total damaged vegetation area was 53.7 thousand hectares, including 7.1 thousand hectares of grassland, and 46.6 thousand hectares of shrub (Figure 1), accounting for 2.49% and 1.16% of the total area of grassland and shrub in Yemen, respectively. Compared with December 2022, the newly damaged vegetation area in Yemen was 41.5 thousand hectares, including 4.4 thousand hectares of grassland, and

37.1 thousand hectares of shrub. Al-Hudaydah province had the largest damaged area of 32.5 thousand hectares, followed by the province of Hajjah with an affected area of 9.3 thousand hectares, Al-Mahwīt with an affected area of 9.0 thousand hectares, and Dhamār and Raymah with affected area of 2.7 and 0.2 thousand hectares, respectively.

This study also used SDGSAT-1 satellite remote sensing data to monitor the desert locust damage in the severely affected areas in Western Yemen (Figure 2). The study areas are located in Al-Hudaydah. Area 1 is in the northern Al-Hudaydah, 40.0 kilometers from Abs in the north and 84.1 kilometers from Hudaydah in the southwest. Area 2 is in the southern Al Hudaydah, 77.6 kilometers from Hudaydah in the northwest and 90.0 kilometers from Ibb in the southeast. The vegetation types in area 1 include grassland and shrub, with a total area of 67.96 thousand hectares. The monitoring results showed that the damaged area of vegetation was 13.51 thousand hectares, accounting for 19.9 % of the total vegetation area in area 1. Among them, the damaged area of grassland was 0.05 thousand hectares, and the damaged area of shrub was 13.46 thousand hectares, accounting for 0.63% and 22.5% of the total area of grassland and shrub in area 1, respectively. The vegetation type in area 2 is shrub, with a total area of 67.50 thousand hectares. The monitoring results showed that the damaged area of vegetation was 3.21 thousand hectares, accounting for 4.76 % of the total vegetation area in area 2.

The comprehensive analysis shows that, in the coming month, the rainfall on the west coast of the Red Sea is expected to further decrease, which is unfavorable for the survival and reproduction of desert locusts and will result in a decrease in the number of locusts. It is necessary to continue to pay attention to the dynamics of the desert locust disaster in Yemen to prevent the locusts from affecting crop planting in the coming March.



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

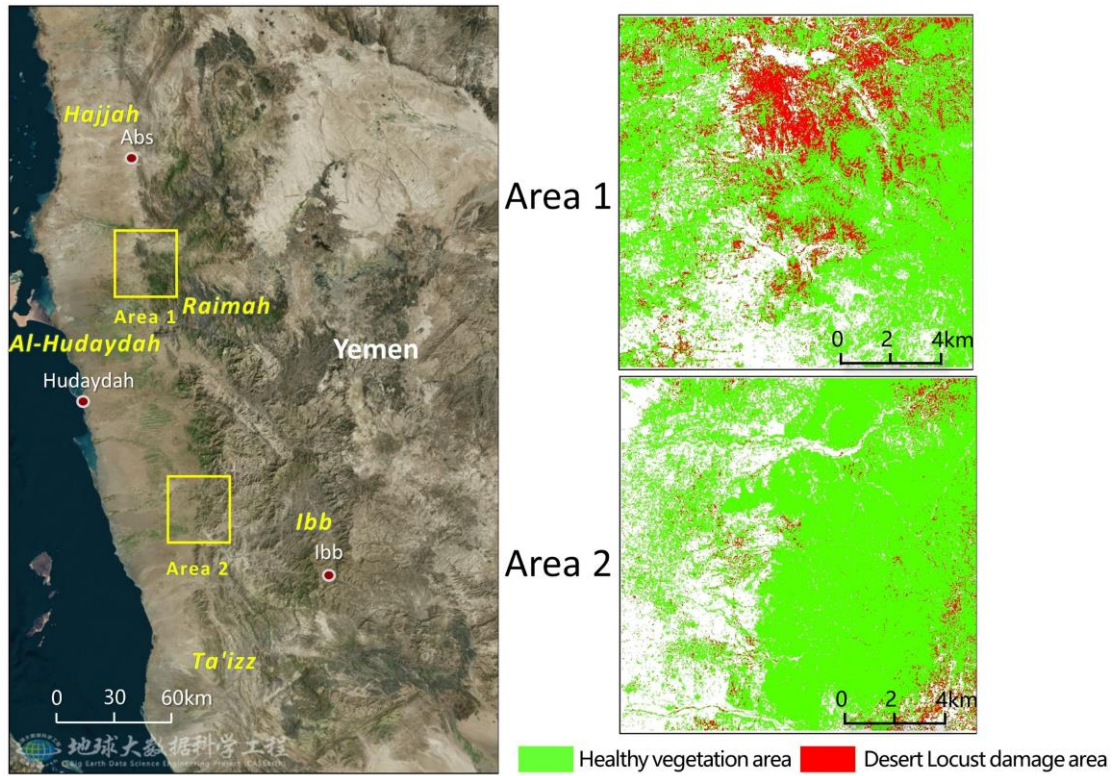


Fig. 2 Monitoring of Desert Locust damage in the key damage areas of Yemen based on SDGSAT-1 images (January 2023)

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.

### Chinese Contributors

Wenjiang Huang, Yingying Dong, Longlong Zhao, Huichun Ye, Mingquan Wu, Kun Wang, Xiaoping Du, Changyong Dou, Jun Yan, Jingcheng Zhang, Bei Cui, Linsheng Huang, Dailiang Peng, Huifang Wang, Hong Chang, Yun Geng, Chao Ruan, Huiqin Ma, Anting Guo, Linyi Liu, Naichen Xing, Yue Shi, Qiong Zheng, Yu Ren, Hansu Zhang, Tingguang Hu, Yanru Huang, Yu Jin, Chao Ding, Biyao Zhang, Zhongxiang Sun, Xiangmei Qin, Xueling Li, Ruiqi Sun, Yingxin Xiao, Zhuoqing Hao, Jing Guo, Mingxian Zhao, Kehui Ren, Xiangzhe Cheng, Kang Wu, Yong Liu, Bo Wu, Weiping Kong, Juhua Luo, Jinling Zhao, Dongyan Zhang, Xiaodong Yang, Yanhua Meng, Wenjie Fan, Yue Liu, Gang Sun, Bin Wu, Qing Zhang, Dacheng Wang, Wei Feng, Xianfeng Zhou, Qiaoyun Xie, Muyi Huang, Jing Jiang, Zhaochuan Wu, Cuicui Tang, Fang Xu, Jianli Li, Wenjing Liu, Junjing Lu, Furan Song, Qingsong Guan, Qinying Yang, Chuang Liu, Yunli Han, Yuzhen Zou, Lu Li, Xinyu Chen, Yunlei Xu, Jing Wang, Qibao Lu, Fanchu Kong, Juncheng Shang.

### Foreign Contributors

Belinda Luke, Bethan Perkins, Bryony Taylor, Hongmei Li, Wenhua Chen, Pablo Gonzalez-Moreno, Sarah Thomas, Timothy Holmes, Stefano Pignatti, Giovanni Laneve, Raffaele Casa, Simone Pascucci, Martin Wooster, Jason Chapman.

### Advisory Experts

Bing Zhang, Gensuo Jia, Jihua Wang, Qiming Qin, Puyun Yang, Guofei Fang, Shouquan Chai, Yuying Jiang, Jingquan Zhu, Jinfeng Zhou, Dongmei Yan, Xiangtao Fan, Jianhui Li, Jie Liu, Tianhua Hong, Yubin Lan, Jingfeng Huang, Huo Wang, Anhong Guo, Zhanhong Ma, Yilin Zhou, Xiongbing Tu, Wenbing Wu, Feng Zhang, Zhiguo Wang, Lifang Wu, Dong Liang, Yanbo Huang, Chenghai Yang, Liangxiu Han, Ruiliang Pu, Jiali Shang, Hugh Mortimer, Jon Styles, Andy Shaw, Jadu Dash.

### Funding Information

Strategic Priority Research Program of the Chinese Academy of Sciences (XDA19080304), National Key R&D Program of China (2017YFE0122400 and 2021YFE0194800), National Natural Science Foundation of China (42071320 and 42071423), Beijing Nova Program of Science and Technology (Z191100001119089), International Partnership Program of Chinese Academy of Sciences (183611KYSB20200080), Alliance of International Science Organizations (ANSO-CR-KP-2021-06), GEO Community Activities "Global Crop Pest and Disease Habitat Monitoring and Risk Forecasting", Dragon 5 "Application of Sino-Eu Optical Data Into Agronomic Models to Predict Crop performance And to Monitor And Forecast Crop Pests And Diseases" (57457).

### Citation

Report of Monitoring and Assessment of Desert Locust in Africa and Asia, (2023). *Desert Locust Monitoring and Loss Assessment in Yemen (January, 2023)*. Beijing, China: RSCROP.

### Disclaimer

This report is a product of the Vegetation Remote Sensing & Pest and Disease Application Research Team of the Aerospace Information Research Institute, Chinese Academy of Sciences. The analyses and conclusions in the report do not represent the views of the Chinese Academy of Sciences or the Aerospace Information Research Institute. Users can legally quote the data in this report and indicate the source. However, any judgments, inferences or opinions made based on the report do not represent the views of the Team. The data published in this report are for reference only. The Team does not bear any legal responsibility arising from the use of the report. Official Chinese boundaries are used in the report.

### Contact Us

Tel: +86-010-82178178      Fax: 010-82178177      Email: rscrop@aircas.ac.cn  
Address: No.9 Dengzhuang South Road, Haidian District, Beijing 100094, China  
Websites: <http://www.rscrop.com> / <http://www.rscropmap.com>      Post Code: 100094

