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LOCUST INVASION IN ETHIOPIA: SCOPE & IMPACT

Evidence from the World Bank-Supported
High-Frequency Phone Surveys

John Ilukor and Sydney Gourlay

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This document has been prepared by John Ilukor (Economist, Development Data Group, World Bank, Kampala, Uganda) and Sydney Gourlay (Economist, Development Data Group, World Bank, Rome, Italy).

Valuable comments were received from Alemayehu Ambel (Development Data Group, World Bank), Melissa Williams (Agriculture Global Practice, World Bank), and Alberto Zezza (Development Data Group, World Bank).

BACKGROUND

The desert locust, the most destructive migratory pest in the world, is highly mobile and feeds on large quantities of any kind of green vegetation, including crops, pasture, and fodder with great potential to cause deterioration in the food security situation across the East Africa region. Ethiopia experienced two invasions of locust in 2020. The first invasion, which spread from Yemen to Ethiopia, Kenya, Somalia, Uganda, Sudan, and Tanzania, took place from January to May. This first invasion of desert locust is reported to have invaded 180-240 Woredas and laid to waste over 200,000 hectares of land in Ethiopia alone, primarily in crop land in eastern and southern Ethiopia. The second invasion of locust in Ethiopia, which started in late September and peaked in October-November is the worst locust invasion and feared to be 20 times more severe than the first invasion and it has destroyed crops, grazing lands and trees. The impacts of locust invasions are exacerbated by COVID-19 restrictions, war, and flooding which are expected to substantially reduce Ethiopia's economic growth. Poverty levels are expected to rise and over 2 million people estimated to fall into poverty while the scale of Productive Safety Net Programme is expected to rise from 9 million to as high as 15 million.¹

This brief reports on the scope, intensity, and type of damage incurred by rural households as a result of both the first and second locust invasions in Ethiopia, based on high-frequency phone survey data.

At the end of April 2020, the World Bank Living Standard Measurement Study team piggy-backed on the ongoing COVID-19 High Frequency Phone Survey (HFPS) by integrating a short module on locusts to monitor the spread and impact of the desert locust. To implement the HFPS, the team leveraged the Living Standards Measurement Study - Integrated Surveys on Agriculture (LSMS-ISA) program by drawing a sample of households interviewed in the 2018/2019 round of the Ethiopia Socioeconomic Survey (ESS).² The extensive information collected in the ESS, less than one year prior to the pandemic, provides a rich set of background information on the COVID-19 High Frequency Phone Survey of households which can be leveraged to assess the differential impacts of the COVID-19 and desert locust invasion. A module on locust was integrated into the fourth, sixth, and seventh rounds of the HFPS, conducted in April/May 2020, September/October 2020, and October/November 2020 respectively.

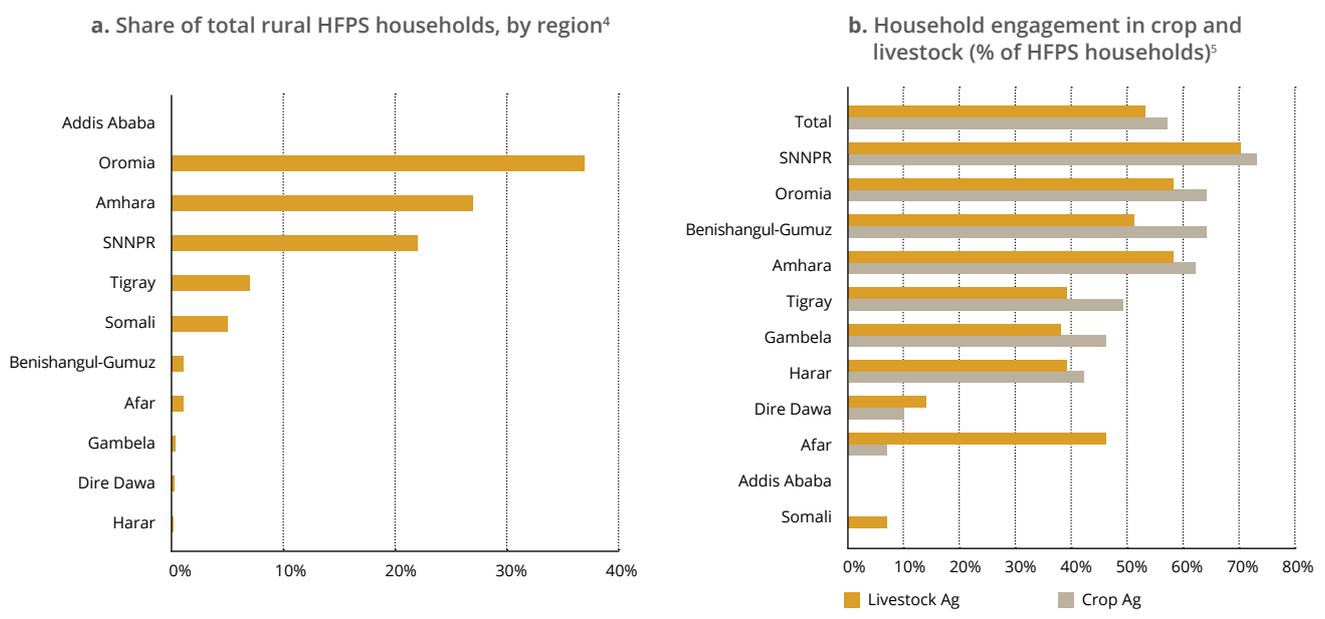
¹ One UN Assessment: Socio-Economic Impacts of COVID 19 in Ethiopia (2020). Available here: <https://ethiopia.un.org/en/87497-one-un-assessment-socio-economic-impact-covid-19-ethiopia>

² The first round of the Ethiopia HFPS covered a sample of 3,249 households from both urban and rural areas. For a description of the Ethiopia HFPS methodology see the Monitoring COVID-19 Impacts on Households in Ethiopia: Survey Methodology Document, by Ambel et al. (2020; <https://bit.ly/3rigwvK>).

The HFPS round four survey asked households about the presence of locusts in their kebele and on their farm, separately, and the extent of damage observed on their farms as a result of the first invasion of locusts. The same module was repeated in round seven of the HFPS, with a slightly expanded set of questions following the peak of the second invasion. A set of questions was also included in round six of the HFPS but given that it was early on in the locust invasion, that data is not presented here. To provide context to the locust findings, the breakdown of the rural population and agricultural participation of the HFPS sample is provided by region in Figure 1. Note that these regional agricultural participation rates are not necessarily representative of the country as the HFPS sample is not regionally representative.³

The highest proportion of Ethiopia’s rural households interviewed are from Oromia (37%), followed by Amhara (27%), and Southern Nations, Nationalities, and Peoples’ Region (SNNPR, 22%), with the smallest share in Harar, Dire Dawa and Gambela as shown in Figure 1a. Overall, the share of households cultivating crops (57%) is higher than those engaged in livestock (53%). Most of the HFPS households engaged in crop and livestock farming are from SNNPR, Oromia, and Amhara as shown in Figure 1b. In the Somali region, very few households in the HFPS sample are engaged in agriculture and only 7% kept livestock.

Figure 1. Share of rural households interviewed by region and engagement in crop and livestock



Note: Ethiopia HFPS is not representative at the regional level; for illustrative purposes only.

³ For a complete picture of agricultural participation by region, see the Ethiopia Socioeconomic Survey (ESS) 2018/19 Survey Report (available in the World Bank’s Microdata Catalog: <https://microdata.worldbank.org/index.php/catalog/3823/related-materials>)

⁴ Share of total rural households in Ethiopia, as of the Ethiopia HFPS Round 4 survey.

⁵ Crop and livestock engagement for HFPS households is determined from the Ethiopia Socioeconomic Survey (ESS), in which HFPS households were included.

INCIDENCE OF LOCUSTS

Over half of all rural households experienced locusts in their kebele, and nearly 30% experienced locusts on their own farms, during the first locust invasion. At the peak of the second invasion, 37% of rural households observed locusts in the kebele and 20% on their farm. In both invasions, incidence of locusts was widespread impacting all regions with rural populations, with the

Afar, Somali, and Harar regions having the highest incidence of reported locusts in the kebele and on the farm. Figure 2 illustrates the location of locusts reported in the HFPS sample, with the icons representing the rural households who reported locusts in the kebele and those who did not, in both the first and second invasions.⁶

Figure 3 illustrates the incidence of locusts for both the first and second invasion by region (note that this is for

Figure 2. Location of locusts reported in the HFPS, by invasion

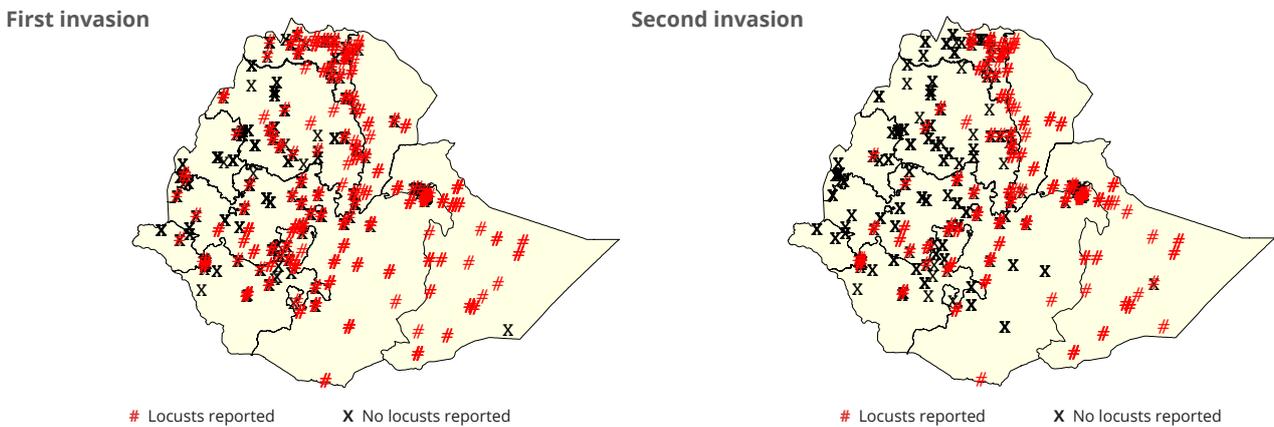
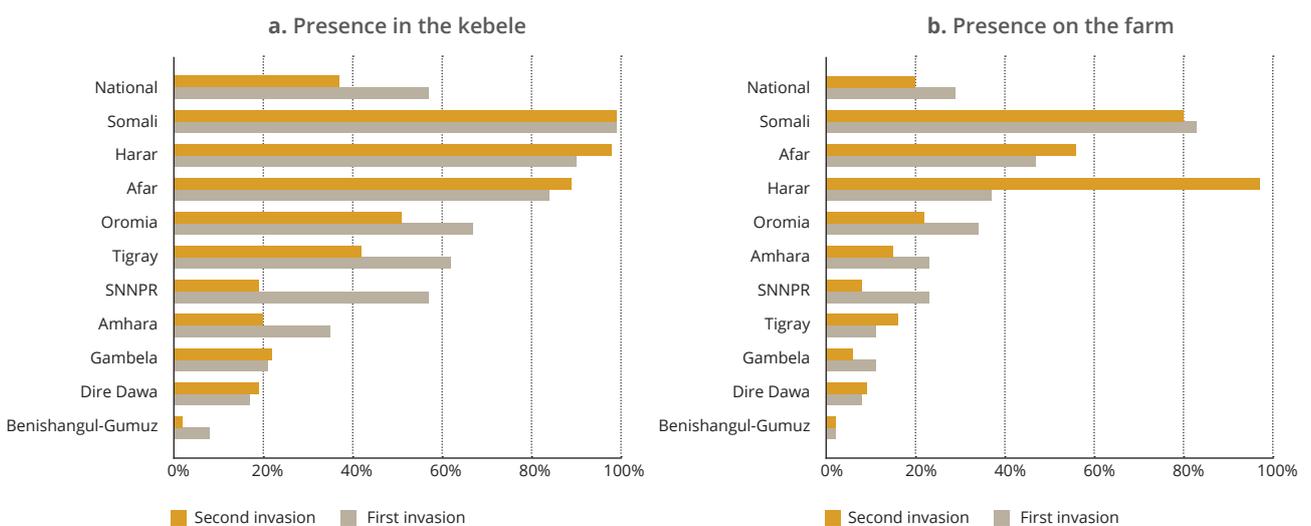


Figure 3. Proportion of rural Households reporting locust invasion in the two rounds at kebele and farm level, by region



Note: Ethiopia HFPS is not representative at the regional level; for illustrative purposes only.

⁶ Note that figure includes only the rural households interviewed in the HFPS and is not necessarily representative of the rural population. GPS locations are offset from the true location to protect respondent anonymity.

illustrative purposes only as the HFPS is not representative at the regional level). The higher number of rural households reporting locusts at the kebele and at farm level in the first invasion relative to the second invasion may be attributed to the fact that second invasion occurred in regions like Afar, Harar, and Somali which are less populated than Oromia, Amhara, and SNNPR where the first invasion hit harder.

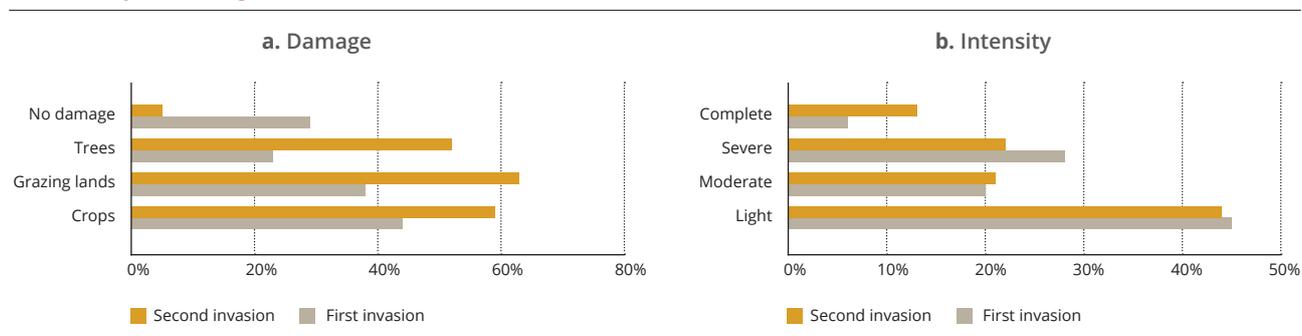
LOCUST DAMAGE AND DAMAGE INTENSITY

Fifty-nine percent of households that reported locusts on their farm in the second invasion also reported damage to crops as a result, with 63% reporting damage to grazing lands and 52% reporting damage to trees. Damage incurred as a result of the first locust invasion was reportedly lower, with 44% of households with locusts on their farm reporting crop damage, 38% reporting damage to grazing lands, and 23% reporting damage to trees (Figure 4a). The results suggest that the second invasion may be more detrimental to the agricultural sector

than the first invasion, as evidenced also by the smaller proportion of rural households that reported no damage in the second invasion relative to the first invasion. This is also supported by the difference in the intensity of damage reported by households. Complete damage was reported by 13% of households at the peak of the second invasion, while only 6% of households with damage in the first wave reported it to be complete damage (Figure 4b). Given both the incidence and intensity of reported damage, it appears the second locust invasion was more destructive than the first, as predicted in the locust watch.⁷

Eighteen percent of households who reported crop damage as a result of locusts in the second invasion reported complete crop damage (compared to 11% in the first invasion). Damage to grazing lands as a result of the second invasion was significant, with 20% of households who reported damage to grazing lands indicating complete damage, and 25% indicating severe damage (Figure 5). Trees fared relatively well, with over 40% of households reporting light damage to trees

Figure 4. Proportion of rural households reporting locusts to have damaged crops, grazing lands, and trees as well as intensity of damage



⁷ Desert locusts in East Africa: A plague of another order (2020). Available here: <https://reliefweb.int/report/ethiopia/desert-locusts-east-africa-plague-another-order>

in both the first and second invasions. With 57% of households engaged in crop agriculture and 53% engaged in livestock, damage to crops, trees, and grazing lands as a result of locusts is both inevitable and detrimental. The timing of the second invasion, after the crops were planted, nearing maturity or at the start of the harvest, a period when crops were vulnerable to damage, likely attributed to the increased crop damage observed in the second invasion relative to the first, where the invasion came on before the planting season.

LOCUST CONTROL MEASURES

Eighty-three percent of rural households with locusts in the kebele reported noise making or smoke as a control or prevention method, with a smaller share of households using backpack

spraying (10%), aerial spraying (8%), and burying of the locusts (4%), in the second invasion (data not available for the first invasion; Figure 6a). Nine percent of the rural households with locusts in the kebele reported to have done nothing to control the locust. Fifty-six percent of the households using some control or prevention method reported that method was very effective (Figure 6b). Six percent of the households using control or prevention methods reported them to be ineffective, as shown in Figure 6b. The HFPS data allows for an understanding of the effectiveness of the various methods separately but given the low incidence of households using the burying or spraying methods, effectiveness is presented in aggregate. However, note that only 42% of households employing the noise or smoke making method reported it to be very effective.

Figure 5. Intensity of locust-induced damage

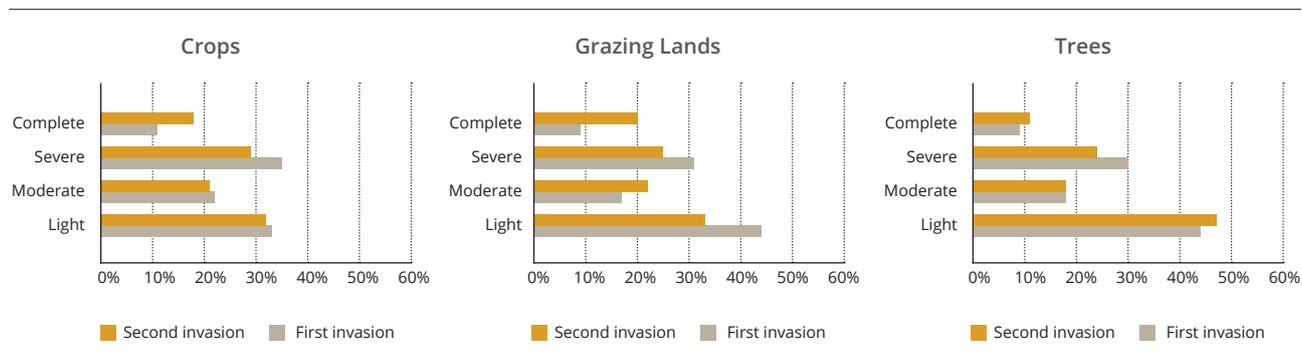
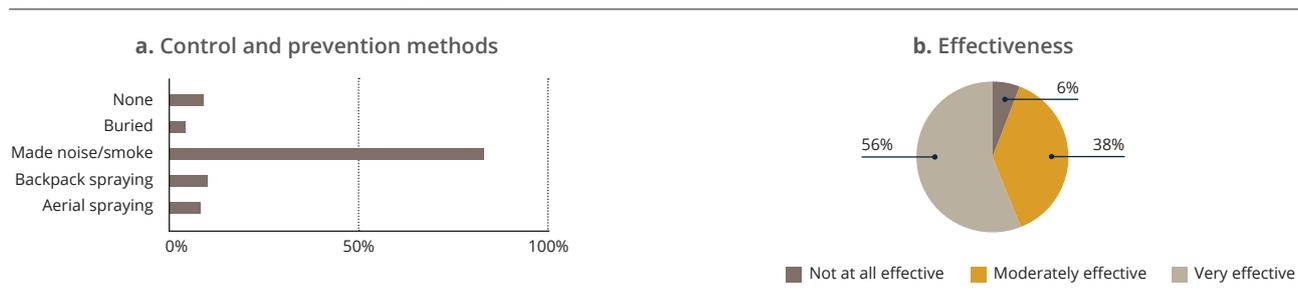


Figure 6. Locust control methods reported by rural households with locusts in the kebele, and their effectiveness



SUPPORT NEEDS FOR LOCUST-AFFECTED HOUSEHOLDS

Sixty-four percent of households that reported locust in their kebele indicated that some form of support was needed in order to cope with the second locust invasion, as shown in Figure 7 (data not available for the first invasion). The most requested form of support was food items (32%) followed by cash (21%). The least requested forms of support were livestock feed (7%), seed for next season cultivation (3%), and work to earn income (1%). The need for support in the form of food was highest in Somali and Harar regions. The share of households indicating a need for support via hat not needing any form of support, the majority of these households did not experience locusts on their own farm.

Looking at households that experienced locusts on their farm, we find that support in the form of food was most frequently reported as necessary by households who incurred crop damage (42% of households), followed by households who incurred damage to grazing lands (37% of households), as seen in Figure 8a, which is consistent with households engaged in agriculture for subsistence. Cash was sought most frequently by households that suffered tree damage (38% of households with tree damage). Where complete or severe damage was incurred as a result of the locusts, food support was the primary need, with 69% and 39% of households who reported complete or severe damage also indicating a need for food, respectively (Figure 8b). None of the rural households that reported completed damage requested livestock feed or seed.

Figure 7. Reported support needs (% of households with locust reported in kebele)

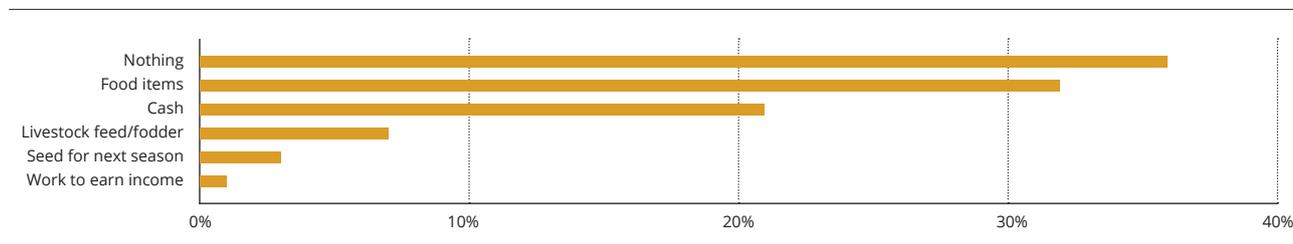
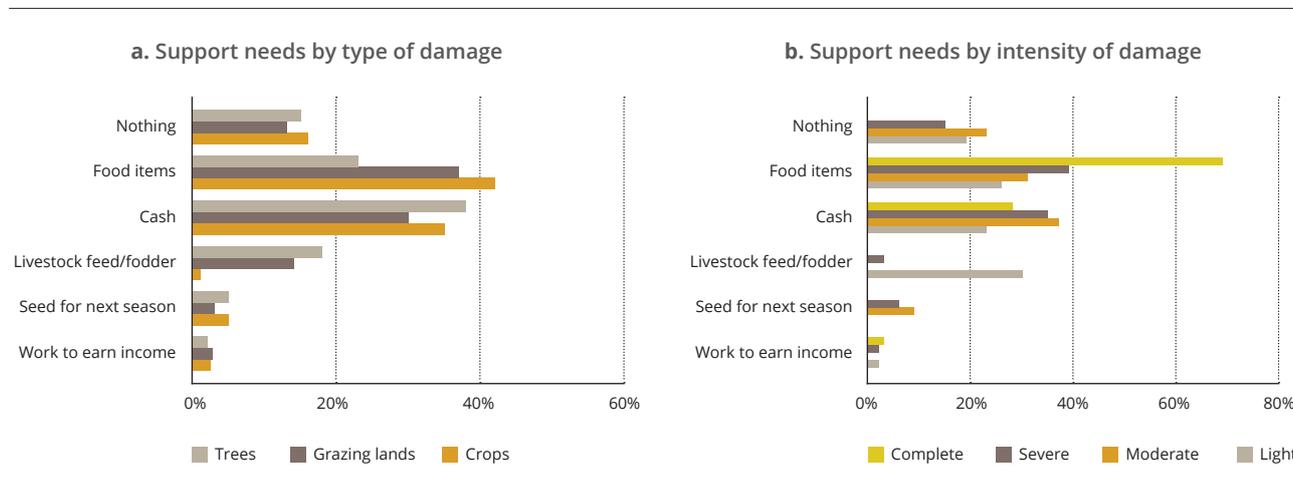


Figure 8. Support needs for rural households with locust damage on farm, by type and intensity of damage





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EVIDENCE FROM THE WORLD BANK-SUPPORTED HIGH-FREQUENCY PHONE SURVEYS

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