

13 December 2021




PRELIMINARY SATELLITE-DERIVED DAMAGE ASSESSMENT



Mount Semeru, East Java province, Indonesia

 Status: Widespread damage structures and agriculture area observed

 Further action(s): Continue monitoring



INDONESIA



MOUNT SEMERU, EAST JAVA PROVINCE

Population exposed to lahar or living close to affected zones

EAST JAVA



LAHAR
EXTENT
~ 24 km²

POPULATION
EXPOSED
~ 6,000

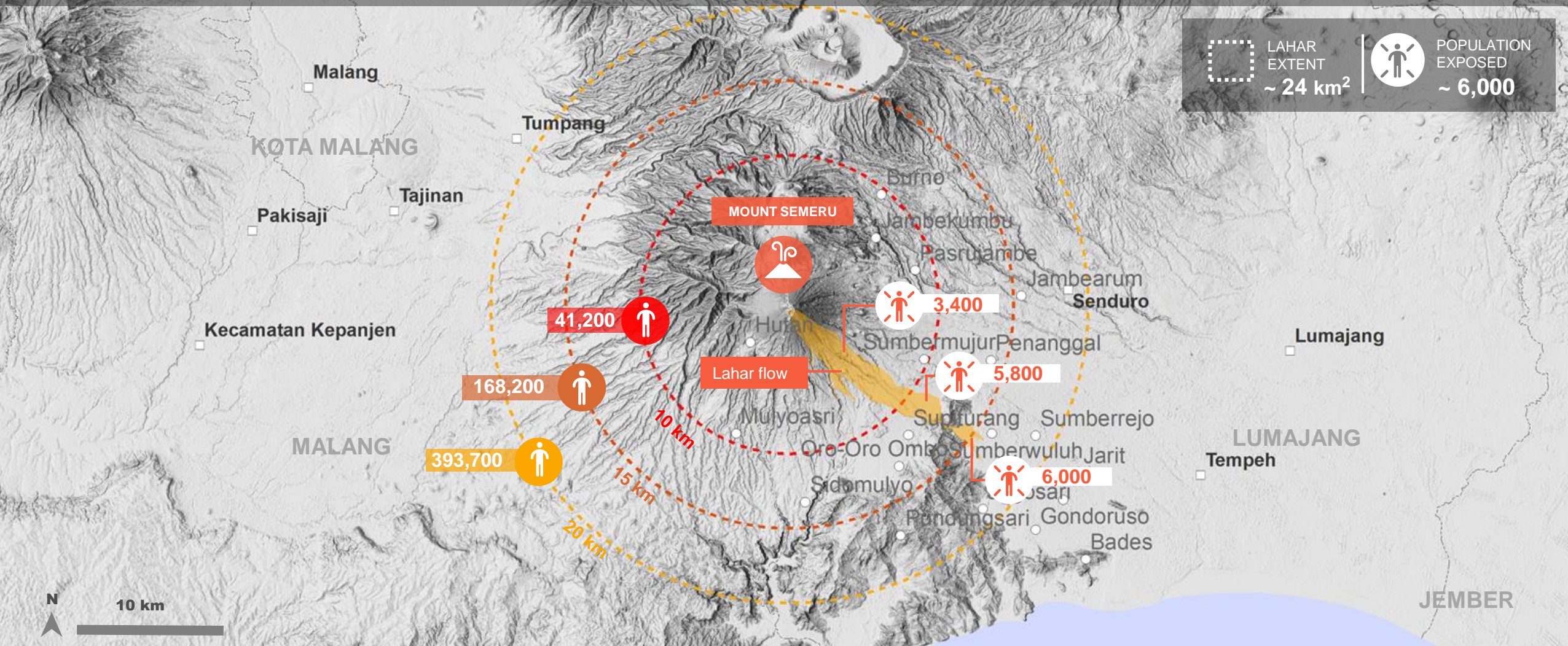


Image Center : 112°55'40.199"E 8°5'57.643"S
Background : ALOS Global DSM
Lahar extent : National Research and Innovation Agency, Indonesia
Population data : WorldPop 2020

● Village
■ City/Town

● 10km
● 15km
● 20km
Total population within each radius zone

--- District boundary
--- 10km radius zone
--- 15km radius zone
--- 20km radius zone

■ Potentially affected area by Lahar
● Population exposed within radius zone

MOUNT SEMERU, EAST JAVA PROVINCE

Affected areas by lahar and ash deposit

EAST JAVA

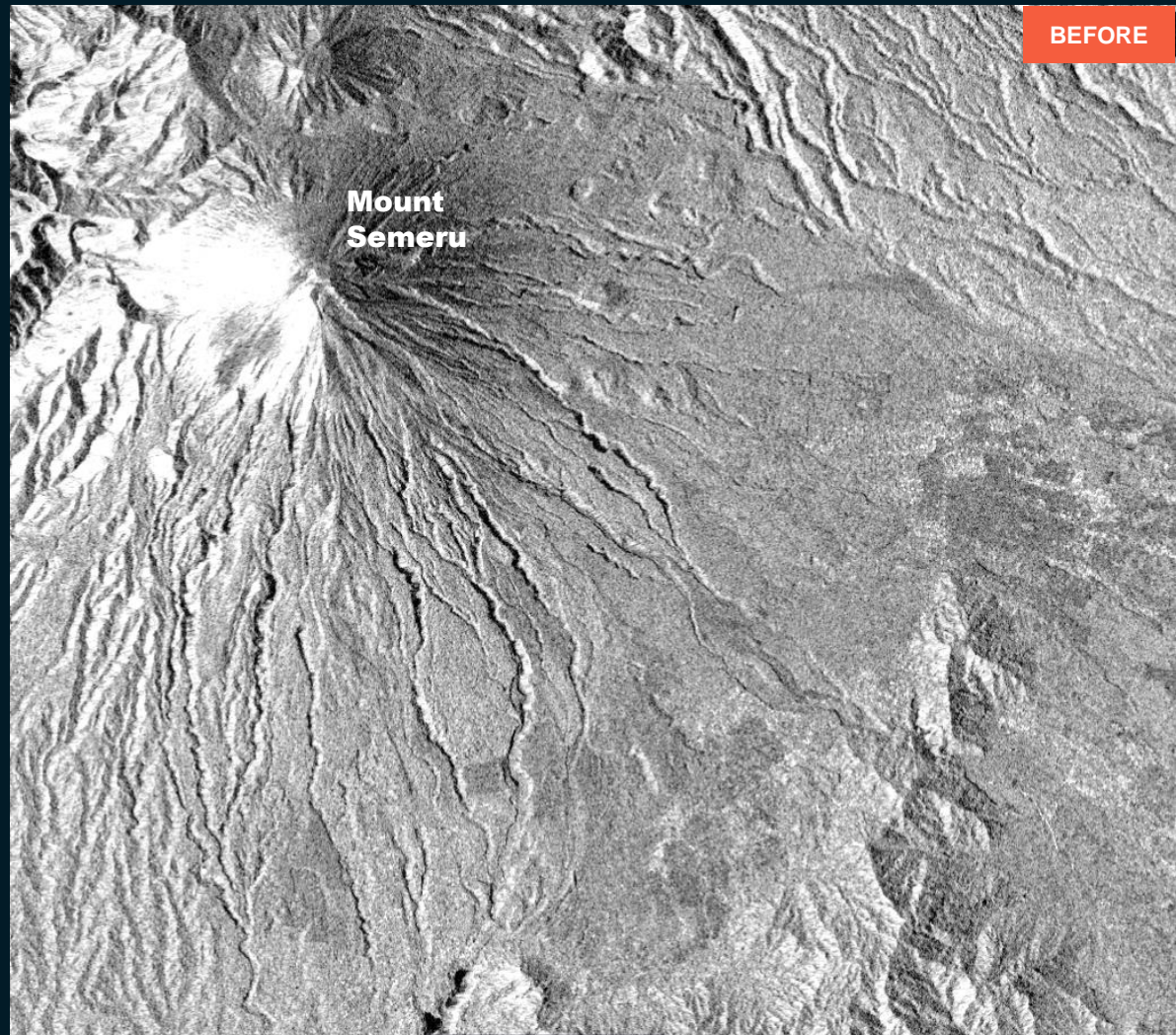


Pleiades image acquired on 11 December 2021
Image Center :112°58'27.489"E 8°9'5.609"S

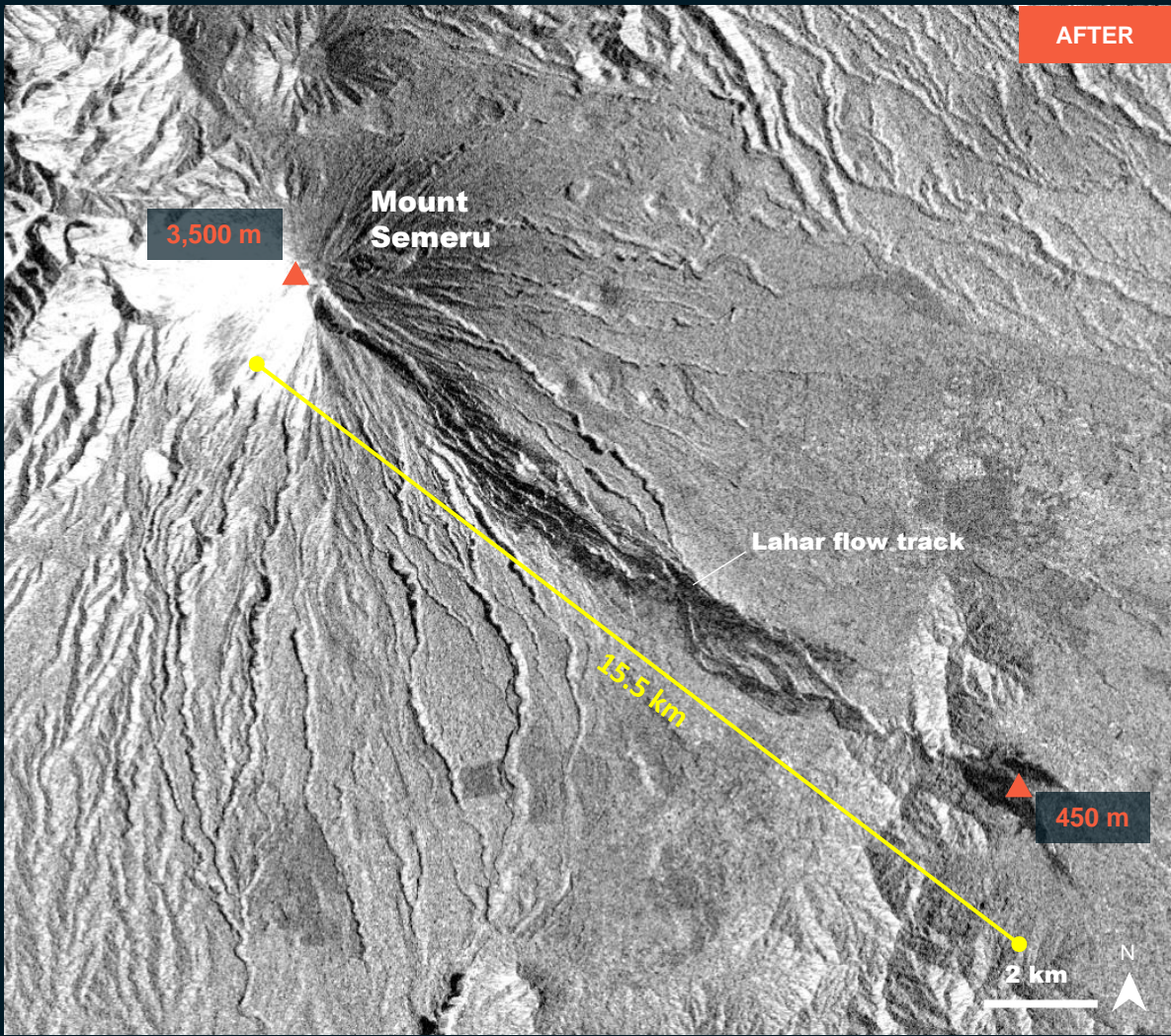
MOUNT SEMERU, EAST JAVA PROVINCE

Lahar flow track observed in southeastern the Mount Semeru

Image center:
08°10'14.4"S
112°59'37.8"E



Sentinel-1 / 25 November 2021

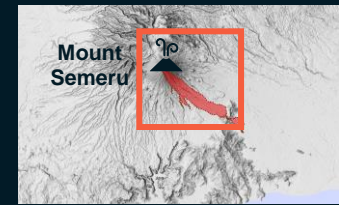


Sentinel-1 / 7 December 2021

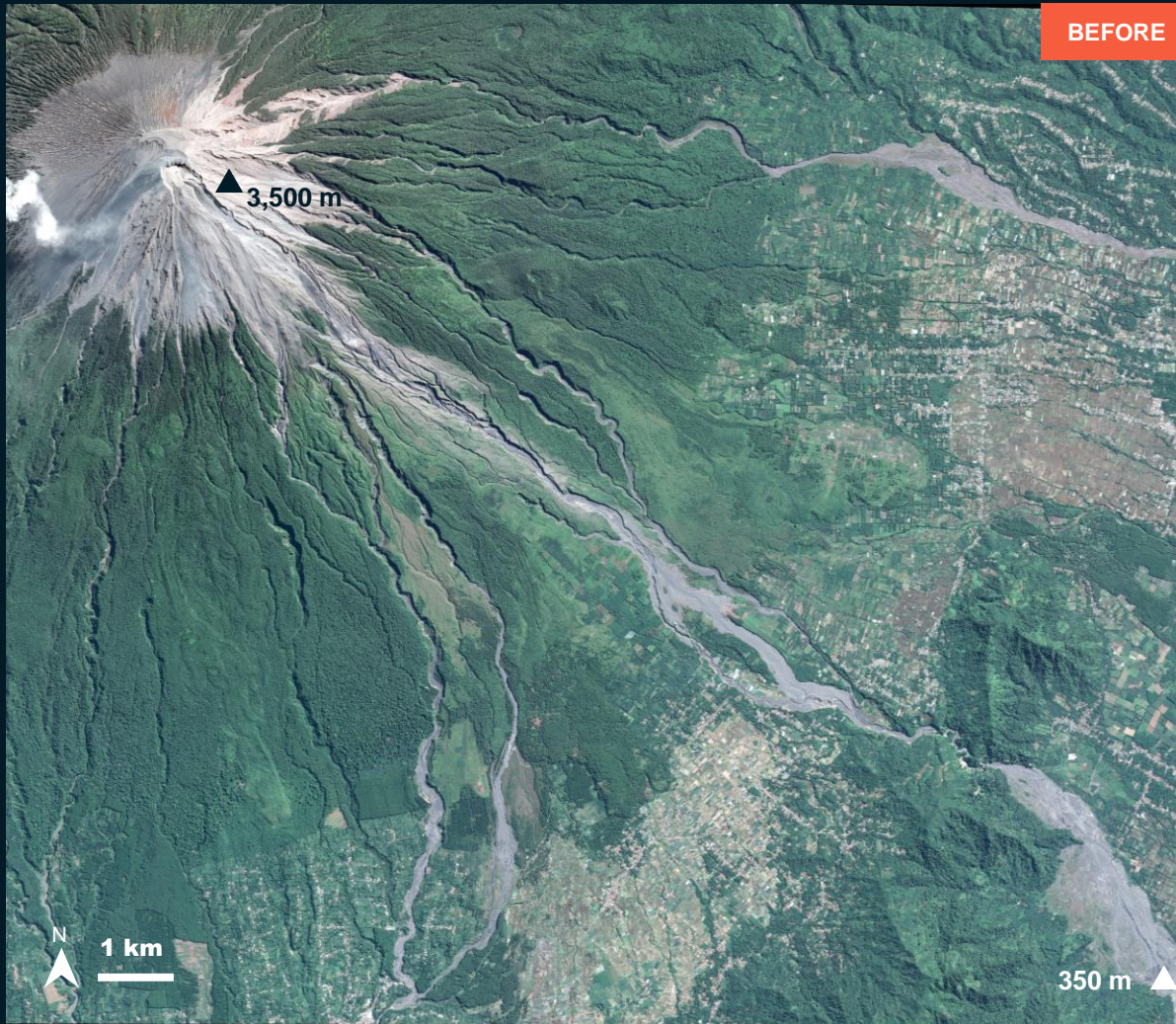
MOUNT SEMERU, EAST JAVA PROVINCE

Mount Semeru and surrounding

Image center:
112°58'15.221"E
8°9'1.271"S



Widespread volcanic ash coverage observed over southeastern part the Mount Semeru



Pleiades / 24 July 2021



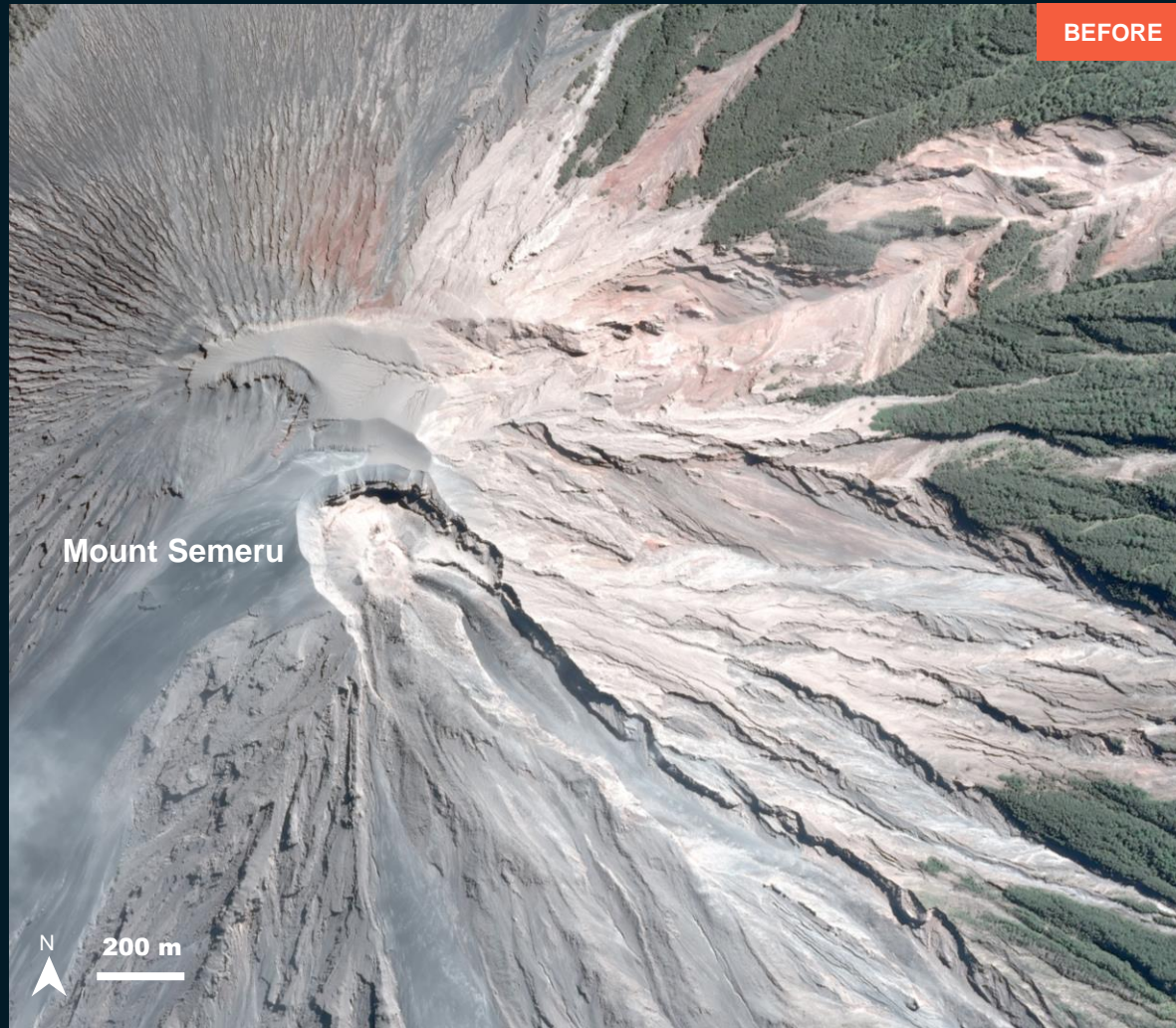
Pleiades / 11 December 2021

MOUNT SEMERU, EAST JAVA PROVINCE

Over the vent of mount Semeru

Collapsed evidence and Lava flow trail observed

Image center:
112°55'49.253"E
8°6'46.437"S



Pleiades / 24 July 2021

Pleiades / 11 December 2021

MOUNT SEMERU, EAST JAVA PROVINCE

~ 10 km southeastern of the crater

Damaged houses, damaged road, and affected agricultural area observed

Image center:
112°59'57.616"E
8°10'4.713"S



Pleiades / 24 July 2021



Pleiades / 11 December 2021

MOUNT SEMERU, EAST JAVA PROVINCE

~ 9.7 km southeastern of the crater

Damaged houses, damaged road, and affected agricultural area observed

Image center:
112°59'17.283"E
8°10'19.904"S



Pleiades / 24 July 2021

Pleiades / 11 December 2021

MOUNT SEMERU, EAST JAVA PROVINCE

~ 10.4 km southeastern of the crater

Damaged houses, damaged road, and affected agricultural area observed

Image center:
8°11'34.8"S
112°53'34.8"E



Pleiades / 24 July 2021

Pleiades / 11 December 2021

MOUNT SEMERU, EAST JAVA PROVINCE

~ 11.5 km southeastern of the crater

Damaged houses, damaged road, and affected agricultural area observed

Image center:
113°0'23.15"E
8°10'24.064"S



Pleiades / 24 July 2021



Pleiades / 11 December 2021

MOUNT SEMERU, EAST JAVA PROVINCE

~ 13 km southeastern of the crater

Damaged road, damaged bridges and damaged houses observed

Image center:
113°1'7.559"E
8°10'53.625"S



Pleiades / 24 July 2021



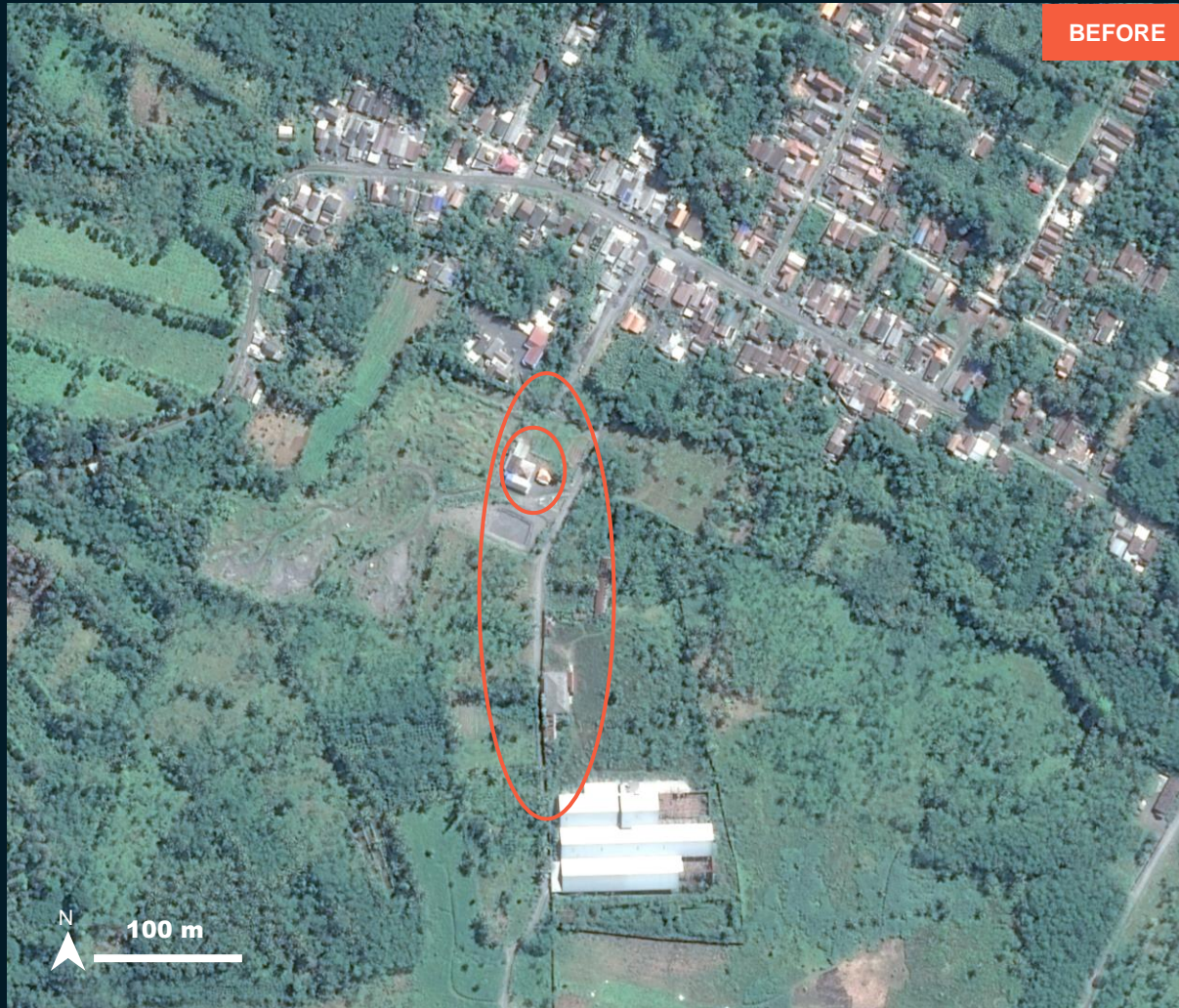
Pleiades / 11 December 2021

MOUNT SEMERU, EAST JAVA PROVINCE

~ 14 km southeastern of the crater

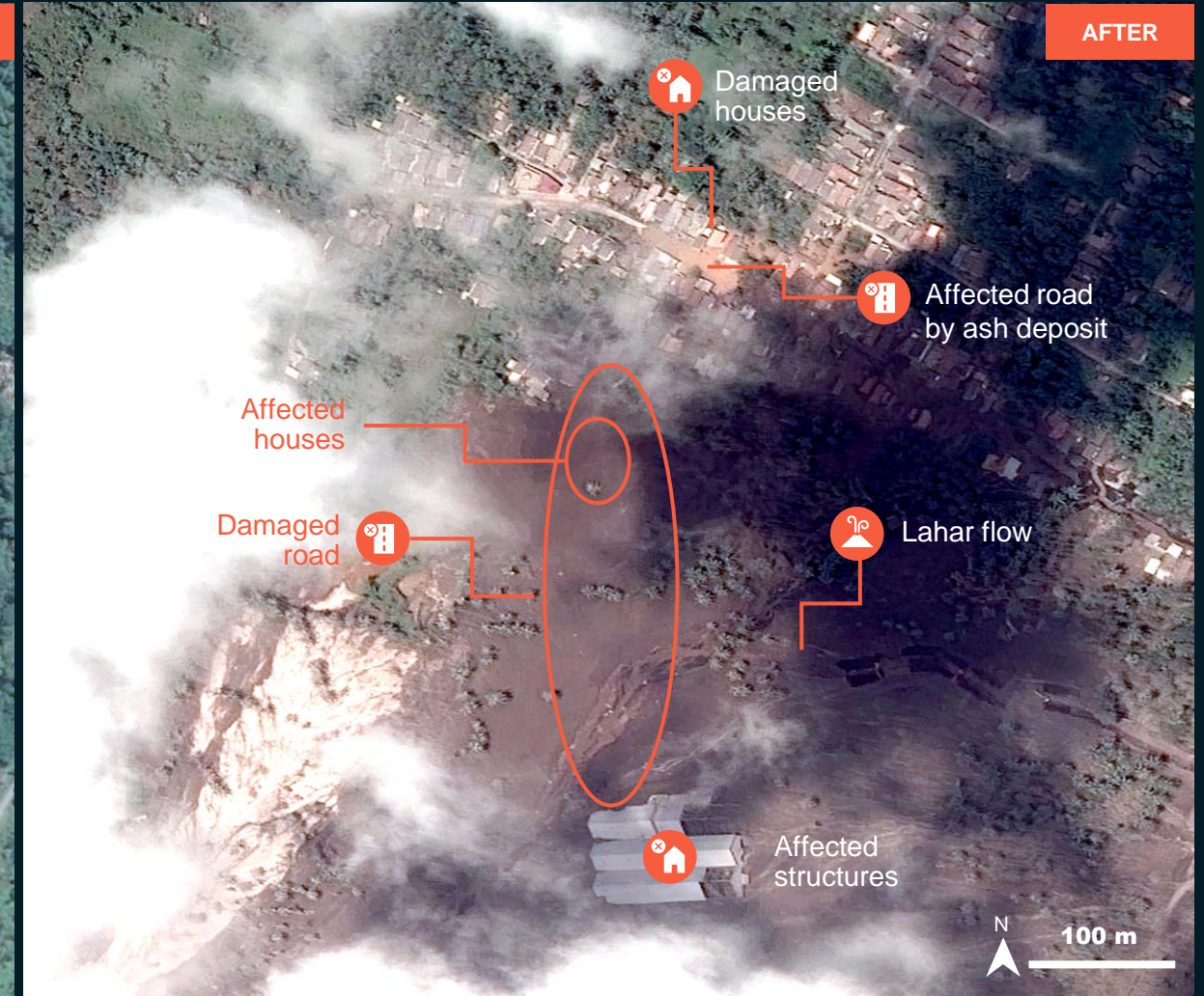
Damaged road, damaged bridges and damaged houses observed

Image center:
113°1'45.026"E
8°10'41.298"S



BEFORE

Pleiades / 24 July 2021



AFTER

Pleiades / 11 December 2021

MOUNT SEMERU, EAST JAVA PROVINCE

~ 16.5 km southeastern of the crater

Potentially affected Sumberwuluh Candipuro bridge and damaged structures observed

Image center:
113°2'29.576"E
8°12'28.886"S



Pleiades / 24 July 2021



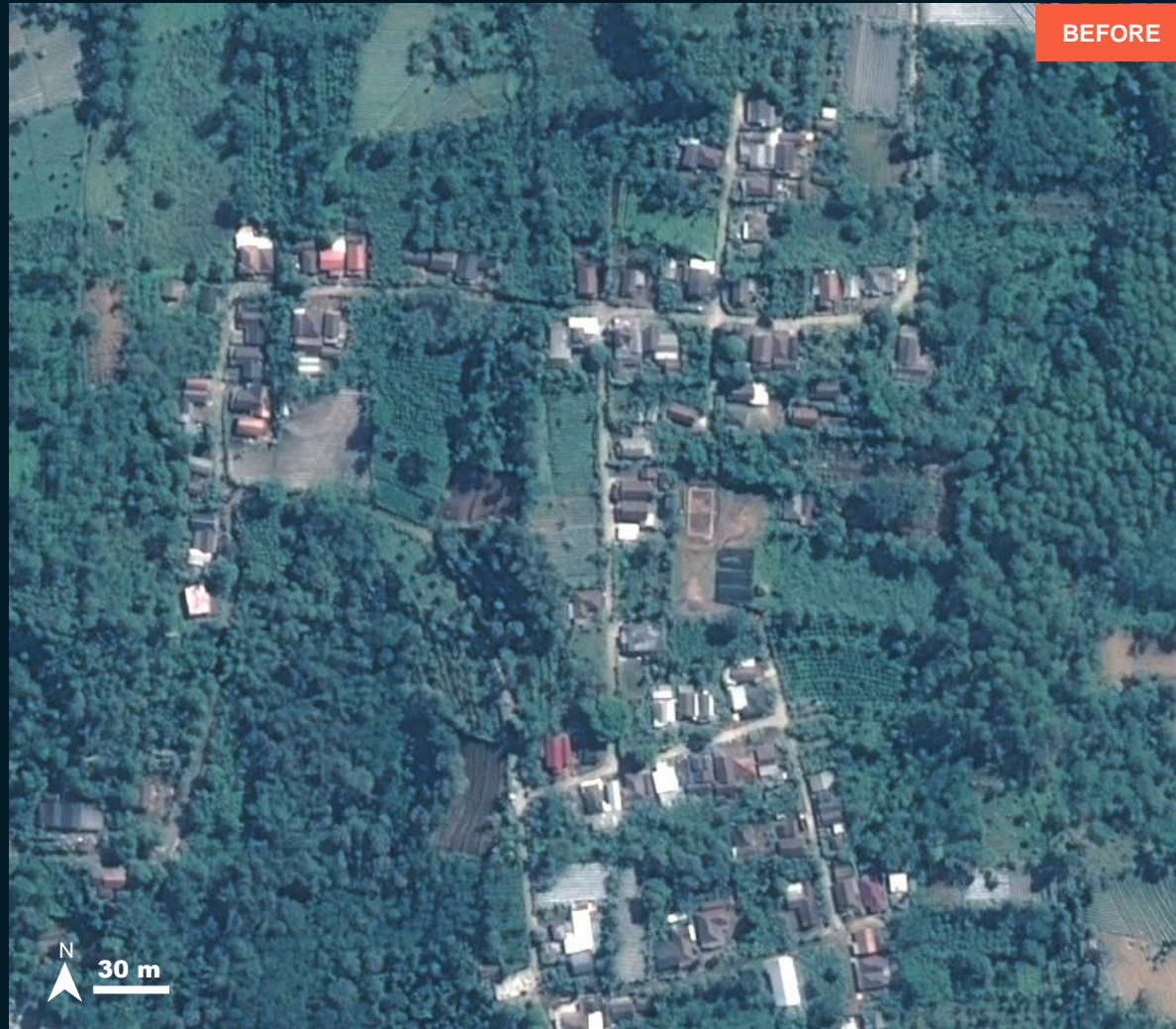
Pleiades / 11 December 2021

MOUNT SEMERU, EAST JAVA PROVINCE

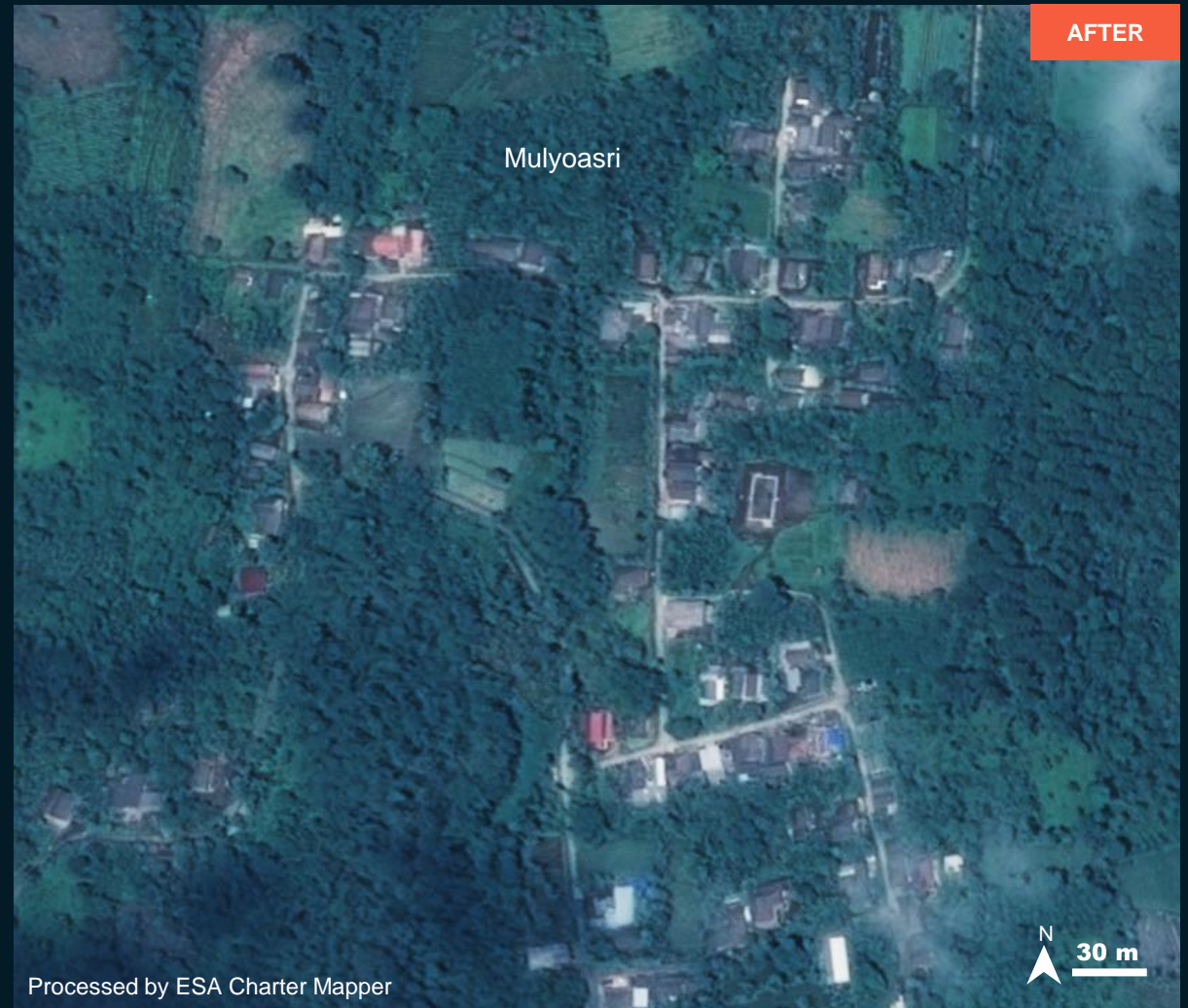
~ 9.3 km southwestern of the crater

No damage observed

Image center:
8°11'34.8"S
112°53'34.8"E



Pleiades / 24 July 2021



Processed by ESA Charter Mapper

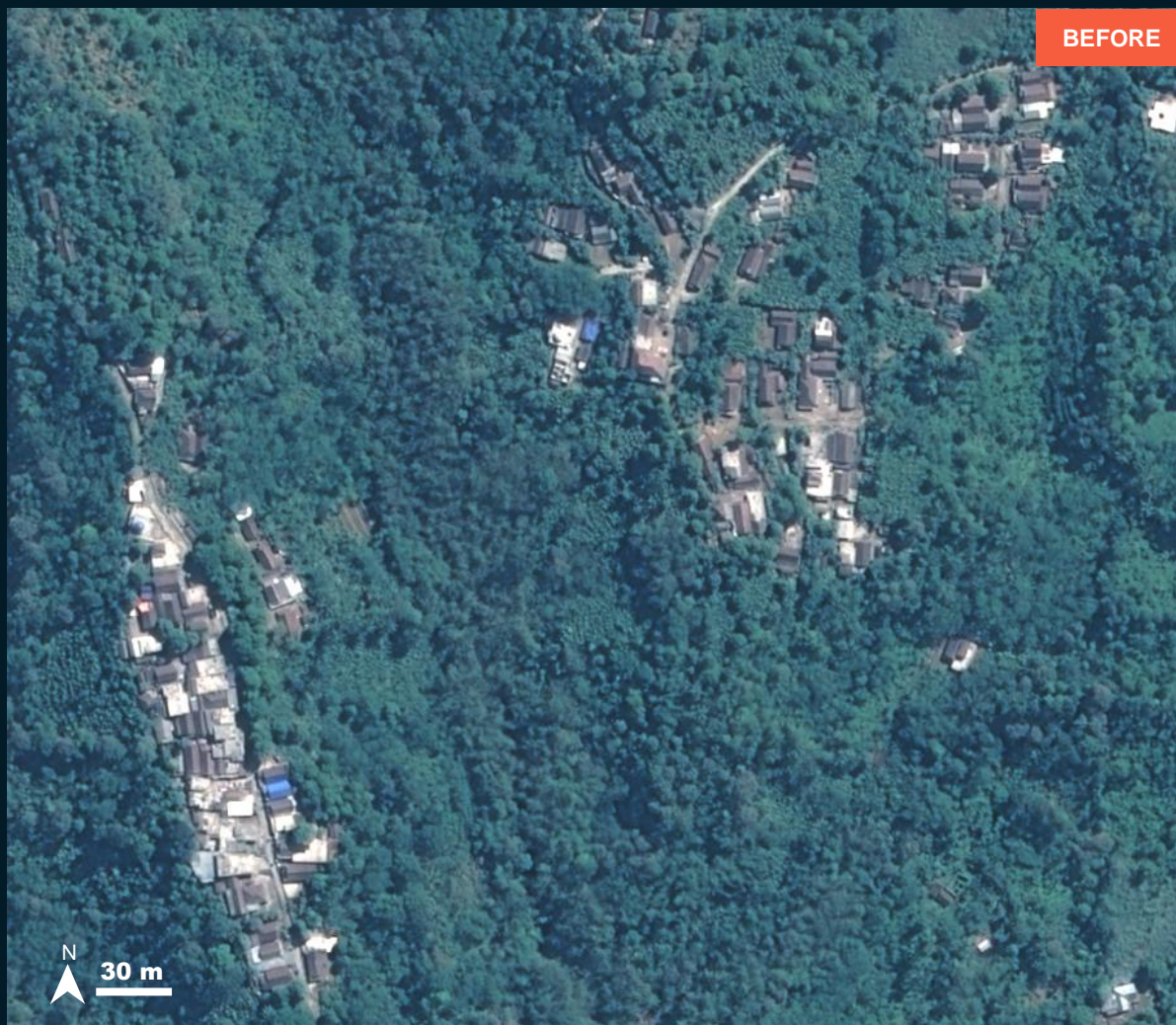
Pleiades / 10 December 2021

MOUNT SEMERU, EAST JAVA PROVINCE

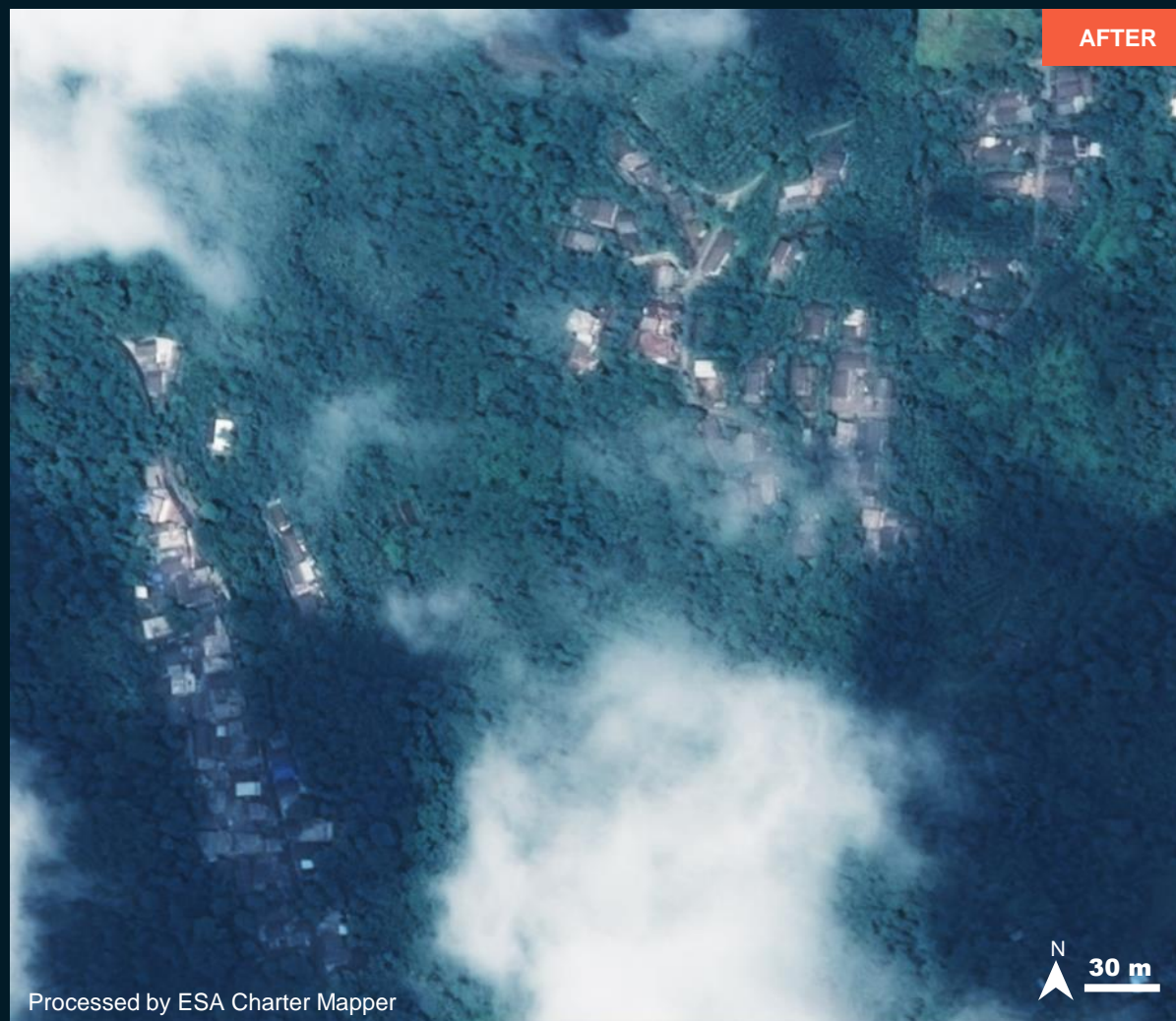
~ 10.2 km southwestern of the crater

No damage observed

Image center:
8°12'10.8"S
112°54'07.2"E



Pleiades / 24 July 2021



Processed by ESA Charter Mapper

Pleiades / 10 December 2021

SUMMARY OF FINDINGS

- Hot ash deposits observed in southeastern parts of the mount Semeru as of 8 December 2021.
- Widespread damage to houses, roads, and agricultural lands observed in Lumajang district, East Java province as of 11 December 2021.
- Gladak Perak bridge appears to be destroyed as of 11 December 2021
- Potentially affected Sumberwuluh Candipuro bridge observed as of 11 December 2021.
- No obvious widespread damage observed in the southwestern parts of the mount Semeru as of 10 December 2021.

COPYRIGHTS AND SOURCES

Data sources:

(1) Satellite Image (Post-event)

Sentinel-1 / 7 December 2021 about 10:49 UTC

Resolution: 10 m

Copyright: Contains modified Copernicus Sentinel Data [2021]

Source: ESA / The Charter

Pleiades / 10 and 11 December 2021

Resolution : 50 cm

Copyright : CNES (2021), distribution Airbus D&S

Source : Airbus DS / The Charter

(2) Satellite Image (Pre-event)

Sentinel-1 / 25 November 2021 at 10:49 UTC

Resolution: 10 m

Copyright: Contains modified Copernicus Sentinel Data [2021]

Source: ESA

Pleiades / 24 July 2021

Resolution : 50 cm

Copyright : CNES (2021), distribution Airbus D&S

Source : Airbus DS / The Charter

(3) Ancillary data

Lahar extent : National Research and Innovation Agency, Indonesia

Geological data: USAID - USGS Volcano Disaster Assistance Program

Administrative boundaries: Badan Pusat Statistik

(BPS - Statistics Indonesia)

Population data : WorldPop 2020

Analysis: United Nations Satellite Centre (UNOSAT)

Production: United Nations Satellite Centre (UNOSAT)

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