Assessment Date: March 27, 2013

HUMAN RIGHTS WATCH

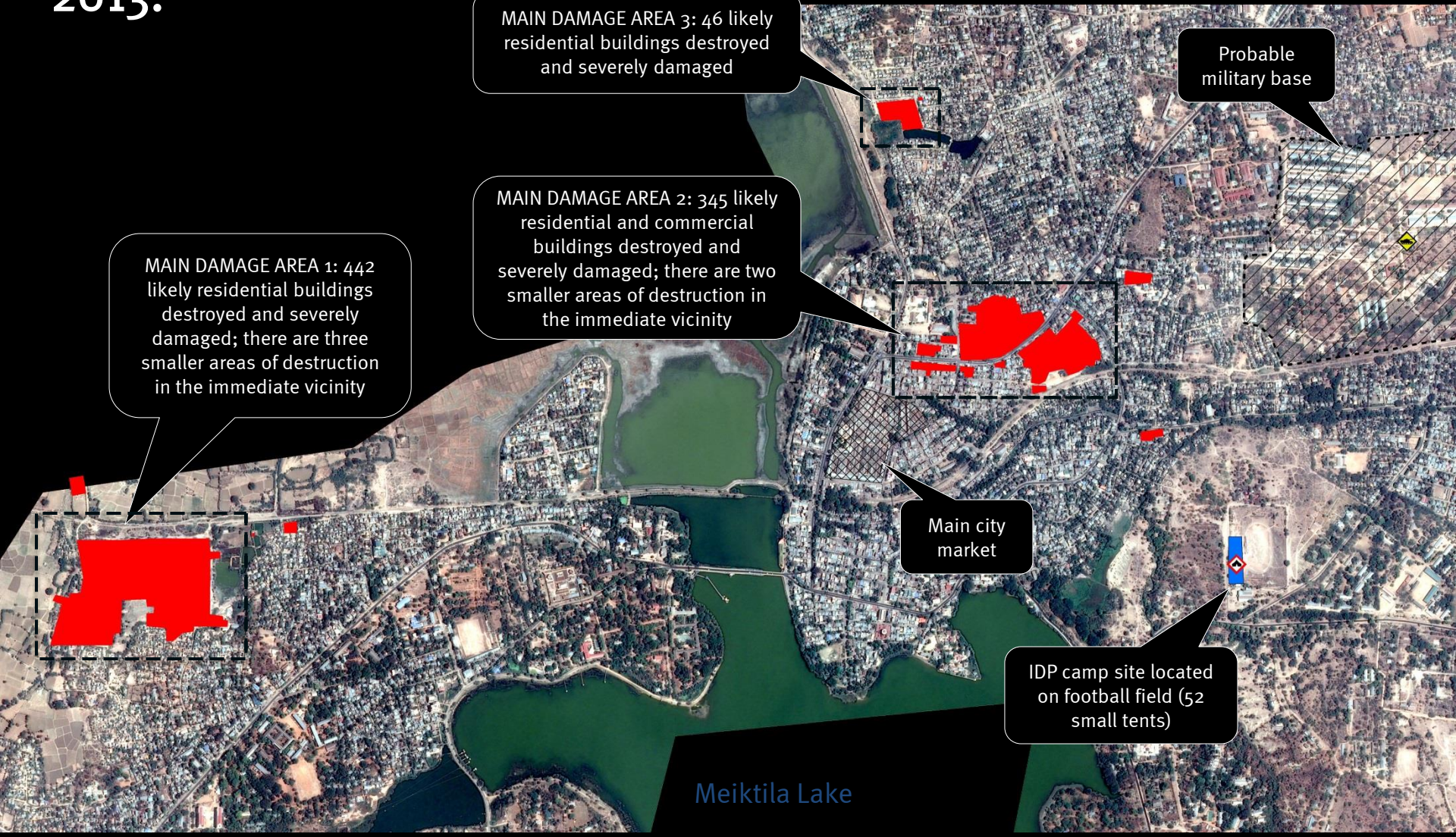
Satellite-Based Damage Assessment for City of Meiktila, Mandalay Region, Burma

(Assessment based on satellite imagery recorded on the morning of March 26, 2013)

Summary of main findings: A total of 828 destroyed and 35 severely damaged buildings were identified within the city of Meiktila (Meiktila township, Mandalay Region, Burma) likely caused by arson attacks reportedly occurring between March 20 -22, 2013. Damages are spatially concentrated within multiple areas of near total destruction measuring approximately 24.5 hectares in total area. Damages are located on both the western and eastern sections of the city, with the three highest concentrations located west and northeast of the main city market. It is likely that a small percentage of destroyed or severely damaged buildings have not been identified because of extensive tree cover. Total building damages are therefore likely to be higher. A single concentration of 52 small tent shelters likely erected for people displaced by the violence was identified on a football field located southeast of the main city market.

Damage Analysis: Human Rights Watch; Satellite Sensor: Pléiades-1A; Image Copyright: Astrium 2013; Source: Astrium

Meiktila - Overview of Building Damage Areas as on March 26, 2013:



Damage Analysis: Human Rights Watch; Satellite Sensor: Pléiades-1A; Image Copyright: Astrium 2013; Source: Astrium

City Coordinates: 20.882N 95.860E

Meiktila (Main Damage Area 1) as on December 13, 2012

(Pre-violence view of largest concentration of building damages)

Damage Analysis: Human Rights Watch; Satellite Sensor: Pléiades-1A; Image Copyright: Astrium 2013; Source: Astrium

Area Coordinates: 20.878N 95.836E

Meiktila (Main Damage Area 1) as on March 26, 2013

(Post-violence view of largest concentration of building damages)

Damage Analysis: Human Rights Watch; Satellite Sensor: Pléiades-1A; Image Copyright: Astrium 2013; Source: Astrium

Area Coordinates: 20.878N 95.836E

Meiktila (Main Damage Area 1) as on March 26, 2013

(Post-violence view of largest concentration of building damages– Damaged Buildings Annotated)

Damage Analysis: Human Rights Watch; Satellite Sensor: Pléiades-1A; Image Copyright: Astrium 2013; Source: Astrium

Area Coordinates: 20.878N 95.836E

Meiktila (Main Damage Area 2) as on December 13, 2012

(Pre-violence view of second largest concentration of building damages)

Damage Analysis: Human Rights Watch; Satellite Sensor: Pléiades-1A; Image Copyright: Astrium 2013; Source: Astrium

Satellite image has been rotated by 180 degrees to improve visualization

Area Coordinates: 20.885N 95.864E

Meiktila (Main Damage Area 2) as on March 26, 2013

(Post-violence view of second largest concentration of building damages)

Damage Analysis: Human Rights Watch; Satellite Sensor: Pléiades-1A; Image Copyright: Astrium 2013; Source: Astrium

Satellite image has been rotated by 180 degrees to improve visualization

Area Coordinates: 20.885N 95.864E

Meiktila (Main Damage Area 2) as on March 26, 2013

(Post-violence view of second largest concentration of building damages– Damages Annotated)

Damage Analysis: Human Rights Watch; Satellite Sensor: Pléiades-1A; Image Copyright: Astrium 2013; Source: Astrium

Satellite image has been rotated by 180 degrees to improve visualization

Area Coordinates: 20.885N 95.864E

Meiktila (Main Damage Area 3) as on December 13, 2012

(Pre-violence view of third largest concentration of building damages)

Damage Analysis: Human Rights Watch; Satellite Sensor: Pléiades-1A; Image Copyright: Astrium 2013; Source: Astrium

Satellite image has been rotated by 180 degrees to improve visualization

Area Coordinates: 20.891N 95.861E

Meiktila (Main Damage Area 3) as on March 26, 2013

(Post-violence view of third largest concentration of building damages)

Damage Analysis: Human Rights Watch; Satellite Sensor: Pléiades-1A; Image Copyright: Astrium 2013; Source: Astrium

Satellite image has been rotated by 180 degrees to improve visualization

Area Coordinates: 20.891N 95.861E

Meiktila (Main Damage Area 3) as on March 26, 2013

(Post-violence view of third largest concentration of building damages – Damages Annotated)

Damage Analysis: Human Rights Watch; Satellite Sensor: Pléiades-1A; Image Copyright: Astrium 2013; Source: Astrium

Satellite image has been rotated by 180 degrees to improve visualization

Area Coordinates: 20.891N 95.861E

Meiktila (IDP Camp Site) as on March 26, 2013:

(Post-violence view of IDP Camp Site located 750m southeast of the main city market)

Damage Analysis: Human Rights Watch; Satellite Sensor: Pléiades-1A; Image Copyright: Astrium 2013; Source: Astrium

Satellite image has been rotated by 230 degrees to improve visualization

IDP Camp Coordinates: 20.8773N 95.8711E

Notes on Data Sources and Methodology:

- All imagery analysis was conducted by Human Rights Watch in support of ongoing research on sectarian violence in Burma, based on a time series of two very high resolution satellite images (Pléiades-1A) recorded on the mornings of March 26, 2013 (post-violence) and December 13, 2012 (pre-violence).
- Commercial Imagery was purchased through Astrium Geo-Information Division. Imagery Copyright Astrium 2013.
- Multiple active fires were detected across the western and central portions of Meiktila at 03:35 and 06:40 UTC (March 22, 2013) by the MODIS sensor aboard the NASA satellites Aqua and Terra.
- These results are preliminary and are subject to revision or correction pending additional imagery review, new testimony and/or ground verification. It is likely that a small percent of destroyed or severely damaged buildings have not been identified because of extensive tree cover.
- Ancillary GIS data from NGA, NASA , Google and ESRI was also used.

Damage Analysis: Human Rights Watch; Satellite Sensor: Pléiades-1A; Image Copyright: Astrium 2013; Source: Astrium