ANALYSIS SUMMARY: This analysis is based on an assessment of satellite imagery recorded on 22nd September 2011 following a gas pipeline explosion that took place on 12th September 2011, within the Mukuru-Sinai slums of Nairobi, Kenya. Analysis revealed that the explosion took place in the highly congested Mukuru-Sinai slums along the river Ngongo. This is a preliminary damage assessment, and it is likely to represent a reliable minimum estimate; the actual building damages within this area are likely to be larger.
Overview of gas pipeline explosion in the Mukuru-Sinai slums of Nairobi, Kenya
By UNITAR/UNOSAT – 28 September 2011

ANALYSIS BACKGROUND: This is a satellite-based quantitative assessment of destruction of buildings caused by recent gas pipeline explosion within the Mukuru-Sinai slums near the Lunga Lunga industrial estate of Nairobi, Kenya. Satellite imageries acquired on 20 November 2010 and 22 September 2011 were used for this analysis.

ANALYSIS RESULTS:
1. Damage assessment: A time series analysis of satellite imagery acquired between 20 November 2010 and 22 September 2011 were used to assess the damages to buildings and the surrounding area caused due to the explosion of the gas pipeline. A total area of approximately 10,600 m² was found to be significantly affected. Within this zone, a total of 77 buildings were damaged, of which about 57 were destroyed and a further 20 were severely damaged. It appears that gas leaked from the pipeline into the adjacent Ngong River causing significant damage to the Ngong river system. Figure 1 illustrates the damaged zone before and after the explosion. The roofs of the damaged buildings were primarily made of iron and other metals. Apart from the damages to the buildings, the satellite image also reveals a significant contamination of the river Ngong possibly due to gas leak and other debris from the destruction zone.

Figure 1: Overview of the zones before and after the explosion
2. **Overview of the situation:** Figure 2 shows an overview of the region of Lunga Lunga industrial estate, where the explosion occurred. There appears to be a partially exposed gas pipeline leading to the slums where the explosion probably took place. It appears that some buildings in the Mukuru-Sinai slums have been built over the gas pipeline. In some parts, the pipeline also traverses close to River Ngong intersecting the residential slum. The map also reveals the KPC industries and power plants in proximity to the zone of gas explosion. The Mukuru-Sinai slums are one of the most densely populated slums in Nairobi and the access to these slums are through the Lunga Lunga road. It is estimated that there are about 3000 buildings covering an area of approximately 400,000 m$^2$ to the north of the river Ngonga and adjacent to the gas pipeline.

![Figure 2: Overview map of the region](image)

This is a preliminary analysis and has not yet been validated in the field. Please send feedback to UNITAR/UNOSAT at the contact information below.

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This pipeline, owned by the Kenya Pipeline Company Ltd (KPC), is a 450 km pipeline from Mombasa port to Nairobi (Line I), the diameter of which is about 35 cm. Based on reports accessed from KPC website http://www.kpc.co.ke/ on 27/09/2011.