

INCIDENT BRIEF

September 2025

Damage Assessment of Afghanistan's August 2025 Earthquake

Executive Summary

- On August 31, 2025, a magnitude 6.0 earthquake struck eastern Afghanistan near the Pakistan border, with a shallow hypocenter that amplified its destructive force. This was followed by several significant aftershocks, including a magnitude 5.2 event.
- The earthquakes caused widespread destruction, with approximately 8,000 buildings collapsed and over 2,200 fatalities as of September 4. Many of the victims were women and children trapped in their homes by the midnight quake.
- Satellite radar data analysis revealed up to 23 cm of ground uplift near the epicenter. Within 50 km of the epicenter, over 13,000 buildings, representing nearly 4% of the total, were partially or entirely damaged, with some villages experiencing up to 90% of the buildings collapse, leaving residents without shelter.
- The exceptionally high casualties, despite the earthquake's moderate magnitude, were caused by a combination of poor building resilience, inadequate disaster preparedness and response, and landslides that blocked aid access.
- Afghanistan's political isolation, leading to a severe reduction in international development aid, has significantly hampered both emergency response and long-term risk reduction strategies.
- Women face life-threatening barriers to medical care and humanitarian aid due to gender-based restrictions and a shortage of female health workers.

Context

On August 31, 2025, a moderate yet highly destructive earthquake struck eastern Afghanistan (Kunar Province) near the Pakistan border¹. The magnitude 6.0 quake struck just before midnight at 23:47 local time (19:17 UTC), with an epicenter in Kunar Province, approximately 27 km east-northeast of Jalalabad City. The hypocenter was located at a very shallow depth of ~8 km¹, which amplified the shaking intensity at the surface. The United States Geological Survey estimated a maximum shaking intensity of IX (Violent) on the Modified Mercalli scale in the epicentral area¹. Strong tremors were felt across a wide region, including Kabul and Islamabad, over 200 km away. The earthquake occurred as a result of thrust faulting on a plate boundary; the Indian tectonic plate is colliding with the Eurasian plate under the Hindu Kush, and this sudden slip released accumulated strain in the shallow crust¹. Several aftershocks followed, the largest being a magnitude 5.2 tremor a few hours later and another M5.2 on September 2, 2025². Notably, a second strong quake (M5.6) struck the same region on September 4 during ongoing relief efforts, causing additional alarm (though no significant new damage)³.

The physical destruction was extensive. Local authorities initially counted ~5,400 homes ruined, but later reports raised this figure to beyond 6,700 as assessments expanded³. Some sources even suggest that up to 8,000 collapsed or uninhabitable structures will be considered when all affected districts are taken into account. Also, unpaved village roads and footbridges were destroyed in landslides, and there were reports of blocked highways due to rockfalls along the steep valleys². Critical facilities, such as health clinics in these remote areas, have been damaged.

The human toll of the earthquake has also been devastating. Initial reports on September 1 indicated over 800 people killed and around 2,500–2,800 injured⁴. However, as rescue teams reached remote valleys and more bodies were recovered, the estimated death toll rose sharply. As of 4 September, Afghan authorities reported approximately 2,205 fatalities and 3,640 injured³. The vast majority of the casualties occurred in Kunar Province, particularly in five districts near the epicenter, where almost every structure collapsed⁵. Neighboring Nangarhar Province suffered comparatively fewer losses, with about a dozen deaths reported in initial tallies⁴. Tragically, many victims were women and children who were inside their homes when the quake struck at midnight⁴.

Findings

This Incident Brief by the United Nations University Institute for Water, Environment and Health (UNU-INWEH) analyzes the impacts of the recent earthquake. Surface deformation from the mainshock (M6.0, August 31) and the largest aftershock (M5.6, September 4) was mapped using Interferometric Synthetic Aperture

Radar (InSAR) processing of two Sentinel-1 image pairs acquired by the European Space Agency between 21 August to 2 September and 25 August to 9 September 2025. In addition, a preliminary estimate of building damage from the 31 August event was derived through coherence change analysis of the 21 August to 2 September pair.

The results reveal LOS uplift of up to 23 cm near the mainshock epicenter and approximately 17 cm above the largest aftershock, consistent with deformation expected from a thrust-fault earthquake mechanism. Also, a reduction in coherence is often attributed to a change in surface backscattering properties, in this case, the collapse of buildings⁶. We found that of the 359,508 buildings within 50 km of the epicenter, about 13,241 (3.7%) likely experienced partial damage to total collapse. In many villages, 90% or more of the buildings were damaged or destroyed, leaving the population homeless. The collapsed buildings were predominantly rural mudbrick or adobe houses, along with some small masonry shops and community buildings.

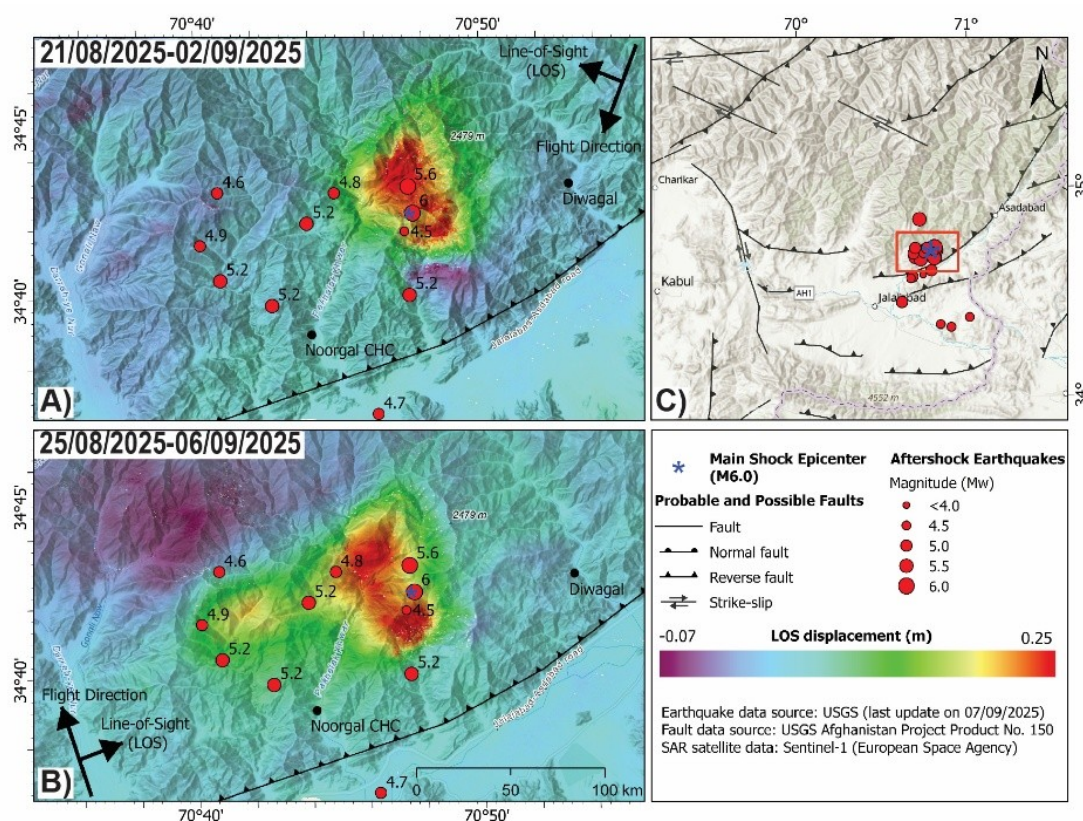


Figure A) Surface displacement derived from InSAR processing of an image pair acquired in descending orbit of Sentinel-1 satellite during August 21 to September 2, 2025. The map shows up to 23 cm uplift (positive values) in LOS at the epicenter of the August 31 earthquake. **Figure B)** Cumulative surface displacement from InSAR processing of an image pair acquired in ascending orbit of Sentinel-1 satellite during August 25 and September 6. Map shows up to 23 cm uplift in LOS at the epicenter of the August 31 earthquake and about 17 cm above the aftershock of September 4. **Figure C)** Regional seismotectonic, including active faults and largest aftershocks. Source: US Geological Survey.

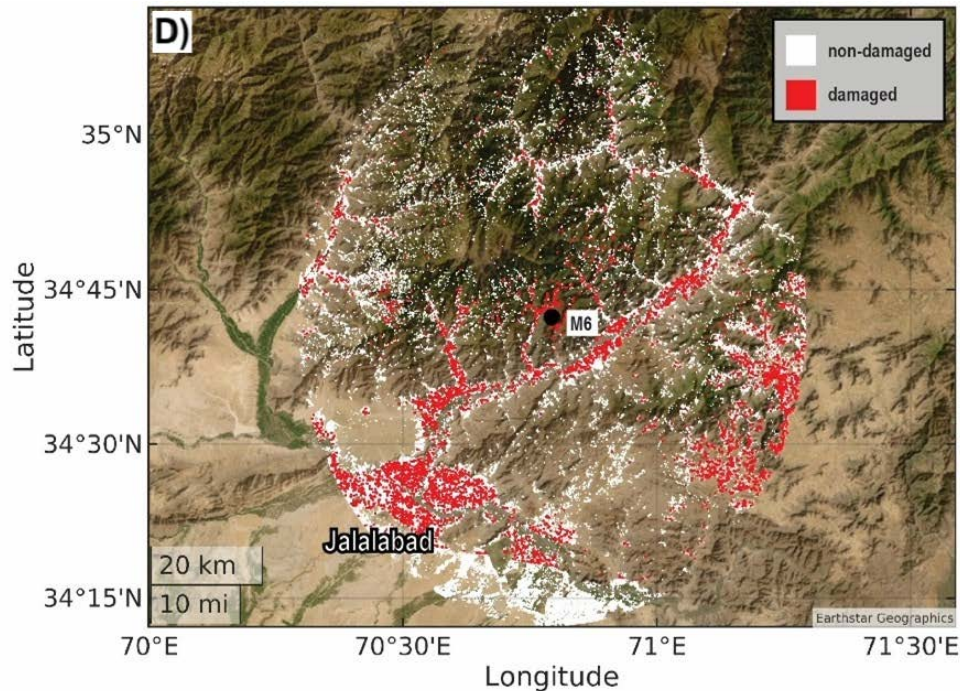


Figure D) Building damage map associated with the 31 August event, showing the location of all buildings within 50 km of the epicenter, with non-damaged buildings (white) and likely damaged buildings (red) identified from analysis of the coherence change in the pair formed using SAR images acquired between 21 August and 2 September.

Contributing Factors to High Casualties

The exceptionally high number of casualties despite the moderate magnitude of the earthquake was the result of several compounding factors, each of which amplified the human impact of the event.

Geological factors and the timing of the earthquake:

The earthquake's shallow depth and thrust mechanism caused intense ground motion directly under the populated areas of Kunar Province. With an epicentral intensity of IX¹, the shaking was severe enough to bring down even sturdier structures. Because the quake struck just before midnight, most people were indoors, asleep, and thus fully exposed to the risk of collapsing buildings. The timing meant that many did not have a chance to flee outdoors once the shaking began. Additionally, numerous survivors recount that aftershocks (including a magnitude 5+ jolt early the next morning) dealt further damage to structures already cracked by the main shock. Some buildings that survived the initial tremor later collapsed during these aftershocks, injuring or trapping residents who had re-entered to retrieve belongings or assist others.

Building vulnerability: Decades of poverty and conflict in Afghanistan have resulted in people living in buildings that are highly vulnerable to earthquakes. In the affected provinces, homes are typically constructed from mud bricks or rough stone masonry with minimal engineering². Walls are often unreinforced

and bear heavy flat roofs (e.g., made of timber and mud), which can cave in entirely when shaken. Most rural Afghan homes lack solid foundations⁷ and use sun-dried brick masonry that “crumbles like sand” under strong shaking. In Kunar’s narrow valleys, these traditional adobe structures were simply not designed to withstand any lateral seismic forces. Consequently, when the ground shuddered, entire dwellings collapsed almost instantly, causing a high fatality rate for those inside⁸. The absence of enforced building codes or earthquake-resistant design, due to weak governance and limited resources, meant that even public buildings and newer constructions did not fare much better. In short, the structural fragility of the housing stock was a primary reason a magnitude 6.0 temblor proved so deadly.

Geographic isolation: The geography of eastern Afghanistan exacerbated both the impact and the difficulty of response. The epicentral area is located in the Hindu Kush mountains, characterized by steep-sided valleys and unstable slopes. Weeks of prior heavy monsoon rainfall had saturated the soil. The quake triggered numerous landslides on these weakened slopes². Whole hillsides gave way, burying roads and hamlets in rubble. This not only caused additional casualties in a few settlements but also cut off many communities at the worst possible time. With roads blocked by landslides and bridges damaged, rescue teams and aid convoys struggled to reach the hardest-hit villages.

Political contributors: The broader context of Afghanistan's political situation has greatly influenced both the vulnerability and the emergency response⁷. Afghanistan has become more isolated from the international community after the Taliban takeover in August 2021⁹. Development aid that supported infrastructure and social services was drastically reduced or halted². This has left Afghanistan's government and population with extremely limited resources to invest in disaster risk reduction⁸. For instance, community preparedness programs and enforcement of building standards have not been priorities amid economic collapse and governance challenges. When the earthquake struck, disaster response capacity was quickly overwhelmed, and the country's isolation impeded rapid international assistance. Afghan government officials appealed for foreign aid, acknowledging that they could not cope alone². However, many countries have been hesitant to engage directly with the Afghan government authorities. Diplomatic and aid channels that existed prior to 2021 are now constrained by sanctions and non-recognition. Notably, in the wake of this disaster, no foreign government immediately sent rescue teams or direct relief, a stark contrast to disaster responses in other countries². Humanitarian agencies already on the ground (UN bodies, Red Crescent, NGOs) have mobilized, but they face funding shortfalls. International donations for Afghanistan have plummeted, from \$3.8 billion in 2022 to about \$0.77 billion in 2023, partly due to donor fatigue and frustration with certain government policies (such as bans on women's participation in aid work)². These funding cuts meant that even the UN and NGOs lacked sufficient supplies and personnel, delaying the delivery of tents, food, and medical care to quake victims¹⁰. The political isolation thus directly translated into slower and smaller-scale emergency response, which likely contributed to higher mortality in the crucial first few days after the quake.

Socio-economic factors: Chronic poverty and decades of war have made the Afghan population extremely vulnerable to disasters¹¹. Many families in Kunar live in marginal conditions and had no choice but to build inexpensive mudbrick homes on risky terrain. The lack of public awareness on earthquake safety measures or retrofitting also meant communities were unprepared⁸. After the earthquake, affected people expressed feelings of helplessness and abandonment. Survivors noted that they "spent the whole night looking for help" in vain, and some feared that those "behind the mountains [were] dying in silence" without the world's knowledge⁴. This underscores a psychological impact: the impression among locals that, due to Afghanistan's political situation, help might not arrive or would arrive too late. Such despair can compound the disaster's toll, as people may not know where to turn for assistance. Furthermore, social norms under

the current regime (e.g. women needing male escorts to travel) could hinder some survivors from promptly accessing aid or medical care. In summary, pre-existing societal vulnerabilities and the population's mistrust of any effective government support amplified the earthquake's human impact.

Disproportionate impact on women and girls:

Women and girls face unique and amplified challenges due to a system of gender-based restrictions. The most critical issue for women survivors was the lack of adequate medical care and the barriers to accessing humanitarian aid¹². Under current government practices, women are prohibited from receiving treatment from male doctors unless a male chaperone accompanies them. This restriction, combined with a severe shortage of female healthcare workers, worsened by the ban on women's medical education, creates life-threatening delays. In addition, the restrictions on women's public presence and interaction with unrelated men prevent them from easily requesting help or receiving supplies from male aid workers¹². The ban on Afghan women working for many humanitarian organizations has further crippled the aid response, as the shortage of female humanitarians severely limits safe and direct access to affected women and girls.

Final Remark

The tragic outcome of this moderate earthquake reveals urgent policy lessons for both Afghanistan and the international community. This disaster was not merely a natural event but a stark revelation of geopolitical and socio-economic vulnerabilities. A disaster of this scale in a fragile state demands a combined approach of improving local resilience and adapting to international engagement.

Reducing building collapse risk is critical. Low-cost measures, such as reinforcing mudbrick walls with timber, steel, or wire bands, and utilizing lightweight roofs, can significantly enhance seismic safety. Training programs for builders and homeowners should incorporate both traditional methods (e.g., wood lattice) and modern engineering principles. Public campaigns on retrofitting and reconstruction tied to "build back better" principles can ensure safer housing. Over time, adopting seismic codes in cities and towns will be vital, supported by political will and international aid. Donors and NGOs can help by subsidizing safer materials, such as cement and rebar, for rural communities.

The deployment of seismic monitoring infrastructure, including seismometers and GNSS stations, in seismically active regions (i.e., Kabul, Herat, and the northeastern region) can significantly strengthen long-term monitoring efforts and research capacity.

Such networks provide localized insights into fault dynamics, enabling the identification of zones that are most vulnerable to seismic hazards.

The aftermath of the recent earthquake revealed major gaps in preparedness to meet the challenges posed by natural calamities to human life and property. Afghanistan, with international support, should invest in community-based disaster response by training villagers in first aid, search-and-rescue, and evacuation drills. Local volunteer teams, equipped with basic tools and pre-positioned supplies (tents, food, water, and medicine), can provide immediate relief in remote areas. Infrastructure upgrades, roads, communications, footbridges, and retaining walls would ease aid delivery and reduce hazards. Strengthening meteorological and geological agencies to monitor landslides and floods would enhance early warning systems and protect quake-affected communities.

Afghanistan's quake also highlights a policy dilemma: aiding people under a sanctioned government. Humanitarian exceptions must override politics in disasters. Global actors should establish rapid aid protocols through neutral intermediaries (e.g., the UN, the Red Crescent). The authorities must ease access, including lifting bans on female aid workers that restrict the access and activities of non-governmental organizations and volunteers. Constructive engagement, linking disaster aid to guarantees of safe and equitable operations, could build trust without requiring political recognition. Neutral corridors and local partnerships can ensure assistance reaches those most in need.

Afghanistan, a highly earthquake-prone country and increasingly vulnerable to geohazards, must be integrated into global disaster risk reduction efforts, despite its isolation. Frameworks like the Sendai DRR¹³ should include Afghanistan in their training, knowledge-sharing, and funding efforts. A transparent resilience fund could support hazard mapping, safer schools and clinics, and community education. Investment in monitoring (seismic stations, satellite remote sensing) is vital to guide planning and relocation. Reducing casualties requires addressing root vulnerabilities, poverty, weak infrastructure, and governance, while leveraging each disaster, such as the 31 August 2025, earthquake, as a catalyst for safer housing and international cooperation.

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doi: 10.53328/INR25MSIR002
ISBN: 978-92-808-6130-0

Disclaimer: The views and opinions expressed in this paper do not necessarily reflect the official policy or position of the United Nations University.

Recommended Citation: Shirzaei, M., Daqiq, M. T., Lucy, J., Werth, S., Sharma, R., Velasco, M. J., Matin, M., Madani, K. (2025). Damage Assessment of Afghanistan's August 2025 Earthquake. United Nations University Institute for Water, Environment and Health (UNU-INWEH), Richmond Hill, Ontario, Canada, doi: 10.53328/INR25MSIR002.