Shock Trend Analysis – AFG2313

Methodology Note

Afghanistan | April 2025

Afghanistan is facing a deepening humanitarian crisis, where according to a UNDP report, 85% of the population lives below the poverty line, surviving on less than $1 per day.[1] As projected by the HNRP 2025, an estimated 22.9 million people will require humanitarian assistance in 2025.[2] Additionally, based on the IPC classification in October 2024, around 14.8 million people are facing high levels of acute food insecurity.[3]

Given these figures, the people of Afghanistan are overwhelmed by exposure to multiple shocks, which continue to worsen existing vulnerabilities in their communities. According to MSNA data from 2024, about 95% of households reported experiencing at least one disruptive event in the 12 months preceding data collection.

Background

Afghanistan, due to its geographic location and socio-economic context, is among the countries regularly exposed to a wide range of shocks. In the current constrained environment, these shocks further exacerbate humanitarian needs and undermine the coping capacity of affected communities.

To monitor shock occurrences across the country, REACH and WFP established the Shock Monitoring Index (SMI)[4] in 2023. The SMI is framework that aims to systematically track and analyze the incidence, interplay, and severity of various shocks, such as conflict, natural hazards, and displacement, with a detailed focus on the district level. By leveraging advanced data analysis and remote sensing technologies, the SMI provides monthly updates, enabling a nuanced understanding of the evolving risk landscape.

Since the launch of SMI in April 2023, REACH has recommended using the SMI data, along with other available data sources, to conduct a sensitivity analysis and thresholds review of the SMI. This analysis aims to offer more contextualised insights into the nature of the shocks and effectiveness this system.

Key Objective

This anlaysis seeks to evaluate the current Shock Monitoring Index (SMI) thresholds to improve the detecton of varying shock severity levels more effectively.

[1] UNDP, https://www.undp.org/stories/approximately-85-percent-afghans-live-less-one-dollar-day
[2] HNRP-2025: https://www.unocha.org/publications/report/afghanistan/afghanistan-humanitarian-needs-and-response-plan-2025-december-2024
[3] IPC, Afghanistan: Acute Food Insecurity Situation for September - October 2024 and Projection for November 2024 - March 2025 | IPC - Integrated Food Security Phase Classification
[4] SMI, https://repository.impact-initiatives.org/resources/view-resource/?id=68935

Methodology Overview

The shock and trend analysis mainly relies on the shock events already monitored and detected by the SMI, since April 2023. SMI monitored both occurrence and severity of the shocks in 5 pillars,[5] which include Conflict, Disease Outbreak, Displacement, Natural Hazards, and Market.

SMI thresholds review (Sensitivity Analysis)

Since the launch of the SMI the REACH RTM team, with support from the Assessment and Analysis Working Group (AAWG), has continuously reviewed the efficiency of the framework in detecting and categorizing shocks. This process includes regularly evaluating the thresholds used to define the severity of shocks.

As part of this ongoing effort, this study will conduct a comprehensive review of the current SMI thresholds by analyzing historical shock data. The review will leverage secondary datasets such as the Multi-Sectoral Rapid Assessment Form (MSRAF) and natural disaster reports from OCHA. By comparing the magnitude and impact of shocks captured in these datasets with the SMI's thresholds, we aim to assess how well the current thresholds align with real-world outcomes.

This analysis will help determine whether the existing thresholds accurately reflect the severity of shocks. Based on this evaluation, the study will recommend adjustments or the establishment of new thresholds to improve the SMI's ability to capture the true impact of shocks on affected communities. Additionally, other sources, such as news outlets and relevant articles, will also be reviewed to provide further context and insights into the evolving severity of shocks.

For example, Table 2 lists recorded earthquakes in Afghanistan from recent years, along with their corresponding SMI severity values. Earthquakes are monitored under the SMI as a sub-pillar of Natural Hazards, alongside other sub-pillars such as Drought, Flooding, and Winter Conditions.

To evaluate the effectiveness of the thresholds, each incident is assessed based on the Modified Mercalli Intensity (MMI) magnitude reported by the United States Geological Survey (USGS), the number of casualties (deaths and injuries), and how well the SMI thresholds correspond to the magnitude and

[5] The SMI initially consisted of 6 pillars. During severity component development, the RTM team and AAWG members decided to exclude the "Policy-Access" pillar, as this pillar was not life-threatening. NB: this pillar still exists in the occurrence component, which is consistently sharing with WFP each round.

classification of the shock. If any discrepancies arise between the earthquake MMI, casualties, and threshold categories, suggestions for updating the thresholds can be made.

The current earthquake thresholds in SMI are as follows:

Table 1: SMI thresholds for MMI magnitude of earthquake

Severity	Earthquake intensity (MMI)
Very High	MMI >= VI
High	V <= MMI < VI
Moderate	IV <= MMI < V
Low	MMI < IV

Table 2: List of earthquakes[6] recently happened in Afghanistan and corresponding SMI severity

Date	Province - District	Deaths	Injuries	MMI	SMI Severity
2023-10-07	Herat – Zindajan	1480	2400	VIII	Very High (4)
2023-03-21	Badakhshan – Yamgan	21	424	V	High (3)
2022-09-06	Badakhshan – Teshkan	6	9	III	Low (1)
2022-09-04	Kunar – Nurgal	18	42	VII	Very High (4)
2022-07-18	Khost – Spera	0	44	V	High (3)
2022-06-21	Khost – Spera	1163	2976	VIII	Very High (4)
2022-02-05	Badakhshan – Zebak	3	0	IV	Moderate (2)
2022-01-17	Badghis – Qadis	30	49	VI	Very High (4)
2018-01-31	Badakhshan - Yamgan	2	22	VI	Very High (4)

Based on the above thresholds and the comparison with SMI severity, incidents like Herat-Zindajan and Khost-Spera, both with an MMI of VIII, are appropriately classified as Severity 4, the highest in the SMI. The number of casualties also supports this classification, indicating a major disaster. Similarly, events like Kunar-Nurgal (MMI VII) and Badghis-Qadis (MMI VI) align with expected severity levels.

A point of concern arises with the Badakhshan-Teshkan event, which had an MMI of III but resulted in many casualties. Despite this, SMI classified it as Low (1), suggesting no significant shock. This discrepancy in the SMI system would suggest to further review with more records in this magnitude, if more evidence indicate minimal casualties then the threshold need to adjust and apply changes to include it in at least Moderate (2) level of shock severity.

[6] Afghanistan Earthquake List, https://en.wikipedia.org/wiki/List_of_earthquakes_in_Afghanistan

Data Sources

Table 3: Data sources

Dataset	Data Collection Method	Source	Availability
Shock Monitoring Index (SMI)	Secondary Sources, Remote Sensing, KI interview	REACH	Apr 2023 – now
Whole of Afghanistan Assessment (WoAA)	Annauly – HH level - Multisectoral	REACH	2019 - now
Humanitarian Situation Monitoring (HSM)	Quarterly – KI level – Multisectoral	REACH	
MSRAF	Community KI level	IOM	2023 - now
IOM Climate Vulnerability Assessment 2024-12	Community KI level	IOM	2024
OCHA Disaster Incidents	District level	OCHA (Field offices)	2024, 2025

Limitations

SMI has been operational since April 2023, which is a relatively short timeframe for conducting a robust sensitivity analysis[7], in addition limited availability of alternative sources that capture the evidence face us with major challenge. For example, in market pillar, there are no dedicated source other than used in SMI that comprehensively monitor market prices[8] or disruptions to compare against the SMI records. As a workaround, indicators from HSM are used to identify any spike in market volatility. However, these indicators are KI based.

Similarly, for the conflict pillar, the situation is even more constrained. Reliable and publicly available sources that objectively record events are scarce. The sensitivity of such information often results in making it difficult to validate SMI data through external references. To address these challenges, the study will complement existing datasets with media and news reports. This will help compile a comparison list for evaluating SMI shocks, particularly for pillars where institutional data is lacking or inaccessible.

[7] For certain pillars particularly natural hazards the availability of historical data allows for retrospective analysis that can extend the timeline beyond the initial SMI launch.
[8] Two sources used in SMI market pillar, Jointly Market Monitoring Initiative (JMMI) from REACH and Vulnerability Analysis and Monitoring (VAM) from WFP.