

BĀRĀN (Balkh Rain Network) A Citizen Science-Based Rainfall Monitoring Pilot in Northern Afghanistan

Progress Report (January 2026 - March 2026)

SmartPhones4Water (S4W)

Expanding Citizen Rainfall Monitoring in Northern Afghanistan

Over the past three months, the BĀRĀN (Balkh Rain Network) project has continued to strengthen community-based rainfall monitoring in northern Afghanistan. Despite the country's limited meteorological infrastructure, our citizen science network is steadily producing valuable local climate observations that help fill important data gaps.

During this reporting period, our network expanded and continued to deliver consistent daily observations. With the dedication of our citizen scientists, we collected approximately 2,160 rainfall observations from 24 stations, recorded on a daily basis. These data points contribute to improving local understanding of rainfall variability in a region where reliable ground measurements have been extremely scarce.

A particularly encouraging development has been the continued growth of our community observer network. Over the past quarter, the BĀRĀN network expanded beyond Balkh city and now covers two important watersheds: the Balkhab Watershed and the Khulm Watershed. During this period, 11 new citizen scientists joined the network, allowing us to broaden our rainfall monitoring coverage across additional locations. These volunteers receive simple rain gauges along with training on how to accurately measure rainfall and share their observations through mobile phones. Their contributions play a vital role in strengthening local climate data collection in a region where ground-based observations remain extremely limited.

Citizen Scientists-Based Water Data

Operating a scientific monitoring network in Afghanistan today comes with significant challenges. Restrictions on many forms of public participation, especially for women, have created difficult conditions for community engagement in scientific activities.

Despite these limitations, we are proud to share that two of the newly joined observers are women who are bravely contributing as citizen scientists. Under the current regime, many forms of women's participation in work, education, and public activities are heavily restricted. Nevertheless, these women continue to support environmental monitoring from their communities by recording daily rainfall observations.

Their participation highlights the resilience and commitment of Afghan communities to contribute to climate knowledge, even under difficult circumstances. It also demonstrates the unique potential of citizen science to create small but meaningful opportunities for engagement in environmental research.



Why This Data Matters

Rainfall is one of the most critical environmental variables affecting agriculture, water resources, and livelihoods in Afghanistan. However, the country's formal meteorological observation network has deteriorated over decades of conflict and institutional disruption.

By empowering local volunteers to measure rainfall with low-cost instruments, the BĀRĀN network is helping rebuild an essential source of environmental information. These observations support research, improve understanding of climate variability, and can eventually contribute to better water management and disaster preparedness.

How It Worked

24

Monitoring Sites

Spread across rural and urban districts of Balkh Province

24

Citizen Scientists

Trained community members recorded rainfall each day

Smartphones

for data reporting

Data submitted via ODK Collect, an open-source smartphone app

3 Months of Monitoring

Daily observations collected from January 2026 to March 2026

~2160

Daily Rainfall Records

Consistent daily submissions verified, and quality checked

Low-cost

Model

Cost per observation: ~\$1, proving affordable and effective

What We Learned

Rainfall monitoring is possible—even in fragile settings



Local volunteers submitted rainfall data consistently, achieving a 96% daily reporting rate across 24 sites.

Ground truth matters



Citizen data helped identify where satellite estimates (CHIRPS) were inaccurate—especially in capturing light rainfall or mountainous areas.

Simplicity works



Low-tech tools, minimal training, and regular check-ins created a reliable, low-cost monitoring system.

Youth engagement is key



Younger volunteers showed the highest consistency, especially when recruited through personal networks.

Cost-efficient data collection



The entire project operated on ~\$2,100, averaging ~\$1 per data point – far less than traditional weather stations.

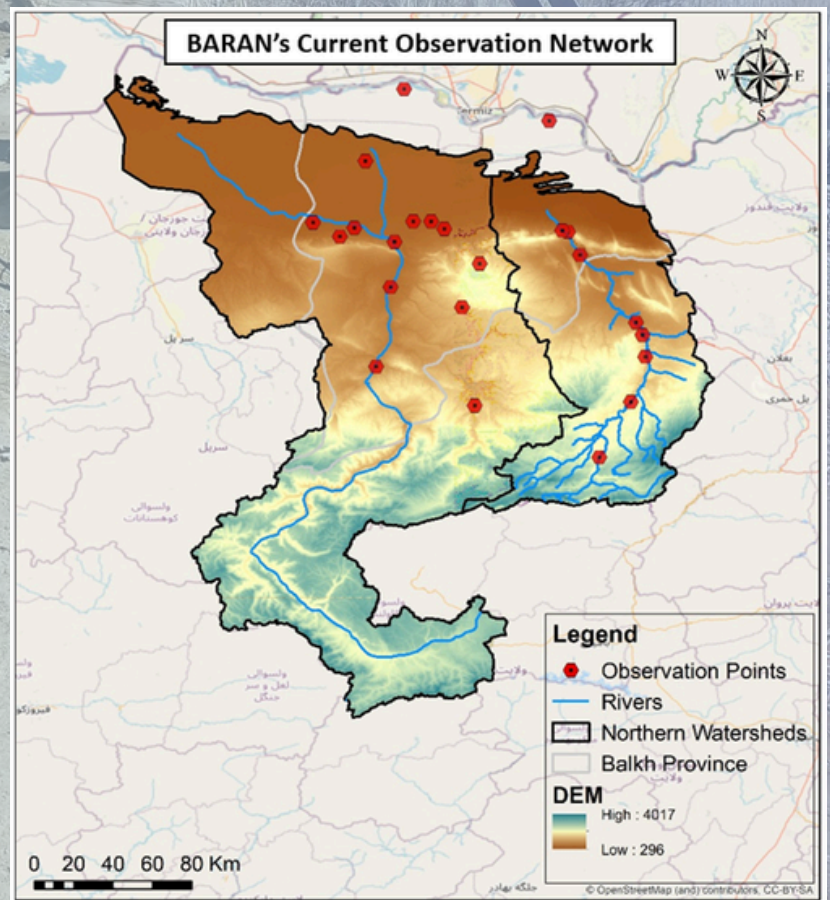
Looking Ahead

With additional support from donors, we aim to expand the BĀRĀN network further across northern Afghanistan. Future funding will help us:

- Install additional rainfall monitoring stations
- Train and support more citizen scientists
- Improve data management and quality control
- Encourage greater participation of women in community-based environmental monitoring

Every contribution helps us strengthen this grassroots scientific network and build a more complete picture of Afghanistan's changing climate.

We are deeply grateful to everyone who supports this initiative. Your generosity makes it possible for local communities to contribute directly to rebuilding Afghanistan's climate observation capacity.



Thank you for being part of this effort.

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