AVALANCHE FORECASTING IN AFGHANISTAN, PAKISTAN, AND TAJIKISTAN

A 100+ year avalanche cycle hit the Panjshir Valley of Afghanistan in February 2015 killing close to 200 people in one night. Survivors stand atop their home in a village that was hit from climax slides.

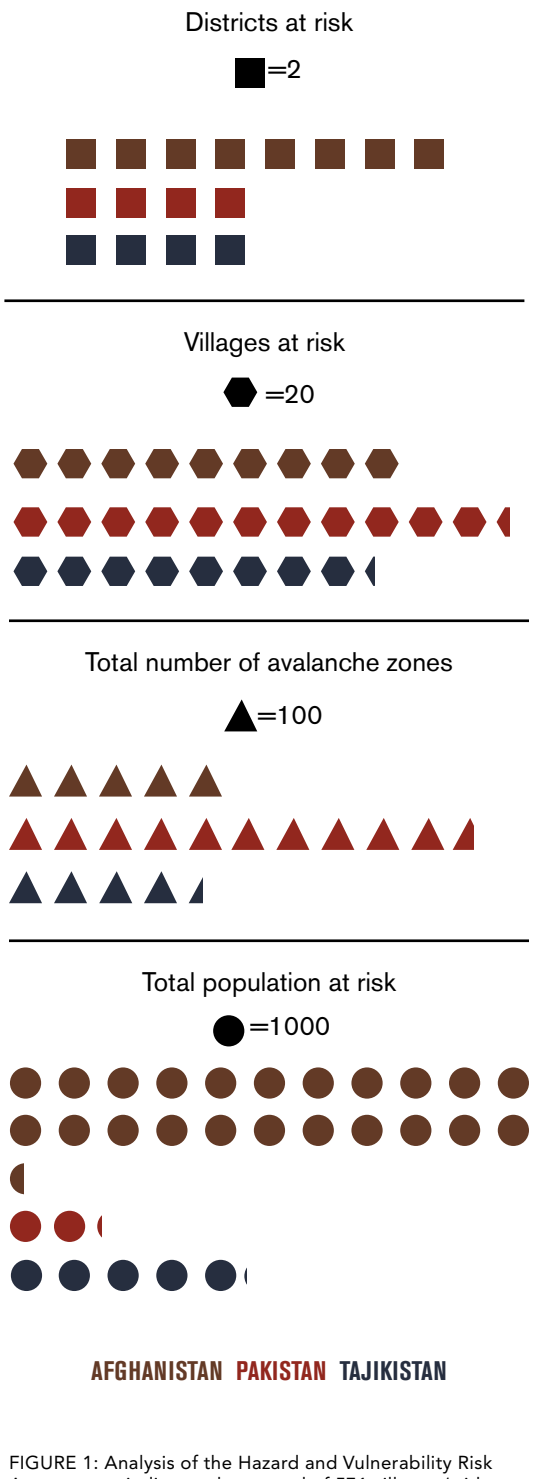

FIGURE 1: Analysis of the Hazard and Vulnerability Risk Assessments indicates that a total of 571 villages (with a population of 29,889, 75% in Afghanistan) are prone to avalanches across the three countries.

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Home of the Karakorum, Hindu Kush, and Pamir mountains, Central Asia has a serious avalanche hazard. Mountain communities throughout Pakistan, Afghanistan, and Tajikistan experienced a widespread avalanche cycle in March 2012 and again in February 2015 that destroyed villages, killed livestock, and took the lives of hundreds of residents. In March 2012 an avalanche destroyed a village in the Badakhshan province of Afghanistan, killing at least 50 people. A week later an avalanche buried 13 families in eastern Nuristan province in Afghanistan, killing at least 45 people. A week later an avalanche killed four and injured three members of the same family in a remote village in northwestern Pakistan. The valley received heavy rain and snowfall over the 48 hours prior to this event. Five members of another family were killed by an avalanche on the same night near Chitral in Pakistan. As a result of record snowfalls, nearly twenty avalanches struck villages throughout southern Tajikistan during the last two weeks of March 2012, damaging and destroying several houses and other facilities and killing at least one person and fifty cows.

Focus Humanitarian Assistance (FOCUS), an affiliate of the Aga Khan Development Network, is a disaster risk management agency that helps vulnerable communities build resilience to natural and man-made disasters, mostly in south and central Asia. In response to the 2012 avalanche tragedy, FOCUS asked me to develop a strategy to reduce avalanche fatalities in these remote areas. The developed world has the financial and technical resources to effectively manage avalanche risk, but this is not the case in the rugged mountains of Central Asia. The avalanche problems are unique and deadly, requiring simple, sustainable, and inexpensive solutions.

First, using data from previous disasters, FOCUS conducted a hazard, risk, and vulnerability inventory in their area of operation in Afghanistan, Pakistan and Tajikistan, revealing 571 villages with a high avalanche risk *(Figure 1)*. Then I trained their field staff in basic avalanche awareness and created weather and avalanche alert thresholds *(Figure 2)* to warn them of impending danger. These thresholds trigger a response of contacting both their national weather service and me to help them determine if evacuations are needed.

FIGURE 2

In 2014 I wrote a community training manual on avalanches which has since been translated from English into Urdu and Dari. It was written to educate and train community members in the 571 high risk villages. The manual has seven chapters, each explaining a topic relevant to community members about avalanches. Even for the uneducated, the manual has sections of hands-on activities for trainers to teach avalanche basics.

For the 2015-16 season, FOCUS established Weather Monitoring Posts (WMPs) to aid in avalanche forecasting for the highest-risk villages. A total of 82 WMPs were activated in January 2015 (17 in Afghanistan, 45 in Pakistan and 25 in Tajikistan). Observers record daily weather and avalanche activity. Every morning the countries central FOCUS communication center calls each observer on his cell phone and immediately posts the data online which populates a map that I look at over morning coffee. I analyze the inputs and, if necessary, advise field units about current avalanche potential. Observations include avalanche occurrence, maximum and minimum temperatures, 24-hour snowfall amount, total snow depth, wind speed and direction as well as 24-hour rainfall amount. This new community-based weather program has allowed FOCUS, along with the communities it serves, to better understand weather and avalanche patterns which have never been identified or quantified.

This holistic system of avalanche education, weather monitoring, and avalanche reporting allows me to help the field staff determine when avalanche danger is rising, when a village should be evacuated, and when people can return after an avalanche cycle. Since the program was implemented, villages have been evacuated hours before getting hit by massive avalanches, thereby saving lives. The people in these remote villages have experiences that are almost unimaginable to westerners, such as being blown to safety across rivers by the air blast of an approaching avalanche or knowing that herds of goats walking in starting zones early season (much like bootpacking) is a good thing. This entire community-based program relies on simple, low cost solutions: manual weather stations, rules of thumb, and basic avalanche awareness training at the local level. ▲

TOP: Villagers dig out homes, bodies, animals and salvage clothes in the aftermath of a large avalanche in the remote Wakhan corridor where access is only on foot.

CENTER: An avalanche in 2015 in northeastern Afghanistan hit a village that destroyed homes and killed eight, including a 12 y.o boy and an infant.

BOTTOM: Animals are the financial equivalent of a savings account. Avalanches kill many goats and cows every year, devastating the economics of a village. This avalanche was in the very remote Wakhan Corridor of Afghanistan.