Chapter 16
Community Resilience Through Local Action: AKAH's Winter Preparedness and Avalanche Readiness Programme

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Abstract Snow avalanche represents one of the dominant hazards across high mountain ranges in Central and South Asia in winter and spring seasons, resulting in loss of lives, assets and livelihood. The Aga Khan Agency for Habitat (AKAH) has prioritised 616 out of 2496 assessed settlements as high avalanche risk settlements, with over 40,000 people directly exposed across the AKAH programme areas in Afghanistan, Pakistan and Tajikistan. Between 2010 and 2021, 919 avalanche events and 362 fatalities were recorded, out of which 807 events and 109 fatalities were located in the AKAH programme areas. In response to the intense avalanche cycle in 2012, which took 148 lives across these 3 countries, FOCUS Humanitarian Assistance initiated the preparedness against avalanche hazard, which later became the AKAH's Winter Preparedness and Avalanche Readiness Programme (WPARP),

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a comprehensive multi-pronged programme, formally launched in 2017. WPARP became the AKAH flagship programme and ensured the avalanche-specific preparedness prior, during and after the avalanche season (November to March), with a positive outcome on the ground, as evident from the disaster and loss database.

The comparative analysis of the avalanche events and fatalities in the AKAH's operational and non-operational areas, and pre/post-WPARP years, indicates heightened preparedness, effective response and improved resilience. Despite the 578% increase in avalanche incidents in 2021 as compared to 2017, recorded fatalities were down by 12% in the AKAH programme areas and neighbourhood. Similarly, fatalities to event ratio, for the AKAH programme (7.4) and non-programme areas (0.4), shows a fewer number of fatal avalanche events in the programme area. The first-hand information from the ground serves as a testimony of enhanced community resilience brought about by the WPARP, directly contributing towards the first four of the seven targets of the Sendai Framework for Disaster Risk Reduction 2015–2030 (SFDRR) and indirectly contributes to central aspiration of the 2030 Agenda for Sustainable Development—"to leave no one behind". Thus, WPARP demonstrates that financing local level interventions is key to achieving global commitments.

Keywords Community resilience · Avalanche · Institutional preparedness · Risk anticipation · Prevention

16.1 Introduction

The term "resilience" is derived from the Latin word resilire (rĕsĭlĭo, rĕsĭlis, resilui, rĕsĭlīre; resilĭens -ĕntis), meaning the act of rebounding, i.e. to rebound/recoil, from "re-" back + "salire" to jump, leap (Indirli 2019; Klein et al. 2003). It is a multidimensional term having different connotation according to field of research (Indirli 2019; MacAskill and Guthrie 2014; Alexander 2013; Fleming and Ledogar 2008). Found for the first time in several Latin authors, the term "resilience" passed through medieval culture until intellectuals who strongly contributed to the birth of the modern scientific method (as Francis Bacon), nineteenth-century encyclopaedists, the Rankine's quantitative definition in engineering and finally to psychology, anthropology and ecology, with the fundamental Holling's contribution in 1973. In the last decades, the concept expanded quickly into social-ecological systems, disaster/risk assessment, sustainability, and adaptive capacity to cope with catastrophic scenarios. Nowadays, multidisciplinary scientists and representatives of public/private organisations largely use the term "resilience", but with increasing ambiguity about its properties and attributes (Indirli 2019). The term is said to have made the transition from material science, psychology, ecology, social sciences, development aid and economics and study of organisation (Combaz 2014). The modern resilience has a root among psychologists and psychiatrists (Fleming and

Ledogar 2008; Alexander 2013), used to describe differing degrees of psychological vulnerability to abrupt shocks (Alexander 2013). The concept of resilience entered the field of disaster risk management about three decades ago (Irajifar et al. 2013; Indirli 2019). Today the word "resilience" is widely used in disaster management, and it is mostly found in conjunction with the term "disaster", as disaster resilience. The UNISDR definition of resilience is "The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions" (UNISDR 2009). This paper presents the AKAH's Winter Preparedness and Avalanche Readiness Programme (WPARP) as a case of multi-pronged programmatic approach to enhance the community resilience to avalanches. The paper elaborates how AKAH's WPARP ensures sustained engagement to enhance four resilience capacities of the vulnerable communities (ESCAP 2018): anticipatory capacity, absorptive capacity, adaptive capacity and transformative capacity. The analysis of disaster and loss records of the recent past is presented as a first-hand data as a testimony of the positive impact on the ground.

16.2 The Aga Khan Agency for Habitat (AKAH)

The need for an integrated and holistic disaster risk reduction (DRR) programme to deal with increasing threat in the face of climate change is the premise on which the Aga Khan Agency for Habitat (AKAH) was founded in 2015. Five different organisations (Aga Khan Development Network, AKDN; Aga Khan Planning and Building Services, AKPBS; Focus Humanitarian Assistance, FOCUS; Prince Sadruddin Aga Khan Fund for the Environment, PSAKFE; Disaster Risk Management Initiatives, DRMI; and Programme Management Office, PMO) were integrated to establish AKAH—an apex agency to lead holistic approach to DRR and Climate Change Adaptation (CCA) programmes. Currently, AKAH is operational in five countries: Afghanistan, India, Pakistan, Syria and Tajikistan (Fig. 16.1), referred to as AKAH programme countries, and across specific target areas, referred to as the AKAH programme areas.

AKAH aspires to ensure "safe and sustainable habitat in which communities, families and individuals can thrive" (AKAH 2017a). This goal is realised through ensuring safe physical setting for living, improved preparedness and effective response to cope with disaster, assuring also economic opportunities and access to social and financial services for development. It is delivered through four operational themes: Safety, Resilience, Services and Opportunities; the emergency management remains at the core of AKAH's mission.

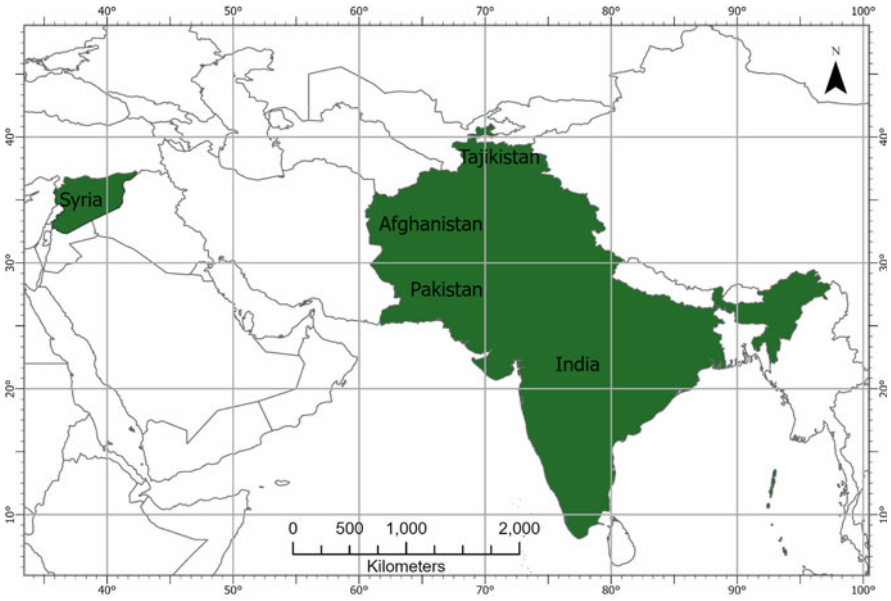


Fig. 16.1 Map showing AKAH countries in dark green colour

16.3 Snow Avalanche: Dominant Winter Hazard

The AKAH programme areas, being mostly located in the northern mountainous regions in Afghanistan, Pakistan and Tajikistan, experience heavy snowfall and regularly witness snow avalanches during winter and spring seasons. AKAH identified 616 high avalanche risk villages (217 in Afghanistan, 234 in Pakistan, and 165 in Tajikistan) out of 2496 assessed settlements, with over 40,000 people directly exposed to avalanche hazard. Through the AKAH avalanche inventory, 919 incidents and 362 fatalities were recorded between 2010 and 2021 in the AKAH programme areas and neighbourhood (Fig. 16.3a). Among the total fatalities, 299 were male and 63 were female. Of the total events, 86% occurred in the AKAH programme areas (Fig. 16.3b), and 89% of those events post-dated the AKAH's WPARP. The total events increased, while fatalities declined over the decade (Fig. 16.4). The year 2012 was exceptional with 148 fatalities that catalysed the formulation of an avalanche preparedness strategy, which finally culminated in the set-up of the AKAH's WPARP.

Climate change is expected to aggravate the hazard situation, as warmer and wetter winter will increase the avalanche frequency as well as the intensity (Ballesteros-Cánovas et al. 2018). The increase in avalanche incidents was associated with the sharp rise in temperature in Pakistan (De Scally and Gardner 1994). Figure 16.2 shows the association between snow fall amount, temperature, rainfall and avalanche incidents (Figs. 16.3 and 16.4).

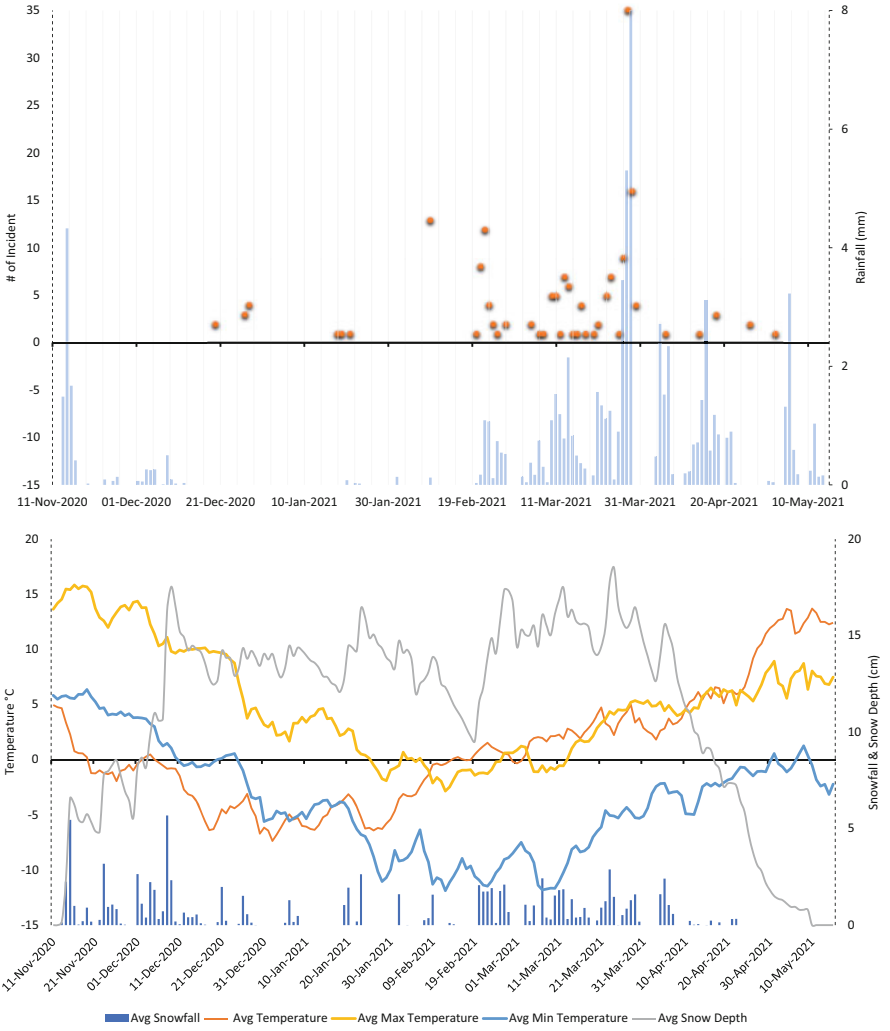


Fig. 16.2 Data from WMP maintained by AKAH indicates association between weather and snow data to avalanche events

16.4 AKAH's Winter Preparedness and Avalanche Readiness Programme

The record snowfall and subsequent cycle of avalanches, with a widespread impact and fatalities across Central and South Asia in 2012 (see Box 16.1), signed the start of the current AKAH's WPARP under FOCUS. The multi-pronged programme consisting of risk assessment, feeding into designing of village-level disaster management plan (VDMP) and implementation of series of community-based

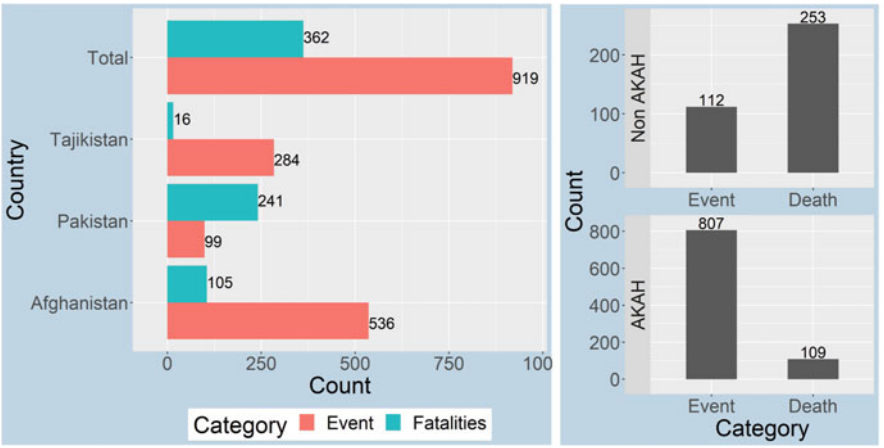


Fig. 16.3 Bar graphs showing total avalanche and fatality counts by countries (**a**) and by programme area (**b**)

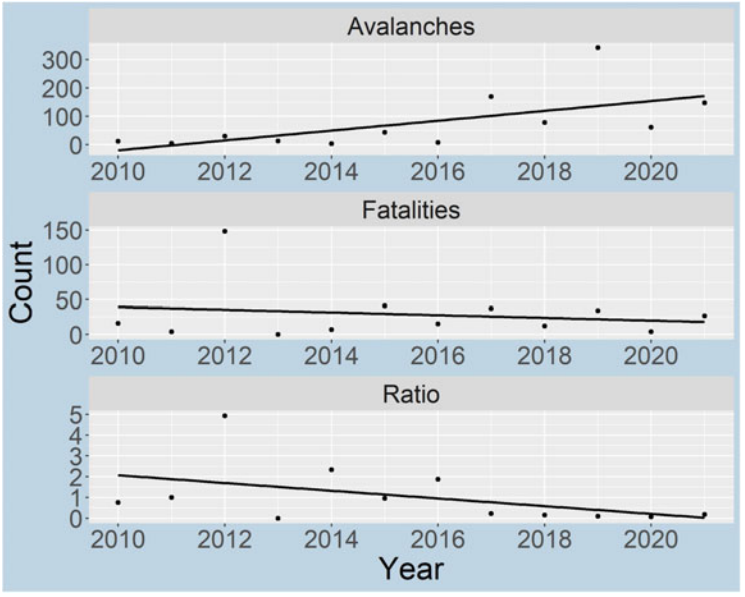


Fig. 16.4 A decade (2010–2021) long trend of avalanche (top), fatalities (middle) and ratio (bottom) using avalanche database from both AKAH programme areas and non-programme areas in the three countries

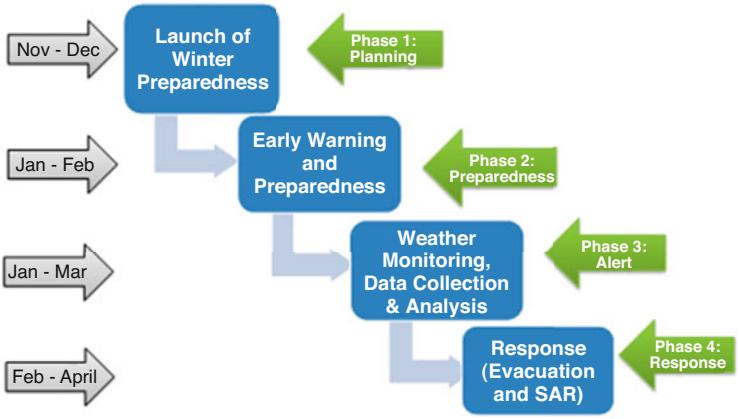


Fig. 16.5 AKAH's WPARP cycle outlining sequencing of multiple phases

interventions was formally launched across the avalanches-prone AKAH programme countries in 2017. The strategy (AKAH 2017b) puts its emphasis on the improved institutional and community preparedness for the avalanche season, starting from November to March, and articulates a sequence of activities implemented prior, during and after an avalanche season (Fig. 16.5). The operationalisation of the strategy is facilitated through the promulgation of relevant Standard Operation Procedures (SoPs) and a self-evaluation tool. The year 2017 is considered watershed year and separates the pre-programme and post-programme periods, respectively, for analysis and discussion.

Box 16.1
On March 5, 2012, an avalanche destroyed the village of Dispay in the Shukai District of Badakhshan in Afghanistan, killing at least 50 people. A week later, on March 12, an avalanche buried 13 families in eastern Nuristan province in Afghanistan, killing at least 45 people. Following week, an avalanche hit the remote Qurqulti Village in Gilgit Baltistan in Pakistan, killing four family members and injuring three of them, on March 19. Five members of another family were killed on the same night in Wakht Village in Chitral in Pakistan, when an avalanche hit their house. Nearly 20 avalanches struck villages through Badakhshan, Tajikistan, in the last 2 weeks of March the same year (2012), damaging and destroying several houses and other facilities and killing at least 1 person and 50 cows.

16.5 Programme Framework

16.5.1 Pre-Avalanche Season

The pre-emptive resource allocation and positioning of capacity enable an effective and timely response, which is critical to save lives. Therefore, the major thrust of AKAH's WPARP is the ex-ante preparedness, as elaborated below.

16.5.1.1 Identifying and Prioritising Avalanche-Prone Settlements

High avalanche risk villages are identified using a HVRA framework, similar to the one adopted in Switzerland (Raetzo et al. 2002). HVRA is a critical, scientific process that serves as the foundation for AKAH's DRR planning and programming, a multi-hazard framework implemented through a desktop-based assessment in conjunction with the community-level assessment. The settlement multi-hazard risk score is calculated on the basis of the exposure to hazard and vulnerability (AKAH 2020). As mandated by the SoP, HVRA is repeated every 3 years or immediately after an event, to ensure relevance to changing ground realities. Using the risk score, high avalanche risk villages are identified and prioritised in the AKAH's WPARP.

16.5.1.2 Village Disaster Management Plan (VDMP)

In order to build up a good situational awareness of risk faced by the community, Village Disaster Management Plan (VDMP) is prepared in close coordination with the community leaders and members, including representatives from vulnerable groups. The document identifies and elaborates the community-level risk and reduction measures, including emergency management elements. The VDMP is used as a blueprint to define and implement current and future risk reduction measures. Out of 616 high avalanche risk villages, VDMPs have been developed for 514 (83.4%) settlements. VDMPs are printed in local languages and distributed to community leaders, members and volunteers. The communities are educated and trained to use the VDMP through annual awareness exercises and drills.

16.5.1.3 Community Emergency Response Team (CERT)/Volunteers

The role of the community volunteers is indispensable in building community resilience, to prepare for and respond to disasters (Brennan et al. 2005). A total of 1434 strong specialised teams with 26,314 trained volunteers (Fig. 16.6), out of which 37% (9856) are female, forms the force behind AKAH's WPARP in these 3 countries. The Community Emergency Response Team (CERT) constitutes 65%

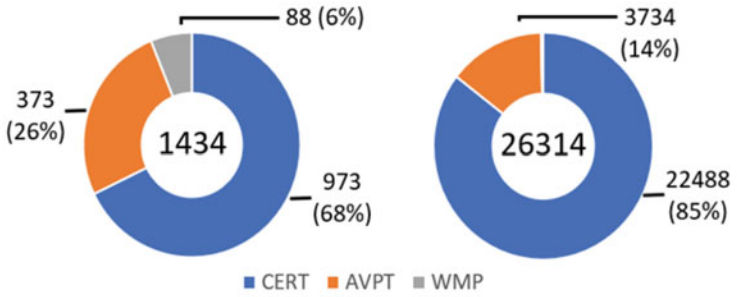


Fig. 16.6 Pie chart showing teams (left) and team members (right)

Photo 16.1 AVPT members in Nishusp village in Tajikistan practising avalanche search and rescue

of the AKAH's volunteers, and those specialised in avalanche emergencies are called Avalanche Village Preparedness Team (AVPTs, Photo 16.1) in Afghanistan and Tajikistan. There are 373 AVPTs with 3734 volunteers in these 2 countries, out of which 27% are women. These CERT and AVPT volunteers are trained on community-based disaster risk management (CBDRM), basic avalanche science, lifesaving survival techniques, first aid and search and rescue (SAR) techniques. In addition, AKAH has trained 7 Search and Rescue Teams (SARTs, Photo 16.2) with 106 members in these 3 countries, of which 29% are women. The SARTs are trained to the International Search and Rescue Advisory Group (INSARAG) standard and undergo regular practice sessions. It is an AKAH's volunteer force in Pakistan, while

Photo 16.2 SART volunteers in Gerojoi village in Dushi district of Afghanistan during search and rescue simulation

they are on AKAH's payroll in Afghanistan and Tajikistan. AKAH makes concerted efforts to make gender-friendly workspace by creating conducive environment and support systems for women to enrol. The contribution of trained volunteers represents a big part of the AKAH's WPARP success (see Box 16.2).

Box 16.2
On 3 April 2016, an evacuation of inhabitants from 3 at-risk houses by CERT and WMP volunteers took place in Shimshal village of Hunza, Pakistan; 25 lives were saved from an avalanche that struck early next morning at 5 AM, with the complete damage of one house and the partial damage of other two. Similarly, on 15 January 2019, the AVPT volunteers warned police officers in the Nivodak checkpoint of Khorog (Tajikistan) about a possible avalanche event, advising them to organise an evacuation. An avalanche occurred the same night, hitting and destroying the police base; fortunately, the timely action saved the lives of eight people. In Afghanistan, a timely rescue by SART volunteers saved five people of the Sarchashma village of Maimai district in Badakhshan, on 12 February 2020, when they were hit by an avalanche while fetching fodder.

16.5.1.4 Community Awareness and Education

The awareness generation and education on preventive measures play a decisive role in reducing risk (Shaw et al. 2009). It should be considered a real "functional, operational, and cost-effective tool for risk management" (Torani et al. 2019), acknowledged as "a crosscutting issue to achieve the four priorities" of the SFDRR (Shiwaku and Shaw 2016). Informed and aware individuals and communities are better prepared and respond timely and appropriately. If well informed about appropriate actions against risk, children can respond promptly and appropriately (Nifa et al. 2017). Without awareness of risk and preparedness activities, communities will not invest on preparedness even when capacity for investment is there. Knowledge of risk and appropriate preparedness to deal with it motivate and nudge the communities.

AKAH conducts community awareness sessions on avalanche and associated risk in avalanche-prone villages every year, before a hazard season. The community members are made aware of HVRA findings, basic avalanche science, avalanche preparedness and response, survival techniques, evacuation plan, early warning and appropriate action during emergencies. The awareness session is delivered using presentations, photographs and video clips (see Box 16.3), by training officers and geologists.

Box 16.3
Pari Gul and First Aid is a 5-minute video clip in Urdu with English subtitles, developed by AKAH in Pakistan to educate community members on how to administer first aid in different emergency situations—wound opening, fracture, chocking and unconscious state.

16.5.1.5 Emergency Communication

"Emergency communication refers to communication in the context of emergencies, disasters, catastrophes, and other crises" (Allen 2017). Timely communication is vital for the effective response and recovery. As the AKAH programme areas are located in remote mountains, devoid of any mode of communication, AKAH has invested on establishing "fail-safe communication" in the form of two or more modes of communication in high-risk villages. AKAH has trained one member of the community to operate and for the system upkeep. To ensure communication between AKAH team and communities all around the clock, a radio operator is

Modes of Communication	Answered	Switched off	Damaged	Functionality %	Total
CODAN	19	11		63%	30
VCN	64	20	4	73%	88
THURAYA	3	8		27%	11
VSAT	35	15	4	65%	54

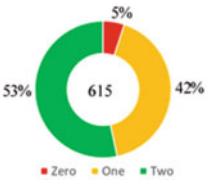


Fig. 16.7 Daily call log (25 October 2021) of emergency communication system maintained by AKAH Afghanistan (left), and number of avalanche-prone villages by modes of communication across three countries

always on standby (24/7 all year long) in AKAH office premises. Daily communication is made between the AKAH radio operator and the trained community communication person, and call log is maintained (Fig. 16.7). Currently out of 616 avalanche-prone villages, 328 villages have a dual mode of communication, 256 villages have a single mode of communication, and 31 villages are without any communication mode (Fig. 16.7).

16.5.1.6 Weather Monitoring Posts (WMPs)

A direct correlation exists between weather and snowpack parameters with avalanche events (Peitzsch et al. 2021; Dreier et al. 2013; Castebrunet et al. 2012) with large amount of new snow associated with avalanche days (Dreier et al. 2013), as evidenced in Fig. 16.2. In absence of hydro-met stations at higher altitude in remote locations, AKAH installed 88 manual weather monitoring posts (WMPs) recording temperature, snowfall days, snow depth/thickness and rainfall in the last 24 hours. Of the total WMPs, only 17% are in elevation above 3000 masl (Fig. 16.8). These WMPs are managed by trained village volunteers, who feed a daily report of snow and weather parameters to the database focal at the AKAH Country Office who populates the centralised online database. The AKAH's Avalanche Expert uses the daily local weather and snow report in conjunction with regional models, to forecast snowstorm and issue a weekly weather advisory bulletin.

16.5.1.7 Capacity Building and Drills

Experience has shown that the most effective risk reduction solutions are those implemented at the local level (Kusumasari 2010). Thus, the local capacity is indispensable to create a required ecosystem to enhance community resilience by breaking reliance and dependencies with external support systems. The AKAH's WPARP has a strong focus on the capacity building of volunteers, communities and staffs. The teams are regularly trained on weather/snow observation and recording, search and rescue and first aid. In addition, village seminars and team drills on snow probing, evacuation, first-aid, search and rescue are regularly conducted. AKAH, in

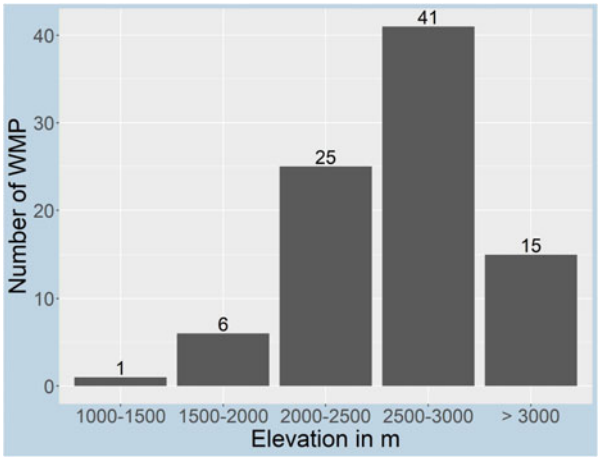


Fig. 16.8 Distribution of AKAN's weather monitoring posts (WMPs) by elevation

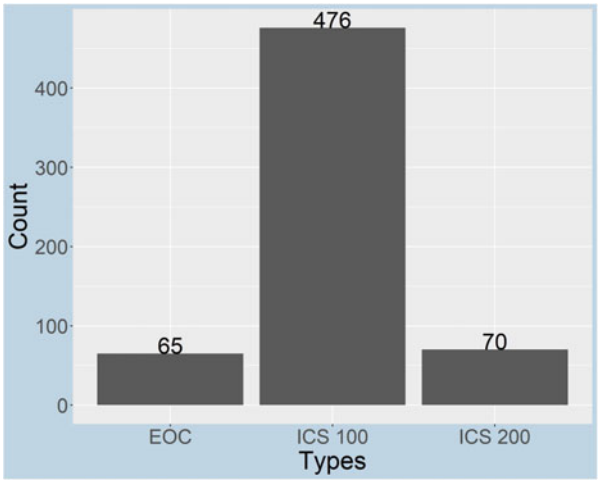


Fig. 16.9 Numbers of staffs trained on ICS and EOC in these three countries

partnership with the Justice Institute of British Columbia (JIBC), has trained key staffs and volunteers on Incident Command System (ICS) and Emergency Operating Centre (EOC) to improve emergency response (Fig. 16.9).

16.5.1.8 Stockpiles

Stockpile is a cornerstone of the emergency preparedness. AKAH's Stockpile Strategy outlines multi-tiered stockpile approach (Fig. 16.10) to improve coverages particularly in high-risk settlements. AKAH currently maintains two levels of

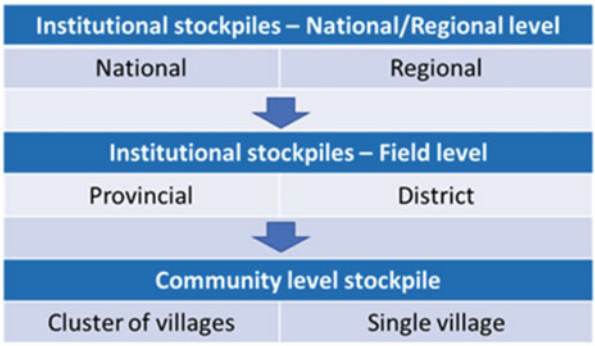


Fig. 16.10 Multi-tier stockpile approach adopted by AKAH

stockpiles: a community (village/cluster) level and an institutional (region/provincial/district) level, varying in size and management mechanism. The Institutional or Regional Stockpiles are large stockpiles established with the objective to cater to medium- or large-scale emergencies in a particular region/district. These stockpiles are owned and managed by the AKAH Country office and hence deployed at the discretion of Chief Executive Officer (CEO). The second set of stockpiles are the community stockpiles established to cater to local-level disasters affecting a village (or cluster of villages); they are typically owned and managed by the CERTs and local village leaderships. Currently, out of 616 high avalanche risk villages, 70% (434) villages have access to stockpiles within 12 hours of reach.

The stockpile strategy is operationalised through SoP which defines quality and volume of contents, upkeep procedures and calendar and access procedures, in line with international humanitarian standards. Accordingly, the assessment, inventory and, if required, replacement/replenishment of stockpiles are done annually mostly under core funding.

16.5.1.9 Mitigation Projects

Mitigation is an action taken to reduce or eliminate the risk to people and property from hazards and their effects by managing probability and consequences (Bullock et al. 2013). AKAH has implemented in the field two types of mitigation interventions; they are avalanche terracing and snow glide tripod (Photo 16.3). The terrace, with a width measuring 1.5 times the avalanche depth, is constructed across the avalanche-prone slope to capture the avalanche mass, containing its progression further down into living areas. This measure, although simple and comparatively inexpensive, has proved successful in minimising the risk. These terraces have been further fortified by planting trees in some areas. In addition to minimising an avalanche risk, terraces resulted equally effective in minimising risk from rockfalls. AKAH repairs the damaged terrace after every avalanche incident. The installation of a snow glide tripod is another mitigation project mostly implemented in Pakistan,

Photo 16.3 Avalanche mitigation interventions (terracing and snow glide tripod) implemented by AKAH Pakistan in Shershal village in district Lower Chitral

to prevent the release of snow mass and/or contain moving snow mass, by inducing surface roughness. Currently there are 59 mitigation sites across the 3 countries.

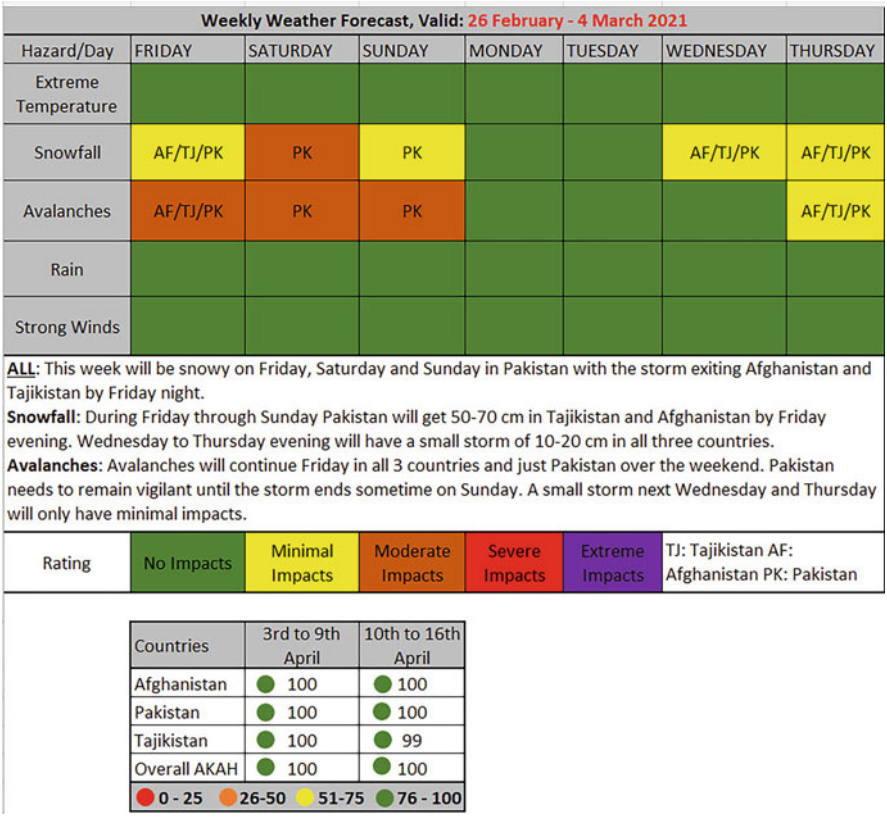
16.5.1.10 Self-Evaluation Exercise

A self-evaluation exercise is done twice: a pre-season assessment in October, followed by a post-season assessment in April. The pre-season self-evaluation exercise allows to identify existing gaps in the preparedness and work on it. It is done using a matrix scoring (from 0 to 3) 21 criteria covering 4 themes: Management, Risk Assessment and Planning, Knowledge and Education and Disaster Preparedness and Response, based on current arrangement status. Country-specific recommendations (short term and long term) are drawn out on the base of the findings of the pre-season self-evaluation exercise.

16.5.2 During an Avalanche Season

16.5.2.1 Weather and Avalanche Advisory Service

Starting in November up to March of the following year, an avalanche expert issues weekly a weather and avalanche advisory bulletin (Fig. 16.11) every Friday for the next 1 week, based on assessment using a global/regional weather model in conjunction with local weather and snow data. The forewarning is passed on to the



Weekly Weather Forecast, Valid: 26 February - 4 March 2021

Hazard/Day	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
Extreme Temperature							
Snowfall	AF/TJ/PK	PK	PK			AF/TJ/PK	AF/TJ/PK
Avalanches	AF/TJ/PK	PK	PK				AF/TJ/PK
Rain							
Strong Winds							

ALL: This week will be snowy on Friday, Saturday and Sunday in Pakistan with the storm exiting Afghanistan and Tajikistan by Friday night.
Snowfall: During Friday through Sunday Pakistan will get 50-70 cm in Tajikistan and Afghanistan by Friday evening. Wednesday to Thursday evening will have a small storm of 10-20 cm in all three countries.
Avalanches: Avalanches will continue Friday in all 3 countries and just Pakistan over the weekend. Pakistan needs to remain vigilant until the storm ends sometime on Sunday. A small storm next Wednesday and Thursday will only have minimal impacts.

Rating	No Impacts	Minimal Impacts	Moderate Impacts	Severe Impacts	Extreme Impacts	TJ: Tajikistan AF: Afghanistan PK: Pakistan

Countries	3rd to 9th April	10th to 16th April
Afghanistan	100	100
Pakistan	100	100
Tajikistan	100	99
Overall AKAH	100	100

0 - 25 26-50 51-75 76 - 100

Fig. 16.11 Weekly weather and avalanche advisory bulletin (top) issued during the avalanche season and weekly WMP performance report (bottom)

communities and community volunteers through emergency communication channels and advised accordingly.

16.5.2.2 Monitoring of WMP Performance

The reporting of daily weather and snow data from the WMPs is the critical starting point for generating a weekly advisory and the subsequent action in the ground. Thus, the report on WMP performance (Fig. 16.11) is monitored and shared every week to the management. Any issue in reporting is immediately taken up and addressed in consultation with the WMP volunteers.

16.5.3 Post-Avalanche Season

16.5.3.1 Reflection and Learning

A second self-evaluation exercise of the programme is done in early April, immediately after the end of an avalanche season in March, to reflect and learn from the season. The reflection is done in areas of four key themes as with pre-season self-evaluation template. A country-specific recommendation is drawn and followed up till the next avalanche season.

16.6 Recommendation and Conclusion

The decrease in fatalities even with an increase in events in the last decade serves as compelling first-hand evidence of the improved community resilience against an avalanche hazard, across the AKAH's programme areas in Afghanistan, Pakistan and Tajikistan. Many of the fatalities were in non-residential areas, away from the villages, mostly while commuting between the villages. Twelve out of thirteen fatalities in Tajikistan occurred in activity areas, as locals were hit by an avalanche while on their way. Despite 578% increase in avalanche incidents in 2021 compared to 2017, fatalities recorded gone down by 12% in the AKAH programme areas and neighbourhood (Fig. 16.12). Fatalities to event ratio (event divided by fatalities) shows one death for eight events in the AKAH programme areas, while one death for one event in the non-programme areas. The same analysis for pre- and post-WPARP years in the AKAH programme areas shows 1 death for 2 events and 1 death for 14 events, respectively. This result shows fewer fatalities in the AKAH's programme areas and in post-WPARP period, indicating that local-level interventions led by AKAH have effectively built the communities' resilience, directly contributing to the first four targets of the SFDRR and indirectly to first three SDGs.

While the programme has proved successful with first-hand evidence of positive impact on the ground, there is a need to integrate the avalanche preparedness into other local-level programmes such as School Safety Programme. Educating students on avalanche science, hazard and preparedness will better prepare future community members and leaders. There is a need to innovate and improve avalanche forecasting from regional to a more localised scale, to mobilise local-level preparedness. An integrated multi-hazard mitigation approach by combining structural and Eco-DRR solutions should be considered for a better result with multiple benefits. Over time government needs take over the programme as a part of its annual programme to ensure sustainability of the programme.

The WPARP stands as the testimony that financing local-level interventions pays off in terms of saving lives through enhanced communities' capacities: anticipation capacity, absorptive capacity, adaptive capacity and transformative capacity. The

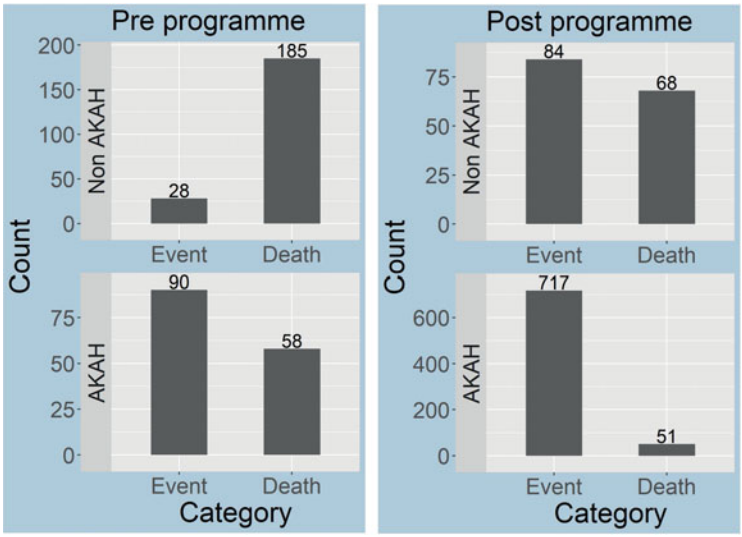


Fig. 16.12 Event and fatalities statistics for AKAH programme and non-programme areas, and pre- and post-AKAH's WPARP

investment on return for financing local-level interventions is in lives saved and should be increased if SFDRR and SDGs are to be met.

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