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Resilient nations.*

# Recovery Needs Assessment 2015 Warm Weather-Induced Mudflows and Flooding



Developed by the Disaster Risk Management Program, UNDP Tajikistan  
for  
REACT Tajikistan

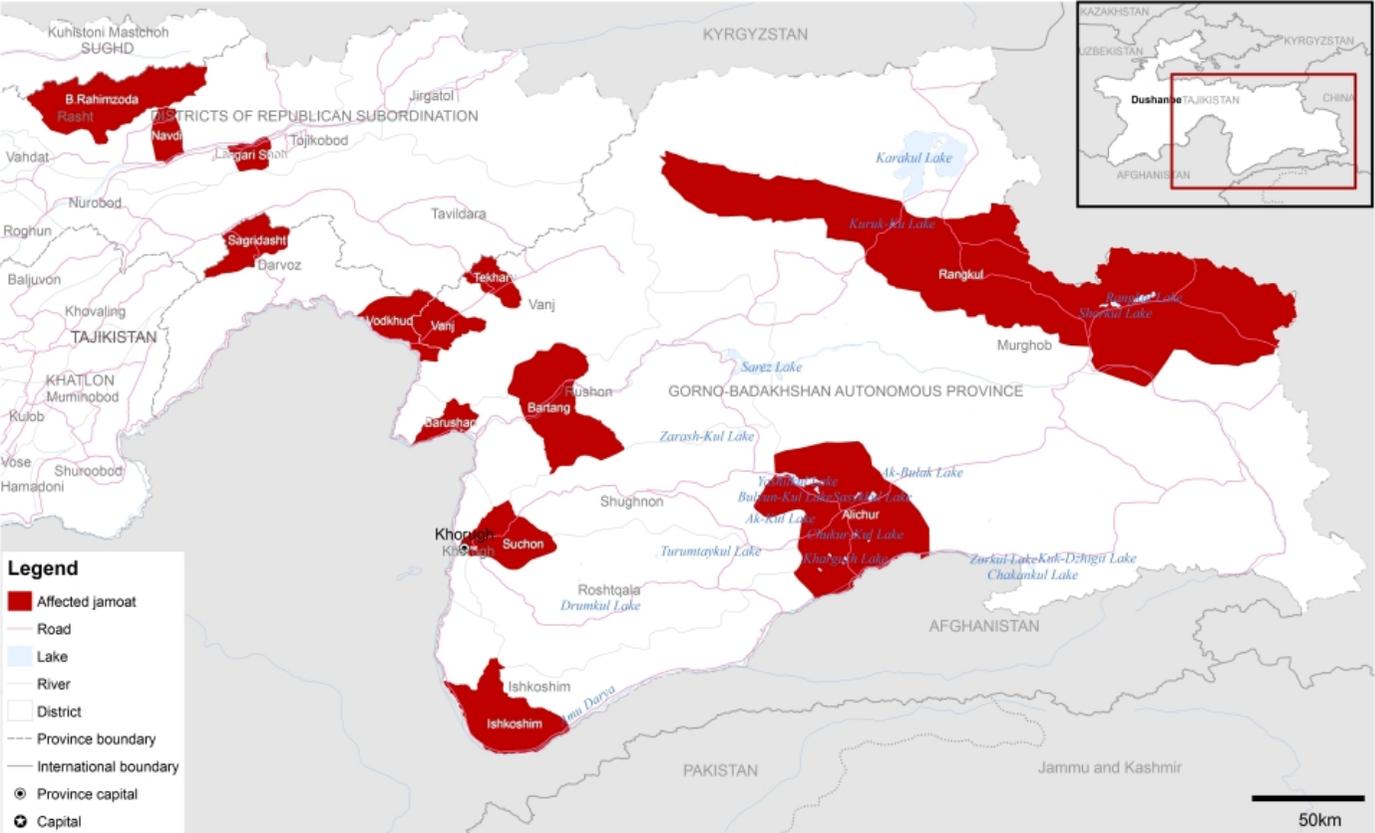
**December 2015**

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# Disaster-Affected Locations

**TAJIKISTAN: Overview of disaster affected jamoats in July-August 2015** (as of 19 August 2015) 



The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.  
 Creation date: 20 August 2015 ID: ROCCA\_00031 Glide number: FL-2015-000094-TJK Sources: DIVA-GIS, ESRI, GD, NSDI Tajikistan, OCHA, UNCS. Feedback: rocca@un.org www.unocha.org/rocca www.reliefweb.int

## 1. Executive Summary

Unprecedented high temperatures and aberrantly heavy rainfalls across the mountainous ranges of Tajikistan resulted in melting of glaciers in the upper reaches leading to mudflows and floods in the areas situated along the foothills. The indigenous and assisted early warning helped prevent sizeable loss of life, but the damage to access infrastructure, energy transmission systems, productive systems and community and household assets inflicted a heavy economic damage upon the country in general and the directly affected communities in particular. The national humanitarian institutions, led by the government and coordinated under the REACT, undertook relief operations to save lives and to prevent secondary disasters. In the realm of early recovery and reconstruction, the government prioritised housing reconstruction and refurbishment, followed by repair to the most crucial access and energy infrastructure.

Disaster Risk Management Programme (DRMP) of UNDP took the lead on behalf of the REACT partners, in its capacity as the lead agency for early Recovery, to conduct a rapid assessment of the ER needs in the worst affected areas. An international consultant, duly assisted by the DRMP staff, undertook the exercise relying primarily on the secondary data with some triangulation through field visits and spot checks.

This Assessment Report summarises the findings of the mission undertaken during September and October 2015. The Report identifies three categories of activities viz., Immediate, Medium Term and Long Term initiatives. The thematic imperative behind the exercise is that the recent disaster has exacerbated some existing vulnerabilities in the hazard prone areas and has also unearthed some new ones. The approach proposed in the Report is to address the vulnerability to hydrogeological natural disasters in a sustainable manner, pursuing resilience to the changing climatic conditions in parallel with responding to the immediate needs at the community and household levels.

The immediate term responses cover the repair and/or restoration of the critical social, productive, access and safety infrastructure, with a focus on quick provision of basic amenities, restoring livelihoods, facilitating access to markets, with a view to save the affected areas from similar impeding disasters in the upcoming winter and the subsequent spring season.

The parallel stream of medium-term actions seeks to initiate knowledge-based work on the root causes that can potentially turn the –old and the newly emergent- hazards into disasters. These include developing capacities at various levels to update and/or compile the hazard profiles of the affected areas in view of the changed climatic conditions, take measures to halt the degradation of the watershed areas where the hazards originate from, analyse the hazard related issues at the river-basin and sub-basin levels, and, facilitate institutional linkages to manage the hazards in an integrated manner.

The long-term propositions mainly aim at institutionalising, up-scaling and mainstreaming the land use plans, utilising the knowledge-base and capacities being created and also address the new technological challenges such as new housing techniques in the previously dry, but recently flooded areas.

The Report also ventures at prioritising the river basins for medium and long-term actions, on the basis of the nature of hazard, the elements at risk and probability of occurrence. This exercise indicates the Panj river basin to be in need of prioritised attention.

## 2. Purpose and Process

This **2015 Mudflow Recovery Needs Assessment** was conducted by the Disaster Risk Management Program, UNDP Tajikistan, to identify strategic and critical recovery needs following the initial relief response to the warm weather-induced mudflows and flooding which affected Tajikistan between July and August 2015. The report is intended to assist REACT partners develop recovery plans and proposals to assist the affected communities recovery fully from the mudflows and other disaster impacts. In keeping with current best practice, the report incorporates risk reduction and build back safer as underlying concepts.

The **2015 Mudflow Recovery Needs Assessment** was developed from 2<sup>nd</sup> September to 10<sup>th</sup> October 2015 under the leadership of Mr. Usman Qazi, a recovery expert engaged by UNDP through its recovery surge capacity mechanism. Travel to develop the report included visits to Rasht Valley and Gorno-Badakhshan Autonomous Oblast (GBAO) as well as meetings with officials in Dushanbe and in the field. **Annex A** provides a schedule of the assessment work and **Annex B** provides a list of persons met.

The initial results of the assessment were presented to REACT on 6 October 2015 and comments incorporated into the report. The presentation from the above mentioned meeting is attached separately.

## 3. Disaster Background

The unprecedented high temperatures and unusually heavy rains induced glacial melts and the consequent floods and mudflows in various parts of the country during the months of July and August 2015. The hilly areas of Direct Rule Districts and Gorno-Badakhshan Autonomous Oblast were particularly badly affected. The floods and mudflows wreaked havoc on large infrastructures, community infrastructure, households and livelihood assets. At least seven lives were lost in the disasters and life remained disrupted in many affected areas for up to a week as a result of damage to access infrastructure, power supply and evacuation of population to safer places. A preliminary estimate by the Government of Tajikistan puts the quantum of economic losses to the tune of USD 100 million.

The humanitarian community, coordinated by the government, responded by providing lifesaving assistance to the affected population through the provision of emergency shelter, food stuff, non-food items, water, health and hygiene supplies and services, and social protection measures for the vulnerable sections of the affected communities. A quantitative snapshot of the response of humanitarian community can be viewed at REACT Situation reports.<sup>1</sup>

A **Relief and Early Recovery Plan** was compiled by the humanitarian community under the REACT humanitarian coordination architecture in July 2015, to supplement the government's response. The government's efforts towards Recovery have been mainly concentrated on repair of critical infrastructure, reconstruction and replenishment of houses and relocation of population from the areas rendered uninhabitable and dangerous due to the flooding.

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<sup>1</sup>[http://untj.org/files/Publications/DRMP/Disaster\\_Situation\\_reports/2015/Overview\\_of\\_Disasters\\_July-August\\_2015.pdf](http://untj.org/files/Publications/DRMP/Disaster_Situation_reports/2015/Overview_of_Disasters_July-August_2015.pdf)

## **Guiding Concepts for Supporting Successful Recovery**

The following concepts should guide a process leading to successful recovery from the 2015 mudflows.

### **Focus on the Most Vulnerable**

Recovery should prioritise the most vulnerable in the affected communities for early interventions to forestall secondary disasters such as seasonal floods, avalanches and mudslides. Prioritization would be informed by triangulation of social, geographical and geological data to identify the most vulnerable. No section of the beneficiary population should be excluded from recovery efforts.

### **Rebuild Livelihoods**

Emphasis would be laid on the initiatives that facilitate a quick restoration of economic activities of the affected communities to reduce reliance on external assistance for subsistence.

### **Securing Human Development Gains**

The recovery strategy should enable affected communities to return to at least the level of human development existing before the disaster and help them continue their quest of attaining the national and global development goals.

### **Reducing Risks – Building Resilience**

Recovery should ensure that the reduction and mitigation of risks are integrated into all recovery initiatives to build resistant and resilience to future disasters, especially from the climatic variations.

### **Partnership**

Recovery should build on the existing capacities in the affected areas, especially local government and local and international development organisations, promoting joint programming wherever possible.

### **Transparency and Accountability**

This principle would imply putting in place systems for regularly reporting against the achievements of targets and expenditures against them for the donors, the government, the NGOs and the beneficiaries, with a view to promote performance and financial accountability across the recovery process.

### **Coordination**

Efficient recovery should minimize duplication and promote complementarity. The recovery process should build upon the REACT experience to ensure close coordination among all actors.

## **4. Recovery Overview at the Time of the Assessment**

The governmental initiative of providing in-situ or relocated housing to the affected households appears to have made significant progress in the areas visited. Much of the target beneficiary population has received newly built houses and household goods – in some cases more and better than they previously possessed. According to the government officials interviewed, plans are afoot to provide the ancillary amenities and productive assets such as access roads, bridges, animal sheds, schools, agricultural lands and water, especially in the resettled communities.

Some communities in Rasht have borne the brunt of the disaster, but the bulk of recovery needs lie in Gorno-Badakhshan Autonomous Oblast, where some important parts of the communication and power linkages, including on the international highway to Kyrgyzstan and China are damaged. In particular, the Murghab area has become more vulnerable to similar hydro-geological events because the already scarce vegetation cover is lying further degraded due to disorganised grazing practices, apparently overwhelming the carrying capacity of the pastures.

## **5. Current and Outstanding Needs**

### **5.1. Overview**

The destruction of assets, exacerbation of existing risks and creation of new risks as a result of the recent disaster warrants a comprehensive re-thinking of the recovery approach under the vision of addressing the immediate (or imminent) humanitarian challenges that threaten the lives and assets of the affected population in a manner that makes them resilient to future risks. The immediate needs can be addressed through restorative activities at the local level, but the quest for a resilient and sustainable recovery warrants integrated action at the level of river basins and sub-basins in the affected areas. The area affected by the recent disaster includes the valleys along the vital international highway that provides a most crucial trade link between Tajikistan and the neighbouring trading partners. The observations during the assessment indicate that only localised action would not address the larger hydro-geological hazards that have the potential of not only directly affecting multiple communities along the river basins but also have the potential of indirectly affecting the whole country whose economy would be disturbed due to disruption of vital trade routes and by increasing the financial burden on the national exchequer for responding to relief and recovery challenges.

This scenario warrants a rethinking of the previous practices. While attending to the immediate needs of the disaster affected areas and communities, it also requires action to, at least: update the hazard profiles; increase investment in capacity development of the development planners and managers; reform the preparedness and response systems, and, halt the degradation of the fragile eco-systems. The recent disaster, while causing massive damages to the lives, livelihoods and infrastructure, may also be seen as an opportunity to address the risks – both existing, exacerbated and new- with a view to tackle the issue in a sustained and holistic manner.

The humanitarian community would need to work closely with the government at all levels and also with the communities at the grassroots level to foster a culture of resilience through making the development practice climate proof and risk resistant. In this wake, a number of initiatives would be needed to manage the risks in the most vulnerable areas, mainstreaming Disaster Risk Reduction in development at all levels, up-scaling the community based risk reduction and risk management, strengthening the coordination mechanisms for DRR and response such as the REACT forum, and, promoting synergies among the government, the civil society and the communities for maximum returns to investment in DRR.

This report is informed by the information collected and collated by the REACT partners, whose situation reports, assessment figures and response updates helped immensely in identifying the areas for site visits to carry out a rapid assessment of early recovery needs. Being the premier coordination forum for risk reduction and response, the salient findings of the exercise were shared in a REACT meeting on October 6 and the feedback from it has been incorporated into report.

The recent disaster indicates that its causes are an aberration from the previous climatic pattern and -viewed in the backdrop of the global trends- the temperature variation as well as the altered rainfall pattern may be the early signs of a changed hazard profile of the area. The increased fragility of the eco-system –due to both global climate change as well as the local human activity- would mean that the existing knowledge base and the consequent disaster management mechanisms would prove inadequate for the requisite responses. The impacts of a geological event such as an

earthquake would be exacerbated due to the changes in the strength of the glacial ice cap and the loosened and degraded soil.

A comprehensive, shock-resistant and sustainable recovery from the recent disaster requires actions in at least three categories of time frame. These would include –both in terms of timeframe for execution as well as impact- immediate term actions, medium term actions and long term actions.

### Immediate Actions

The immediate actions would involve an early restoration and repair of the access, productive and protective infrastructure, principally in the communities where in-situ recovery is possible. These would be aimed at:

- a quick revival of farm-based and market-oriented livelihoods;
- alleviation of hardship in accessing important social amenities like schools and clinics;
- providing ease in fetching water for domestic use, and,
- ensuring safety for land, infrastructure and lives from imminent erosion and flooding.

For the resettled communities, immediate term activities would also include development of new productive and social infrastructure as well as urgent risk-mitigation measures where the new settlements are prone to disasters in the upcoming winter and spring seasons due to snow and increased flow in the rivers. An indicative list of locations with such immediate needs is given as Annex 1.

These activities are localised in scale and lie within the capacity and the mandate of humanitarian non-governmental and inter-governmental organisations such as the UN and the INGOs.

The proposed timeframe for the implementation of these activities is up to 8 months.

### Medium term Actions

The medium term activities would include compiling and/or updating the risk profiles of valleys lying along the tributaries of Panj river, especially the ones lying on both banks of the river in Shughnan district; the glacial valleys feeding into Murghab river especially on the right bank, and a similar exercise in select tributaries of Surkhob river in Rasht. This exercise would build upon the previous and on-going work by the government and some INGOs in the realms of geographical hazard mapping and localised risk management. The risk profiles would be used to inform the selection of structural and non-structural measures to mitigate the impacts of future climatic events.

Structural measures may include a combination of earthwork such as check-dams, concrete and gabion masonry work, and bio-engineering measures such as plantation to stabilise the uplands and to secure the valuable assets in the valley bottoms and along the ridges.

The UN and the INGOs can take lead in initiating and facilitating this process but it is essential that the government authorities and local communities participate in identification, design and execution of these works. The medium term initiatives must include a component of training the relevant government officials and community members to ensure the up-keep and maintenance of the recovered/ reconstructed infrastructure in future.

Non-structural measures would principally include putting in place Early Warning Systems wherein a combination of scientific and human intelligence would trigger the warning and modern telecommunication would be employed to transmit it to the potential targets and service providers. The investment in EWS would also include putting in place a response protocol in which the responsibilities of each section of stakeholders would be determined through dialogue and consensus and the understanding of their respective roles would be deepened through practice drills and exercises.

The UN agencies and INGOs already having the experience of piloting such initiatives would be best suited to up-scale and mainstream their learning into broader and integrated programmes in this regard. The active partnership among the humanitarian organisations, the governmental meteorological and disaster agencies and the communities is crucial for a meaningful execution of this proposition.

The green upper reaches of the tributaries to Panj river as well as in Rasht district, are used as grazing grounds by the communities living along and at the bottom of these streams. According to the interviews conducted with locals, the livestock population has increased during the recent years, straining the natural vegetation and has subsequently contributed to the degradation of soils in the upper and medium reaches of pastureland in both Rasht and Western Pamir, especially in the sub-basins falling in Shughnan district. This has led to loosening of soil previously held by the rootstock of the vegetation and has added to the landslide hazard in case of avalanches and glacial melt.

In the hyper-arid Tundra eco-system of Murghab district, the sparse vegetative cover, mostly comprising of a shrub species locally known as *Trasken* is under serious stress due to excessive grazing as well as uprooting. A 2005 study had identified these two activities as major sources of desertification in this area<sup>2</sup>. The quite visible degradation of soils has not only accentuated the phenomenon of gullying by wind erosion in the valley bottoms but has also exacerbated the impact of floods, whose increased pace results in the erosion of degraded and fragile river banks, threatening human settlements and vital infrastructure as well as negatively affecting the contours and depth of water bodies due to increased silt load in water.

In the absence of a system to promote sustainable use of vegetative resources, the situation is likely to become gradually worse.

Addressing this challenge would require coming up with sustainable use plans of the watershed areas based on a participatory assessment of the carrying capacity of the fragile rangelands. These would include:

- promotion of rotational grazing,
- promotion of “vertical” (qualitative) growth of the livestock rather than “horizontal” (quantitative/ numerical) expansion of flock size,
- strengthening the market linkages for animal products so that the owners get better economic value for a smaller flock, and, conservation of trees and non-timber forest products etc.,

These are cross-sectoral activities and a coalition of the technical assistance providers from the humanitarian agencies; the governmental agencies responsible for land

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<sup>2</sup> Beckle, S-W and Wucherer, W In book: Land-use change and mountain biodiversity, Chapter: Vegetation of the Pamir (Tajikistan): Land Use and Desertification Problems, (Ed), Spehn, Körner, Liberman, pp.239-251

management, pastureland and forest management and livestock development, the local government officials, and, the local communities would have to be formed with a clear articulation of their respective roles and responsibilities, to undertake these measures.

The proposed timeframe for the implementation of these activities is up to 18 months.

### Long term Action

The longer term actions would include a number of initiatives that are: mitigating in nature, but essentially work on the principles and patterns generally identified with the realm of development. These would include:

- Implementation and follow up on the actions initiated in the medium term, and making efforts at institutionalising them at all levels of society, especially through policy reform and capacity building of the public sector managers, and the communities,
- Implementation of land use plans, including sustainable use of pastures and forests, documenting the lessons learnt from them and employing them as input to capacity building packages and policy reform advocacy,
- Assisting the government and people in previously dry areas that have received heavy precipitation lately, to alter the housing designs. For instance, the lack of foundations and installation of flat roofs in Murghab area is not a viable housing technology any more, and new, climate resilient techniques such as concrete foundations and sloping metallic roofs would have to be introduced. Perhaps the technology would have to be piloted initially, with the ancillary capacity building of the local masons and self-builders, while exploring partnerships with financial institutions to finance such investments on easy terms and conditions.

This set of proposed activities would require a continued participation of technical non-governmental and intergovernmental organisations; the government agencies mandated to look after housing, land management, pastureland, forest and livestock development; local authorities, community members, and, private sector financial institutions.

The time frame for these activities is proposed to be between 3 to 5 years.

### Geographical Prioritisation

It can be contended that the whole of Tajikistan is prone to hydro-meteorological disasters, especially in the backdrop of changing climate patterns as exhibited in the unusual weather events this year. In the light of the experience from the last disaster however, certain valleys contributing to the main river systems pose a fairly eminent threat of turning the hazard into disaster. The framework that can be employed to prioritise the geographical locations for initiating the activities is proposed as follows.

The prioritisation framework takes into account three main factors viz., Source of Hazard, Elements at Risk and Probability of Occurrence. In this schema, the source of hazard i.e., the glaciers and streams is a variable whose locations are known and fixed. The second element i.e., the number of humans, homes, pieces of infrastructure, assets etc., exposed to a certain glacier or stream would arguably be the most important factor determining the priority. The third factor i.e., how likely the occurrence of disaster event is, has become uncertain due to the recent tumults in the old weather patterns, but the recent disaster sites are perhaps worthy of more attention because of the physical fragility introduced by this year's events.

Source of Hazard:

This denotes the presence, magnitude and proximity of the source of hazard to the valuable assets. In case of the affected areas of Tajikistan, the source of hazard is the presence of glaciers and steep watershed where snow melt and excessive rains can cause a combination of mudslides and flash floods.

Elements at Risk

This factor denotes the quantum (and significance) of human settlements, houses, household and community assets, infrastructure, sources of livelihood etc., that are exposed to the hazard.

Probability of Occurrence

This factor denotes the likelihood of a hazard turning into a disaster. Usually, historical trends guide this judgement but the global climate change has introduced a large element of uncertainty, particularly for fragile eco-systems such as glaciers. In case of Tajikistan, it would be prudent to consider the likelihood of a recurrence of the events that unleashed the last disaster because the physical integrity of the glaciers upstream of the affected areas has been compromised according to the experts' observations.

Below is a ranking of risk in various locations affected by the last disaster, as per the rapid assessment and secondary data (Very High=4; Very Low=1):

<b>Location</b>	<b>Hazard</b>	<b>Elements</b>	<b>Probability</b>	<b>Risk Level</b>
Panj River Basin (particularly the sub basins of Barsem, Khingab and Bartang Rivers)	4	4	3	(11/12)
Murghab River	4	3	3	(10/12)
Vakhsh River (particularly the sub basin of Surkhob River and Navdi micro-basin)	4	3	3	(10/12)

In terms of scale also, the recovery needs can be classified into three categories of needs: Large Infrastructure, Community and Household Assets and Risk Mitigation.



Destroyed highway in Murghab, GBAO

The large Infrastructure damages are mostly visible in GBAO area where sizeable parts of the highway, bridges and power lines have been damaged. These are state assets and require large-scale investment for proper recovery. At the moment, the governmental authorities have made some makeshift arrangements to keep the

services running. The government officials repeatedly expressed the need for assistance in the form of fuel to maintain these services using the earth moving machinery at their disposal. These need concerted and large-scale efforts to restore them sustainably. These needs, though important and urgent are way beyond the scope of the humanitarian community and fall under the ambit of reconstruction/development. The humanitarian/ development partners can, at best, provide technical assistance for mainstreaming risk reduction and resilience in the design for reconstruction of these damaged elements.

The most visible impact of the disaster is on the community and household assets where houses, tracts of fertile land, irrigation channels, drinking water supply, access paths, small bridges, livestock pens, flood protection embankments and small hydropower systems have been either washed away or buried under deep rubble. In the area of housing reconstruction, the government has



Makeshift bridge in Barsem, Shughnan

adopted a phased approach wherein the households with the most urgent need –the ones whose houses were totally destroyed- have been prioritised for reconstruction and, where identified as being on vulnerable land, relocated. Certain houses that were classified as partially damaged or as facing potential danger in the coming months, have also been slated for relocation within a period of two to three years.

In some places, assisted or spontaneous recovery efforts by the communities have made at least the most crucial access paths and water supply temporarily operational, but these are, at best, stop gap arrangements and need urgent attention and assistance.



Submerged houses in Barsem, Shughnan

The most complex issue that challenges the divide between the themes of “recovery” and “risk reduction” is that of the creation of new hazards even for the assets that appear unaffected at the moment. In most locations, the disaster has redefined the local hazard profile and made the previously safe community and state assets vulnerable. The damage to protection infrastructure changes in gradient of the micro-

drainage basins, as well as the increased unpredictability of precipitation and flow levels due to climate change warrant urgent actions that lie at the cusp of Recovery and Risk Mitigation. Any laxity in this regard is quite likely to create a larger scale disaster during the next spring season.

## 5.2. Damage and Immediate Recovery Needs

**Table 1** summarizes essential recovery needs identified in the assessment in six categories. Annex C provides a corresponding estimate of costs associated with the proposed interventions. All the recovery issues highlighted in this report were identified during discussion with the government officials, community members, NGOs and frontline managers of the local development departments.

1. **WASH**, water, sanitation and hygiene, considered first priority.
2. **Access and Services**, including repair or rebuilding roads, bridges and the electrical supply to a level which re-establishes normal social and economic activities and enables recovery to proceed.
3. **Livelihoods**, including recovering and rebuilding the daily means of survival of the affected populations, including on-farm and non-farm economic assets and activities.
4. **Risk Reduction**, covering those actions needed to reduce or mitigation future risk, particularly from mudflows.
5. **“Other”** covers identified needs not covered in the other categories.

<b>Table 1 - Recovery Needs Overview</b>					
<b>Location</b>	<b>Recovery Needs</b>				
	<b>WASH</b>	<b>Access and Services</b>	<b>Livelihoods</b>	<b>Risk Reduction</b>	<b>Other</b>
Bedak village, Rasht District	Pipe and storage tank			De-silting of river bed	Shelter for people without documents
Mazori Bolo village, Rasht District		Power transformer, bridge  Road rehabilitation			Clean-up and reconstruction of auxiliary buildings for partially affected households
Mazori Poyon village, Rasht District	Valve, pipes and storage tank	4.5 kms of wire, poles and power transformer	5 kms irrigation channel, off-take		Clean-up and reconstruction of auxiliary buildings for partially affected households
Manem village,	5 kms long water pipeline,		Agricultural land development,	Avalanche protection through	

Shughnan District	storage tanks		animal sheds,	terracing, plantation, protection walls	
Barsem and Kolkhozobod villages, Shughnan District		Access road and Bridge	Irrigation channels	Lowering of the artificial lake in the main river bed; repair of protection walls along the Barsem stream	
Mundara village, Shughnan District				Protection walls along the flood torrent	
Buni village, Shughnan District				Protection walls along the flood torrent	
Boybar village, Ishkashim District		2 kms road, 2.5 kms of power line	20 kms of irrigation channels	Retaining walls for erosion control	
Pshikharv village, Vanj District		Bridge reconstruction		Debris removal and plugging of breached torrent bank; protection walls along the main stream	Micro hydel power plants replacement
Barushan village, Rushan District			Irrigation channels	Flood protection walls	
Bardara village, Rushan District		Bridge	Irrigation channels		
Jorf village, Darvaz District		Bridge		Flood protection walls	

Baravn village, Darvaz District	Construction of infiltration gallery / collector well at the tail end of the torrent to provide drinking water		Repair of irrigation channels and aqueduct	Repair of embankments of the torrent inside the village	
Rang Kul village, Murghob District		Repair of the damaged school wall	21 Cow sheds, 11 temporary abodes used by the shepherds		
Madyan Village, Murghob District		Repair of access roads	Green houses for off season vegetable production		Improvement in housing construction techniques to adjust to wet conditions
Murghob Centre, Murghob District					Bank protection on the right bank to halt erosion; Improvement in housing construction techniques to adjust to wet conditions
Toktamish village, Murghob District		Minor repair to roads and bridges			
Bashkumb ez village, Murghob District		Access bridge replacement			

The following table provides the elaboration of the snapshot of immediate recovery needs in each of the most affected localities:

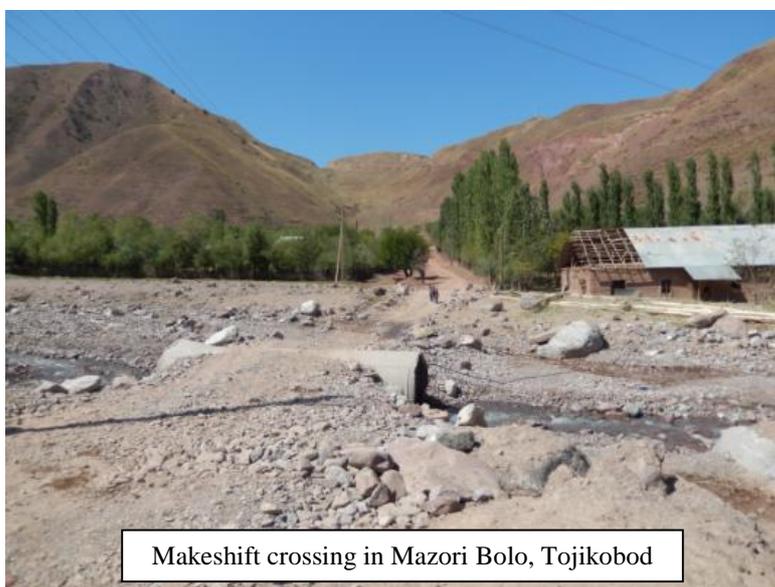
### 5.2.1. Rasht District, Direct Rule Districts (DRD)

Current Situation	Early Recovery Needs
<p><u>Bedak village</u> Population: 2069 (1030 male / 1039 female)</p> <p>Requiring Recovery Assistance: The 44 families losing their houses have been resettled in an area that is in close vicinity to their place of origin and the house construction is in advanced stage. The access to the new settlement is through a fair conditioned road and the access to social amenities such as school and health centre has not been worsened for the resettled. The resettled people lost most of their assets during the mudslide but are assured by the government that the domestic use items would be replaced. The primary source of livelihoods for the people is remittance from migrant labour. It was reported that around 70 small ruminants and one bull (owned by around 10 families) perished in the disaster.</p>	<ol style="list-style-type: none"> <li>1. The new settlement is being provided with drinking water through a makeshift supply system consisting of a 2.5 cm diameter rubber pipe brought in from a spring. The community members fill in jerry cans from it for domestic use. The community reported that the source of water is at a distance of around 80 meters up in the torrent-way along a difficult stony terrain. There may be merit in looking into improving the water supply through securing the source, installing a proper conveyance network and also constructing a night storage tank with multiple taps.</li> <li>2. Around 6 households have not been able to be resettled despite having lost their homesteads, and are presently sheltered by the relatives and friends in the old village. Reportedly, these families do not possess the requisite documentation to make them eligible for government support.</li> <li>3. The river bed in the original village is silted up and poses the risk of spring and summer flooding of the other houses which remained unaffected during the last mudslide.</li> </ol>

### 5.2.2. Tojikobod District (DRD)

Community/Village description	Early Recovery Needs
<p><u>Mazori Bolo village</u> Population: 1283 (677 male / 606 female)</p> <p>The mudslide destroyed ten houses, some agricultural land, a power transformer of 160 KW capacity and a bridge linking the next valley of Rahimzoda with the main village road.</p> <p>In addition, around 20 houses were heavily damaged but not to a great extent to warrant government assistance.</p>	<p>Presently, the houses on the left bank of the stream are being supplied electricity from the one remaining transformer, which is inadequate. The access on-foot and perhaps tractor to the right bank and to Rahimzoda has been temporarily restored through placing a concrete 45 cm diameter pipe in the stream and piling debris on both its side as makeshift ramps. This arrangement is already fragile and is not likely to withstand the slightest increase in flow.</p>
<p><u>Mazori Poyon village</u> Population: 1172 (614 male / 558 female)</p> <p>The ten affected households from Mazori Bolo have been resettled near the Mazori Poyon village, at a straight distance of around 3 kilometres from the place of origin. All ten houses are in advance stage of construction. Each household would be allotted a plot of agricultural land in close vicinity to the new settlement. The place is presently served with a makeshift water supply comprising of a rubber pipe from a</p>	<ol style="list-style-type: none"> <li>1. The drinking water supply needs to be upgraded to include a proper valve from the main supply line, with a storage tank.</li> <li>2. The potential agricultural land has been commanded in the past through a 5 kilometres long lined channel that emanated from a (now dilapidated) gated off-take. The channel has fallen into disrepair for at least a couple of decades and its rehabilitation would increase the agricultural productivity of the land to be allotted to the resettled community.</li> </ol>

<p>punctured underground pipeline. Similarly, temporary electricity connection has been brought in from the Mazori Poyon main village which would turn inadequate once the houses are fully functional.</p>	<p>3. The settlement is at a reported distance of 4.5 kilometres from the main power grid and would need a length of wires, poles and perhaps transformer to ensure secure supply of electricity.</p>
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Makeshift crossing in Mazori Bolo, Tojikobod

### 5.2.3. Shughnan District, Gorno Badakhshan Autonomous Oblast (GBAO)

Community/Village description	Early Recovery Needs
<p><u>Manem village</u>            Population: 229 people ( 112 male / 117 female)            82 households whose houses were worst affected in Barsem and Kolkhozabad relocated to this location. Houses are near completion. The construction of school has been initiated. Presently, water is being trucked in for domestic use and there is a plan to bring drinking and irrigation water from a source around 5 kms away. Each house has been built on 600 Square Meter plot, but the place does not have adequate space for constructing latrines, or for animal sheds. They have been proposed a collective animal sheds for everyone but they are not enthusiastic about it. Presently, the fallow land around the village is undeveloped and unfit for agriculture or animal husbandry.</p>	<p>Houses and proposed school site are exposed to avalanche hazard and bio-engineering measures such as terracing, plantation and construction of a protection wall at the foothill is needed. Water supply, agricultural land development, animal sheds and irrigation channel (5 to 7.5 km) are needed for a full recovery.</p>
<p><u>Barsem and Kolkhozabad villages</u>            Population: 1679 people (785 male / 894 female)            The worst affected houses have been relocated but the artificial lake formed in the river bed poses a threat to the remaining houses and service infrastructure, when the flow increases during the next spring season. The access bridge and road to the villages were washed away in the disaster and a precarious makeshift bridge and dirt road are</p>	<p>Existing 224 houses as well as Pamir Energy installation upstream of the village are vulnerable to future floods as well as rise of water in the artificial lake during the spring. Lake needs to be drained and debris removed from the river bed. The bridge and road need to be properly built to ensure all weather access to the main highway. Flood protection along the banks of the torrent needs to be repaired to reduce risk of erosion. New irrigation channel is needed to</p>

presently serving the community. The restored road and bridge are already dangerous and would become more perilous and virtually unusable under snow.	replace the one damaged in the mudslide to save the wilting orchards.
<u>Mundara village</u> Population: 1517 ( 762 male / 755 female ) Due to the glacier melting there is a high risk for the households.	Protection walls along the flooded torrent need to be repaired to forestall the risk of future inundation and erosion.
<u>Buni village</u> Population: 572 ( 271 male /301 female ) Due to the glacier melting and damage to flood protection walls, there is a high risk for the households..	Protection walls along the flooded torrent need to be repaired to forestall the risk of future inundation and erosion.

#### 5.2.4. Ishkashim District, GBAO

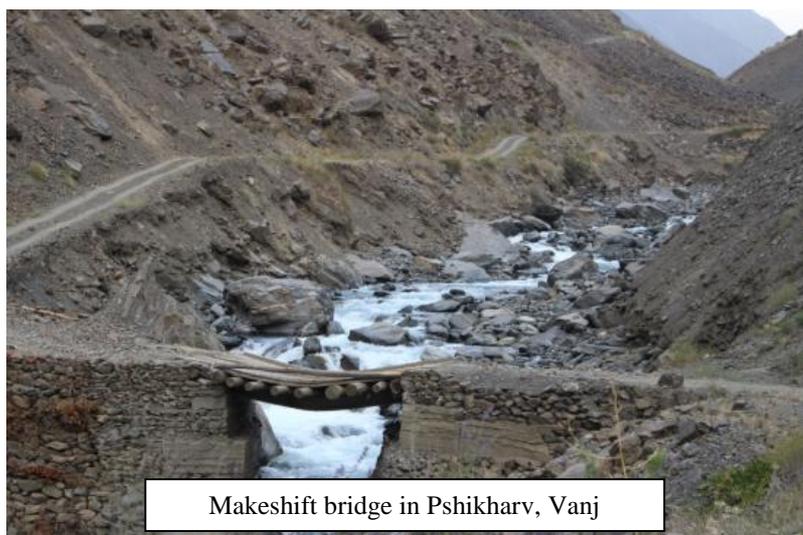
Community/Village description	Early Recovery Needs
<u>Boybar village</u> Population: NA The access, power and irrigation infrastructure was severely damaged.	2 kms of road, 2.5 kms of power line, 20 kms of irrigation channels as well as the retaining walls to protect them from erosion need to be rebuilt.

#### 5.2.5. Vanj District, GBAO

Community/Village description	Early Recovery Needs
<u>Pshikharv village</u> Population: 348 ( 171 male / 177 female ) The ancient torrent path got blocked due to landslide induced by heavy rains and consequently the flood breached the right bank of the torrent, devastating two houses and burying tracts of orchard land under debris. The flood in the main river bed also eroded orchard lands and washed away small hydro-power systems installed by the community.	The breach in the torrent poses a serious avalanche and flood threat to all the remaining houses and requires plugging, as well as debris removal from the original torrent path. The protection walls in the main river need to be re-built to save the remaining orchard land from erosion. The makeshift bridge on the village road needs to be upgraded. The community needs help in replacing the micro hydropower systems.

#### 5.2.6. Rushan District, GBAO

Community/Village description	Early Recovery Needs
<u>Barushan village</u> Population: 2456 ( 1194 male / 1262 female ) The mudslide partially damaged 1 house and eroded tracts of agricultural lands and irrigation network.	Irrigation infrastructure including the irrigation channels and retaining walls needs repairs.
<u>Bardara village</u> Population: 540 ( 261 male / 279 female ) 6 Houses were fully and 8 partially damaged and access and irrigation infrastructure is disrupted.	Bridges, flood protection walls and irrigation channels need repair/ restoration.



Makeshift bridge in Pshikharv, Vanj

### 5.2.7. Darvaz District, GBAO

Community/Village description	Early Recovery Needs
<p><u>Jorf village</u>            Population: 595 ( 293 male / 302 female )            The stream passing through the village received heavy floods due to abnormally heavy rainfall and damaged the embankments, eroded the orchard land and washed away a concrete foot bridge between the two banks, providing access to the school by the children living on the left bank. Presently, an individual villager has installed a makeshift wooden bridge that is used by the pedestrians.</p>	<p>The protection walls need to be repaired and the bridge rebuilt.</p>
<p><u>Baravn village</u>            Population: 237 ( 121 male / 116 female )            5 kms of irrigation channel and drinking water supply have been washed away and 17 households at the tail end of the torrent are without a reliable water supply, straining the survival of orchards, putting extra burden on women for fetching water and risking the health of tail-end communities.</p>	<p>Exploring options for construction of a Filtration Gallery near the tail end settlement to provide drinking and irrigation water is a high priority. Flood protection walls also need to be repaired.</p>

### 5.2.8. Murghab District

Community/Village description	Early Recovery Needs
<p><u>Rang Kul village</u>            Population:963 ( 462 male / 501 female )            The 12 fully damaged houses have been rebuilt. 21 houses were partially damaged. The 1 km and 630 meters of auto road Murgab-Rang Kul was washed by flood. . Around 21 cowsheds were also damaged in the floods but have not been rebuilt. There are 11 temporary abodes used by the shepherds in the rangelands that got damaged and need recovery assistance. The local school has received some damages and is need of repair.</p>	<p>The 21 cowsheds and the 11 temporary abodes used by the shepherds as shelters during grazing season need to be re-built. The damaged walls of the local school need repairs.</p>

<p><u>Madyan villages</u>  <u>Population: 348 ( 181 male / 167 female )</u>  Apart from the damage to the roads, rains damaged green houses used for indoor horticulture. The housing stock does not have the appropriate foundations and roofing materials to cope with the changed, wet weather and the entire housing stock is now crumbling.</p>	<p>Access roads and greenhouses need to be repaired or re-built to restart livelihoods. Sustainable and economical solutions such as concrete foundations and sloping metallic roofs for houses need to be provided as long term resilience measures.</p>
<p><u>Murghab Centre</u>  In addition to creating the new vulnerability for the housing stock, the floods eroded the right bank of the stream passing through the town. The villagers and the government have put in place sand bags as temporary measures for flood protection. Four houses with crumbled foundations and damaged roofs have been relocated.</p>	<p>Bank protection with a combination of concrete and gabion embankments for the areas near human settlements is needed. Sustainable and economical solutions such as concrete foundations and sloping metallic roofs for houses need to be provided as long term resilience measures.</p>
<p><u>Tokhtamish village</u>  <u>Population: 740 ( 364 male / 376 female )</u>  The local health centre was badly damaged and has been relocated. The road and some bridges are lying damaged and temporary measures such as creation of diversions have been taken by the government to restore access. The access of villagers to outside world is severely constrained and may get totally disrupted with increase of flow in streams.</p>	<p>Minor repair to roads and bridges is needed.</p>
<p><u>Bashkumbez village</u>  <u>Population: 615 (304 male / 311 female )</u>  Floods washed away the bridge used by animals, shepherds and vehicles to access the pasturelands and a stone quarry, which are crucial for the local livelihood activities. Under a self-help initiative, the villagers have salvaged the metallic bridge skeleton and have constructed concrete wings for the bridge but are unable to complete the repair.</p>	<p>The bridge repair is a priority.</p>

### 5.2.9. Additional Observations

The consensus at the senior government level seemed to be on reiterating the demand for fuel for earth moving machinery, to repair mostly the large infrastructure and for debris removal. The local officials of governmental and non-governmental organisations however, also articulated the need to train the local people and officials to put in place an early warning system. FOCUS Humanitarian Assistance, German Agro Action and Mercy Corps have in place localised pilot programmes related to this that can offer some interesting practical insight into issues related to disaster risk and early warning.

Certain hardware such as the old housing stock in Murghab were designed for dry weather conditions, in a hyper arid environment. The increased precipitation and the increased sub-surface flow along the micro-basins has rendered them highly susceptible to damage through the roof collapse or cracking of foundations on an increasingly unstable soil. These are issues warranting a change in the mode of housing development in the wake of changing climatic conditions and require concerted research



Cracking foundations of houses in Murghab

and innovation for locally appropriate and sustainable solutions. One major issue identified by the local government officials and community members was the affordability of stronger and flood/ resistant building technology and materials by the poor households. The idea of designing and initiating a small loan facility for housing improvement was suggested by one of the interviewed government officials and is worthy of exploration by the development practitioners and policy makers.

## Annex A – Assessment Schedule

Dates	Location of Field Visit
07 September 2015	Gharm/ Rasht, DRD
08 September 2015	Tajikobod, DRD
23 September 2015	Rushan, GBAO
24 September 2015	Khorog, Shughnan, GBAO
25 September 2015	Murghob, GBAO
26 September 2015	Murghob, GBAO
27 September 2015	Vanj, GBAO
28 September 2015	Darvaz, GBAO

## Annex B – Persons Contacted

1. Emergency Advisor, UNICEF, Tajikistan
2. Humanitarian Affairs Officer, UN OCHA, Tajikistan
3. Project Manager, UNDP, Rasht
4. Area Office Manager, WFP, Rasht
5. Head of Hukumat, Rasht
6. Head of CoES, Rasht
7. Local Representative, Ministry of Local Development, Rasht
8. Head of *Jamoat*, Navdi, Rasht
9. Area Manager, German Agro Action, Gharm, Rasht
10. Programme Officer, Mercy Corps, Gharm, Rasht
11. Community members, Bedak village, Rasht
12. Community members, Mazori Bolo village, Tajikobod
13. Community members, Mazori Poyon village, Tajikobod
14. Head of *Hukumat*, Murghob
15. Head of CoES, Khorog
16. Head of CoES, Darvaz
17. Head of CoES, Murghob
18. Head of RCST, Khorog
19. Programme Manager, FOCUS Humanitarian Assistance, Khorog
20. Community members, Barushan village, Rushan
21. Head of *Jamoat*, Manem, Shughnan
22. Community members, Manem, Barsem and Kolkhozabad villages, Shughnan
23. Community members, Pshikharv village, Vanj
24. Head of *Jamoat*, Robarv and 8 March villages, Vanj
25. Community members, Jorf and Baravn villages, Darvaz
26. Community members, Murghob centre
27. Community members, Bashkumbez village, Murghob
28. REACT members representing: EC, World Bank, UNICEF, DFID, UNDP and USAID