



#### PREFACE

The overall 'Catalysts of Change' attempts to look at the relationship between local multi-stakeholder forums and policy environment in post-disaster contexts. It is a research project implemented in Leh and Barmer. This was supported by

START and CDKN and implemented by SEEDS, RDY and UNNATI.

Yet, what lies behind the research and statistics? This compilation of stories attempts to look at some of the broader issues and experiences of these communities in Rajasthan and Ladakh. The voices of these individuals and their insights into their communities and day-to-day lives offer further learning for policy change.

This compilation would not have been possible without the assistance of many people. Our sincere thanks for all their support to officials of the Government of J&K; Padma Tashi and Stanzin Khentse of RDY; Live to Love; Stanzin Dorjai Gya of Himalayan Film House; Swapni Shah, Dilip Bidawat and colleagues at UNNATI; and Ganpat Lal Mehra and colleagues of IDEA. Above all, we are grateful to all the communities and individuals across Ladakh and Rajasthan who have welcomed us into their homes and so willingly shared their experiences. We hope we have been able to reflect their voices in a small way.

SEEDS Team

Whether in the sun-scorched desert plains of Rajasthan or Ladakh's freezing desert mountains

One point was abundantly clear

There was an inherent need to change our approach and lens

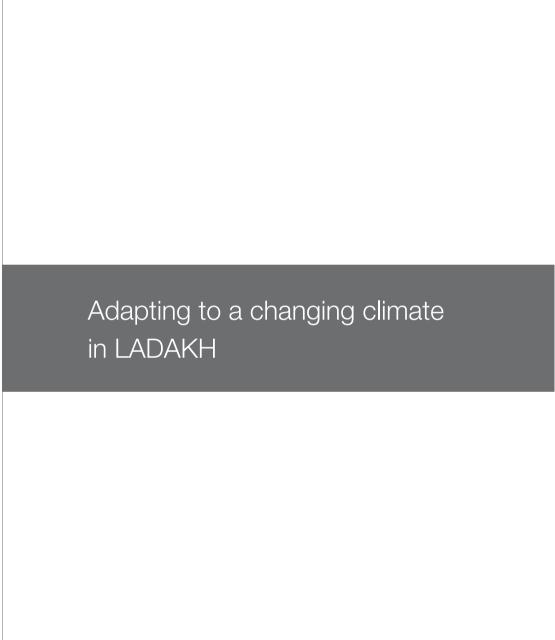
To address a growing extreme weather and climate change fear

But long-term, local and sustainable ways to deal with these issues were key

For not just stakeholders and problems, but the impacts themselves had a broad range

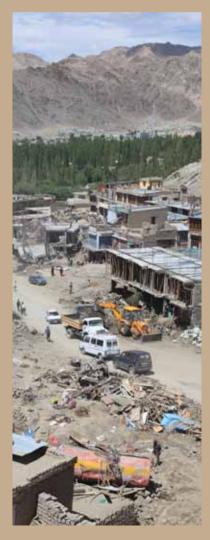
So our approach attempted to look at underlying stresses and encourage shifts in DRR and CCA policy

Empowering local forums as the 'catalysts of change'





## The Leh Flash Floods



On August 5th, 2010, the picturesque landscape of Leh-Ladakh was dramatically transformed. As the clouds burst, flash floods swept the region. The waters send mud and debris coursing down the mountain slopes in resulting landslides. It wreaked widespread damage to Leh, the region's main city, as well as 34 surrounding villages. Buildings, homes, power and telephone lines collapsed, vehicles were washed away and countless people were trapped under the debris.

The situation was dire with relief efforts hampered by the remote location, altitude and harsh climactic conditions.

As the region has recovered, concerns about its sustainability have become more vocal. How do you keep from tipping its delicate ecological balance?





I think it is a very striking observation. A temperature increase of 0.8 -1 degree over the last 30 years. It is a major change.

Tundup Angmo, Climate Change Researcher, Leh



## It's official...the change is real

Analysis of the mean minimum and maximum temperatures in summer and winter in Ladakh over the last 30 years reveal a 0.8 to 1 degree increase in temperature. These 'statistics' have translated into several visible changes on the ground. In fact, every resident's story peels away another layer to the climate change story.

The strange changing rain and snow patterns especially are talked about across the area

"Previously, there was a lot of snow," said Tashi Toldon, a local resident of Serthi Village. "We had to put soil on top of it in April to avoid sliding. But with the changing climate, snowfall has reduced and there is no accumulated snow. The little snow there is melts very soon. So now we have to water the fields before sowing." A side consequence has been a rise in migration from the village as people move to the city to seek alternate livelihoods.

As with other areas of the Himalayas, Ladakh is an extremely fragile ecosystem. If left unaddressed, this temperature rise may result in more changes and catastrophic events.







Even a random look at the valleys of the Ladakh region will reveal a series of 'chortens' and 'mane walls'. A chorten is erected in the memory of a monk or important religious person. They are square and broad on the bottom, becoming rounder and narrower on top. These structures symbolise the five elements of nature: water, earth, air, fire and sky.

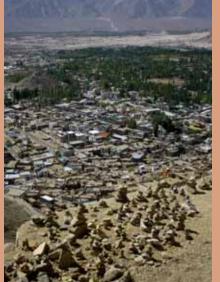


# 'Resilience' hidden in traditional religious beliefs



Mane walls are stone piles built on the sides of the roads; often inscribed with religious motifs. They are usually around 1.5 metres high, 1-5 metres wide and can vary considerably in length.

Both structures are actually built purely based on religious belief. However, they serve an extra purpose. This type of architecture scientifically builds the resilience of the community. Their very shape, size, location and sheer numbers act a block and diversion during floods!



Across the region, one comment was heard again and again. Our belief saved our lives during the 2010 flash floods. That may be true in more than a religious way!





Artificia located a

Artificial glaciers have been innovated and located as close as possible to the village and at lower altitudes than natural ones. These start to melt much earlier as compared to a natural glacier i.e. in the month of April–May. So they supplement additional irrigation water and serve a host of other purposes.

Chewang Norfel, Engineer and Artificial Glacier Innovator, Serthi, Ladakh





## Artificial glaciers to counter water woes

Since times immemorial, the melting water from the glaciers has been the only source of irrigation for about 80% of villagers in Ladakh. Over the last three-four decades, the amount of snowfall has decreased and glaciers are actually retreating in almost every part of the region.

Short summer seasons mean that farmers are only able to cultivate one crop per year which must be sown in April or May. The natural glaciers which are at higher altitudes only start to melt in June which is too late for sowing. The dearth of water can hinder their entire annual livelihood.

The creation of 'artificial' glaciers is helping reverse this problem. Built closer to the villages, this unique and intricate system of water harvesting is helping augment water supply.

Water from existing rivers is first diverted to shady areas of the valley. The water must be slowed to a trickle to ensure it freezes, so the routes are sometimes long and meandering. Small stone embankments are built at regular intervals along the mountain slope. These form shallow pools that freeze as the temperature drops. Over many weeks, as this cycle keeps repeating, a sheet of ice is formed that is several layers thick.

Since the artificial glaciers are constructed close to the village, its benefits are equally distributed amongst all the villagers. Hence, the entire community contributes to maintaining and monitoring it.

Running for the last few years, the projects have mainly been financed by the Government Watershed Department and the philanthropic wing of the Indian army. They have received much positive feedback from the farmers. It has actually increased confidence in farming activities, cutting the migration to urban areas in search of alternative employment.

The artificial glaciers are easily replicable in other south-facing villages with similar characteristics. 14,000 to 16,000 feet altitude; temperatures as low as -15 Celsius; and long peak winters of at least 4-5 months to ensure expansion and formation of the glaciers.





I have seen this weather station for the last seven months. The data collected by this is very informative. For a broader reach, this data can be presented in daily morning assemblies to reach out to the children in local schools in Serthi. Also specific initiatives for environmental safety can be taken up by school children through the guidance of the Climate School.

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## Monitoring the weather and learning about the climate









How do you internalise the impact of 'climate change' on your life day-to-day and find appropriate ways to deal with it? An automatic weather station and climate school in Serthi are helping catalyse change!

The AWS records weather data at regular intervals. This gives the community critical insight into their micro climate. The idea of a Climate School is also being explored. This is a forum to hold workshops and consultations for the community on disaster risk reduction and climate change adaptation issues. The purpose is to ensure that local communities engage with each other in finding local solutions to these problems.

"If initiatives like this are set up in every village," Padma Tashi, head of the local implementing organisation RDY commented, "then farmers will be able to decide for themselves when to sow, plough and harvest."

In the 2012-13 winter, Changthang turned white as far as the eye could see Snow and more snow packed down over all the winter pasturelands that are key

With both goats and sheep requiring extra food in January

The resulting famine claimed thousands of livestock as its fee

Yet the Changpas still greet you with a big smile and a 'julley'

Accepting this new hardship as if in their fate it lay

After losing soo much, their main request is still for fodder and supplies to survive day-to-day

Yet, few people know their issues or listen to what they have to say

A nomadic way of life in severe jeopardy in CHANGTHANG, EASTERN LADAKH





The high altitude plains of Eastern Ladakh are home to a nomadic tribe called the Changpas. For generations, their intricate multi-dimensional pastoral system has centred around their livestock. The region produces around 40,000 kgs of pashmina every year. It also supplies butter, meat and wool for the Ladakh region.

However, the winter of 2012-13 brought a devastating shock. The record snowfall and plummeting temperatures completely cut off all access to the normal winter pastures. Around 40,000 livestock perished due to starvation; with 90% of the young stillborn or dying. Since January and February are the key months both for pashmina hair growth

## Changthang: The Silent Disaster

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We never dreamed the snow would come like this. It got to the point where we couldn't feed our animals or ourselves. We lost around 15% of our flock this year.

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Lundup Gyatso, Sarpanch of Samad Rockchan, Changthang as he related the story of the almost surreal 2012-13 winter.

and birthing, both goats and sheep require extra food at this time. Yaks and horses (which are equivalent to investments) also perished in large numbers. The few attempts to send fodder and relief were impossible at first, as most areas were completely cut off. 20 villages in Durbuk and Nyoma blocks were affected, with the greatest impact on places like Tegajung, Samad and Kharnak.

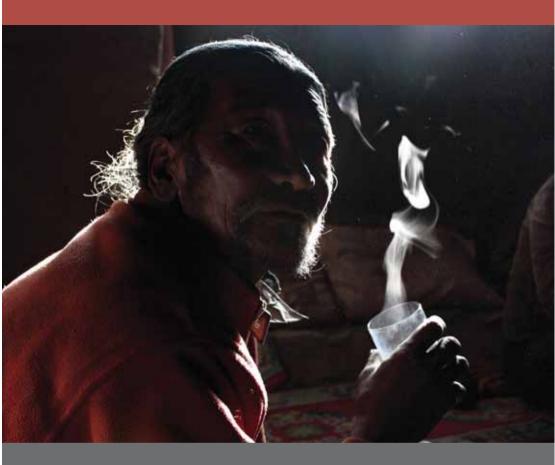
Part of the problem is the drastic change in ratios of goats and sheep. Catering to the growing demand for pashmina, the previous 50-50 ratio has now become a 75% goat – 25% sheep ratio. It was the sheep that actually used to keep the entire corral (flock) warm, since goats are more susceptible to cold. Goats also feed close to the ground while sheep can also survive on bushes, so this has put a strain on the pastures as well.

Despite the losses, Lundup Gyatso is emphatic about not asking for too much. "We take care of ourselves in the summer," he says. "But the winters are extremely harsh. If there could be some covering for the animals and temporary shelter or better tents for us, it would help us survive. Some fodder banks can also help us save our livestock."

The indirect impacts of this silent but massive disaster have echoed throughout the year. Of course, sales of wool and pashmina were limited, severely impacting Changpa livelihoods. At the same time, the entire downstream processing and manufacturing lines that employ thousands of people across Kashmir have also suffered.

Migration from Changthang was already increasing due to the hardships and lack of basic infrastructure. Now it is expected that many more nomads will move to Leh town. There is an inherent fear that this way of life will slowly erode away. As Dr. Muhammad Sharif, District Sheep Husbandry Officer - Leh, comments, "In another two decades, this custom will die unless we improve their socio-economic and living conditions. They try and do things for themselves, but they cannot win against nature."





64-year-old Nawang Tarchen belongs to a traditional changpa family. After losing his father at a young age, he took on the responsibility of his eight brothers and sisters. "We had just 25 livestock and 1 horse at the time," he reminisced, "but with struggle and hard work I managed to increase this to 300 over my lifetime."

His youngest son, Jigmet Norbo, went away to study in Leh. Yet true to family tradition, he has returned to take over his father's flock. He is also the Korzok representative of the Live to Love organisation. "It's difficult," Jigmet comments. "There are many things I don't know and need to get used to. If we could be taught both (traditions and general education), it would be easier."



## A life lived for generations

It was so difficult this winter that at times we felt we would die.

Nawang's family is part of the Tsumet Rockhen changpas (the area where they settle in summer). These 80-90 families have a combined livestock total of around 21,000 sheep and goats. In 2013, they lost about 15% of their total flock.

The group moves together to their various 'allotted' pastures: which vary between three main ones in the winter and four to five in the summers. Each changpa group across the area has this kind of an allotted system and there is an inherent agreement to respect the others' pastures.

It's a hard life. "We really need basic medical facilities," Jigmet Ango and Tsering Kemo comment, "If you fall ill even a little, you can die." As older changpa women, their children were delivered at home. Now, when there are birthing complications, they try and send the women to hospital. This often proves impossible, especially from the winter pastures, with the long journey across the mountains being done on horseback.

Yet despite all the difficulties, the natural optimism and love for their land shines through. "This is our life. In between the mountains, where the area is clean and the air and water are pure. This is our









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The government only provides minimal lodging, food and teacher's salary. But the few teachers here are very dedicated. We try our hardest to get some extra funds and make life a little better for our students.

Phunshuk Angchok, Teacher, Puga Residential Nomadic School, Changthang



The Right to Education Act in India stipulates free and compulsory schooling for all children between 6 and 14 years of age. But what happens when these regulations run contrary to an entire way of life?

## Forced to choose between tradition and formal education

For a few years, the Ladakh Government attempted to balance a nomadic lifestyle with educational needs; running mobile schools that moved with the Changpas. However, these travelling schools were shut down in 2004. The Government instead launched the Residential Nomadic School in Puga. The facility caters to nomadic children from across the region; housing and educating over 120 children between the ages of 3 and 18.

Phunshuk Angchok has been a teacher to these nomadic children for the last 11 years, eight of which were spent travelling with the camps. "At first I was against the idea of a residential school, "he said. "But after I've seen the impact it has had on the students, I have changed my mind." Previously, the students spent most of their time doing chores and couldn't concentrate on their studies. Now that they are with the teachers all the time, they are able to learn about other things like hygiene and games.

Yet, many of the parents are still conflicted between giving their children a formal education and having them learn their traditions. It's a fear that is reflected in the answers of the students. "Life at home is very hard," says 17-year-old Tashi Tsering. "I prefer it at school."

This winter, when the extreme snow and famine struck, the children were at home for the holidays. The few students from Tegajong (one of the worst affected places) breathlessly recount their experience. "It was the first time I ever seen such a big snow," says 16-year-old Chimit Tolkar, "We never used to sleep, but just kept cleaning the snow from the corrals. Yet, in the end we had no food to give them and around 50-60 of our sheep and goats died."

It's been an immense learning for everyone at the school. For the teachers, the frantic attempt to reach their students in cut-off villages and bring them back to school has reinforced their idea that their students must not lose their identity. For the students, it has strengthened the sense of hardship they associate with home. "The government needs to help us," says Tashi. "We need basic facilities."











For the people of Kawas village in Barmer, the 2006 flash floods brought a double tragedy. Their houses were washed away and their lands badly damaged. In fact, parts of the village were under water for up to two years.

Then, the government response to their sheltering needs only compounded the impact of the disaster on their lives. Deeming the area 'unsafe', the surviving families who qualified for compensation were rehabilitated in New Kawas; an area developed just outside Barmer town and far from their farmland.



## Shelter response to the Barmer flash floods compounds disaster impact

Who can move there, so far from our fields and with no space for our livestock? New Kavas is lying empty and we are still at risk here.

Baga Ram, Peraniati Dani, Donda Village, Kawas, Barmer

There are over 1000 families in Kawas now. Most, like Baga Ram, have built houses in their 'danis'. This refers to the area inside or just next to their farming land. Even those who have received homes in New Kawas preferred to spend their own money and build

themselves. The houses are built traditionally with mud walls, straw thatch roofs and circular shapes: with wide open spaces for gatherings and livestock.

The contrast with 'New Kawas' is stark. Row upon row of square, cookie-cutter, two-room concrete houses. Hundreds of shelters that just lie abandoned. Many of the locks have been broken and the fittings have been stolen. There are no open spaces and the houses are too small to accommodate many of the larger families. It is also at such a distance from the farmlands that travelling up and down each day to tend to their crops would be impossible. The one family that has settled there was an exception. "We had no land left and no other option" said Keshav Ram, as he showed off how he had tried to 'traditionalise' his concrete box. "That is the only reason why we came here. Otherwise who will live here?"

In the meantime, Kawas remains just as vulnerable. As far as possible, the families have tried to build on higher land, but the fear of another flood remains. "Since we are not supposed to be here," says Baga, "nothing else has been done to make us safe."











For centuries, traditional water systems have sustained communities in these arid deserts. The elders of the villages speak of songs and stories that revolved around 'nadis' and 'talaabs'. These water reservoirs are replenished by rainfall; as are the tankas (well-like structures for water harvesting) that can be seen in most areas. In Chawa village, Barmer, a new 20-foot nadi is being dug as part of MGNREGA activity. "Work has been going on for two years," says Shukhi Devi, the leader of the Mahila Mandal (women's group) in the area. "At least it is giving us employment. When it is finished, maybe water worries will also reduce."

## The critical role of traditional water systems

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Even where there are pipes, they have no guarantee. Most of the time, the water doesn't come. They break anytime, they can stop working anytime. All our pipes across the region are also connected to one Rajiv Gandhi lift canal. What happens if they cut off the water supply? We need to maintain our traditional systems!

Kheraj Ram, Famer, Kawas village







Yet, the changing attitude to water is apparent in a series of tankas that lie next to this construction. Due to a lack of space in the homes, they were constructed on village land. At one time, these used to be almost like communal property. Now the mud walls have been replaced by concrete; and the loose thatch covering by concrete slabs. Most telling are the large locks on each one. "The water definitely tastes better and cooler in the older ones," Chuna Ram, a Chawa village resident says. "But everyone tells us that the new ones are cleaner. Plus everyone wants to lock their water away."

This isn't the case in Chawa alone, but echoes across the region.

"Marwad is the home of drought," comments Dilip Bidawat, a worker at UNNATI (a local NGO). "For so many years, these communal water systems have been what helped us survive. With the changing climate, reviving these practices is critical."





The water is like poison here, but we have no other choice.
We try and filter it as best we can.

Women of Khalbelia Basti, Thop Village, Pachpadra

## Powerless spells waterless for many communities



In the small hamlet tucked into a corner on the outskirts of Thop Village in Pachpadra, the women face a daily battle for water. They belong to the kalbelia community, an extremely ostracised group who are often relegated to the fringes of the village. Many of their husbands have migrated to the city for work and they live alone with their children much of the time.



The tanka (traditional rain water harvesting tank) in their area is shallow and the water filthy. The many sediments and high iron content have wreaked havoc with their health and the children are constantly ill. Clinging shyly to his mother, an infant with burn-like rashes all over his body typifies the situation.

The women try to explain their story. They walk several kilometres to the nearest big nadi (traditional ground water reservoir) in the village for cleaner drinking water, they say. But they are often taunted and denied access there. For the most part and for all daily chores, they make do with this water.

"What can we do?" one young mother asks. "Our children are even afraid to go to school because they get beaten up. What power do we have when it comes to water?"

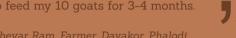




In a time of increasing climate uncertainty, horti-pasture plots have emerged as a harbinger of hope in the Thar desert. Small and marginal farmers constitute close to 80% of the farming community in this region. Their primary livelihood source is livestock and they have traditionally relied on the common lands to meet most of their fodder requirements. However, this common land is now shrinking rapidly and migration is increasing. A pilot project by UNNATI in Western Rajasthan targeted at 65 families with plots of at least 1.5 bighas across seven villages.

## A switch to horti-pasture brings hope for marginal farmers

At first I wasn't very convinced. But I actually managed to have a good result. Apart from the fruit itself, there were enough branches for firewood and fodder to feed my 10 goats for 3-4 months.











Among them is Ghevar Ram, a marginal farmer in Dayakor village, Phalodi. He planted 40 ber (jujube berry) requirements of the project, the family fenced in the plot with a stone wall and did all the work. Consultations were held with the Central Arid Zone Research Institute (CAZRI). A traditional tanka (rain water harvesting tank) was also built for irrigation purposes. At 12 feet deep and

The results have been surprising for Ghevar Ram. In his second year, he was able to earn Rs. 25,000 from the sale of ber from his plot (nearly 300 kilograms). This yielded just Rs. 2,500 from earlier attempts at farming. The only drawback has been for water, for the plot has required them to buy about five to six tankers of water

For marginal farmers across the region, perhaps the most important lesson has been a renewed faith in the productivity of their land. At the beginning, people other villagers are eager to try it. Village and block level MGNREGA functionaries have also shown interest and





## The magic of traditional farming calculations

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There is a period which we call Mirg. It comes for 2 weeks around July. We believe that crops planted in the first week of Mirg will be good. Last year, my crop was over 2 ½ times more than my brother because of this!

Ghevar Ram, Farmer, Dayakor, Rajasthan

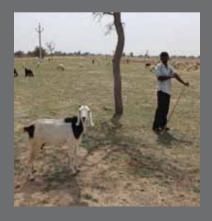


He keeps a diary of everything he sows; the date, time and yield. Over the years, he has compared this to the traditional wisdom passed down orally from generation to generation. In 2012, he decided to do an experiment. As per tradition, he planted crops in the first seven days of Mirg. He had his brother plant crops in the next seven days. Both used the same amount of land (16 bigas), the same seeds and the same water – all in the same area. The results were tremendously different. He has a yield of 105 quintals of groundnuts; while his brother produced just 45 quintals.

"I don't think it's a coincidence," Cheta Ram says. "I wanted to do this to show people the significance. I hope that I can spread this kind of knowledge further."







Akay Muhammad's family has been rearing livestock for the last three generations. Yet, the changing weather patterns have turned him more into a nomad.

Every year, Akay along with his sheep and goats undertakes a long journey; from his small village in Western Rajasthan to one of five to six pre-identified areas in Haryana or Punjab. This includes Kertal in Haryana and Ferozpur, Jalalabad, Roikeda and Patancourt in Punjab. About half of each year is spent there, returning home only around the festival of Holi (March). The fodder from the chickpea harvests and intermittent monsoon rains help feed their animals for the other half of the year.

## Water scarcity turns livestock rearers into nomads

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When there is no rain, we have no option but to migrate. Otherwise, our livestock starve and we lose our livelihood.

Akay Muhammad, Shepherd, Baikor, Phalodi, Western Rajasthan

Each trip costs him at least Rs. 20,000, but he says that is the only option. "There are many who have to move like this," he says. "We now have friends in the other places which is lucky. Otherwise many problems can arise when outside people go there."

They make a point of only selling the young of which there are maybe 30-40 each year. The rest of their livelihood comes from the sales of wool and manure.

The nomadic life is taken in stride, but Akay is deeply disappointed by the sparse assistance provided by the government. The closest veterinary hospital which is 15 kms away charges an extremely high price of Rs.10 per vaccination. The Rajasthan Government has made several veterinary medicines free; but Akay comments that the quality of those medicines is so bad that several of his flock have fallen ill because of them. They would rather spend their own money to buy higher standard medicine.

Over the longer- term, their livelihood seems uncertain. "We need insurance schemes for our livestock", he says. "For only if they survive, we survive."







Adolescent girls are stepping out into the community, many for the first time, to help develop content for short community radio programmes.

Field insights highlighted the need for better awareness on climate change risks and possible solutions.

Radio is one medium that reaches every strata and stakeholder in the community. The hope is that it creates a common platform for issues, debates and messages; including on government schemes that many people are unable to access. Community radio can provide a unique opportunity to explore local concerns in a format suited to local tastes.

## Creating a community radio programme

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Radio programmes, TV and newspapers cover issues of Jodhpur, New Delhi and the world, but not our issues. Community radio programmes are a chance to share our views and things that matter to us; to actually make people listen. Doing it with girls is important as women's perspectives will emerge. Such radio will make our government accountable and help us share knowledge.





This need is acute and growing. One of the most vulnerable regions to climate change, arid Western Rajasthan also has some of the lowest human development indexes in India. Low adaptive capacities and a rigid caste system puts many government schemes and essential services out of reach of some communities. Any improvements are sharply impacted every time a drought or growing extreme events strike.

The gender disparity is part of the reason that a group of local adolescent girls from villages in Pachpadra are at the helm. From interviewing to anchoring and editing; the initiative is trying to teach the girls the basics of putting together a programme. Though this has encountered its own difficulties. The girls themselves are quite shy. Plus, many of the villagers interviewed were uncomfortable at having women – especially young women – be at the forefront. The change will come slowly.

Yet the girls themselves remain optimistic. "We feel this radio programme we're making can spread some awareness," says Meera, one of the community radio reporters. "It has also helped us learn a lot. Otherwise when would we talk to these different people?"







The massive cloudburst in Uttarakhand in June 2013 is the latest in this series of extreme weather events. It has thrown up several of the same issues that have echoed throughout this research. Among others, this includes: the sustainability of extremely fragile ecosystems and the 'regulation' of tourism; 'development' that has harmful impacts in the long-term; policies that have little to do with reality; a lack of access to information; and the hidden suffering of people and areas that are never covered by mainstream media.

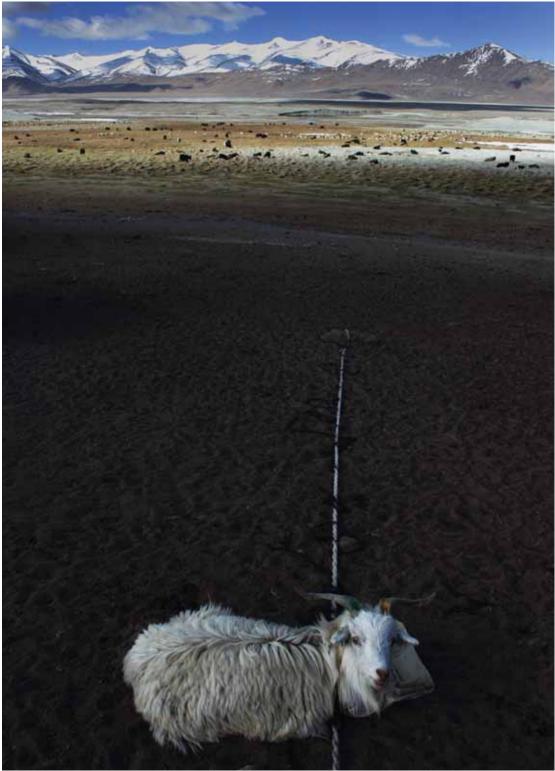
# LOOKING TO THE FUTURE Transferring lessons to Uttarakhand

As Uttarakhand recovers, questions of land rights and large-scale migration of those whose entire livelihood has been wiped out will come centre-stage. Long-term policy planning that keeps in mind the growing impacts of climate change will be essential. There is much learning that can be transferred.

At the core is the strong belief in the local ability to form plans. "Anytime village disaster preparedness needs to be built, arrangements made or people educated; the planning should be done by the people of the village themselves," Padma Tashi, Head of RDY in Ladakh commented. "For if these rough plans can be converted into policies in the right way and implemented; then there will surely be good results."

How do we continue turning these communities into catalysts of change?

















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