

VOICE FOR CHANGE

Agrarian Communities' Action Plan On Climate Change

UTTARAKHAND

June 1, 2015

Introduction

The severe impacts of climate change have begun to appear in several parts of the world with intensity. India is exceptionally vulnerable, with 70 per cent inhabitants depending on climate-sensitive sectors such as agriculture, fishing and forests. The impacts are already visible, especially in agriculture, and will become more severe in the decades to come.

Uttarakhand, which is located in the Indian Himalayan Region, is specifically vulnerable because of several reasons. Some of these are listed below.

What makes Uttarakhand vulnerable to effects of Climate Change?

- Location in a climatically sensitive region - the Indian Himalayan Region
- Dependence of population on climate-sensitive occupations such as cattle grazing, goat keeping, apiculture, poultry, traditional rainwater harvesting, horticulture and other agriculture-allied activities
 - Emissions originating from human activities – related to habitation development, livelihoods, lifestyles, transport, communication etc.
 - Threat posed by melting of Himalayan glaciers, which are an essential source of perennial fresh water supply for the Indo-Gangetic plains
 - Threats posed to forests that are home to rich biodiversity by industry and predatory livelihoods
 - Input intensive agriculture and pressure to produce more from less land and changes in land use
 - Nearly half the population BPL (39.6%) being pushed to climate unfriendly compromises to ensure survival
 - About 90% of the population here have just about 4-5 naalis land (50 naali =1 ha)

Though the issue of climate change is among the highly visible agenda points in global policy debates, there is little participation of the most affected people. In India, it is yet to become a political issue, let alone an electoral issue. Further excluded from any dialogue are the people at the margins - the landless, small and marginal farmers, Dalits and tribals, rural women and children.

Research Methodology

To bring the voices from the margins to the forefront of development debates, Praxis facilitated a community-led research process in 14 habitations located in six districts across Uttar Pradesh, Uttarakhand and Bihar that enabled these communities to engage more substantively with climate change. In Uttarakhand, the processes were facilitated at four habitations in Tehri Garhwal (Chaukigaon, Kuraligaon, Phalenda and Koshkandi) and one in Uttarkasi (Dilsaud).

Community-led research was carried out to map the realities, seasonal variations and changes over time in different aspects related to agriculture and livelihoods and coping mechanisms. Some of the tools that were used include – social map and well-being map to understand the different vulnerabilities in the community, historical transect / trend analysis to map changes over the past few decades.

In the subsequent phase, 13 members from the agrarian communities in these three states, including four from Uttarakhand, were part of a Ground-Level Panel¹ process in New Delhi to collectively analyse

¹ In July 2013, a Ground Level Panel of 14 people living in poverty and marginalisation was facilitated by Praxis in collaboration with Participate in four countries, including India. The Panel responded to the UN High Level Panel's recommendations on what should replace the MDGs. This alternate development agenda evolved by the Ground Level Panel was shared with officials, media and civil society in India and at international forums (<http://ow.ly/MF1t7>). The experience of the Ground Level Panel process opened up possibilities for marginalised communities to inform global development debates from the vantage point of their lived experience. Its objective is to ensure that the process of setting a framework includes actual dialogue with the perspectives of people who live in extreme poverty and who are most marginalised in any context.



the information collected and respond to the State Action Plans on Climate Change.

Community-led research

The team interacted with members from agrarian communities in the five villages as mentioned above. The community-led analysis of climate change and its impact on agrarian communities as experienced by Dilsaud village in Uttarkasi district of Uttarakhand is presented below. At Dilsaud, the team interacted with Sushila Devi, Chandra Devi, Swarn Devi, Ashrafi, Sajna Mehar, Majnu Thakur, Sattu Devi, Sharda Devi, Parvati Devi, Jumla Devi and Jagdai. Using the social map, the community members documented the vulnerabilities of the households in their village. The vulnerable included Dalits, people with disability and widows. They also mapped the well being of the communities based upon the criteria they evolved.

Diagram 1. Reproduced social map of Dilsaud village created by community members

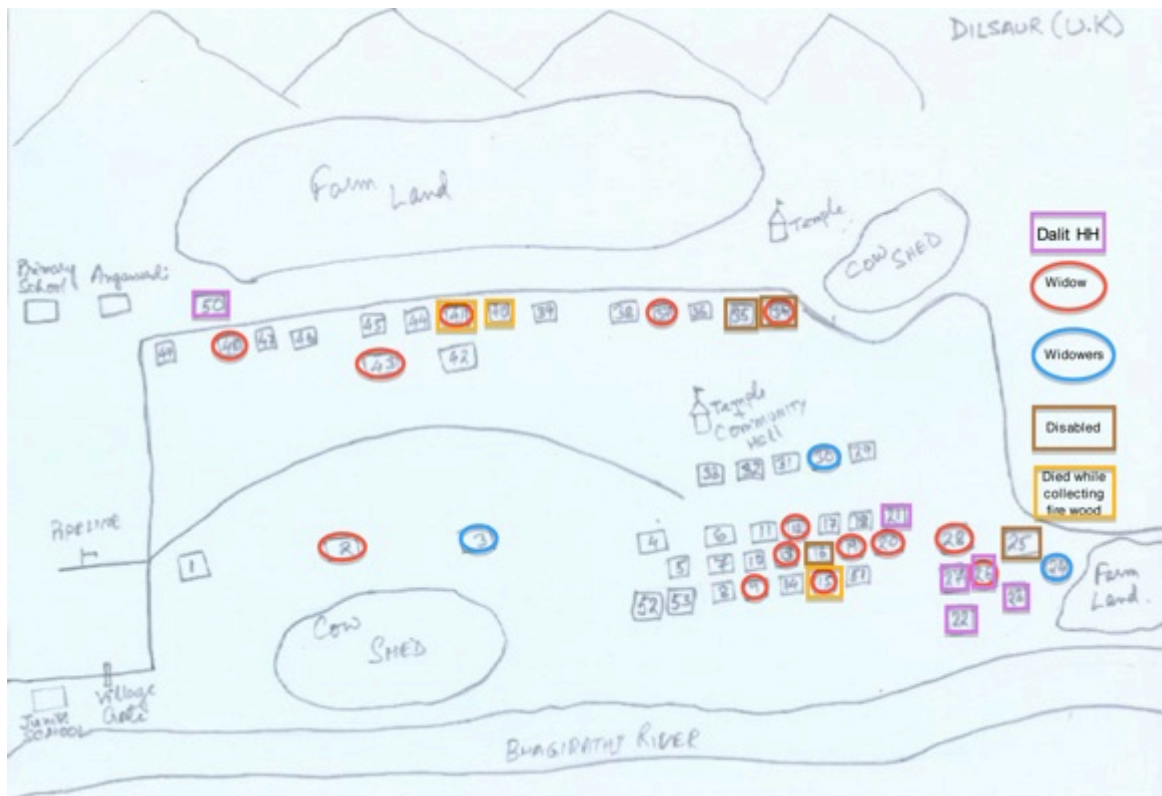


Table 1. Households in Dilsaud arranged by Dilsaud community members according to perceived well being

Category	Households	Criteria
Relatively well off	10, 53, 16, 13, 27, 46,52,47,39,48,38,51	(Stable income/ government job)
Not so bad	45,8,24,48,18,20,36,5,11	(Additional income from business)
Leading a relatively difficult life	12,6,14,19,29,7,1,49,4,42,2,37,15,34,31,30, 28, 25,35,43,36,33,41,32,17,9,40,3,21,26, 22, 50,23	(Unemployed, wage labour, widow headed households and Dalits)

Note: Figures in blue indicate widow-headed households; figures in red indicate Dalit households and figures in green indicate households with people with disability

To understand the community's experience of climate change, a participatory trend analysis was facilitated wherein, the respondents shared and collectively analysed changes over the past two



decades in agricultural practices and associated factors. The participants analysed the trends in different aspects of agriculture, climate and lifestyle. These are presented below.

Table 2. Trends in climate over the past two decades as perceived by Dilsaud community members




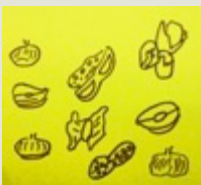





PARAMETER	1990s-2015	DESCRIPTION
Snowfall (July –Sep)		Regular snowfall in January and February used to help agriculture by helping the soil retain the moisture. But now there is hardly any snowfall. And even when it does snow, it snows too little
Unseasonal Rainfall (Feb-March) 		Rainfall has become unpredictable. Incidents of cloud burst have also increased

Table 3. Trends in agriculture and produce over the past two decades

PARAMETER	1990s-2015	DESCRIPTION
Seed and crop diversity 		There has been a drop in the crop diversity over the past few years. Earlier, we used to grow varieties of crops like wheat, rice, urad, barley, mandwa, paalak, arbi, rai, mustard, etc. Now we only grow wheat, rice and a little mustard.
Yield 		Earlier, agricultural output was very good. Because of unseasonal rainfall and wild animal attacks, the output and crop diversity have gone down.
Livestock 		From an average of four buffaloes in every household, the number has come down to one due to unavailability of grass and fodder.













PARAMETER	1990s-2015	DESCRIPTION
Fodder 		Availability of fodder has gone down, forcing women to go to distant jungles to get fodder. Due to the emergence of a new thorn bush, grass has almost vanished. This has, in turn, made the mountain roads very slippery. Many women have met with accidents while collecting fodder and few have also died.
Livestock diseases 		Earlier, incidence and severity of diseases among human beings as well as cattle was low and local medicine was enough to heal them. But now many new and dangerous diseases affect the villagers. In addition, medicinal plants are not as easily available as they were earlier.

Table 4. Trends in forests and wild animals over the past two decades

PARAMETER	1990s-2015	DESCRIPTION
Forest cover 		Forests used to be very dense but now it is increasingly becoming sparse. Many varieties of trees like baanj and buranj have become rare in the jungle near the village.
Crop damage due to wild animals 		Wild animals like wild boars and monkeys have started coming out of the forests to the fields and destroy the crops. As they cannot be killed, we fail to protect our crop.
Natural springs and flow of river 		There were many natural springs, which have vanished now, compelling us to drink water from the river. This causes a lot of diseases.

Similar community-led research was facilitated in the four other villages of Uttarakhand's Tehri Garhwal district – Chaukigaon, Kuraligaon, Phalenda and Koshkandi to understand the agrarian communities' experience of climate change.

“Earlier we used to have snow fall almost every year. The snow helped preserve moisture and the land and also nourished our fields. In the last 10 years, it has not snowed; things have started changing from around 1990. There was a big earthquake some time then and then we have hardly had any snow fall after that”

Community Members at Dilsaud, Uttarkashi



Communities experienced chaotic weather and natural phenomena during this time. They spoke about two earthquakes in the 1990s, droughts in 1999 and between 2007 and 2009, floods in 2010 and 2012 and cloud burst in 2013. These vagaries of climate have primarily affected agriculture and the communities' enterprise around livestock. This in turn has affected livelihoods and food security of the community as well as has drastically changed the perceptions of well being experienced by the community.

"We could plan our agricultural activities according to the seasons and the rain...but this is no longer possible. We sow the seeds and very often they fail to germinate as the rains fail. Due to this we have lost all our indigenous seeds"- Chauki, Uttarakhand

"Agricultural produce was plenty then. We used to sow jowar, rice, wheat, mandua, til, different vegetables, dal, ginger, garlic, potatoes, onions, turmeric, etc. Crops like Jowar, Mandua, Jowari, Kauni have disappeared completely. Til and Cholai are grown no longer"- Koshkhandi, Uttarakhand

The dependence on forests for livestock rearing brings out the stark contrast brought about over time.

"Earlier, we used to get grass for our cattle from the forests. Now, we buy feed from the market"

"Trees like kaphal, buraans etc were in abundance. Hinchal, a local variety, has totally vanished now. Fruit trees such as guavas have stopped growing here now. Our forests used to have oranges, lemons, mangoes, kamli mangoes and other fruit trees. Bamor, a local tree variety, used to grow in abundance near the village. Where are all of them now?"

The changes in agricultural practices and livelihood patterns notwithstanding, certain observations related to issues of equity and governance also came up.

Access to services and opportunities has increased but these are not proportional to the effects of climate change

Communities have reiterated that the tremendous improvements in access to education, health, transport and communication have not been proportional to the negative effects the communities have withstood due to climate change. Most of the individuals said they would prefer holding on to their traditional livelihood – farming, rather than migrate to towns and cities in search of employment or casual labour.

Some people are more vulnerable than others to the effects of climate change

In all the habitations, some households were more vulnerable than the others to the effects of climate change. These households included Dalit households, women headed households, households with disability and landless households. Generally, across the groups, the women were found to be most vulnerable as a disproportionate amount of labour both in the fields and at home fell on them when the men in their families migrated in search of labour and employment.

Dalit groups experienced a sense of discrimination that reduced their chances at adapting to these changes in a dignified manner. Upper caste households dependent on foreign remittances have seen women breaking away from the drudgery of daily household chores and livelihood-related participation. In the case of Phalenda, Uttarakhand, women have gained a sense of autonomy in decision making in livelihood matters as their husbands are outside the country.

Failure of the social security net

- a. **Corruption:** Bribes became common while accessing services like financial and health services
- b. **Poverty Trap:** Lack of profits from agriculture and exploitative conditions for workers who migrate trap workers within unbreakable poverty cycles.
- c. **Absence of approachability:** A sense fear and lack of education led to villagers not approaching officials from the state for issues they faced.
- d. **Criminalisation of local communities / Forest Dwellers for the access to forests:** Limited access to forest produce by communities who have traditionally depended on these resources threatened the sustenance of these communities.



- e. **Lack of sensitivity towards livelihoods:** The state has been localising the access to drinking water in different habitations while the delivery of water for farming through irrigation pipelines or canals has been steadily decreasing.

Unsustainable practices have resulted in new challenges for communities

Communities have indicated changes which they are facing: decline in quality of crops; reduction in the amount of livestock; increase in the use of chemical fertiliser; growth in the intensity of pests; use of new technology due to decrease in uses of traditional sources of energy like cow dung due to climate change. The experiences shared by the community members in the five villages are listed below.

Table 4. Climate change and its impacts as experienced by agrarian communities in Uttarakhand

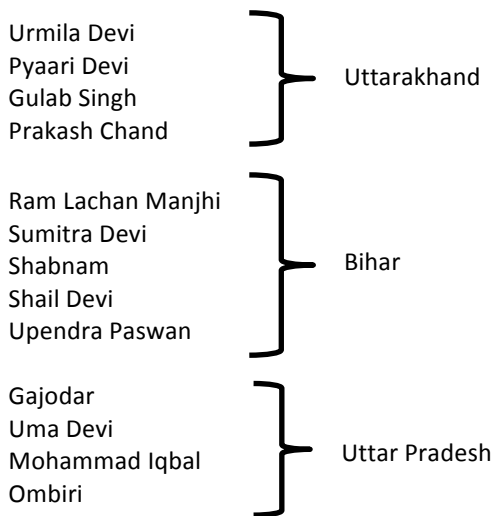
Thematic areas		Habitations in Uttarakhand				
		Chauki	Dilsaud	Koshkhandi	Kuroligaon	Phalenda
A	Climatic Changes					
1	Drought					
	Increased Dry spells	Y	Y	Y	Y	Y
2	Floods	Y	Y		Y	Y
	Cloud burst	Y	Y	Y	Y	Y
3	Erratic rainfall	Y	Y	Y	Y	Y
4	Unseasonal rainfall		Y	Y	Y	Y
	Reduction in snow fall	Y	Y	Y	Y	
5	Frost / hailstones					
6	Rise in temperature	Y	Y	Y	Y	Y
B	Changes in farming					
1	Low productivity	Y	Y	Y	Y	Y
2	Increase in pest attacks	Y	Y	Y	Y	Y
3	Loss of cattle	Y	Y	Y	Y	Y
4	Increase in cattle diseases	Y	Y	Y	Y	Y
5	Increased use of fertilisers and pesticides	Y	Y	Y	Y	Y
6	Loss of food diversity	Y	Y	Y	Y	Y
C	Changes in lifestyle					
1	Migration	Y	Y	Y	Y	Y
2	Increase in diseases	Y	Y	Y	Y	Y
3	Drudgery of women	Y				
4	Loans from moneylender		Y			
D	Other vulnerabilities					
1	Landlessness					
2	Sand Mining					
3	Hydroelectric Dam	Y				Y
4	Child Labour					Y
5	Lack of irrigation facilities	Y	Y	Y	Y	Y
6	Ineffective implementation of social security and livelihood programmes	Y	Y	Y	Y	Y
7	Share cropping					
8	Cattle sharing					
9	Selling of land					
10	Non-receipt of compensation	Y	Y	Y	Y	Y
11	Cutting of forest/trees-Reduced tree cover	Y	Y	Y	Y	Y
Source: Field interactions; Y indicates presence of parameter						



Ground Level Panel (GLP)

Subsequent to the field visits in Tehri Garhwal and Uttarkasi districts of Uttarakhand, four members from the habitations came to Delhi to be part of the Ground Level Panel on Climate Change and Agriculture. Along with nine other panellists from Bihar and Uttar Pradesh, these panellists drew their expertise from their lived experience, and not from any previous role in policy-making or research or academics. The four panellists from Uttarakhand, who were from different villages, collectively analysed their experience of climate change as part of their agrarian life and livelihoods. They also examined the State Action Plan on Climate Change for Uttarakhand and added their inputs to the policy while collectively evolving an action plan on climate change from the perspective of agricultural communities along with the panellists from other states.

The Ground Level Panellists are:



GLP's analysis of experience of climate change

The panellists engaged in a collective analysis of the linkages involved in climate change and agriculture. They reviewed the linkages made at Dilsaud and added linkages where possible based on their unique experience.

Climate change, as experienced by the GLP participants, was seen as a Jalvayu Jaal (a web of multiple issues related to the climate), which are inter-related to each other, mutually causing and impacting each other. They listed a number of variables such as the reduced yield and crop loss caused by factors like unseasonal rains, hailstorms and droughts. The crop loss led to increased dependence on the market, unviable agriculture, leading to migration for work, among other things. Changes in unseasonal rain, reduced snowfall, also caused the rivers to dry up, posing challenges in agriculture.

The respondents compared the Jalvayu Jaal (climate change web) to a Jalvayu Bhoor Bhulaiah (maze), which left them trapped in a reinforcing cycle.

The following diagram presents these linkages.



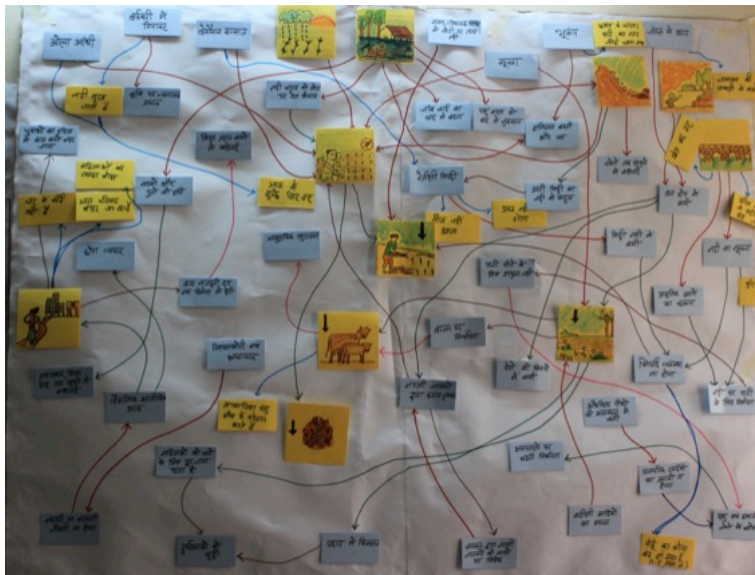


Diagram 2. Causal loop of linkages between climate change, agricultural practices and lifestyles

The Uttarakhand State Action Plan For Climate Change

The state has a net sown area of just 13% though agriculture continues to be the major source of income for more than three-fourths of the state’s population (majority of the land holdings are small, marginal and fragmented). The Uttarakhand State Action Plan for Climate Change (SAPCC) intends to define an overarching climate response framework and develop flexible sector specific response strategies and actions to overcome its significant vulnerability owing to its location in the Indian Himalayan Region.

QUICK FACTS ABOUT UTTARAKHAND SAPCC	
Response strategy	Accelerating inclusive economic growth, promoting sustainable development, securing and diversifying livelihoods, and safeguarding ecosystem services
Community participation	Low (Two-day stakeholder consultations, one in Garhwal and one in Kumaun, were organised)
Nodal agency	Department of Forests
Vulnerability study	No
Net increase in temperature	Between 1.7 degree Celsius to 2.2 degree Celsius by the 2030s as compared to 1970s
Tree Cover change	From 448 sq.km in 2001 to 642 sq.km in 2009
Forest Cover	From 23243 sq.km in 1997 to 24496 sq.km in 2011
Annual Rainfall	Annual rainfall will increase between 60 to 206 mm from 1970s to 2030s Varies from 92 cms in Srinagar to 250 cms in Nainital
Fertiliser consumption	Plains: 150-200 kg/ha/year and hill Agriculture: 5-7 kg/ha/year (2012)
Year-wise damage due to climate change associated disasters	In 2007-08 and 2008-09, the area was affected by drought. State government sought Central assistance of Rs 2415 million and Rs 2001 million respectively. In 2010, massive losses were reported from across the state due to repeated flood, flash flood, landslide and cloudburst events and the state Government had to seek Central assistance of Rs 6530 million.
Land Use Land Use Change and Forestry	Forest area forms 65% of the total area of the state (2008-09)
Gross State Domestic Product Growth statistics	Rs 45580 crore in 2009-10 compared to Rs 41188 crore in 2008-09
Net sown area	13.29% (2008-09)
Plan Outlay Gender Dimensions	The plan has little emphasis on issues of gender and vulnerabilities. It is limited and looks at the role of women sole though Self-help Groups (SHGs).



While acknowledging the state's dependence on natural resources for local livelihoods, it sees the strategic significance of its valuable freshwater reserves also making it a powerhouse for green energy (hydel power) with its 15 important rivers and over a dozen major glaciers. Hydel power is a prime resource base for state's economy (with more than 200 large and medium sized hydro-projects).

The State Action Plan on Climate Change (SAPCC) allocates 0.9% of the total budget outlay for agriculture – which works out to just Rs 79 crore. The panellists examined the SAPCC and added their suggestions to the action plan. The table below details the analysis

S NO	THEMATIC AREA	SAPCC STRATEGIES AND ACTIONS	GLP'S RECOMMENDATIONS
1	Agriculture	<ul style="list-style-type: none"> ▪ Invest in adaptation research capacity ▪ Policy changes ▪ Infrastructure for water management / soil conservation ▪ Relocation to more productive areas and practices ▪ Insurance coverage for farming ▪ Improved information ▪ Dissemination of climate change information / adaptation options ▪ Alternate livelihood options ▪ Exploring role of private sector / financial sector ▪ Research projects/initiatives proposed 	<ul style="list-style-type: none"> ▪ Most government workers share information on climate change etc, mainly with the people who are located in major areas and not with the ones who stay in remote areas like on hilltops. There is need for information flow to these areas ▪ Government assistance to further agriculture - In case of fallow land, government should take it up after five years and cultivate it ▪ Need to incentivise agriculture
2	Irrigation	<ul style="list-style-type: none"> ▪ Network of improved hydrological observation stations ▪ Hydro-meteorological and hydrological data ▪ Ground water monitoring ▪ Monitoring erosion, river carrying capacity ▪ Surface and ground water quality monitoring ▪ Appropriate policy framework > incentivising water harvesting Encouraging non-agricultural type developments ▪ Regulations/frameworks for water withdrawals of industries – royalties, licenses, subsidies and incentives for recycling and recovery, revision of water tariff based on cost recovery principle 	<ul style="list-style-type: none"> ▪ Prevent water pollution in three ways – a) Check on industries for pollution so that effluents don't poison the crops b) Make industries responsible for treating polluted water; c) penalise errant industries ▪ Rainwater should be stored in tanks near the villages and for irrigation the stored water can be diverted to the small ponds located in the fields. ▪ Construct check dams which would help retention of water on one hand and divert the water into the fields on the other
3	Livestock	<ul style="list-style-type: none"> ▪ Investment ▪ Capacity to conserve and manage livestock for sustainable income ▪ Policy support, opportunities in animal husbandry 	<ul style="list-style-type: none"> ▪ The government should provide good breed of livestock and invest more ▪ Income generated from livestock should not be taxable ▪ Livestock rearing should be incentivised ▪ Loans at low interest rates for livestock rearing



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