

POLICY BRIEF

# Barah Anaja

TRADITIONAL SYSTEMS FOR RESILIENCE BUILDING: A CASE IN UTTARAKHAND



Ministry of Environment,  
Forest and Climate Change  
Government of India



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# Background

**Uttarakhand** is the newest Indian Himalayan state where demography and environment are largely governed by altitudinal variation. Geographically it has been divided into five zones tarai, *the doons*, *the middle Himalaya*, *the great Himalaya* and *the trance Himalaya*, which are characterized by diverse climatic zones. A critical problem of the region is loss of forest cover, increased soil erosion, reduced runoff in rivers and spring discharge. Glacier and snowmelt also provide good flows in summer season. Currently, forest cover is 65% of the area (SAPCC, 2012). Average rainfall of the state is 1550 mm. 70% of the population is engaged in Agriculture, but 92% of them are marginal cultivators. Only 10% of the agricultural area is irrigated. The state rivers have enormous cultural and religious significance with for major shrine located near origins of Alakhnanda, Mandakini, Bhagirathi and Yamuna rivers. Livelihoods are also derived from religious as well as recreational tourism (Chopra et al. 2014).

Climate change impacts include excessive spells of rain and increase in mean intensity of monsoons (Ashrit, Kumar, & Krishna, 2001; Chung & Ramanathan, 2006). Agriculture in Uttarakhand is likely to be affected due to increase in temperatures, farmers are experiencing change in peak rainfall and winter precipitation with increased incidences of cloudbursts (GOU, 2015). Agriculture and allied activities contribute to 27.71% (during 2015) to state gross domestic product, where as 70% of the population is dependent on it.





## THE TRADITIONAL AGRICULTURAL SYSTEM OF *Barah Anaja*

**Barah** refers to “12” **Anaja** or **grains** which includes, millets, legumes, vegetables and spices (Jardari 2010). This is a mixed inter cropping system prevalent in IHR, where 12 crops are **sown** in a piece of land **simultaneously**. Around 20-22 variety of crops are said to be a part of this mixed cropping system which varies according to climatic and geographical conditions in the region. The 21 crops are: Mandua, Ramdana, Kuttu, Jowar, Corn, Rajma, Kulath, Bhatt, Reyans, Gurunsh, Tur, Urad, Lobia, Ragadvans, Gurunsh, Moong, Bhangjeer, Til, Jakhya, Bhang, San, Kheera. (Jardari 2010).



Barah Anaja system not only caters to the food security and nutrition of people in this region but also good for soil fertility and animal husbandry. This traditional system has also been highlighted by historians, who have documented the living standard of traditional farmers in Garhwal and Kumaon regions, stating that their cropping pattern catered to all the needs they had like, food, cloth and shelter for the domestic animals (Jadari 2010).

This system is a rain fed agricultural system, which does not require any chemical fertilizer, putting it in the category of sustainable agriculture. This system can be seen as a good practice and potential to contribute as climatic adaptation due to inherent characteristics of the system, and builds resilience to climatic variability and change in the long run.

## *Study area*

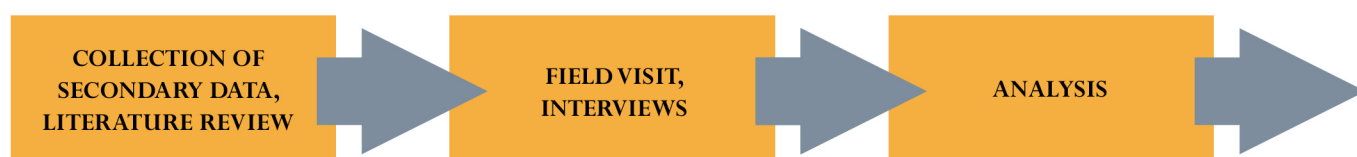
For this study **Kimkhola village**, Block Dev Prayag, at the confluence of Bhagirathi and Alaknanda rivers was taken up. Kimkhola, has approximately 150 households mainly inhabited by Rajput community, is the farthest from the motorable road and is located atop a hill and spread out on slopes on both sides. It is a 3 km trek away from the road. Agriculture and allied activities is the mainstay of the economy. Total main workers in Tehri Garhwal comprised of 62.93%cultivators, 0.83 per cent agricultural labors and remaining 36.24%non-agricultural workers. The district also has high proportion of marginal workers - 31.55% as compared to the state average of 25.9%. Other sources of livelihood include household industry, casual employment, and tourism related income generating activities like shop-keeping, running eateries, providing accommodation etc. Only a minority of them work as government employees and army personnel (WSMD, 2009).





# Methodology

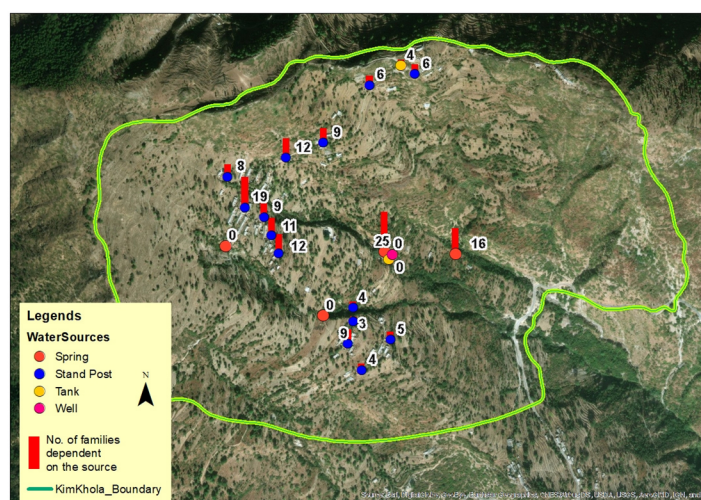
Participatory resource mapping was conducted on cadastral maps in some cases, which were made available from revenue officer (Patwari) at the village office. This map was taken to the community to identify their natural resources and initiate a discussion on them (Sharma et al. 2019). Participatory resource mapping helps in understanding the status, scale and area under cultivation for different barah anaj crops. Check list was prepared beforehand and discussions were carried out revolving around a range of topics like identifying area under irrigated/ unirrigated land, sources of irrigation, sources of drinking water, crop pattern and crop productivity, area under settlements, road network and village infrastructure etc.



Organizations Visited		Type	
TERI Delhi	NGO	Sector Expert	Mr. Vijay Jaydhari
TERI Dehradun	NGO	Communities Interviewed	ST & SC(Rajput)
CEDAR	NGO	FGDs	3
Watershed Management Directorate, Uttrakhand	Government	KII	3
		Oral History	1
Land Revenue Department, Devprayag (Patwari)	Government	Resource Map	1
		Crop Calendar	1

## Analysis

- In the study area, soybean, potato, turmeric, paddy, mandua, maize and rajma are grown in kharif season. Whereas, wheat, ginger and onion are grown in rabi season. Majority of farmers are small and marginal. Agriculture is mostly **non-mechanized**, rainfed and is done for subsistence purposes.





MONTHS ► CROPS ▼	ASOOJ (SEP)	KARTIK (OCT)	FAGUN (FEB)	BAISAAKH (APR)	JETH (MAY)	ASHADH (JUN)	BHADO (AUG)
Madua	Harvesting				Sowing		
Bhatt	Harvesting					Sowing	
Urad	Harvesting					Sowing	
Moong	Harvesting					Sowing	
Raamdana/ Chowlai,maarsu		Harvesting			Sowing		
Lobia/Sungta	Harvesting					Sowing	
Jhangora			Sowing				Harvesting
Wheat	Sowing		Harvesting				
Gahat		Harvesting				Sowing	
Rajma	Harvesting					Sowing	
Kheera,Loki,Petha						Sowing	Harvesting

(Source : Field work)

- There has been a shift in cropping pattern, as cultivation has shifted to soyabean and vegetables to increase the household income. Also, few farmers have started growing wheat instead of Mandua.
- The widely practiced crop diversifying system of ‘Barah anaja’ in the mid hills where more than 12 varieties of crops are cultivated together is prevalent in the study village. Although it has been modified to cater to the needs of the present situation of farming community.
- Discussion with stakeholders also revealed that due to non-availability of credit support and inputs and poor irrigation facility and either diversification or intensification has become difficult but agro-ecological conditions favor diversification of crops.
- Further, events of attacks by monkeys and wild pigs on crops is on a rise and is leading to decrease interest in farming. Also, almost every household in the study village had one family member who has migrated to nearby town/ city in search of employment.





# Recommendations



- Replication at newer sites will be ensured by **enhanced awareness towards the concept itself**, ease of access to funds, and involving multiple stakeholders at various levels, especially organisations present at grassroots levels for facilitating implementation.
- **Collaboration with organisations** at community level for ease of implementation owing to existing rapport.
- **Capacity building of potential implementers** (government officials and planners) in order to ensure involvement at various levels and raise awareness regarding climate change adaptation and concept “**barah anaja**” system, to promote ‘soft measures’ along with ‘hard’ in existing policies.
- **Ensure finance mechanisms** for supporting implementation of various activities. There is budget allotted within existing programs prioritising implementation of ‘hard measures’. Such measure needs to be converged within the same ‘more crop per drop’.
- Conducting **timely monitoring and evaluation** of adaptation measures in order to avoid maladaptation and being mindful of selection of climate appropriate strategies.





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