

Social Capital and Local Institutions- A Perspective to Assess Communities Adaptation Potential to Climate Change



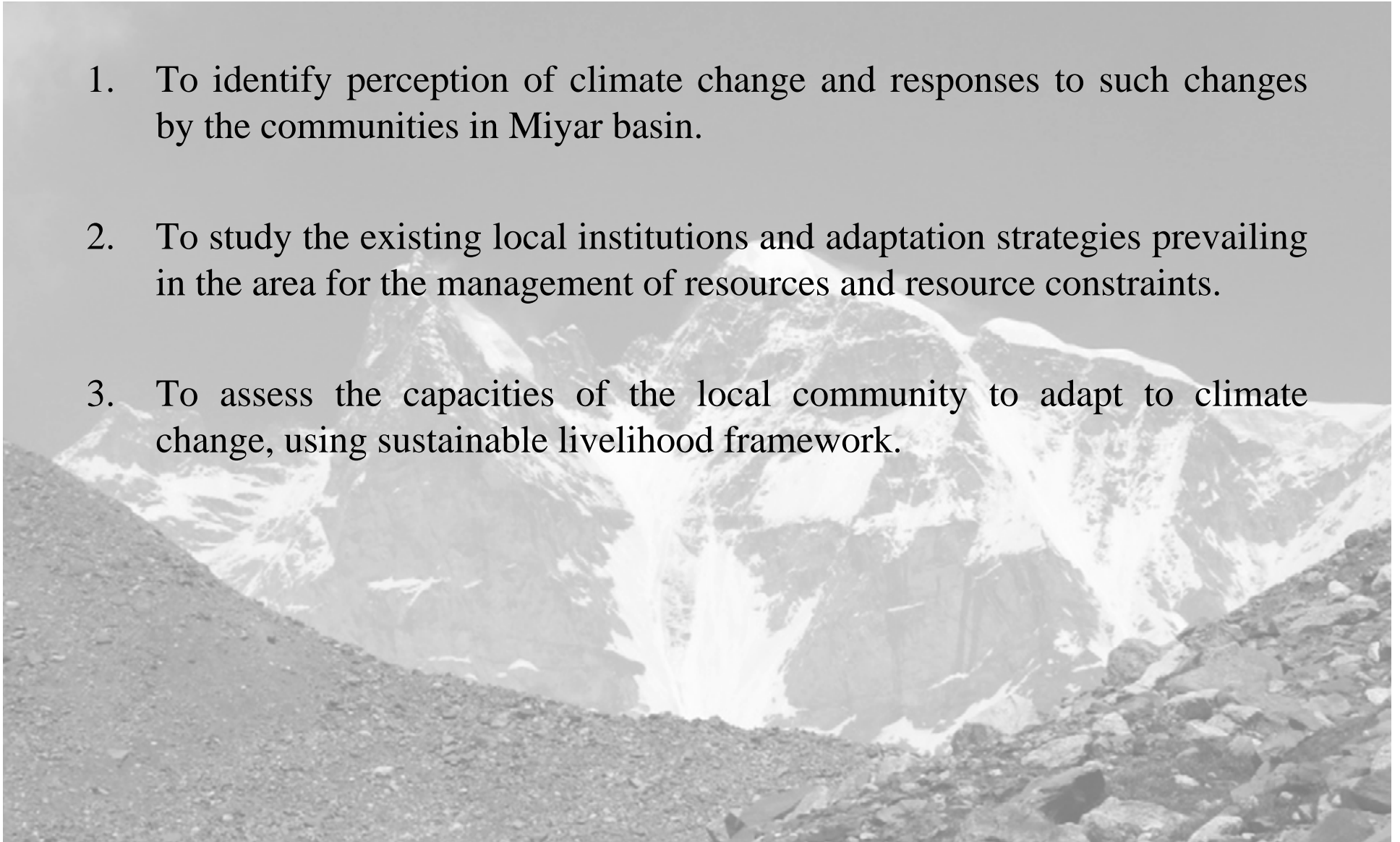
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Objectives of the Study

1. To identify perception of climate change and responses to such changes by the communities in Miyar basin.
2. To study the existing local institutions and adaptation strategies prevailing in the area for the management of resources and resource constraints.
3. To assess the capacities of the local community to adapt to climate change, using sustainable livelihood framework.



Introduction To Study Area

Miyar Watershed

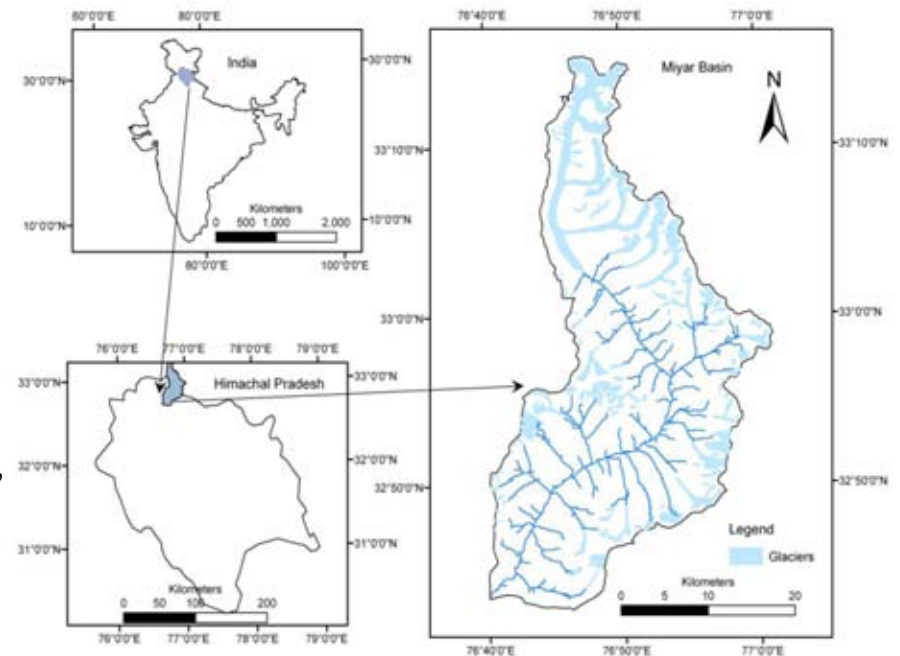
- North-eastern part of Lahaul and Spiti district of Himachal Pradesh.
- Extends between 32°42'36" N - 33°15'24"N – 33°15'24"N latitude to 76°40'12"E – 77°1'15" E longitude.
- The study area included 5 villages (Tingrit, Ghumpa, Urgos, Sukto and Khanjar)

Physiographic Setting

- Physiographically it lies in between Pir Panjal and Zaskar Range.
- Altitude varies from 2600 meters a.s.l to 6448 meter a.s.l, covering 963km² areas

Drainage Pattern

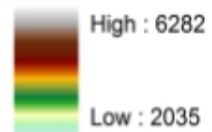
- Miyar is a 6th order basin fed by 26 micro watersheds forming dendritic pattern of drainage (Saini.R, 2008).



Legend Digital Elevation Model

subset_srtm1.img

Value



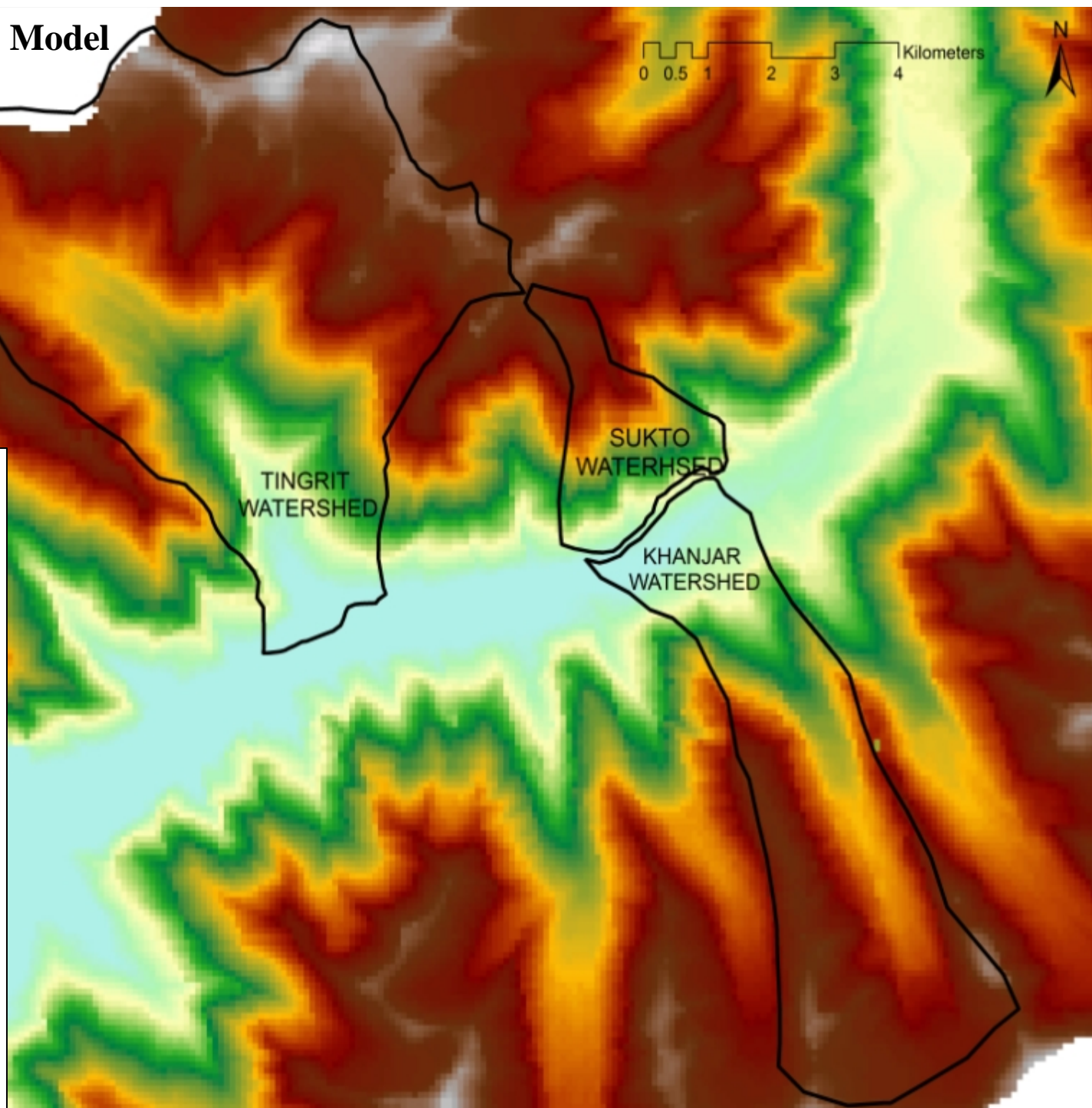
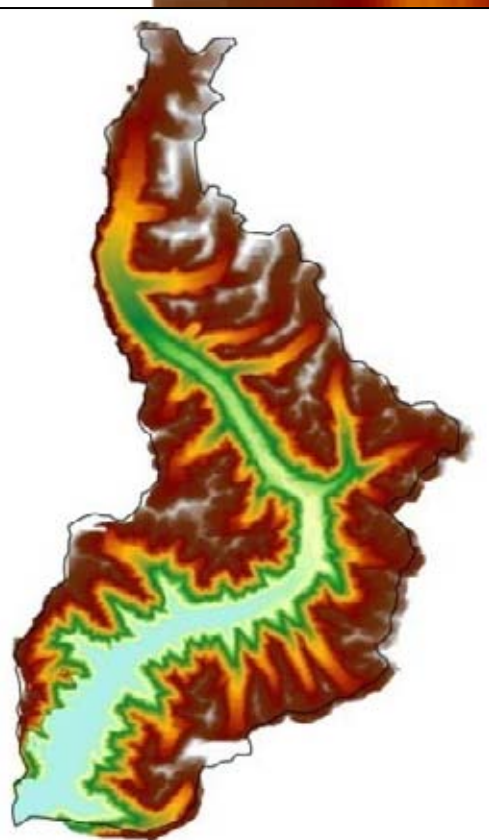
0 0.5 1 2 3 4 Kilometers



TINGRIT
WATERSHED

SUKTO
WATERHSED

KHANJAR
WATERSHED

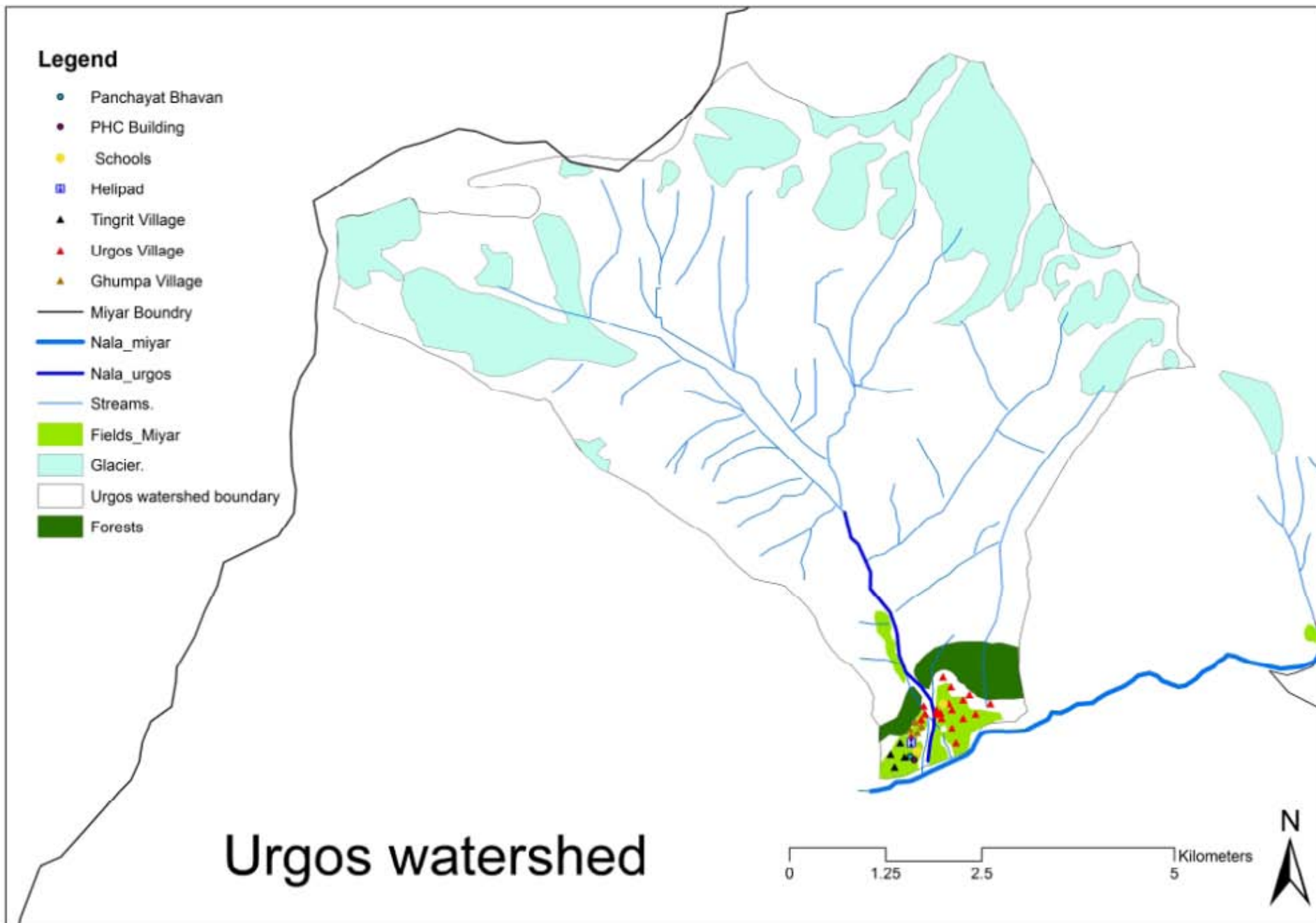


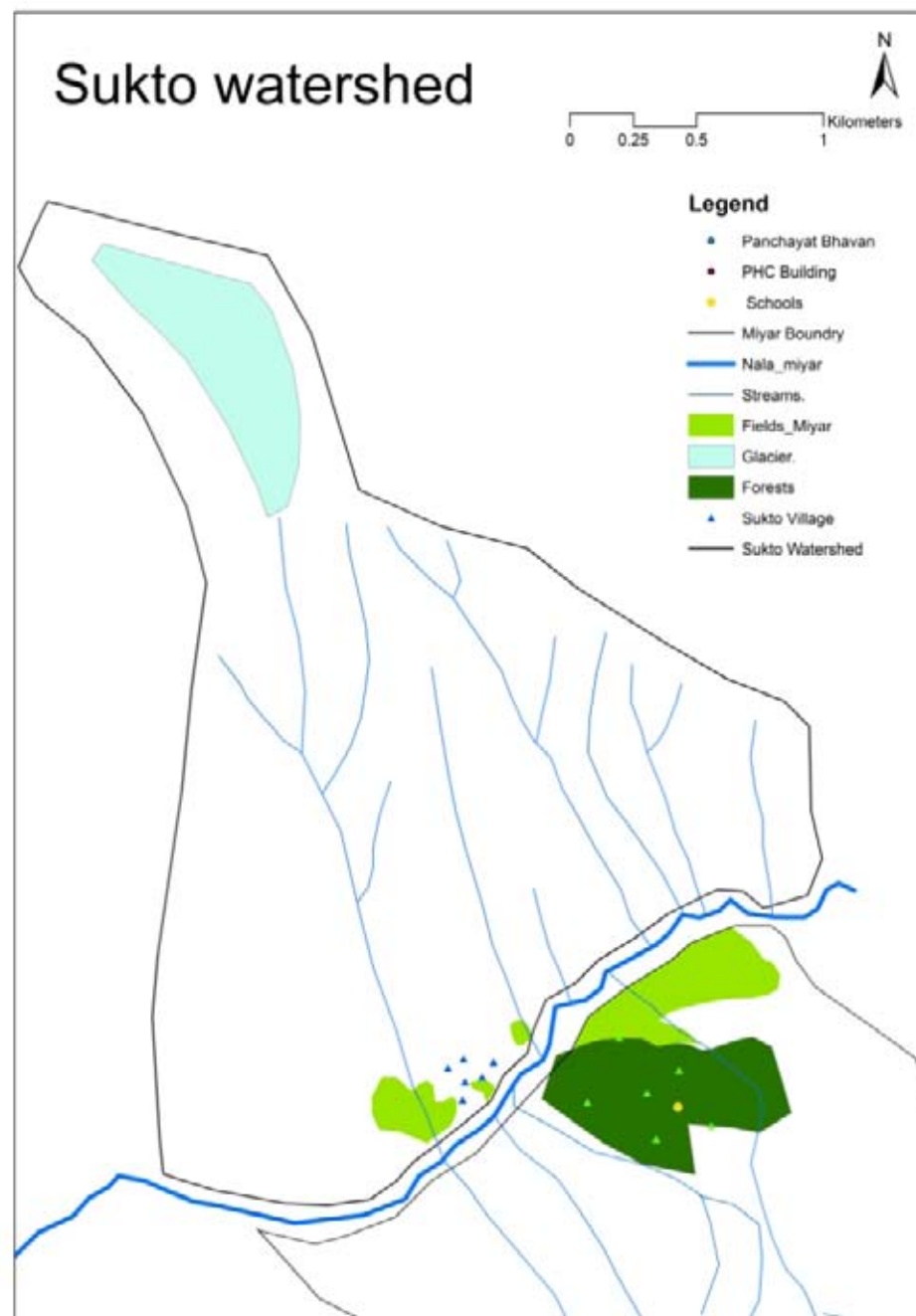
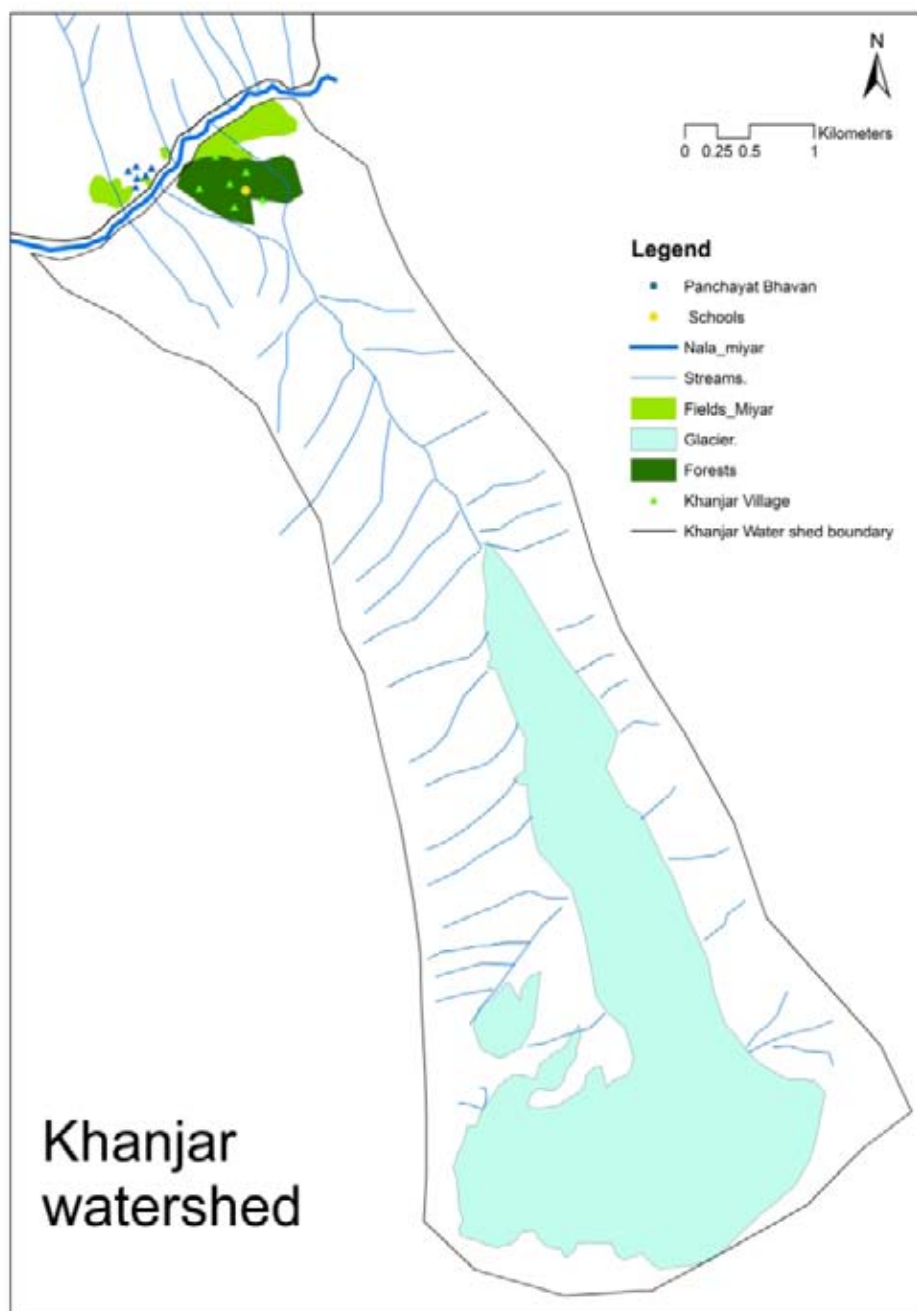
Legend

- Panchayat Bhavan
- PHC Building
- Schools
- ▣ Helipad
- ▲ Tingrit Village
- ▲ Urgos Village
- ▲ Ghumpa Village
- Miyar Boundry
- Nala_miyar
- Nala_urgos
- Streams.
- Fields_Miyar
- Glacier.
- Urgos watershed boundary
- Forests

Urgos watershed

0 1.25 2.5 5 Kilometers





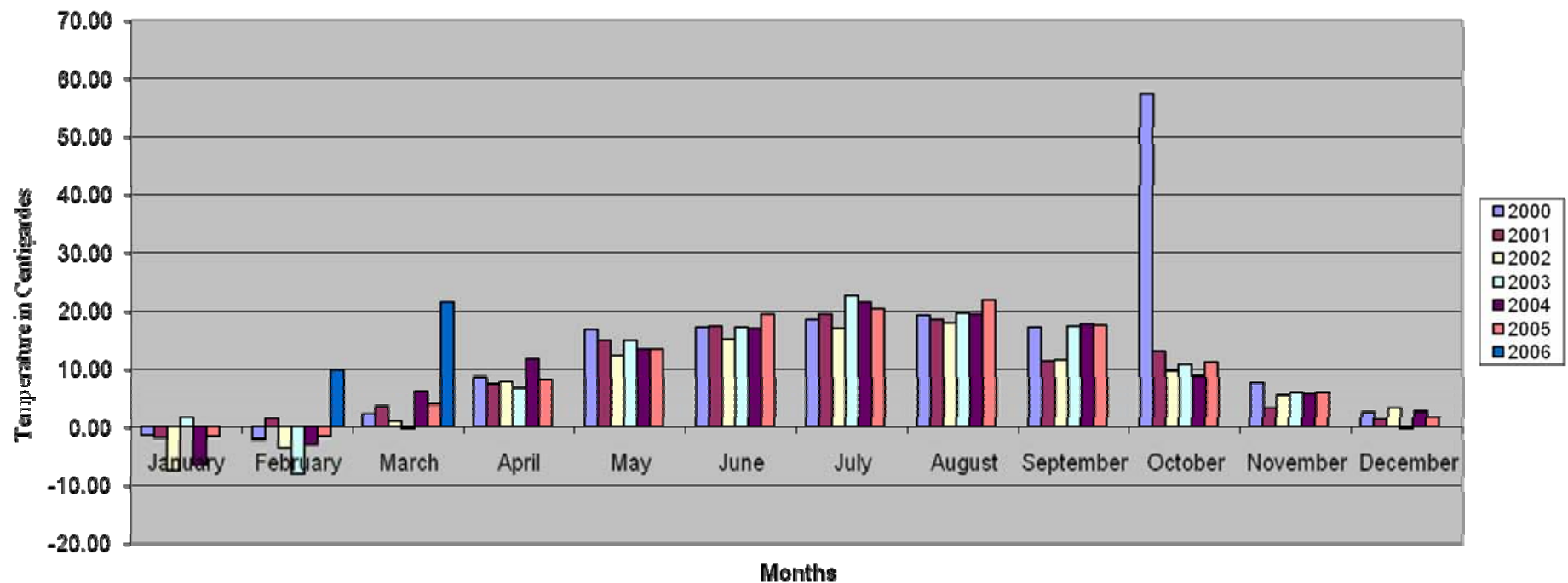
Climate

- Temperature of the valley ranges from below freezing point to 25°C.
- The region experiences typical rain shadow zone.
- North West disturbance causes precipitation but in solid form.

Soil

- Soil of the watershed has been classified into three major groups.
- These groups are skeletal, mountain meadow and snowfield soils. (NATO, 1999) (Saini.R, 2008).

Temperature Variation in The Miyar Valley at Udaipur



Vegetation

- Vegetation cover is of central Asian or Siberia type with dry alpine character at lower elevation.
- Total number of species recorded from the study area is 142, from which 17 are trees, 18 shrubs, 85 herbs and 22 lichens. (Forest Working Plan 1996-2006)

Faunal Elements

Mammals

- Around 13 species of wild mammals, 6 species are carnivorous in nature are found. (Forest Working Plan 1996-2006)

Avifauna

- A total of 44 avifauna species belongs to 26 families and 8 orders are found in the area. (Forest Working Plan 1996-2006)



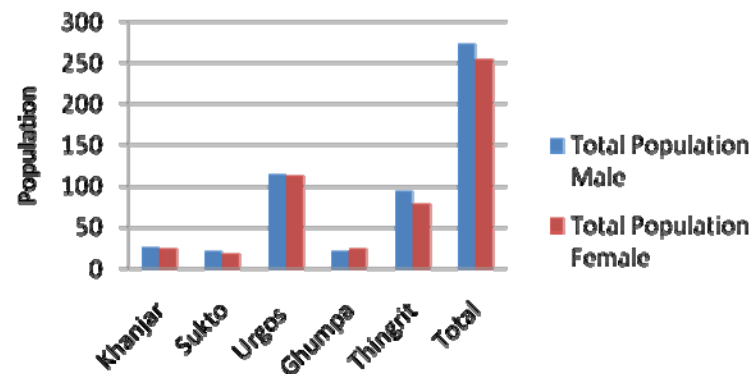
Demography

- Settlements in area are bound to flat terrace, and fans made by streams and nalas and rock avalanche cones.

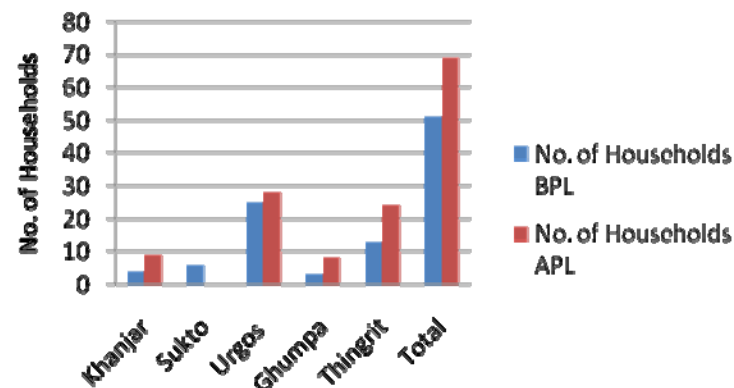
Village	Total Population 1999		Total Population 2001		Total Population 2010	
	Male	Female	Male	Female	Male	Female
Khanjar	25	26	29	32	25	23
Sukto	Data not Available				20	17
Urgos	Data not Available				114	112
Ghumpa	Data not Available				21	24
Tingrit	154	123	167	144	93	78

Source: Panchayat Office, Tingrit

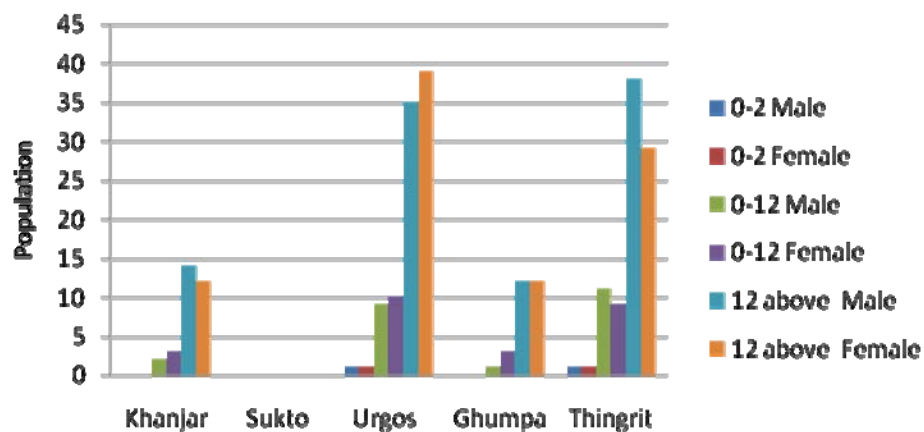
Village Population



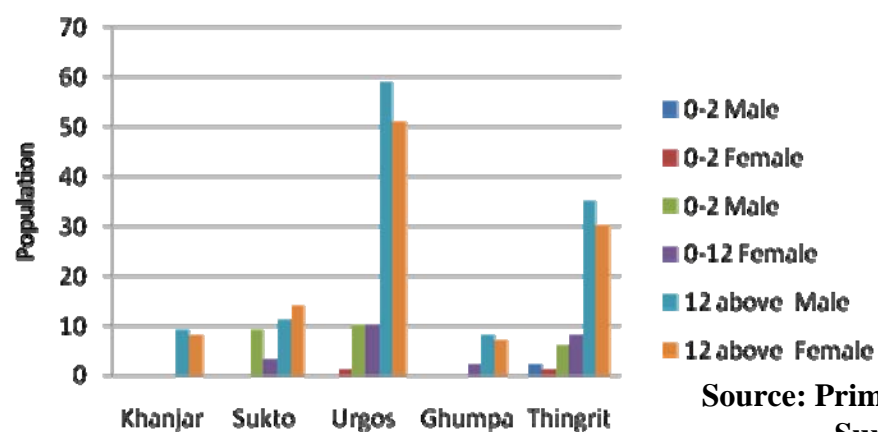
BPL Status Village wise



APL Population Distribution



BPL Population Distribution



Source: Primary Survey

Agriculture

- Agriculture is the major economic mainstay of the people of this valley.
- The main crops grown are, Seed potato, Peas, *Kuth* (*Saussurea lappa*), barley and Buckwheat.



Irrigation

- Field irrigation water comes from majorly from snowmelt water and glacier melt water.
- Water is transported using channels called *Khuls*.

Infrastructure

Houses

- Lahauli building style.
- House is made up of local materials (Slate, Granite and wood)



Water Supply

- . Drinking water is obtained from the springs.
- Water is transported using gravity water supply scheme.

Sanitation

- Almost every house in villages have both type of toilets (Wet toilets & Dry toilets)



Health Care

- 2 allopathic dispensary, 3 Ayurvedic dispensary, 3 Primary Health Sub Centre (PHC's) and one Primary Health Centres (PHC).

Education

S No	Village Name	Primary School	Total Students	Senior Secondary School	Total Students
1	Tingrit	1	13	1	56
2	Ghumpa				
3	Urgos	1	20		
4	Sukto	1	6		
5	Khanjar	1	5		

Source: Primary Survey

Electricity

- Electricity infrastructure was established in the Miyar valley in around 1986-87.
- Introduction of the solar kit and lamps (2003-04)

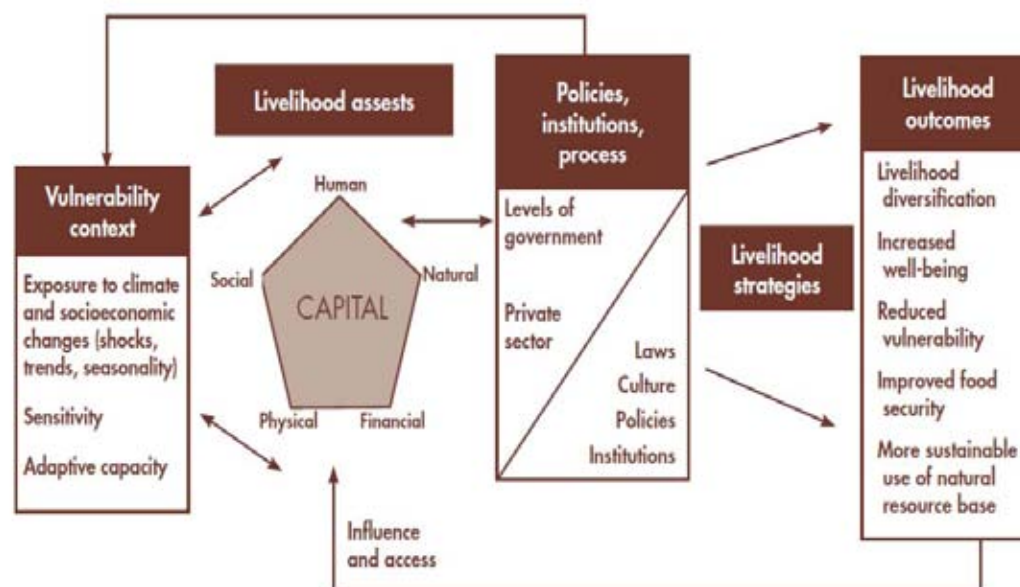
Transportation & Telecommunication

- . The road was constructed around 1998 – 99, & 2008-09 it was extended up to Sukto Village.
- Mobile and telecommunication facility around 2008-09 , Airlift Facility



Methodology

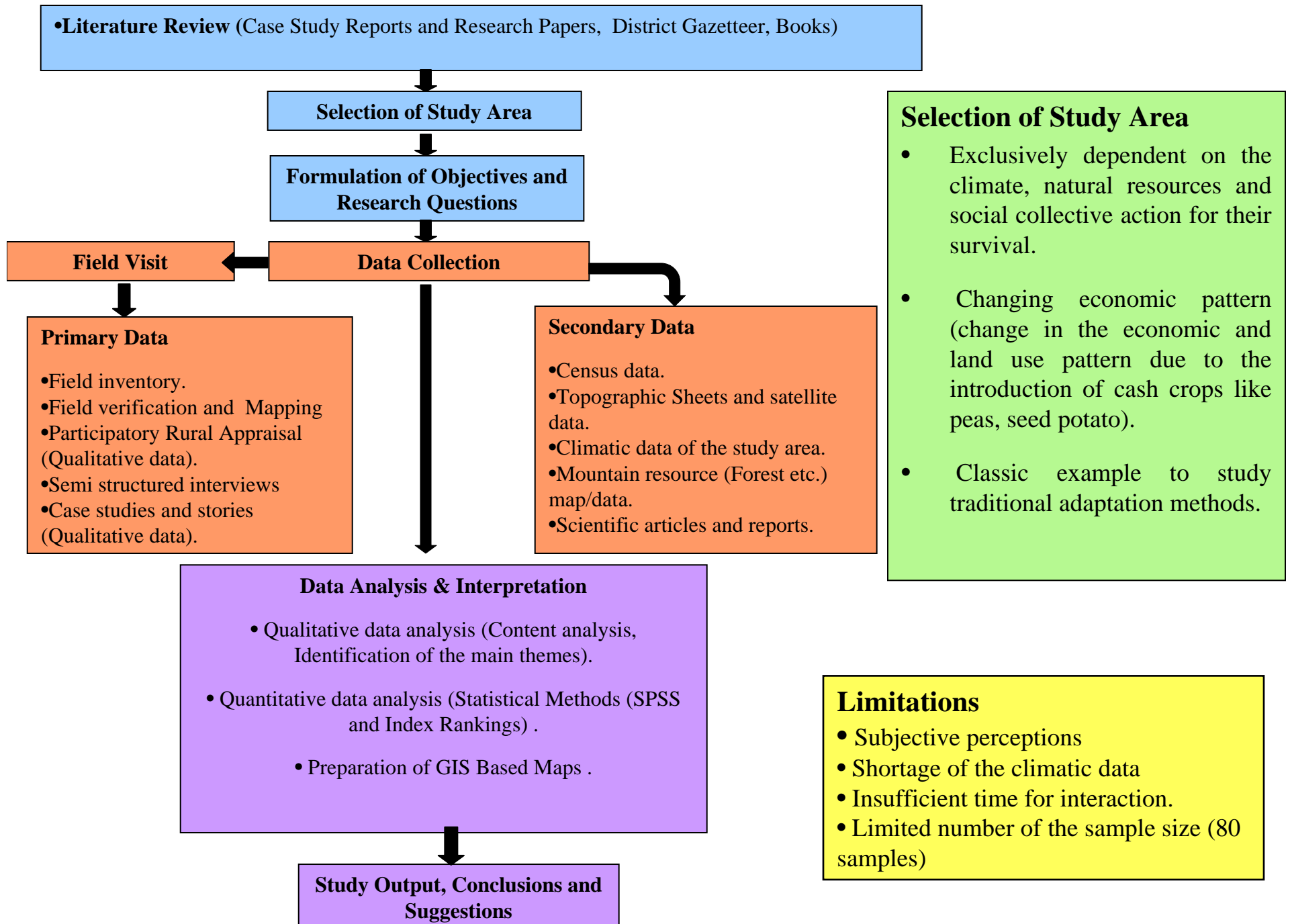
- Community Based Vulnerability and Capacity Assessment Approach (CBVCA)
- Combination of the vulnerability assessment and sustainable livelihoods approaches (SLA)



Source: Adapted from a guidance sheet from the UK Department of International Development (DFID 1999)

Adaptive Capacity	
Sectors/ Resources	Proxy Indicators
Human Capacity	Family size, Education, knowledge, and skills.
Economic Capacity	Income sources , savings, credits & loans
Physical Capacity	House structure and materials, Road connectivity, local technologies and equipments.
Environment (Resources) Capacity	Natural resources (pasture land, forest, fresh water resources), Land holding per family.
Social Capacity	Social structure and relationships, local governance, community support, trust, bonding and network.

Source: Self

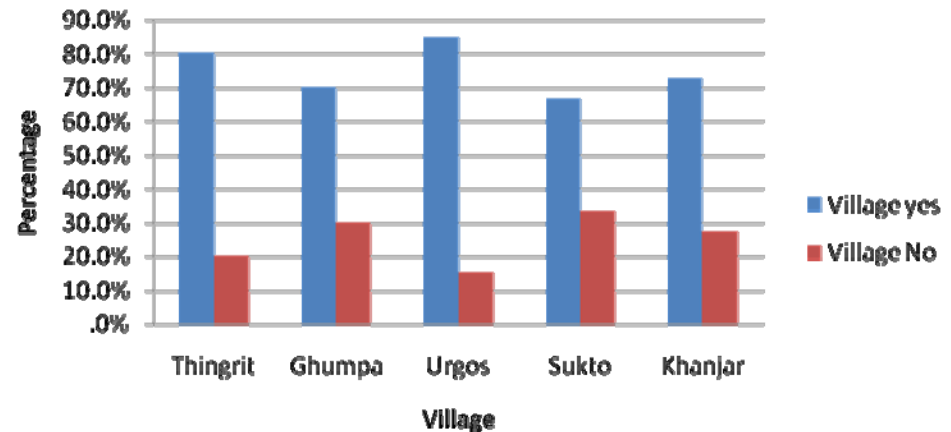


Environmental Change Perception

Temperature

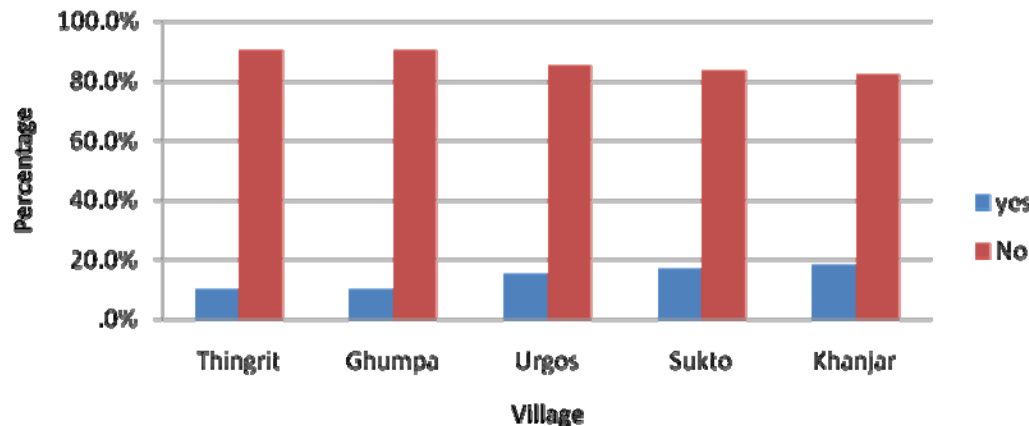
- Himalayas has been much greater than the global average of 0.74°C over the last 100 years (IPCC, 2007a).
- Variety of literature on climatic variability and climatic modelling on NW Himalayan region suggest increasing trend in temperature in near future.

Change In Temperature



Graph showing perception about Perception of Change in Temperature

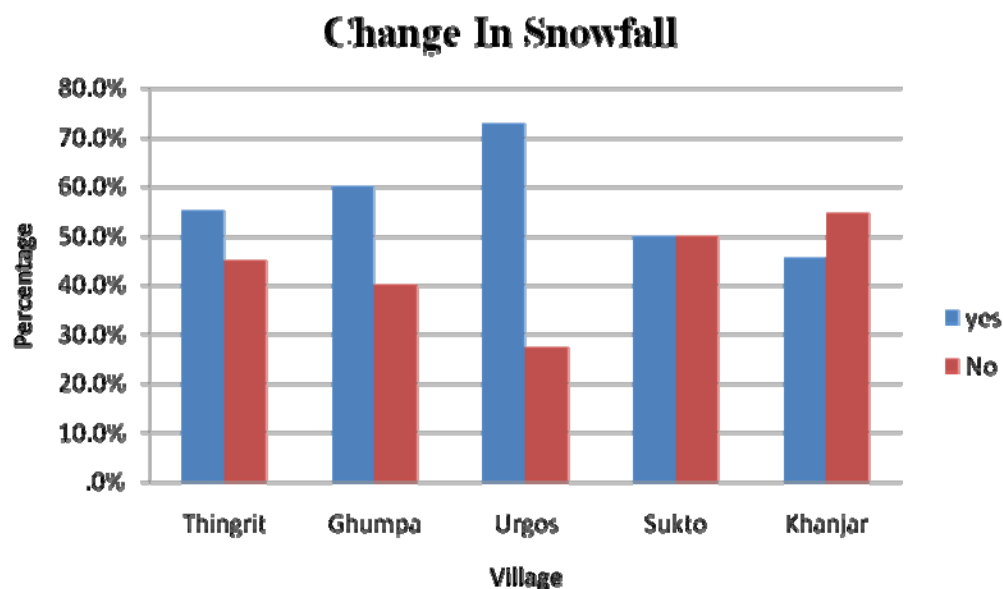
Change in Drinking Water Availability



Drinking Water

- Continued deglaciation could have a profound impact on the water in the large river basins originating in the NW Himalayan region (ICIMOD, 2009).

Source: Primary Survey



“In our village we mutually exchange our water rights, if someone needs water for crops. Since we have plenty of water to feed the whole village”

Says Ram Lal, farmer, Tingrit Village

Coping and Adaptation Mechanisms Implemented By the Communities

S No	Parameter	Communities Perception of Change	Impact on Livelihood	Communities Perception of Risk to Change	Coping & Adaptation
1	Temperature Change	Slight Increase	No Significant Impact	No Risk	No Coping and Adaptation
2	Snowfall	Increased	Little Impact	No Risk (Risk is there if, they try to take two crops in a season)	No Coping and Adaptation
3	Drinking Water Availability	No Significant Change		No Risk (Risk is there if, following year after less snowfall spring dries up)	Diversion of the spring water system to the new source

Source: Primary Survey

Existing Capacities & Technologies For Adaptation

Local Adaptations (Natural Resource Management)

Wonder Plant – Seabuck thorn (*Hippophae spp.*)

- Ability to conserve water and moisture, apart from fixing atmospheric Nitrogen.
- Also used as raw material for producing food, cosmetic, medicine etc.
- Best option to mitigate the problems of fragile eco-system, economic sustainability of marginal farmers



Fuel & Fodder: Willow Trees (*Salix Fragilis*)

- Successful local solution for management of fuel ,fodder and conservation of forest resources.
- Trees are planted in common lands and guarded as common property.



Local Adaptations (Human Resource Management)

Jowari - Labour Exchange (Resource Management)

- Include 4–5 families who share manpower, bullocks, and plough, weed and harvest the fields in rotation.
- Normally women are the ones who work in labour exchange.


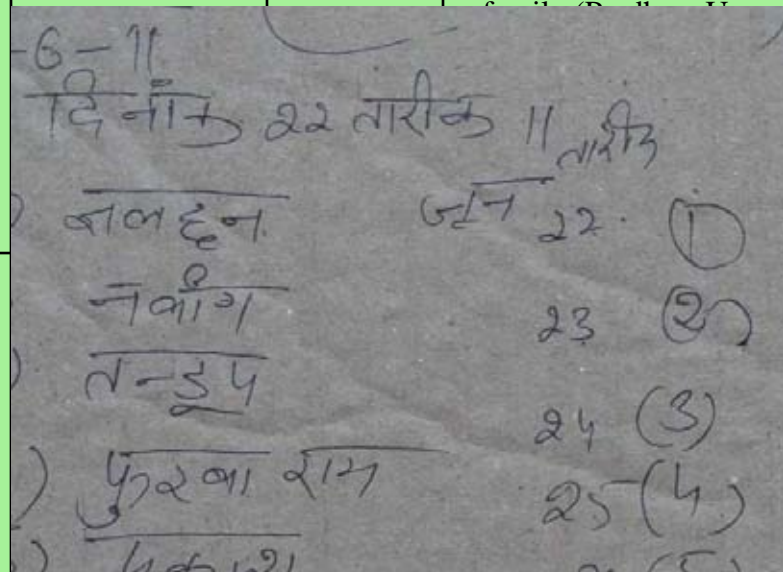
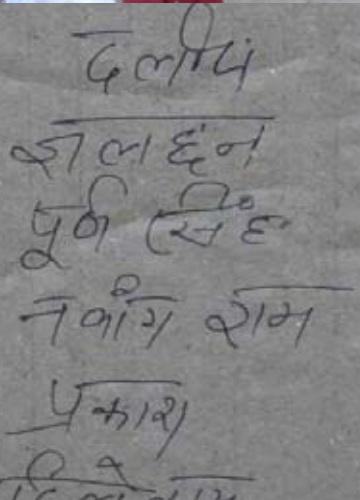
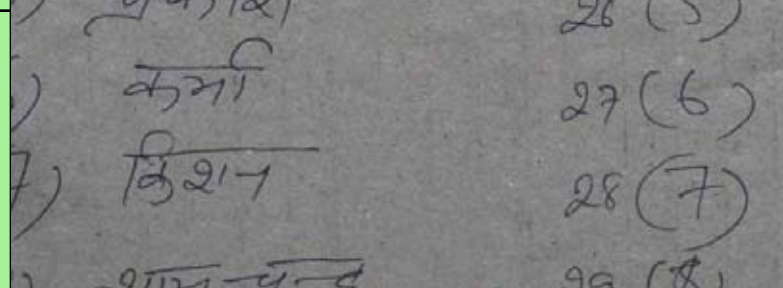


Community Livestock Grazing

- The alpine pastures are managed as common property by the villages.
- Excellent Solution to deal with human resource shortage during peak agricultural season.
- The livestock are taken to alpine pastures by a grazier who receives combined payment from all households in the village.



Local Adaptations (Institutional Management)

S No	Institution	Type	Structure	Tenure	Nature of work	Government	Loan Facility
1	Mahila Mandal	Formal	One member from each				
2					livestock nstruction Roads,		,000 Rs s to the members without any interest rates.
3					on & Khuls, of water	No	

Showing Village wise Institutional Setup

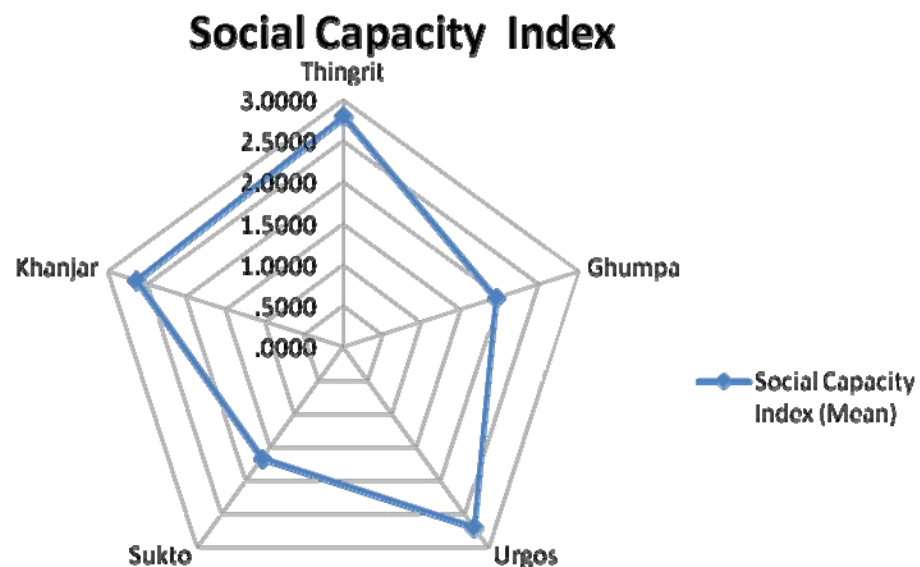
Village	Mahila Mandal	Yuva Mandal	Community Grazing	Gram Panchayat Representation
Tingrit	Yes	Yes	Yes	Yes
Ghumpa	No	No	Combined with Urgos Village	Yes
Urgos	Yes	Yes	Yes	Yes
Sukto	Combined with Khanjar Village			
Khanjar	Yes	Yes	Yes	Yes

Source: Primary Survey

Assessment Of Adaptation Capacities

Social Capital as a Tool for Understanding Adaptive Behaviour in Communities

Rank	Village	Social capital index (Mean)	N
1	Tingrit	2.80	20
2	Urgos	2.69	33
3	Khanjar	2.63	11
4	Ghumpa	1.95	10
5	Sukto	1.66	6



“Even though we live in same house, my brother locks his room doors when he leaves for vacation, overtime trust level has decreased among villagers”

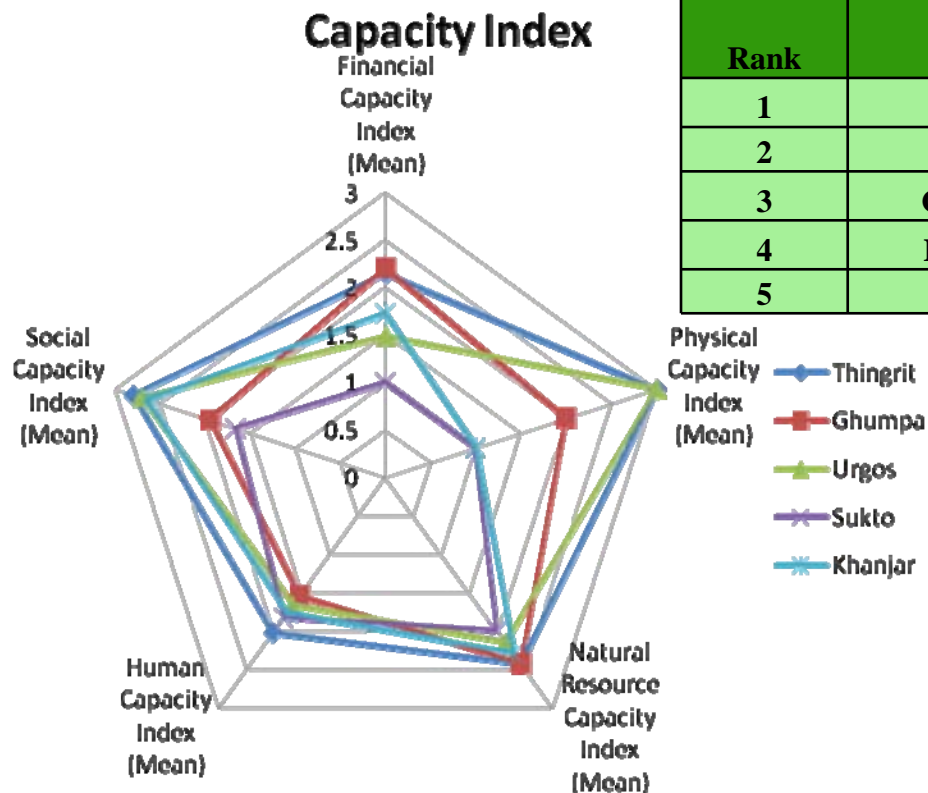
Nurbu Chering, farmer,
Sukto Village

: Table Showing Land holding and it's relation to adaptive potential (Sen.s et al., 2011)

Land Holdings	Human Capacity index	Financial Capacity index	Natural Capacity index	Physical Capacity Index	Social Capacit Index	Cumulative Capacity Index
Small	1.42	1.00	2.00	2.31	2.70	1.88
Medium	1.73	2.00	2.33	2.46	2.69	2.25
Large	2.15	2.19	2.46	2.58	2.23	2.32
Total	1.77	1.74	2.27	2.45	2.54	2.15

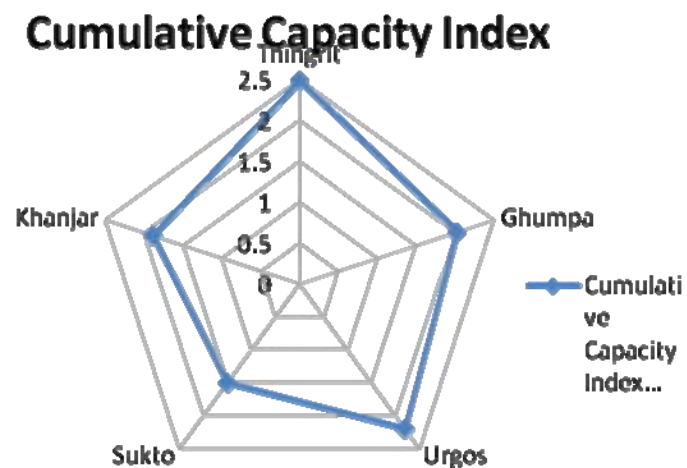
Source: Primary Survey

Village	Financial Capacity Index (Mean)	Physical Capacity Index (Mean)	Natural Resource Capacity Index (Mean)	Human Capacity Index (Mean)	Social Capacity Index (Mean)
Tingrit	2.15	3	2.43	2.02	2.80
Ghumpa	2.20	2	2.43	1.55	1.95
Urgos	1.48	3	2.15	1.66	2.69
Sukto	1.00	1	2.00	1.83	1.66
Khanjar	1.72	1	2.30	1.77	2.63



Graph showing village wise capacity index

Rank	Village	Cumulative Capacity Index (Mean)	N
1	Tingrit	2.48	20
2	Urgos	2.20	33
3	Ghumpa	2.02	10
4	Khanjar	1.88	11
5	Sukto	1.50	6



Graph showing village wise Cumulative Index

Conclusions

- Community feels slight change in climate over few years. But changes doesn't pose any risk to them hence they have not developed any adaptation strategies.
- The mountain communities have inherent adaptive capacity (local institutions and adaptations strategies) to manage resource scarcity and also to withstand future climatic changes up to some extent,
- Local institutions and social capital are both positively correlated.
- Social capital is directly related to development, resilience and increased adaptive capacity of the society.

THANK YOU

