REFLECTIONS ON SOCIAL SUSTAINABILITY OF HUMANE HABITATS :

A STUDY OF INTERDEPENDENCE OF SOCIO-CULTURAL AND ECOLOGICAL LANDSCAPES IN SHAPING EACH OTHER.

Case study : Jana Village, Kullu District, Himachal Pradesh

[1] Author: Prof.Trupti Biswas[1],M.Arch -Urban Design , Research Scholar –PhD in Architecture-Urban Design ,Ajeenkya DY Patil University,Pune,
Co-Author : Dr. Gouri Desai[2] ,PhD Cept- Urban Design ,PhD Guide ,Ajeenkya DY Patil University, Pune ;

ABSTRACT:

The study looks at the inter relationship between the Socio-Cultural practices and their Ecological Landscapes in league of the climate change impact and whether there is a probable pattern of adaptability seen in the communities staying in close connect with their vulnerable ecologies and prevalent cultural practices which tend to sync and align with the ecological setting giving a strong model of social sustainability

Based on the REPORT **A Village Level Climate Change Vulnerability Analysis and Indicative Adaptation Plan Framework Beas River Basin – District Kullu Himachal Pradesh** the layers of ecological mappings are studied and the current pattern of adaptability of the communities to their habitat is understood. Further the socio-cultural layers of the community are studied through field visits and interviews.Whether it is the resillience of the ecology or the deep rooted culture of the community on the background of the climate change is a subject of study and it opens out further enquiries in how further research is needed to find modes of negotiations that need to be done between the communities and their habitat changes to maintain the social sustainability of such communities. Considering ,the Adaptive Capacity ,as potential or ability of a system ,region or community to adjust to the effects or impacts of climate change ,the study further focuses on whether social sustainability can empower such communities to be better prepared for the climate change.

KEY WORDS: ECOLOGICAL LANDSCAPE, SOCIO-CULTURAL LANDSCAPE, CLIMATE CHANGE, ADAPTIVE CAPACITY, SOCIAL SUSTAINABILITY

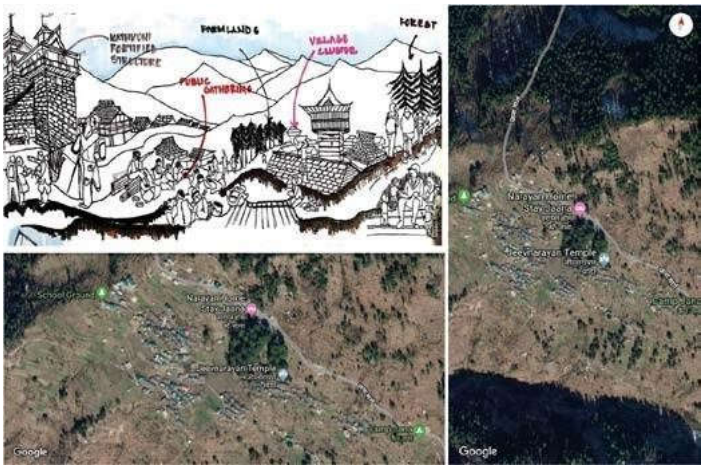
1.0 INTRODUCTION:

With the shifting focus of Landscapes from being Resillient to sustainable,in league of the climate changes affecting the existing ecological processes and the subtle obvious changes in the pattern of how communities staying in extreme connect with their surrounding ecology on a daily basis wherein every acitivity and festival is planned based on the responses of the surrounding environment, a visit to few areas in Himachal Pradesh became a good exposure to study how closely the Human Adaptibility to Nature exists and feeds into the Social sustainability of such communities even in adverse ecological settings,due to their strong socio-cultural bonding.

JANA, KULLU,HIMACHAL PRADESH –

Site Observations :

- Site displays unique socio-cultural values but lacks climate change preparedness
- Site is an example of codependence And Symbiotic relation of Human-with its Habitat and prompts social cohesion through traditional Socio-cultural practices which are revered and followed as daily routine.



Inter dependence of ecological and cultural landscape- Jana village,Kullu,Himachal Pradesh

Conversations with the local community revealed strong narratives suggesting co existence of community with habitat showing resilient community set up in a challenging habitat setting . Site shows strong displays of Associative Cultural landscape typology.

- Physical builtform adaptability see through the current trend of construction and material ,change in the techniques with trend of natural materials for walls and modernized roof seen.
- Farming activities as per traditional practices, Biannual crops is yet a distant reality ,although Barren or uncultivated land is proportionately less.

OBJECTIVES OF THE CURRENT STUDY

- Impact of climate change on study area and its affect on the socio-cultural layer

- Understanding ecological and Socio-cultural dynamix in maintaining social sustainability
- To observe the SOCIAL sustainability model of ecological landscapes facing impact of climate change

Total Area	5503 Sq. Kms.
Altitude (height from MSL in mts)	1500 to 4800
Total Assembly Constituency	4- Kullu, Banjar, Anni, Manali
Climate	Alpine, Cold temperate and Warm Temperature
Major River	River Beas
Population (2011 census)	4,37,424 Persons
Administrative Units	4 Sub Divisions, 4 Tehsils, 2 Sub-Tehsils, 5 Blocks 5 Towns , 300 Villages
Literacy (2011 Census)	3,10,487 Persons (Male 1,76,548; Female 1,33,935; Others 4)
Panchayati Raj	204 Panchayats 71 Backward Panchayats
Agriculture Ago-Climatic Zones Agricultural Land Net Shown Area Irrigated Area	 Mid- Hill, High Hill 65,186 Hectares 36,342 Hectares 2,878 Hectares
Forest Total Forest area Total Forest Cover	 4,952 Sq. Kms. 1,958 Sq. Kms.
Industries Large & Medium Scale Units Small Scale Units	 2 Units 1,962 Units

(source : A Framework for Climate Change Vulnerability Assessments)

2.1.1 Literature Study Methodology :

To study the impacts of climate stimuli on the system of interest (sensitivity),the responses to climate variability and extremes (adaptive capacity) and assess overall vulnerability to climate change based on the report "A Framework for Climate Change Vulnerability Assessments"under study. The ecological vulnerability understanding is based on the Report A Village level Climate change Vulnerability Analysis and Indicative Adaptation Plan Framework,Beas River,Himachal Pradesh

2.1.2 Field visit findings :

The roles of social institutions and its power in communities settled in vulnerable ecologies is studied through physical visits to the Jana village and by interacting with the local community. Their networks of relationships amongst themselves came out as Strong sense of community and attachment.

The ability to cope, or resilience, as connected to assets such as social capital can be considered as a strong point for community settlements in vulnerable ecological zones. (source: USAID ,2014, Vulnerability Assessment Methodologies: A Review of the Literature)

As per the references available, climate change is reality as far as farmers in Himachal Pradesh are concerned and more particularly farmers in Kullu valley are the worst affected. Failure of large number of crops and decline in apple production due to rising temperature and reducing chilling during the last two decades have affected more than 80% peoples livelihood dependent on agricultural pursuits.

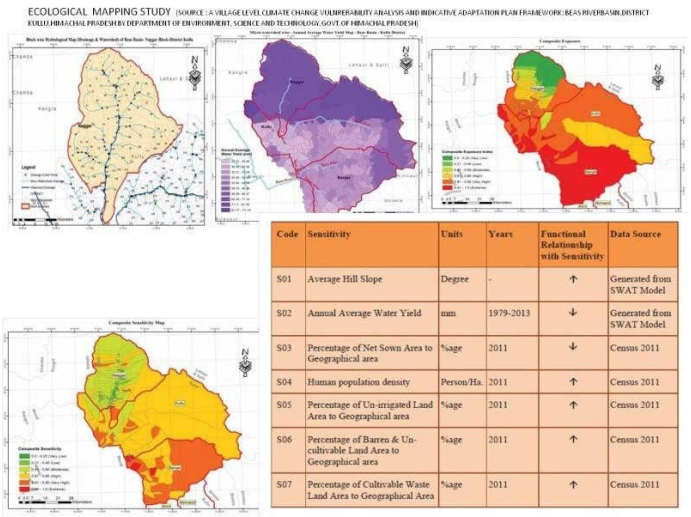
2.1.3 Indicating pointers of vulnerability of Kullu district to the changing climate as **the impact on the Ecological landscape** as follows-

1. Kullu valley is witnessing unusual congestion of multiple economic processes happening simultaneously.

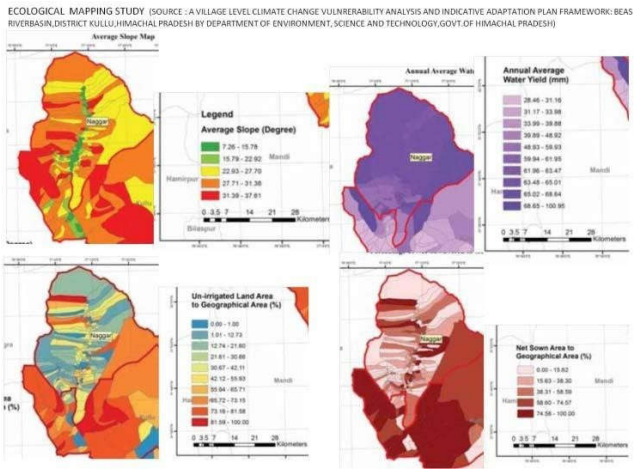
2. Dwindling population of honeybees in wild fauna, a cause of concern to apple production.
3. Dependence of 92% of cultivated area on rains for its water requirements as only 7.92% of the net cultivated area is under irrigation.
4. Dependence of large percentage of rural population on forests, agriculture and horticulture based livelihood.
5. Agriculture is the main occupation of around three quarter of the total rural population and apple cultivation/ production is the major source of income.
6. The Beas River is the life line of the district on which the entire economic growth and livelihood about 90% people depends.
7. Indicators of warming trend of Himalayas have become perceptible, visible and measureable and have forced farmers to abandon one set of crops and adopt new ones as it has become unprofitable to grow apples in lower parts of the valley.
8. Himalayan glaciers and alpine grasslands two most sensitive hot spots identified and indicated at national level are having sizable presence in the Kullu valley.

2.1.4 UNDERSTANDING THE ECOLOGICAL LAYERS :

The catchment is characterised by moderate – low temperatures with mean minimum and mean maximum winter temperatures of -1.6oC and 7.7oC, respectively (Singh and Ganju, 2008). The river rises 4,361 metres (14,308 ft.) above sea-level on the southern face of Rohtang Pass in Kullu at Beas Kund. It traverses through Mandi, Hamirpur Districts and enters the Kangra District at Sandhol, 590 metres (1,940 ft) above sea-level. During its lower course the River Beas is crossed by numerous ferries, many of which consist of inflated skins (darais). Near Reh in Kangra District it divides into three channels, which reunite after passing Mirthal, 300 metres (980 ft) above sea- level. On meeting the Shivalik Hills in Hoshiarpur, the river sweeps sharply northward, forming the boundary with Kangra District.



Code	Sensitivity	Units	Years	Functional Relationship with Sensitivity	Data Source
S01	Average Hill Slope	Degree	-	↑	Generated from SWAT Model
S02	Annual Average Water Yield	mm	1979-2013	↓	Generated from SWAT Model
S03	Percentage of Net Sown Area to Geographical area	%age	2011	↓	Census 2011
S04	Human population density	Person/Ha.	2011	↑	Census 2011
S05	Percentage of Un-irrigated Land Area to Geographical area	%age	2011	↑	Census 2011
S06	Percentage of Barren & Un-cultivable Land Area to Geographical area	%age	2011	↑	Census 2011
S07	Percentage of Cultivable Waste Land Area to Geographical Area	%age	2011	↑	Census 2011



(source:Report by Dept.of Env.,Sc.and Tech.,Govt.of H.P.; A village level Climate Change Vulnerability Analysis and Indicative Adaptation Plan Framework)

2.1.5 ECOLOGICAL MAPPING ANALYSIS :

(source: Report by Dept.of Env.,Sc.and Tech.,Govt.of H.P.; A village level Climate Change Vulnerability Analysis and Indicative Adaptation Plan Framework)

Hydrological Maps conclusions presented in the report : Changes in the cropping pattern and land-use pattern, overexploitation of water resources, and changes in irrigation and drainage systems are changing the hydrological cycle with many climatic reasons and river basins of the district Kullu.
The Hydrological ,Wateryield and Watershed Drainage at Naggar shows 'EXPOSURE DECREASE' resulting in LOW WATER STRESS DAYS ,but HIGH TEMPERATURE STRESS DAYS,which increases the Exposure to Climate Change VULNERABILITY.
The Average Water yield for the site under consideration is 65-68 mm and the average Slope Degree is 22 to 27;the Net Sown area is 38-58 % wherein Majorly the land is cultivable with 5% of land as Barren or uncultivable; with 12-21% irrigated Land area and 3-4% Cultivable Wasteland.; the population density being 14-23% per Hectare.
Interestingly , the increase in Water yield reduces Vulnerability; however the increase in hill slope increases Vulnerability, Hence inspite of good water yield, due to increased slope, the Vulnerability of Jana and surrounding areas is High.

3.1 CULTURAL MAPPING ANALYSIS :

3.2 Socio-Cultural Analysis:

The rituals,cultural activites,whether seasonal or annual prompt the locals to come together as Individuals, communities and institutions. This process unables cooperative action that generates opportunities and resources realized through networks, shared norms and social agency. Similar resources that serve as

sources of social solidarity, encourages social support, security and insurance and also the ability to cope with Climate change or any other disasters in the given ecological settings.

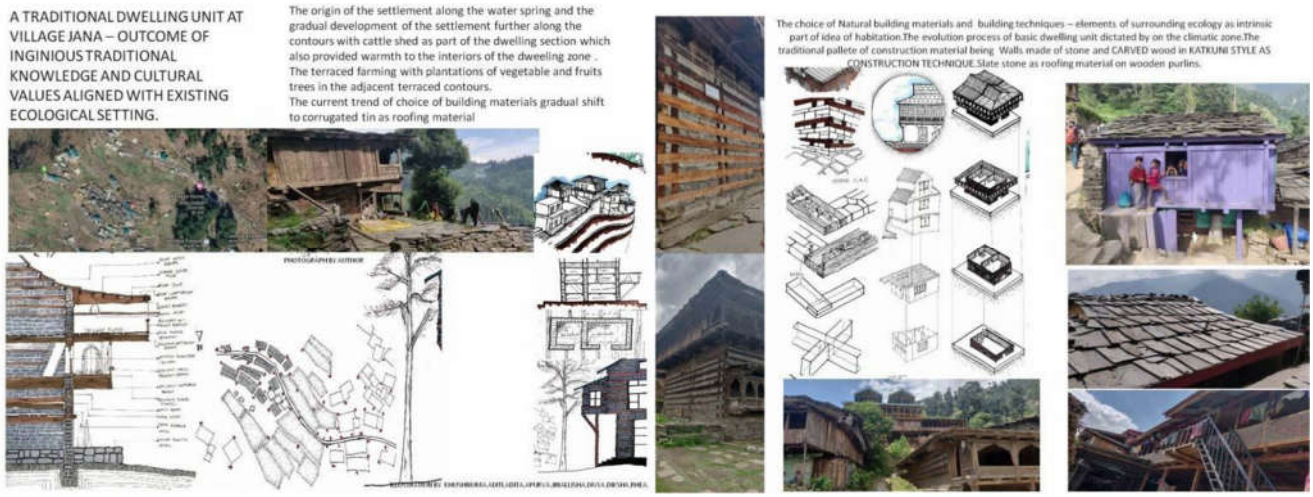
The socio-political settings at macro level added to the within community strong belief structure and notions about the Natural forces being the gaurdians as well as the fury of the GOD somewhere keeps the 'Nature ,Flora,Fauna' on a pedestal of worship ,at times fostering the values of humanity and conservation of Ecology;the best example being the way the SACRED GROVE is highly revered, protected and guarded by the community. Also the temple site and location where the GODS halt and resides during the ceremonial procession which are done during the festivals and religious occasions, the site is maintained with total sacred ness where no person ,neither local nor visitors are allowed to enter or sit.

Narratives showing co relation between Ecological setting and Socio -Cultural practices, values and beliefs which have maintained the social sustainability of the community on a high rank.

The practices show Social Influence and control over indivuiduals on one side ;and parallely show social support,participation and Solidatrity in making the Belief structure as a way of living itself.

The Material Resources show Reciprocity in the way they are selected and utilized; example : The tallest and sturdiest Pine trees are used exclusively for building the place where the God's will

reside.These are single logs with no joints in between; the best wooden planks are used for the main door carvings of such structure and the entire process of building the Religious structure is also done ceremoniously following the Religious Calender and complete sanctity is maintained to the level that none of the residents, or visitors are not even allowed to have a visual glance of the construction activity or the Temple -in-progress



3.3 CURRENT STATUS OF JANA – PHYSICAL AND SOCIAL INFRASTRUCTURE :

3.4 CURRENT STATUS OF VILLAGE JANA WITH SOCIAL INFRASTRUCTURE AND COMMUNITY SUPPORT :

The Availability/Non-Availability of following variables was considered in the survey to understand Adaptive Capacity of the village JANA

ADAPTIVE CAPACITY OF JANA VILLAGE :

S.NO.	VARIABLE CONSIDERED	AVAILABILITY	IMPACT ON ADAPTIVE CAPACITY	RECOMMENDATIONS
1.	Health Centre and Medical Facility	Not Available	Decreases	Immediate need of medical facility and health care centre and women /children health welfare centre **on first priority**
2	Pucca Roads	Available till village entry point	Increases	Vehicular Accesssibility present
3.	Internal paved roads	Available in paver and also natural stone	Increases	Roads with storm water drains available on main road network
4.	Tank or Pond	Not Available	Decreases	WaterManagement needed all year round
5.	Spring Source	Available b ut unmaintained	Decreases	Water quality Management needs immediate attention
6.	Handpump	Available near central ground	Increases	Water available during Rains and Winter months
7.	Irrigation facility	Available in parts	Increases	4 to 15 Ha (as per survey report)Needs better water management and irrigation strategies
8.	Self Help Groups	Not Available	Decreases	Communication and outreach efforts needed to make local community aware about climate change preparedness
9.	Agricultural Credit Societies	Not Available	Decreases	Community collaborative and participatory approach needed
10.	Agricultural Marketing Societies	Not Available	Decreases	Community collaborative and participatory approach needed
11.	Mandis and Regular Markets	Not Available	DECREASES	Needed on priority

(Table contents: study and inferences by Author)

4.0 Inferences for Jana Village based on Department of Environment ,Science and Technology,Govt. Of Himachal Pradesh

(source: A village level Climate Change Vulnerability Analysis and Indicative Adaptation Plan Framework)

Jana (24/46) – Village Code 012830 has composite sensitivity 0.67

Composite Adaptive capacity 0.24 (wherein 0.21 -0.40 indicates **Very High** Capacity) Adaptive Capacity increases with presence of above variables.Composite Vulnerability 0.72 (wherein 0.61 – 0.80 indicates **High Vulnerability Map shows** (Naggar in Moderate but) **Jana Village falls under category of High Vulnerable Village**

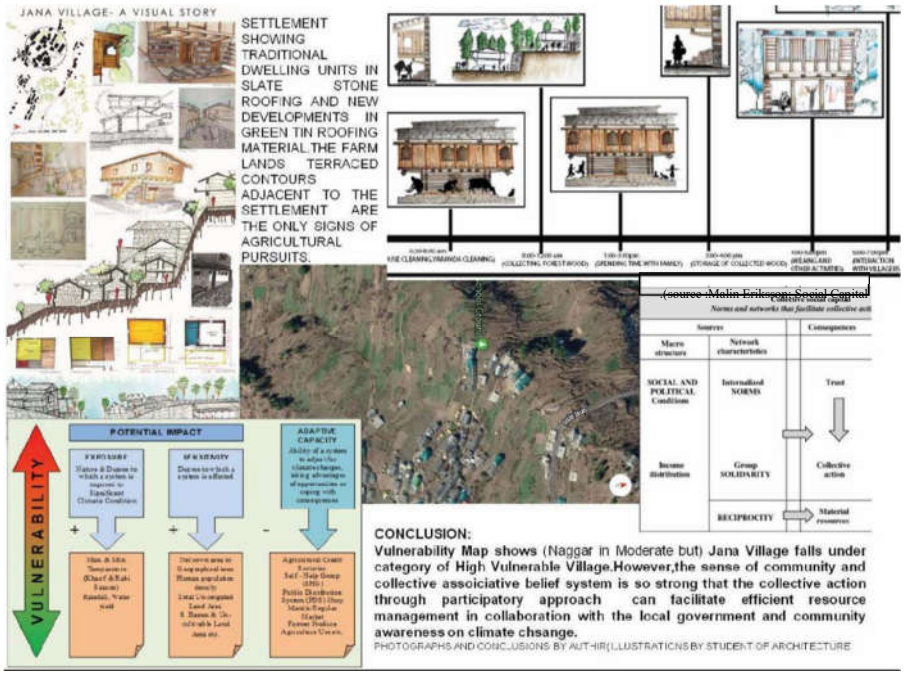


Figure illustrating Socio-cultural layers as intrinsic part of the Built form, regular activities and routine exchanges around the socio-cultural beliefs and social interactions.The daily activities of the local residents ,encourage people to work together with each other on fields as well as off fields wherein a established process of building trusting relationships, mutual understandings and shared actions is prevalently seen.

5.0 CONCLUSION: The social dependence in adverse ecological settings and a strong underlying socio-cultural heritage which keeps the community socially cohesive is the primary factor of having high adaptive capacity and hence a high Social sustainability Value inspite of being an Ecologically highly vulnerable village under climate change.

Sustainability and resilience strategies of the community to cope with extreme conditions of the environment ; Physical sustainance-Katkuni methods of construction, Traditional knowledge bank as well as cultural practices and values which maintain a high value of social sustainability is strongly established through this case study. Priority actions at infrastructure level-Medical facility ,Child birth care,communication ,outreach efforts to inform local communities about likely effects of climate change and also a upgradation in connectvities of socio-cultural value systems through established mechanisms at community level needed.

Further Research needed to improve effectiveness of Adaptation Measures @State level and @Local level with lateral coordination between agencies involved and also socio-cultural bondings to be made more stronger through improvised social -infra structure and encouragement to socio-cultural practices and traditional value systems to be kept alive through future generations of such communities.

Thus , SOCIAL CAPITAL plays an important role in maintaining SOCIAL SUSTAINABILITY :

The networks of relationships among people who live and work in a particular society, enabling that society to function effectively. Social capital broadly refers to those factors of effectively functioning social groups that include such things as interpersonal relationships, a shared sense of identity, a shared understanding, shared norms, shared values, trust, cooperation, and reciprocity.

Coordinated effective framework and further Coordinated implementation most needed by community participatory decision making process and working group method of local community to be encouraged.

References:

1. A Village level Climate change Vulnerability Analysis and Indicative Adaptation Plan Framework, Beas River,Himachal Pradesh

2. A Framework for Climate Change Vulnerability Assessments

3. Review of methodologies for assessing vulnerability – Report submitted to GIZ in the context of the project Climate Change Adaptation in Rural Areas of India composed by Jochen Hinkel, Global Climate Forum (GCF); Lisa Schipper, Stockholm Environment Institute (SEI); and Sarah Wolf, GCF.

4. Review of vulnerability assessments in India; Regional context for Vulnerability Assessment; Policy Framework in India to Address Climate Change and Development of Methodology for Climate Change Vulnerability Assessment by G.J. Lingaraj, Himani Upadhyay, Sambita Ghosh, Sneha Balakrishnan, Arabinda Mishra, Suruchi Bhadwal, and Sreeja Nair, all: The Energy and Resources Institute (TERI).

5. Cutter, S.L., Boruff, B. & Shirley, W., 2003. 'Social vulnerability to environmental hazards', Social Science Quarterly, 84(1), pp. 242–261.

6. Brooks, N., 2003. Vulnerability, risk and adaptation: A conceptual framework, Tyndall Centre for Climate Change Research, s.l.