

# Gram Panchayat Spatial Development Plan for Uppunda and Shankarnarayana, Udupi District, Karnataka

Dr. Deepika Shetty and Team

**Sustainable- Balance which can last, which can be maintained over long period of time, beyond economy, GDP, Per capita income criteria**

**Development – which is better, gives more opportunities, gives better facilities, beyond growth and different from bigger the better concept.**



# Concept and vision : Four pillars of sustainability



## Kestra

- natural setting including geography, climate, flora, fauna etc.

## Loka

- paradigm of the place, a construct of settlement developed through time and historic events.

## Desa

- the socio-economic and political context for governance, lifestyle, demographics, occupation etc.

## Kala

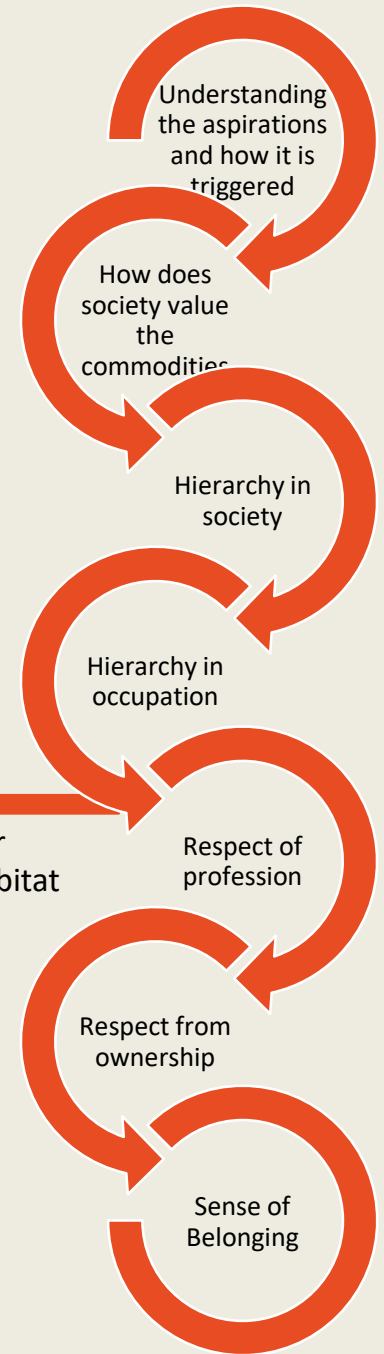
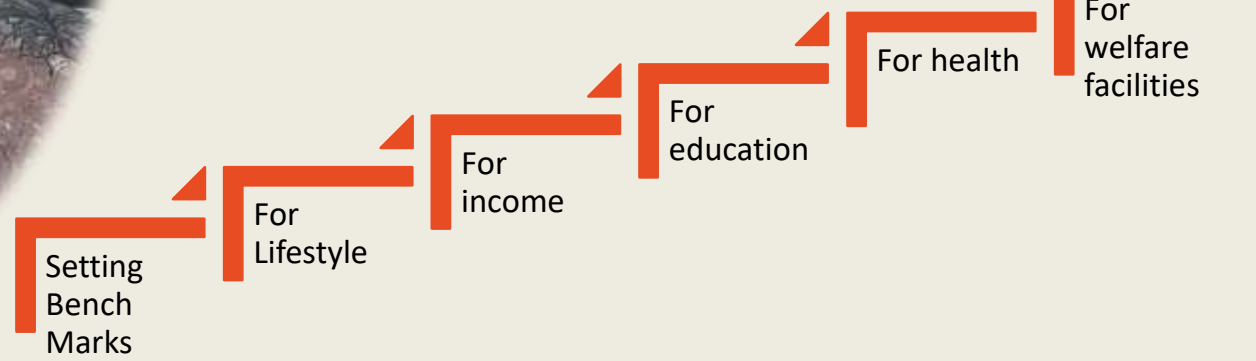
- the current status of the place w.r.t. to physical infrastructure, social and cultural facilities, lifestyle, waste management etc.



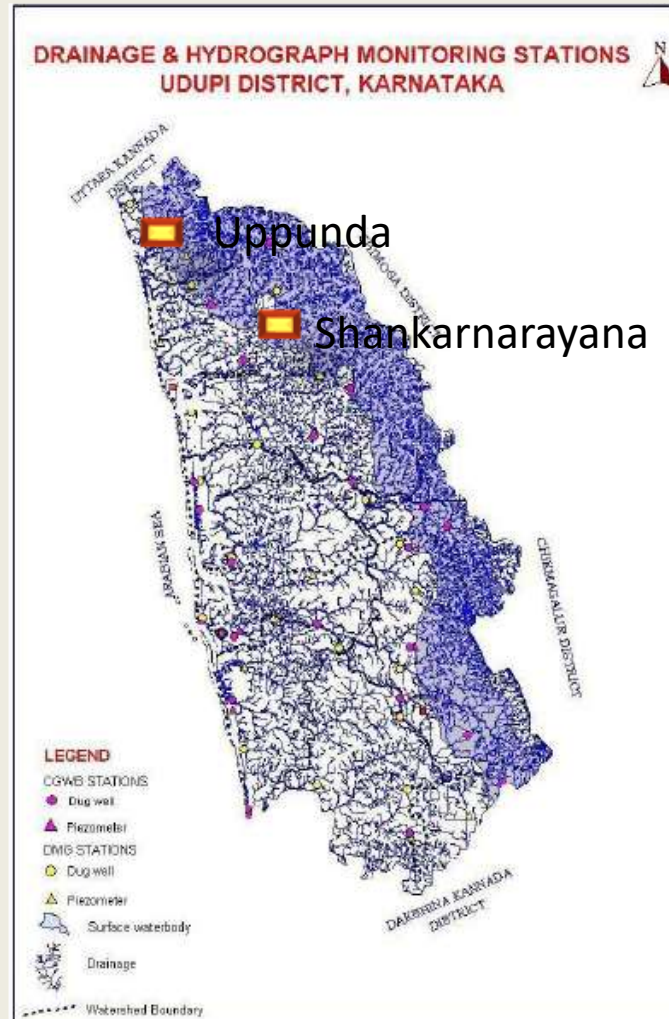
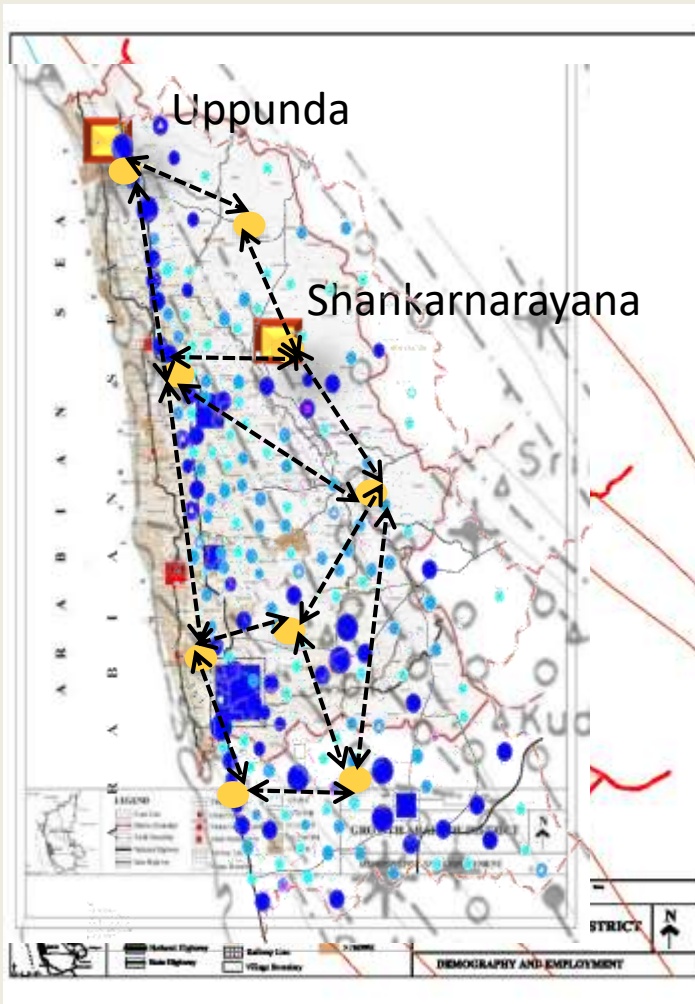
- Questions we need to ask
- What is .....
  - it replacing?
  - the form?
  - the impact?

- How is it managing .....
- waste?
  - energy?
  - services?

- Coming from where .....
- Raw material for products?
  - food?
  - water?
  - Energy?



# Key understanding of District



## Community Facilitation Centres

Education

Innovation Lab

Skill Development

E-library

Distant Education

Business

E-commerce storage and delivery management

Conference and meeting facility

Governance

GIS based Land management and information

Awareness programmes

E-governance

Digital Banking

Health Kiosks

High End Internet facilities





# Timeline

A brief overview of GPSDP proposal by MoPR, SISDP presentation by GOI-MOPR.

Week 1

Distribution of work in teams & listing of data to procure from GPs for GPSDP proposal.

Week 2

Preparation of checklist for GP data collection for both GPs by respective teams.

Week 3

Development of existing land use map by GIS team for both GPs (Source: Bhuvan Panchayat 3.0)

Week 4

Consideration of TCPA & PR acts to implement in the study checklist (As suggested MoPR).

Week 5

Documentation of 6 layers generated by NRSC in the study list related to Infrastructure.

Week 6 & 7

Demonstration on the application of Mobile App by NRSC and timeline of activities was planned by Team MSAP.  
Preparation & Scheduling Plan of Action prior to Site Visit for Infrastructure Team.

1. Listing of Different data needed by various authorities.
2. Drafting Letters to authorities for presentation.
3. Coordinate & brief students for Survey.
4. Requesting GPs to provide volunteers to collect data.
5. Ready with printouts of questionnaires to fill (both in English & Kannada).
6. Listing of Best Practices for proposal.

Week 7 & 8





First virtual meeting on Gram Panchayat Spatial Development Plan for rural areas was held through video conferencing on 1st July 2020 with Secretary and the teams, MoPR,



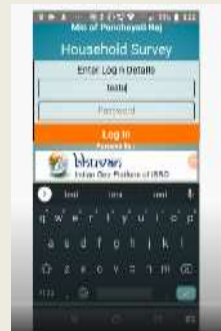
Three teams were formed comprising of MSAP Faculties with three principal aspects:  
TEAM-1: Socio, Economic and Morphology,  
TEAM-2: Environment and Natural Resources  
TEAM-3: Physical Infrastructure.



The progress of review of the initiative taken by team MSAP presenting inception report



Documentation of attributes for field survey and data collection.



Demonstration on the application of Mobile App by NRSC n 26<sup>th</sup> Aug 2020



GP Officials with local volunteers and Team MSAP. 29<sup>th</sup> and 30<sup>th</sup> Aug 2020 making teams for survey





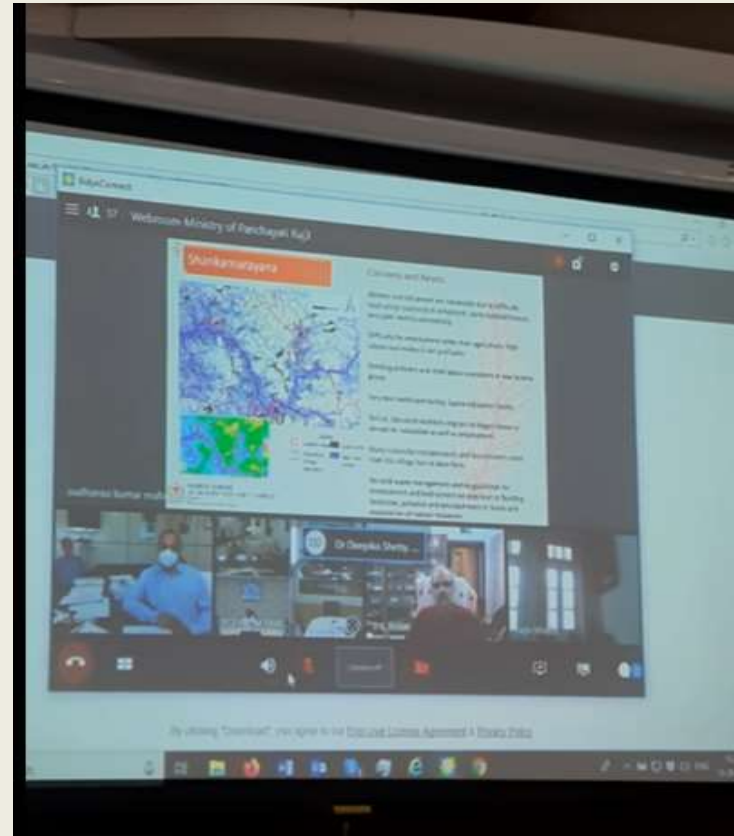
# Timeline

Onsite field visit for project briefing to the Gram Panchayat officials.	Week 9	Data Analysis (Based on:)	
		1. Existing Policy as per Govt. schemes	Week 13 - 19
Onsite field visit to GPs for household surveys and identifying issues and challenges faced by GPs.	Week 9 & 10	2. Understanding of local Practice in both GPs.	
		3. Proposed development for GPs.	
Progressive brief presentation to Ministry of Panchayat Raj.	Week 11	Meeting with stakeholders with proposed development proposals for both	Week 19-20
		Draft proposal circulated for review	Week 21
Revisit to GPs to collect survey forms and discuss on the analysis done by Team MSAP with GP officials.	Week 12	Updated Maps received from NRSC and report of recommendations.	Week 22
		Finalization of Spatial Development Proposal and submission of Report for both GPs.	Week 23





On- site survey collecting household data and infrastructure mapping, soil and water samples 29<sup>th</sup> Aug to 29<sup>th</sup> Sept 2020



Virtual meeting with NRSC with data collected.  
12<sup>th</sup> Sept 2020  
Further meeting with



Focus group discussion with the stakeholders at the respective GP. 18<sup>th</sup> to 28<sup>th</sup> Sept 2020







First Draft of Masterplan was presented to 1st Oct 2020 to Karnataka coordinator Ms Priyanka Mary Francis, Director MoPR, Karnataka and her team, Ms Preeti Gehlot, CEO, Zilla Panchayat, Udupi District and her team, Ms Sudha Ravindran, ISRO, Bangalore and her team.

Stakeholder meeting : Uppunda



Stakeholders feedback taken from 20<sup>th</sup> -28<sup>th</sup> Oct 2020

**Meeting with stakeholders with proposed development proposals for both Week 19-20**

Updated maps received with more accuracy from NRSC on 7<sup>th</sup> Nov 2020.

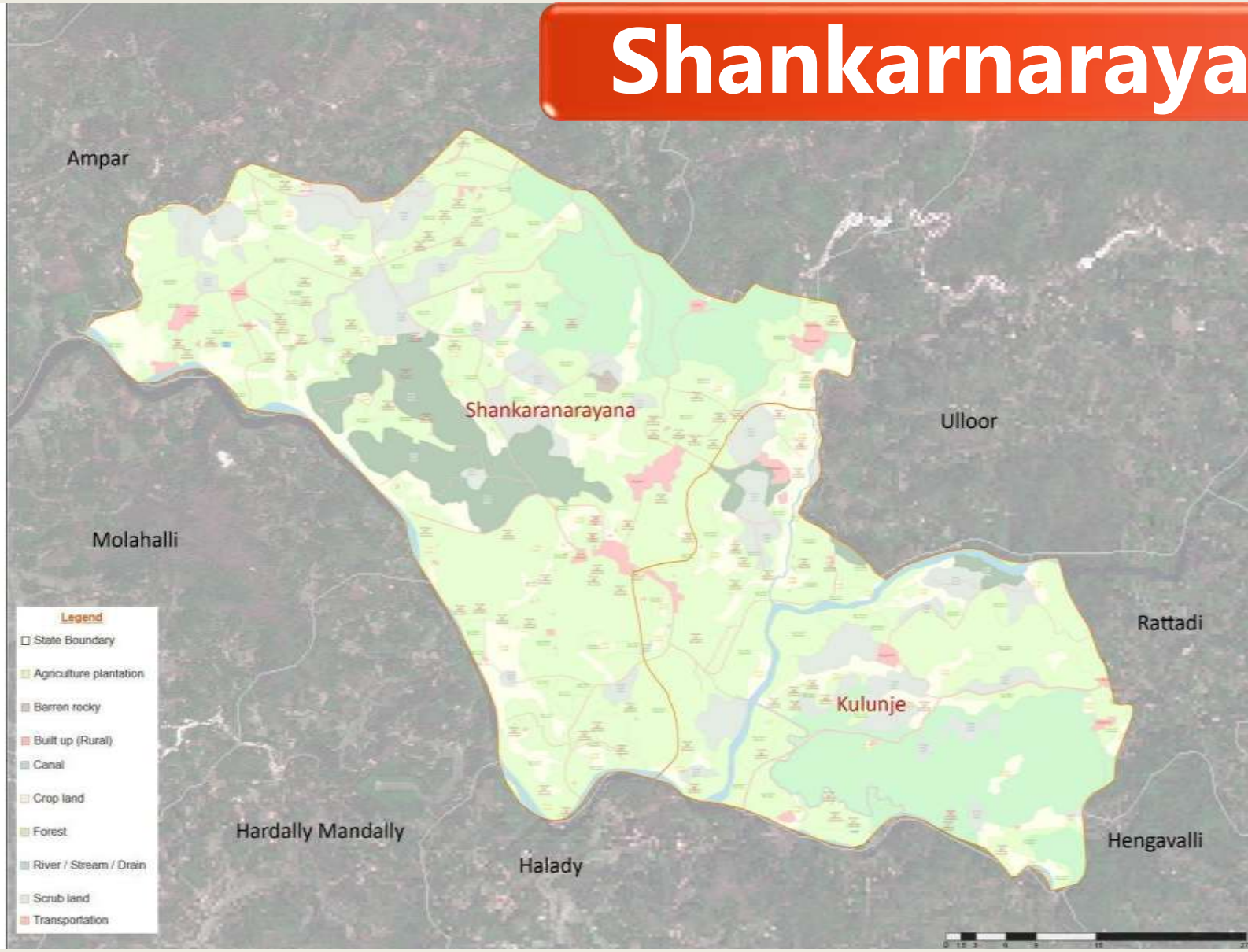
Draft Report was shared with coordinators and Ministry of Panchayati Raj on 12<sup>th</sup> Nov 2020.

Updated chapters with maps and recommendations received from NRSC on 17<sup>th</sup> Nov 2020.

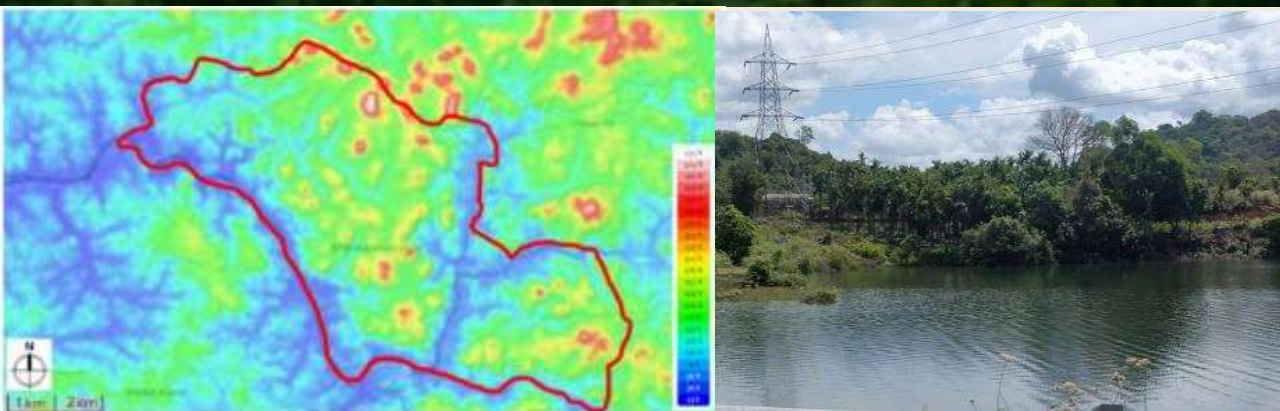
Presentation of draft report to coordinators on 19<sup>th</sup> Nov 2020



# Shankarnarayana



# Shankarnarayana



Population Growth rate 2001-2011 – 2.59%

Population Growth rate 2011-2020 – 17.92%

Average Growth rate – 10.25%

Projected Population for the next 30 years

Total Population in 2050 - 7931

## Panchayat / Anganwadi Records(2020):

Current Population	6066 +2128
No. of Households	1404+441
No. of women	3207+1106
No. of Men	2859 +1021
No. of Children	450+275
Total No. of Habitations	39 +9

- The **7 holy places** namely Subrahmanya, Udupi, Kumbhakaashi, Koteswara, Shankaranarayana, Kolluru and Gokarna together constitute **Parashurama Kshetra**.
- Good amount of rainfall and good fertile soil leads to good productivity from agriculture and horticulture
- Cashew factory in nearby areas has increased productivity
- High biodiversity due to proximity to western ghats
- Literacy 75%. More women are illiterates.



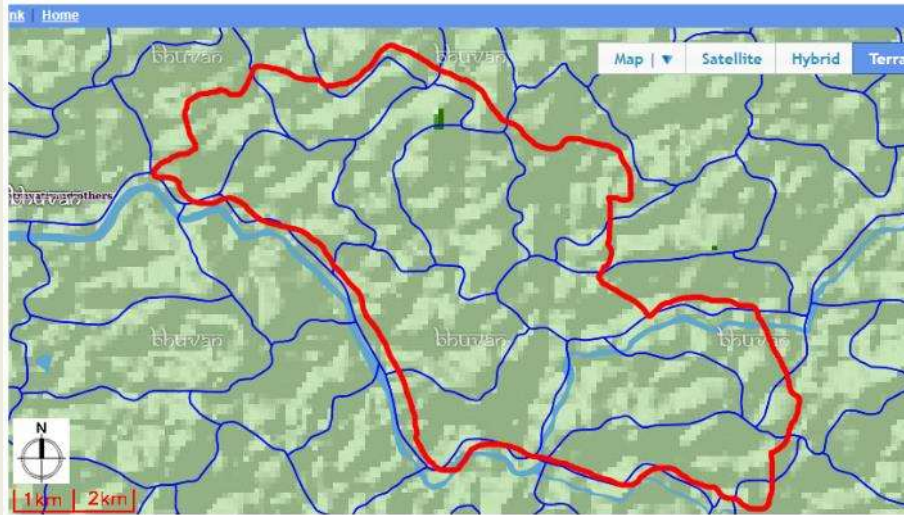


Fig. Watershed Map  
Source: BHUVAN



Fig. Natural Drainage Map  
Source: BHUVAN

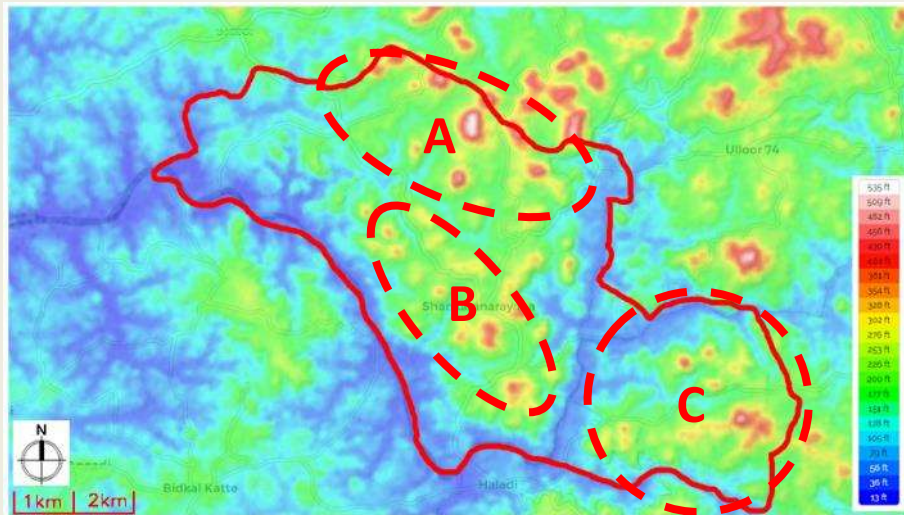
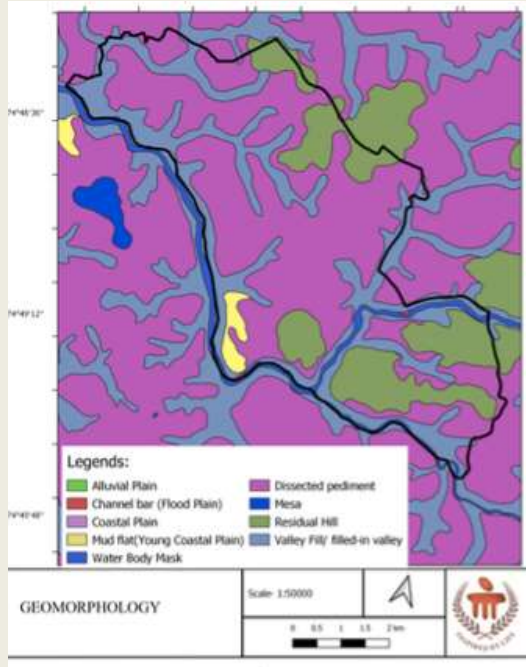


Fig. Topography Map – Colour coded  
Source: <https://en-gb.topographic-map.com/maps/a58g/Shankaranarayana/>

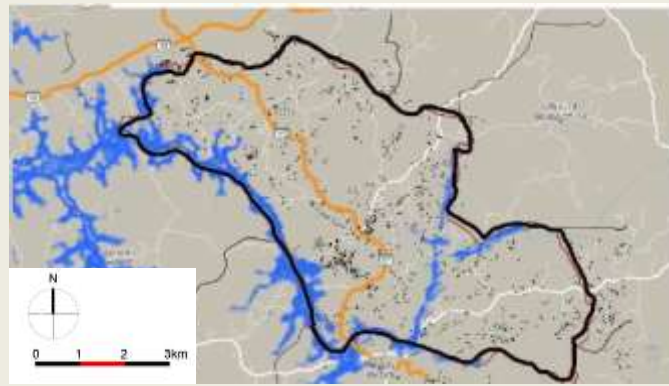
- 40 Km<sup>2</sup> of the gram panchayat is covered by 15 unique water sheds.
- These water sheds and the major drain channels divide the GP into 3 regions.
- These regions are also where we observe the most settlement developing.
- Regions A and B are the domain of Kundapur-Agumbey hwy and thus the region's markets develop here. This region is however bare facing the western ghats and would receive the slow-high volume storm water run-off.
- Region C has a natural drain that blocks most of the north and north-eastern parts from run-off water.



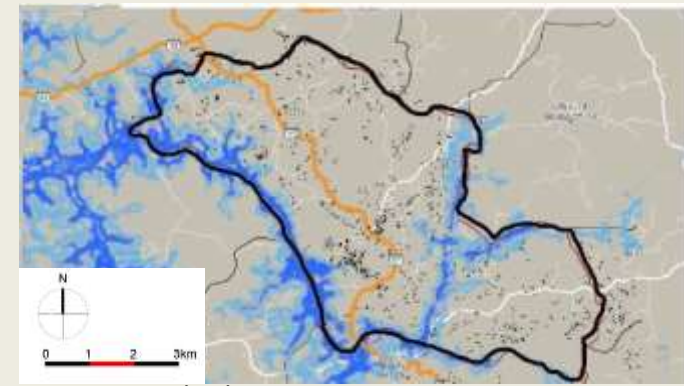


Geomorphology

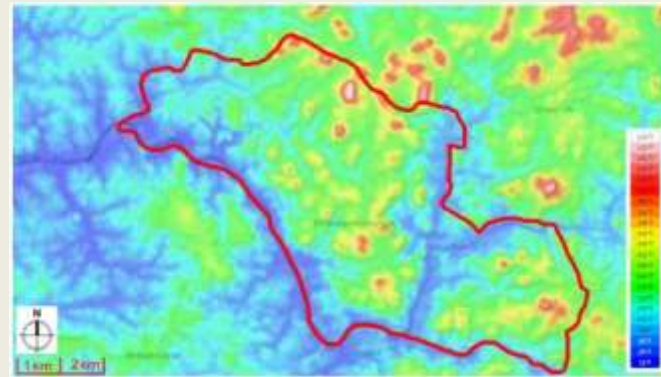
Source: BHUVAN



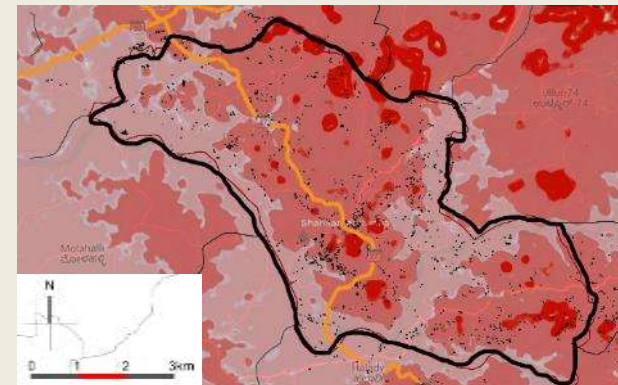
Water body (Current area)



Water body – wet zone area



Topography Elevation Map



Topography Slope Map

Slope	Area	Recommendation	Agricultural Practice
17% – 25%	Steep terrain	Restriction on construction, Buffer vegetation area (trees with large root spread – mango, jackfruit) to control soil erosion	Forested reserve area – NOT to be harvested. (Provides food source for wild animals)
15% - 17%	Agricultural and Residential (Dissected pediment substratum)	Gentle slope, Low rise construction	Agriculture can be practiced along with increasing built up
5% - 15%	River and River bank + Residential (Alluvial plain substratum)	River wet zone to be demarked and restricted of permanent construction.	Agriculture can be practiced in proximate land, Mainly paddy.





# Parameters used in measuring Ghats Vulnerability by various research papers in India

Nature and Environment

Sl no	Parameters	Remarks
1.	Forest-Land Use change (Loss of canopy cover to <10%) or Reduction in forest change	Demand for forest land for agriculture and other purposes including construction and housing.
2.	Regional Elevation	It is used to identify sites that are safe and non prone to landslides.
3.	Use of forest by community	Forest dependence by several communities, Occurrence of fire, Preponderance of invasive species.
4.	Forest Management	Marginalization of native biodiversity
5.	Current climate and variability change	Currently is not affecting the region but analyzing the situation, this might be a concern too.
6.	Soil Erosion	Continuous rains and uprooting of trees leading to this issue.
7.	Forest Cover	The relative or sure land area that is covered by forests.
8.	Slope Management	The improper modification methods adopted on original slope condition in hilly regions for the purpose of construction and widening of the road affects the stability of the cut slope (Singh et al.2013).
10.	Catchment Area	The area from which rainfall flows into a river, lake, or reservoir.



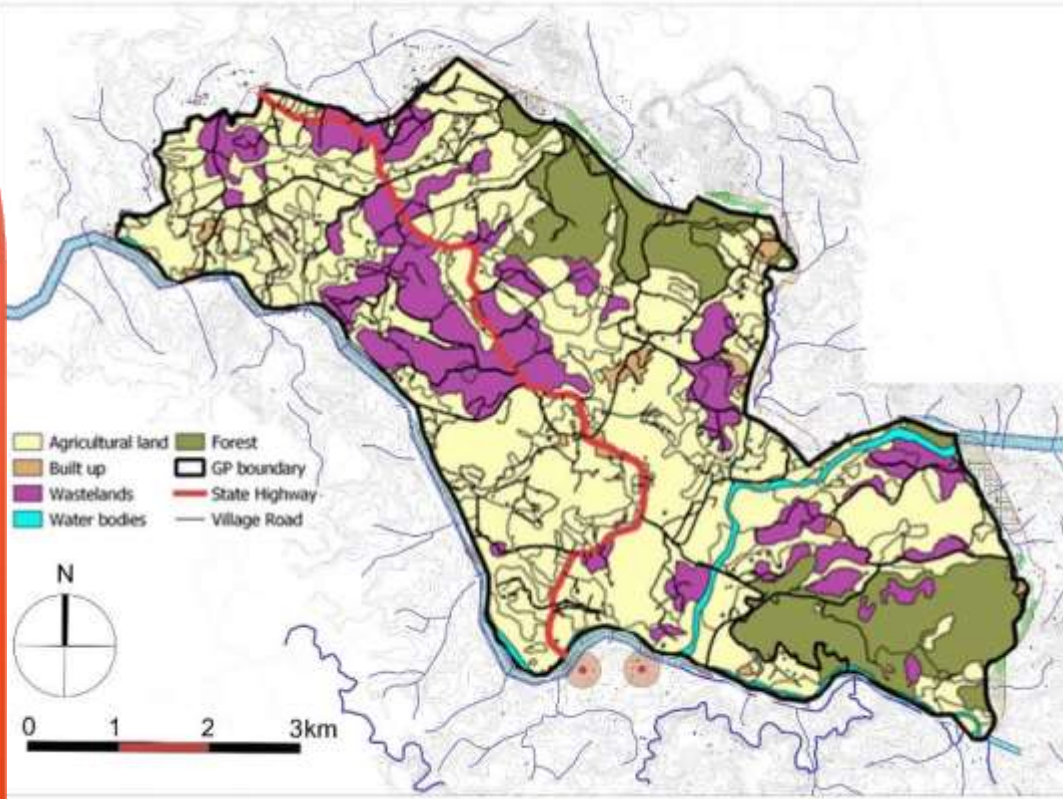


# Various concepts used for Resilience Assessment in different research papers

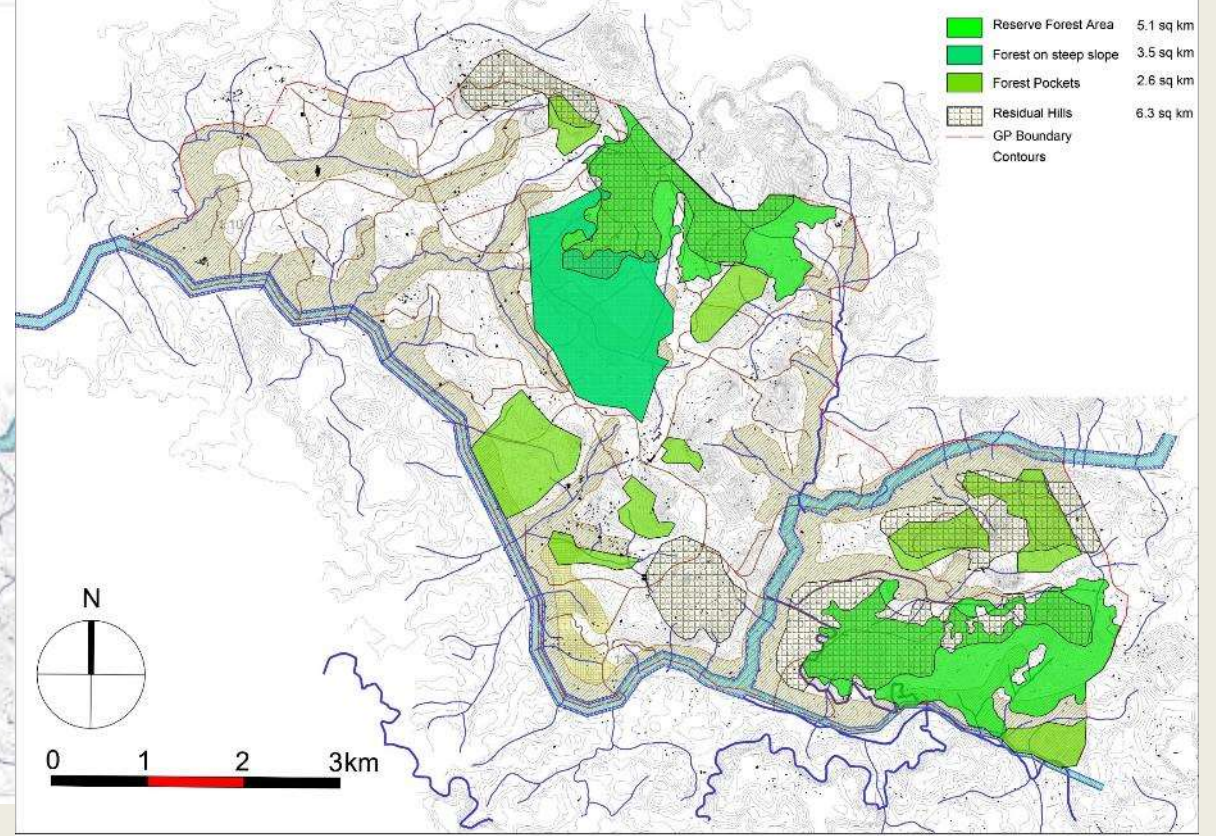
## Nature and Environment

<u>Sl no</u>	<u>Parameters</u>	<u>Remarks</u>
1.	Social	Access to and participation in various groups or organizations. Peace and security in the area.
2.	Economic	The money that allows people to adopt various livelihood strategies. This could be in form of a regular source of income or savings.
3.	Community Capital	The human, natural, built, and social capital from which a community obtains benefits and upon which the community depends for continued existence.
4.	Institutional	All the policies, acts etc. made by the official bodies which helps in vulnerability reduction of the any community.
5.	Housing/Infrastructure	The basic infrastructure which people utilize to function more productively.
6.	Environmental	The natural resources (water, forests, land) and associated services (e.g. storm protection, erosion protection) on which resource-based activities (e.g. fishing, farming, etc.) depend.
7.	Regulatory	Regulations set by the government bodies (e.g. CRZ regulations) that help in biodiversity conservation and thus enhancing peoples' livelihood.
8.	Business Plans	The business plans of private companies that have an impact on rural peoples' livelihood.
9.	Connection and Caring	Helping each other and working together for solutions.
10.	Information and Communication	Information and communication technology (for e.g. prior alert and warning) could enhance rural communities' disaster resilience.
11.	Transformative potential and disaster recovery	The ability of people to quickly return to normalcy once any disaster occurs.





Source: GIS data provided by NRSC and Author generated layers



Source: GIS data provided by NRSC and Author generated layers

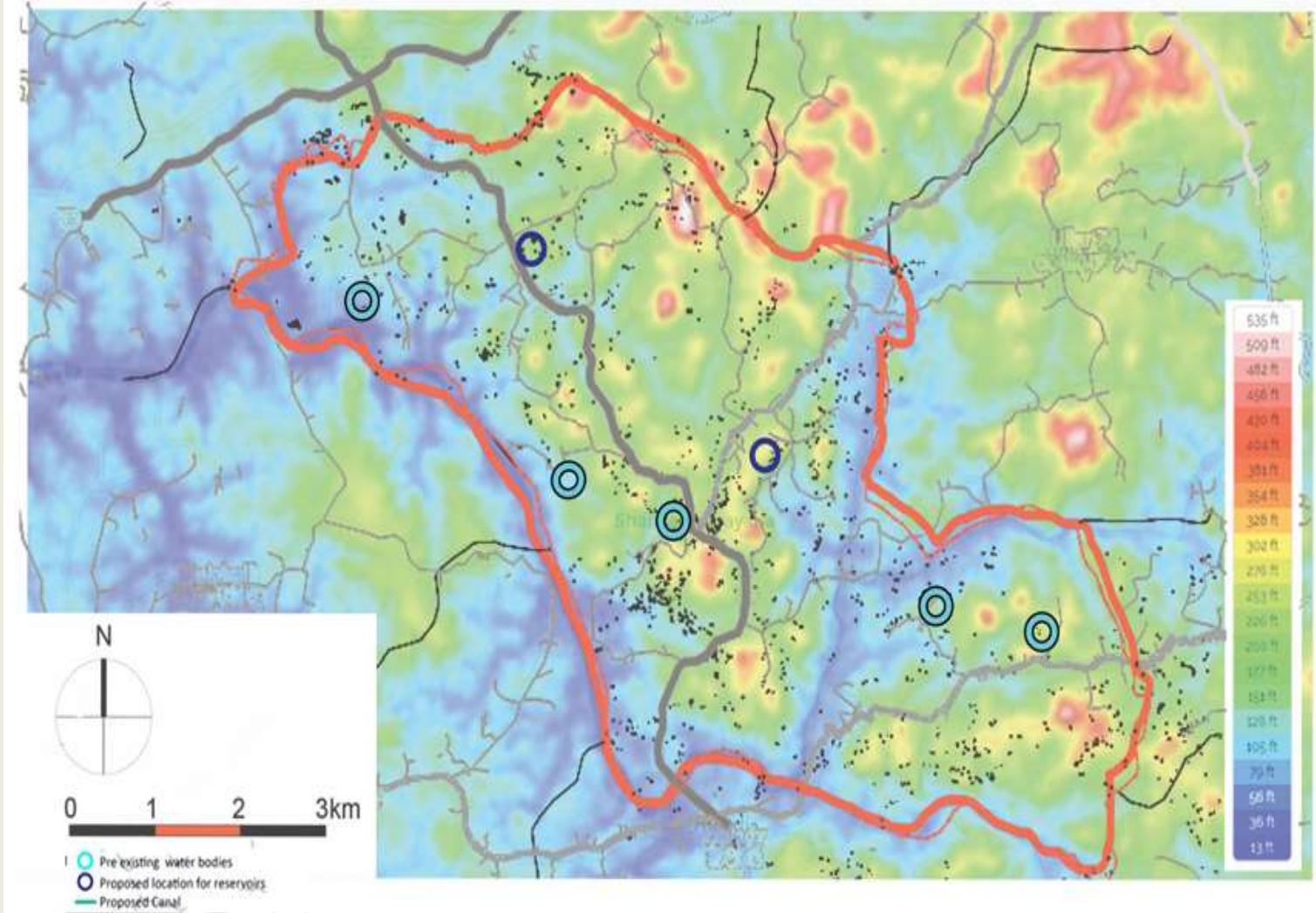
- Reserved Forest – Forest area that are legally protected
- Forest at steep slope – Have to be protected to strengthen the soil
- Residual hills – Have to be afforested and protected
- Forest pockets – Have to be maintained

Buffer for forested areas to be done by wild jack, wild mango – harvestable trees are permitted, cutting trees is not permitted

Forest Zone Map







**Map of existing water bodies. Source: [topographicmaps.com](http://topographicmaps.com) with added layers by author**



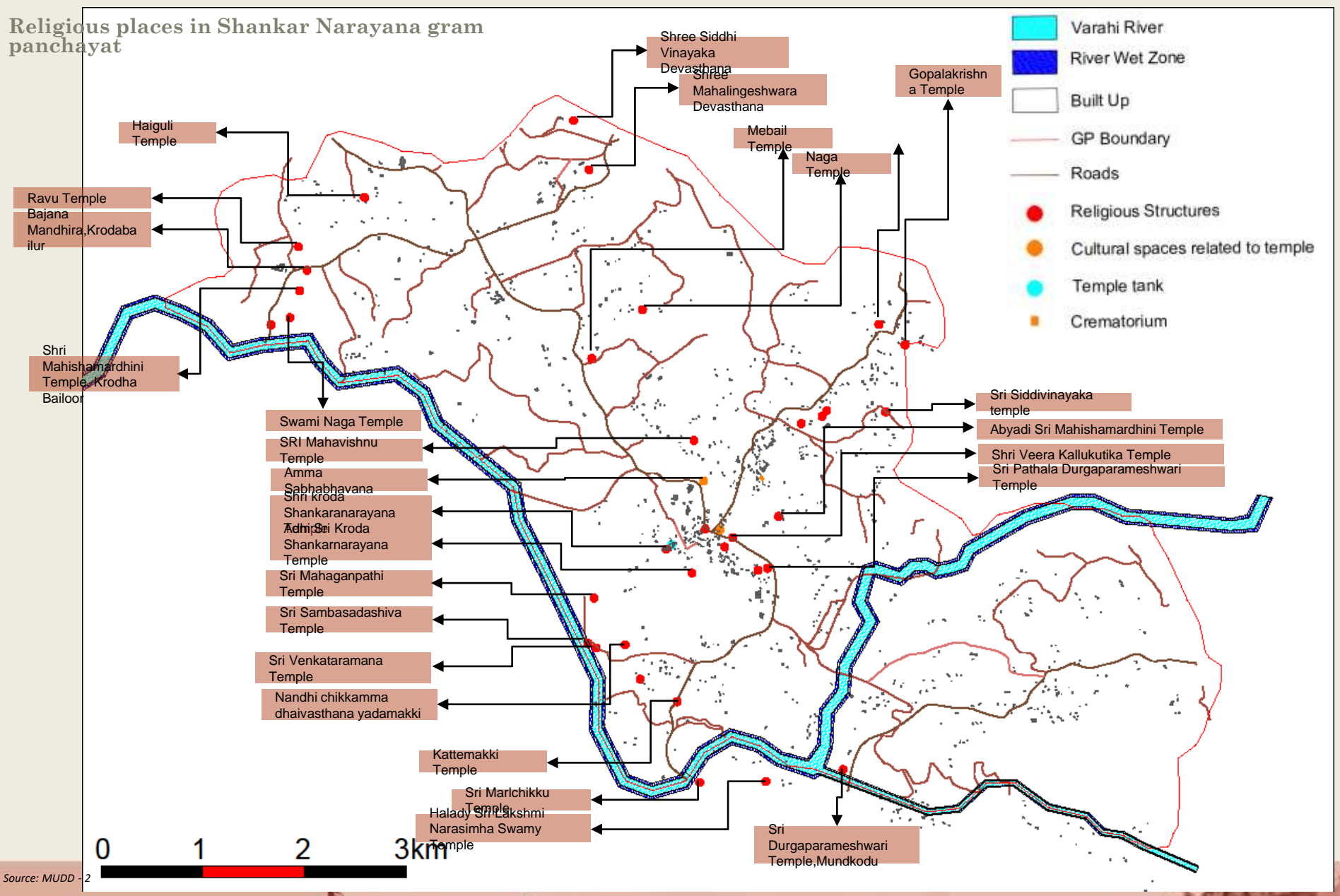
- "**Shankaranarayana**" is considered as one of the seven holy places created by **Maharshi Parashurama**.
- This is one of the rare temples where we can see the sangam (confluence) of **Shankara** (Lord Shiva) and **Narayana** (Lord Vishnu). It was built 400 years ago.
- Shankaranarayana village, named after the temple, is in the valley of **mountain ranges** close to the **Sahyadris**.
- The **7 holy places** namely Subrahmanya, Udipi, Kumbhakaashi, Koteshwara, Shankaranarayana, Kolluru and Gokarna together constitute **Parashurama Kshetra**.
- **Shankara Linga**, which is **round** is on the right and **Narayana Linga** is flat with footprint of the cow is on the left.
- The cow is believed to be that of the **Kamadhenu**, stood dripping milk over the Linga.
- There is **water around Udbhava Linga** at any time of the year. This **holy water** is called **Suddhamrita Theertha**.
- The silver-plated idols of Lor Shankara and Lord Narayana are also installed inside the **Garbjagudi**.
- The holy **water tank** is called as **Koti Theertha**, that is there in front of the temple.
- Panchamukhi Veeranjaneya is an ancient idol, which is revived, **renovated and re-installed** in the presence of **Sri Shreedhara Swamy on 7<sup>th</sup> April 1955**.
- On special occasions Ranga pooje is performed to this idol.





# Religious places in Shankar Narayana gram panchayat

# Tradition and History



Religious Places in Shankaranarayana



# Tradition and History

Conservation of Natural Resources

- River & Forest Protection
- Awareness about mythological, historical and cultural of koti-tirtha and khrodha-giri hill to hold its importance.

Connecting with people

- Enhancing spaces having cultural & social importance.
- Temple management (e.g. Financial, cultural)

Tourism & Income Generation

- Enhancement & Conservation of Social structure and cultural spaces.
- Heritage Zone development (e.g. Heritage walk)

Enhancement of Key features/Events

- Preservation of Food, local art, Folklores, Folkdance, ritual practices, etc.



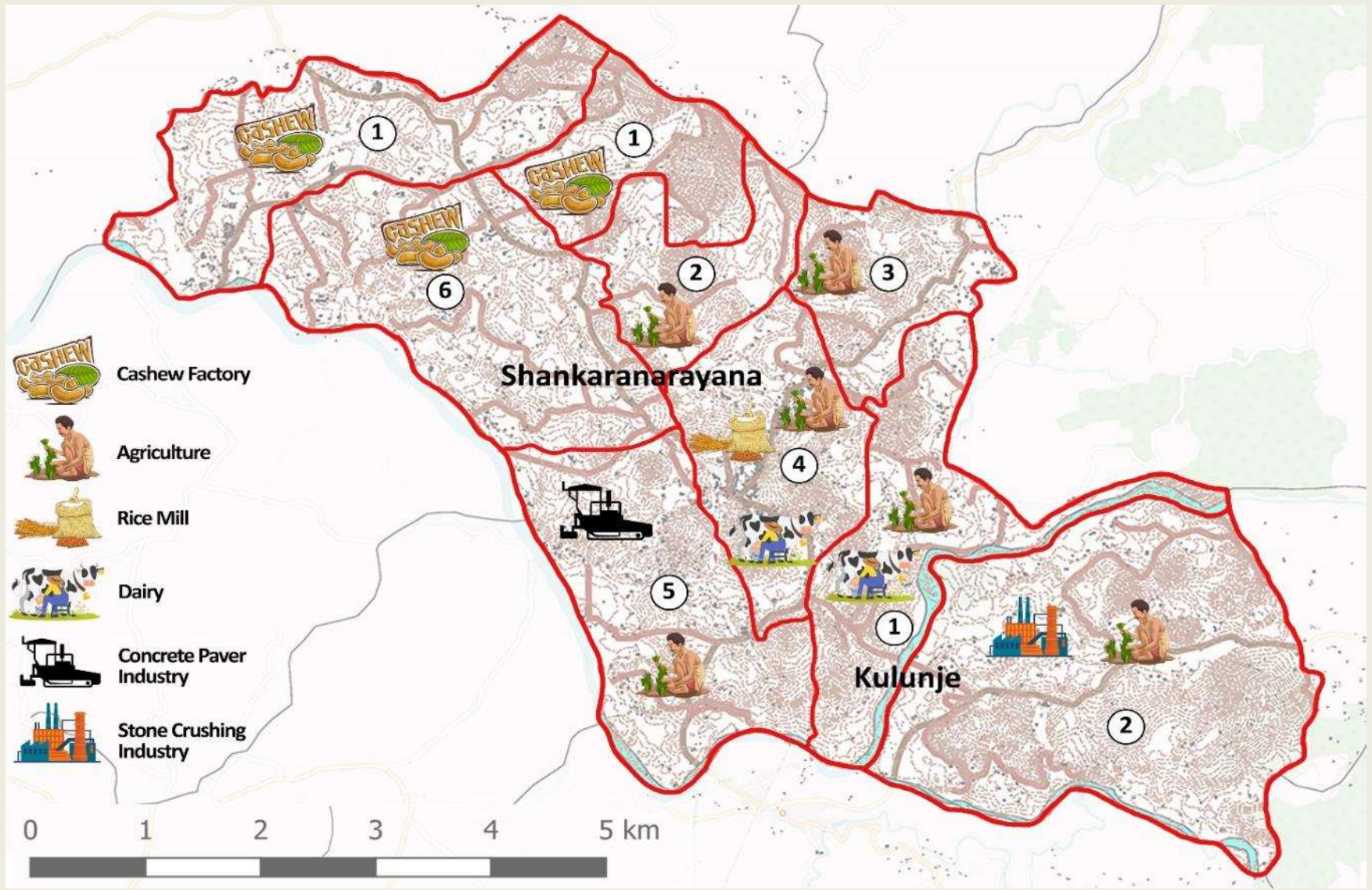
## Socio-Economic

- Wells with sufficient amount of water in most houses, Panchayat Water used too that is available for few hours only and stored.
- 2 wheelers like Bikes and Scooty in most of the houses. Frequent buses for transportation (but not currently due to the pandemic). Autos used for local travel.
- Few houses were well to do with good infrastructure and well maintained houses, while few others stayed in semi pucca houses on rent.
- One of the buildings with around 12 apartments was given on rent; with 1 hall, 1 Bedroom and Kitchen that was sufficient for small and poor families.
- Ward 4 includes the centre of the village too and hence most of the commercial shops, temple, banks, police station and other infrastructure facilities come under them.
- Architectural Character- Most of the houses had sloping roofs with mangalore tiles and walls with laterite and mortar. Rest was G+1 or G+2 made of RCC.
- Landscape-
  - Few households grew Haldi leaves and certain leafy vegetables. Coconut trees, teak and flowering plants like Ratnagandhi seen too.
  - Few others had their agricultural land in the interiors of other remote wards.
  - One of the households had their Daiva (Family god) in a small temple within their compound. There's the well known Veera Kallukutika temple in the core of the commercial space (though doesn't belong to ward 4)
  - Few houses and places like the Police station (360 cm total flight of stairs) and the police quarters are built in an elevated area. Varying topography is seen.
- Cultural amenities:
  - The G. S Acharya Rangamandir in the commercial space becomes a platform for various programs and cultural festivals. It is a well maintained stage that's in used in the evenings to play indoor sports like badminton.
  - Temple however is an important part of the village where every day at around 3:30 to 4pm, Cocks are sacrificed to the God. Lot of tourists while passing through Shankarnarayana mandatorily visit the temple if not put in money in the hundi box that is kept in the road that goes to Udupi. People have lot of faith and worship whole heartedly.





# Socio-Economic factors





# Infrastructure

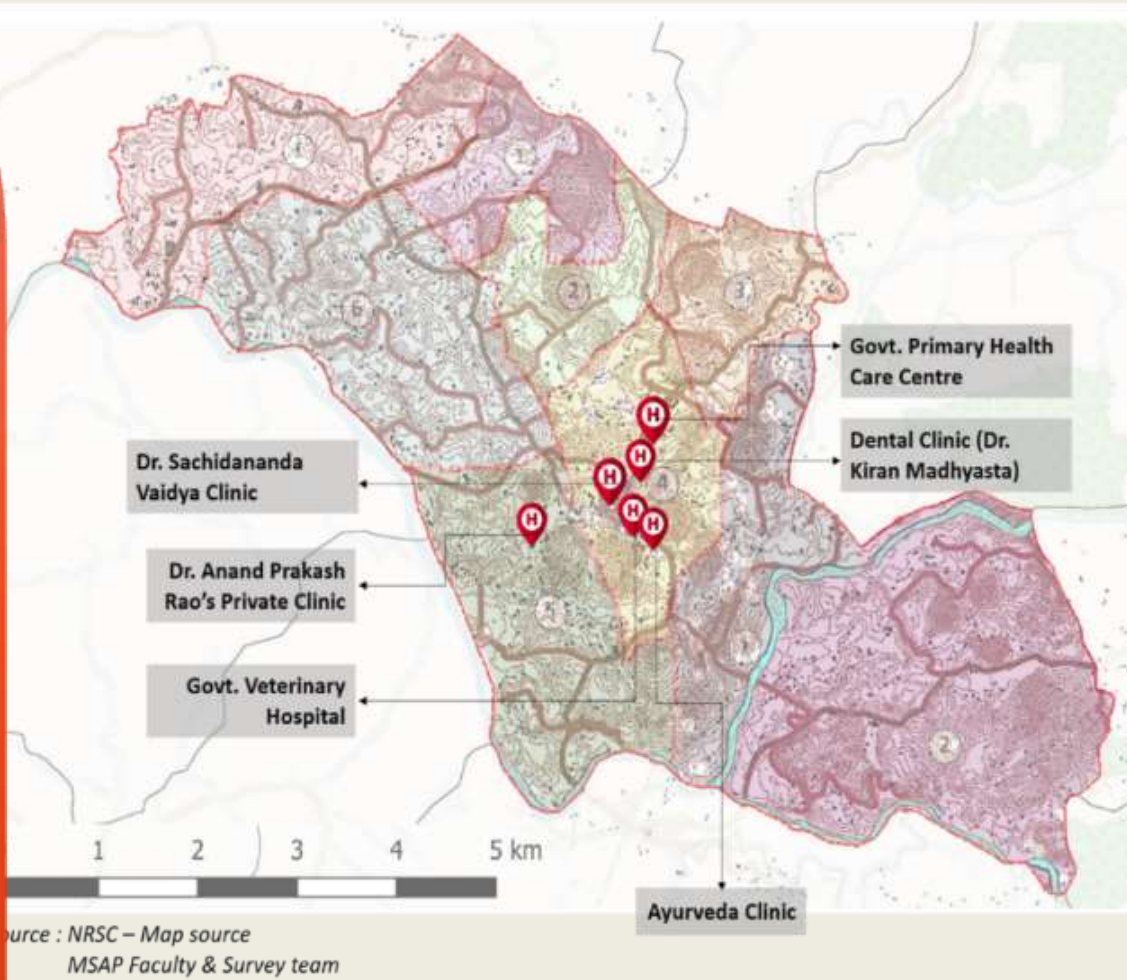


Figure 6.8 Map showing the Health Care Facilities located in the GP (Source: Base data – NRSC)

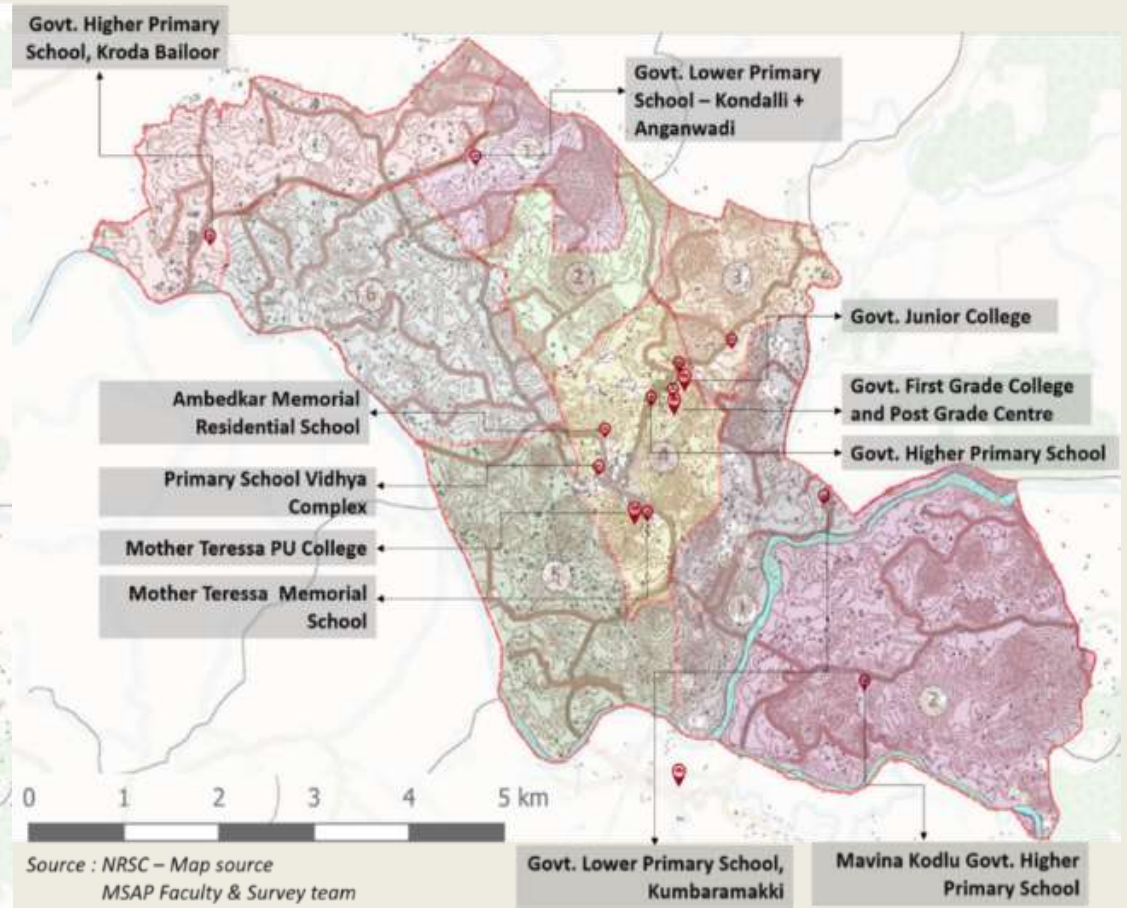
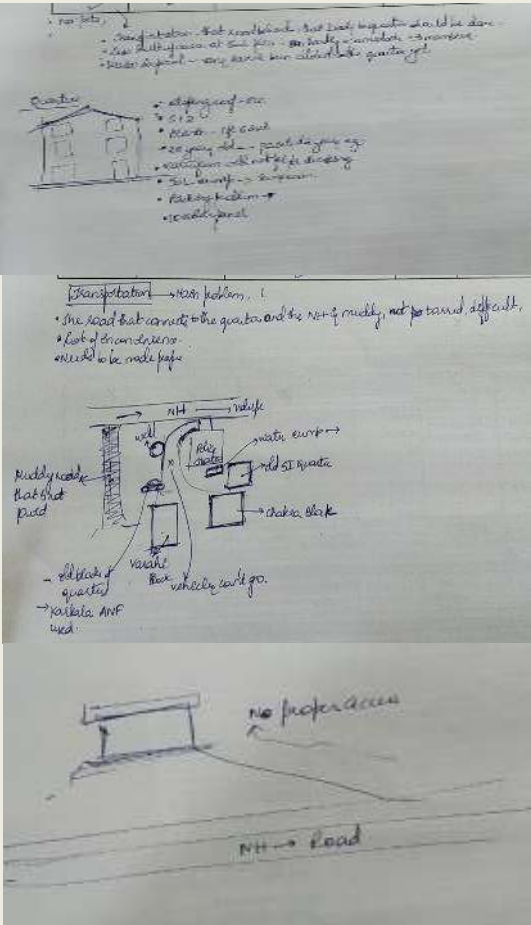


Figure 6.9 Map showing the Education Facilities located in the GP (Source: Base data – NRSC)



# Shankarnarayana

## Infrastructure



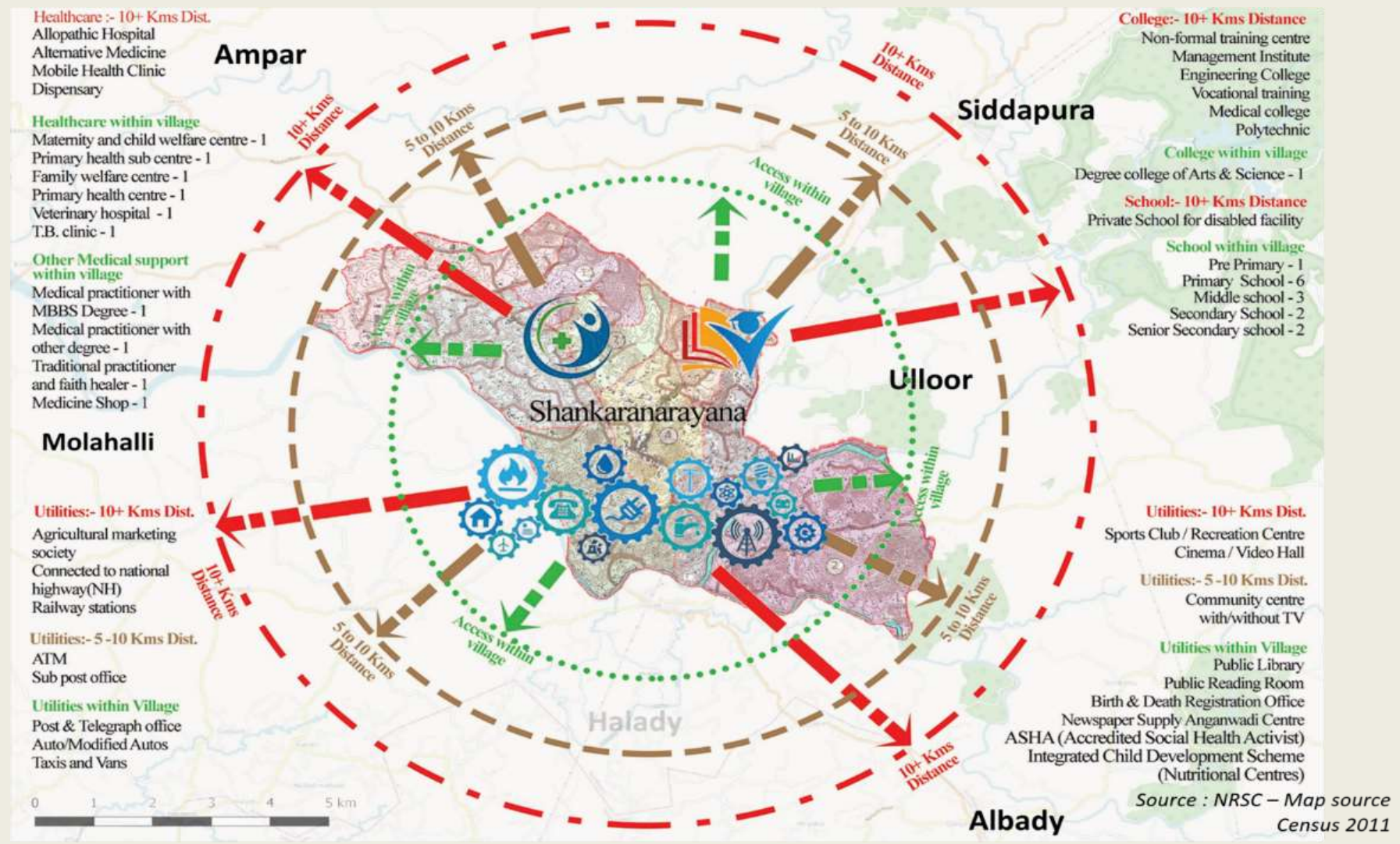
- Transportation- NH is well maintained and the commercial space covered with concrete hollow blocks. The police quarters being in an elevated level needs to have a proper road for the same. It's a muddy road so far and is major problem that they shared.
- Water- from wells or from Panchayat that is supplied at certain intervals only.
- Electricity- from MESCOM
- Housing Condition-
- Waste Disposal- Collected by Panchayat vans. Police Quarters is not yet allotted with the van, so they have been just dumping them in a pit.
- Grocery stores around 1km distance.
- Most of them employed in one or the other sector.
- Septic tank (pit) is seen in most of the houses. Some households have a huge pit below (not connected to any line)
- While few houses have toilets outside, few have them inside.
- Firewood is still used in most household for heating water for bathing or to cook large amounts like rice and stuff.
- Poor internet connections in few households though the tower is close by.
- Composting is seen only few places.
- Vaccination for children given and most household have Ayushman Cards.
- Solar with 10 panels installed behind the Police station for the quarters.
- Well in the police quarter premise is not fit for drinking and old buildings are still in place which can either be cleared or renovated.
- The SI office quarter is in bad conditions and therefore the Current SI stays in a house on rent. They also face the problem of parking.
- Well managed waste management in the VET Hospital.
- One of the hotels was a semi pucca structure and the rent to it was way too expensive.







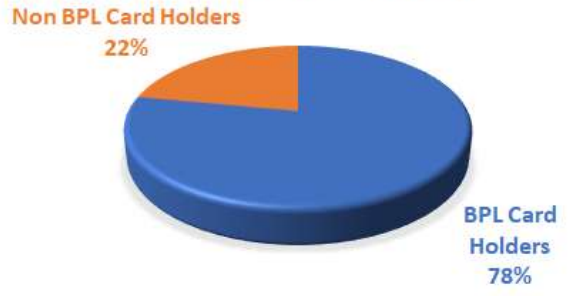
# Infrastructure



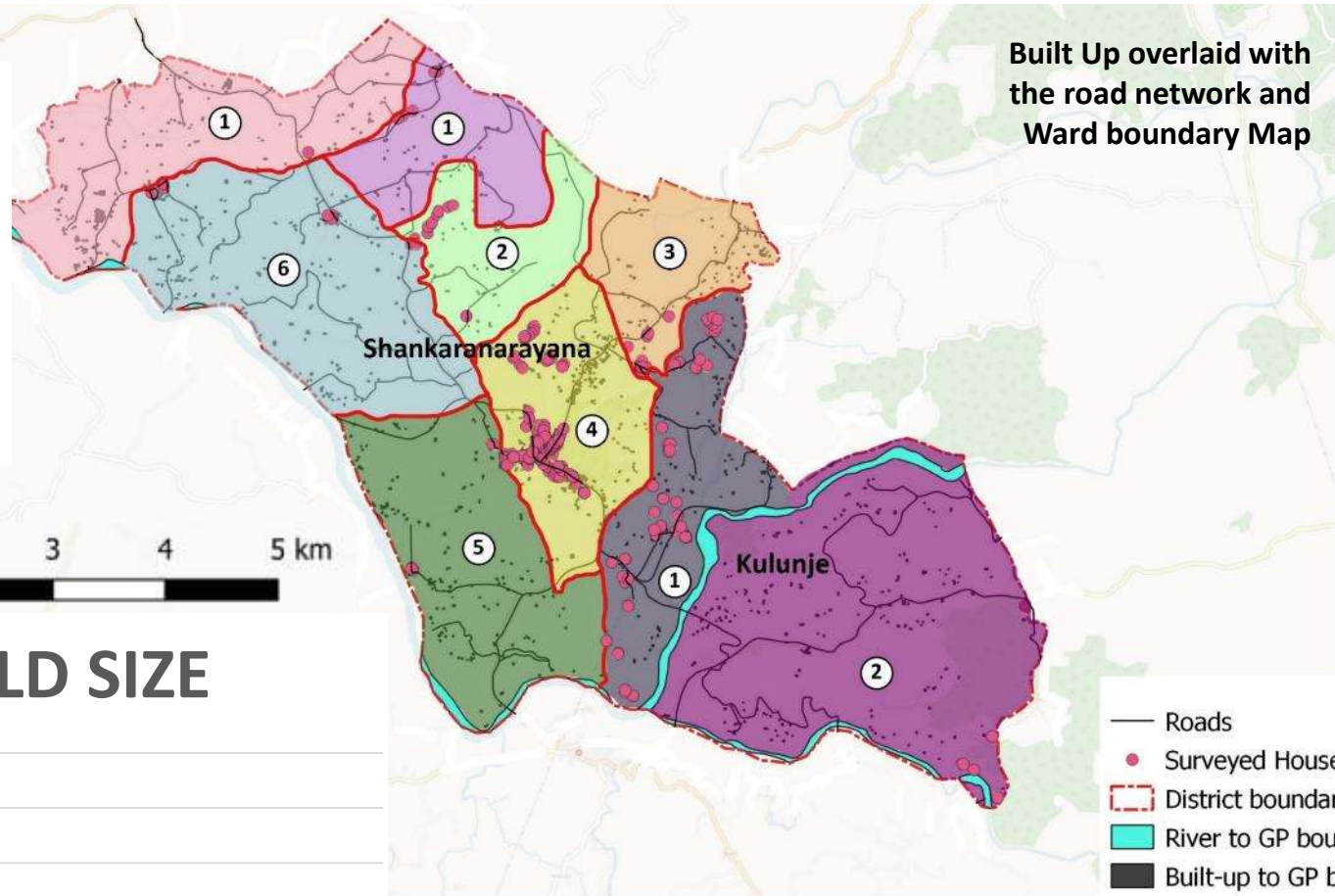
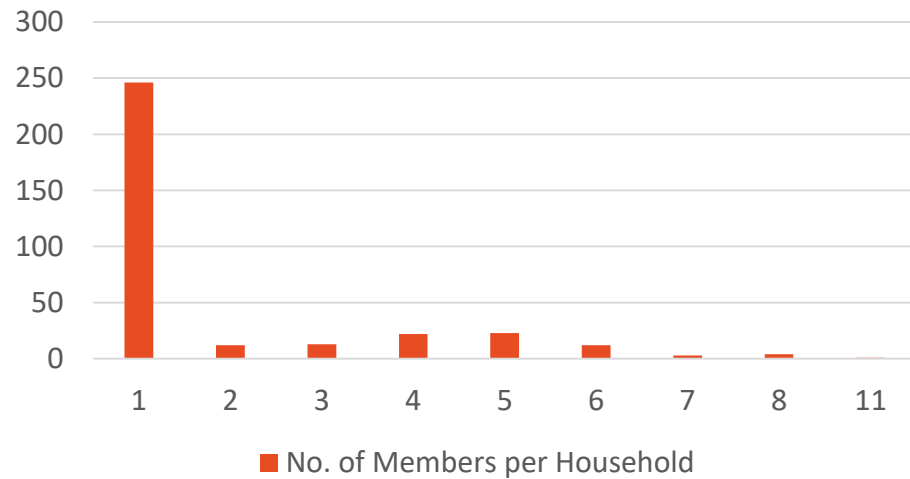
Map showing the Proximity to zones of Influence & Dependency



### BELOW POVERTY LINE CARD HOLDERS RATIO



### HOUSEHOLD SIZE



- From the sample survey, the Household size varies from 1 person per house to 11 people per house
- The maximum household size is 1
- The ratio of female population is higher by 5.45%

Source : NRSC – Map source  
MSAP Faculty & Survey team

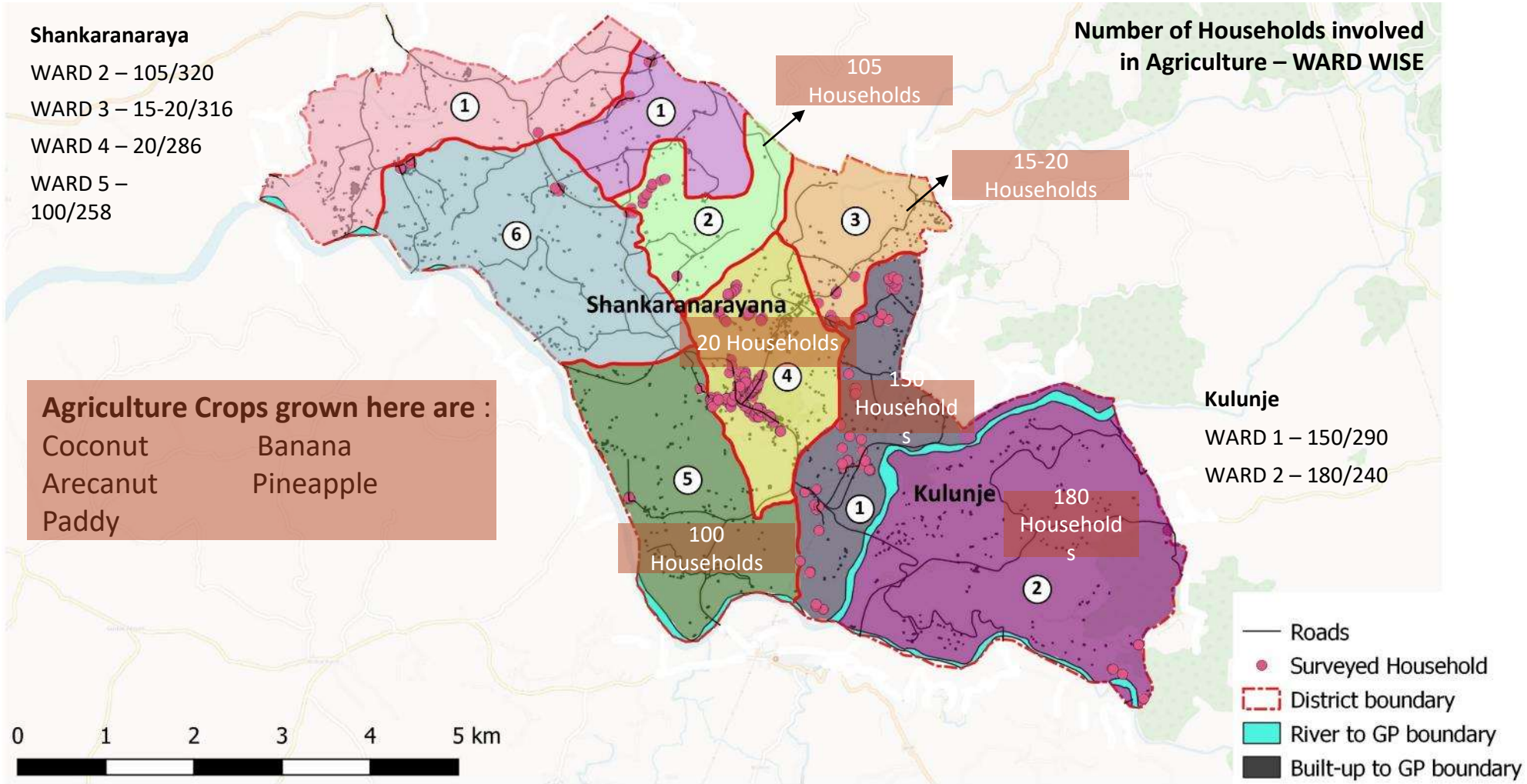


# Infrastructure

**Shankaranarayana**  
 WARD 2 – 105/320  
 WARD 3 – 15-20/316  
 WARD 4 – 20/286  
 WARD 5 – 100/258

## Number of Households involved in Agriculture – WARD WISE

**Agriculture Crops grown here are :**  
 Coconut      Banana  
 Arecanut      Pineapple  
 Paddy



- Possible Income Generating Activities that can be derived from the Primary Crops**
- Small Scale coir Industry
  - Arecanut Peeling
  - Agro Based Food Processing Units
  - Biogas Plant Unit
  - Pineapple jam making – Household Industry
  - Banana Leaf Packaging – Household Industry

Source : NRSC – Map source  
 MSAP Faculty & Survey team



### Educational development for gram panchayat

#### Sustainable Development Goal - 4

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

- As per the 11th Schedule of the 73rd amendment of the Constitution of India Education including primary and secondary school, Technical training and vocational education, Adult and non-formal education and Libraries fall under the 29 subjects transferred to the Panchayats.

#### Policies and schemes for Education development

- Integrated Child Development Scheme (ICDS)
- Sarva Shiksha Abhiyan (SSA)

### Skill development for gram panchayat

#### Sustainable Development Goal – 8

Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

#### Policies and schemes for Skill development

- National Skill Development Programme (NSDP)
- National Digital Literacy Mission
- National Rural Livelihood Mission
- The Technical and Vocational Education and Training (TVET)
- Training of Rural Youth for Self-Employment (TRYSEM)
- Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY)
- Deen Dayal Antyodaya Yojana (DAY-NRLM)
- Mahatma Gandhi National Rural Employment Guarantee Act, (MGNREGA)

### For sustainable local Economic Development

<b>Map</b>	<ul style="list-style-type: none"> <li>• Enterprise opportunities in the village</li> <li>• Employment opportunities for different all social categories</li> <li>• Micro, small and medium enterprises within the panchayat area</li> </ul>
<b>Identify</b>	<ul style="list-style-type: none"> <li>• Potential candidates to set up enterprises</li> <li>• Skills of interested candidates</li> </ul>
<b>Facilitate</b>	<ul style="list-style-type: none"> <li>• Prevention of child labour and create awareness on prevention of child labour</li> <li>• Jobs under MGNREGS</li> <li>• Entrepreneurial development training</li> <li>• Handholding support for new enterprises</li> <li>• Job creation through convergence of ongoing schemes and sponsorships</li> </ul>
<b>Maintain</b>	<ul style="list-style-type: none"> <li>• Database on labour and employment</li> <li>• Categorization of disabled based on nature and degree of disability</li> </ul>
<b>Create</b>	<ul style="list-style-type: none"> <li>• Awareness on equal wages for men and women for equal work</li> <li>• Village-level child protection committees and promote child protection services</li> </ul>

## Key area to be taken care for Gram panchayat Development



### Special focus on Gram panchayat local economic development plan

- Maximized production and employment opportunities through agriculture, animal husbandry and by adoption of best technologies and practices.
- Assured employment opportunities for all households in the village
- Ensuring equitable wages for men and women, zero child labour.
- Employment opportunities for persons with disabilities.

## Few Potential scheme for Rural Development

1. Accelerated Rural Water Supply Programme (ARWSP)
2. Beti Bachao Beti Padhao (BBBP)
3. Deen Dayal Antyodaya Yojana (DAY)
4. Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY)
5. Deen Dayal Upadhyaya Grameen Kaushalya Yojana
6. Green India Mission (GIM)
7. Integrated Child Development Scheme (ICDS)
8. Janani Suraksha Yojana (JSY)
9. National Bamboo Mission
10. National Digital Literacy Mission
11. National Health Mission (NHM)
12. National Mission for Empowerment of Women (NMEW)
13. National Mission for Sustainable Agriculture (NMSA)
14. National Rural Drinking Water Programme (NRDWP)
15. National Social Assistance Programme (NSAP)
16. Navajit Shishu Suraksha Karyakram
17. Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)
18. Rashtriya Bal Swasthya Karyakram (RBSK)
19. Rashtriya Krishi Vikas Yojana (RKVY)
20. Rashtriya Swasthya Bima Yojana (RSBY)
21. Sarva Siksha Abhiyan (SSA)
22. Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (RGSEAG) –SABLA

## Policies Focusing on Rural Skill Development

### National Rural Livelihood Mission

National Rural Livelihood Mission (NRLM) is a poverty alleviation project implemented by Ministry of Rural Development, Government of India. This scheme is focused on promoting self-employment and organization of rural poor. The basic idea behind this programme is to organize the poor into SHG (Self Help Groups) groups and make them capable for self-employment.

In 1999 after restructuring Integrated Rural Development Programme (IRDP), Ministry of Rural Development (MoRD) launched Swarnajayanti Grameen Swarajgar Yojana (SGSY) to focus on promoting self-employment among rural poor. SGSY is now remodelled to form NRLM thereby plugging the shortfalls of SGSY programme

### Training of Rural Youth for Self-Employment (TRYSEM)

The programme is in vogue since 1979. Its main thrust is on equipping rural youth in the age group of 18-35 years with marketable skills and technology to take up vocations of self employment in agriculture and allied activities, industry, services and business. The other objectives of this programme are:

- To achieve an overall socio-economic improvement in the rural areas;
- To provide modern facilities and technical know-how in order to increase the production and per capita income.

On an average, 3,00,000 rural youths are trained every year. On completion of training, the TRYSEM beneficiaries are assisted under the IRDP

### Role of TVET in Rural Development

TVET (Technical and Vocational Education and Training) is essential for development of skilled human resource. So far, TVET has played subdued role in rural development because of the low educational status of rural population. However, the TRYSEM programme which is an important training programme for inducting rural youth to viable self or wage employment ventures has been revamped. It is now provided in recognized institutions like Industrial Training Institutions, Farm Science Centres, Polytechnics, etc.

In addition, there are several other organizations and agencies which organize short and long duration training programmes for upgrading the skills. Some of these agencies are: Non-Government Organizations, Schools in rural areas offering vocational courses, State Government Departments like Agriculture, Horticulture, Sericulture, Animal Husbandry and Dairying, Fisheries, Social Welfare, Health and Family Welfare, Product-wise Boards such as Coffee, Tea, Cashewnut, Horticulture, Khadi and Village Industries Commission



Source: [apppwta.gov.in/en/content/mission](http://apppwta.gov.in/en/content/mission)



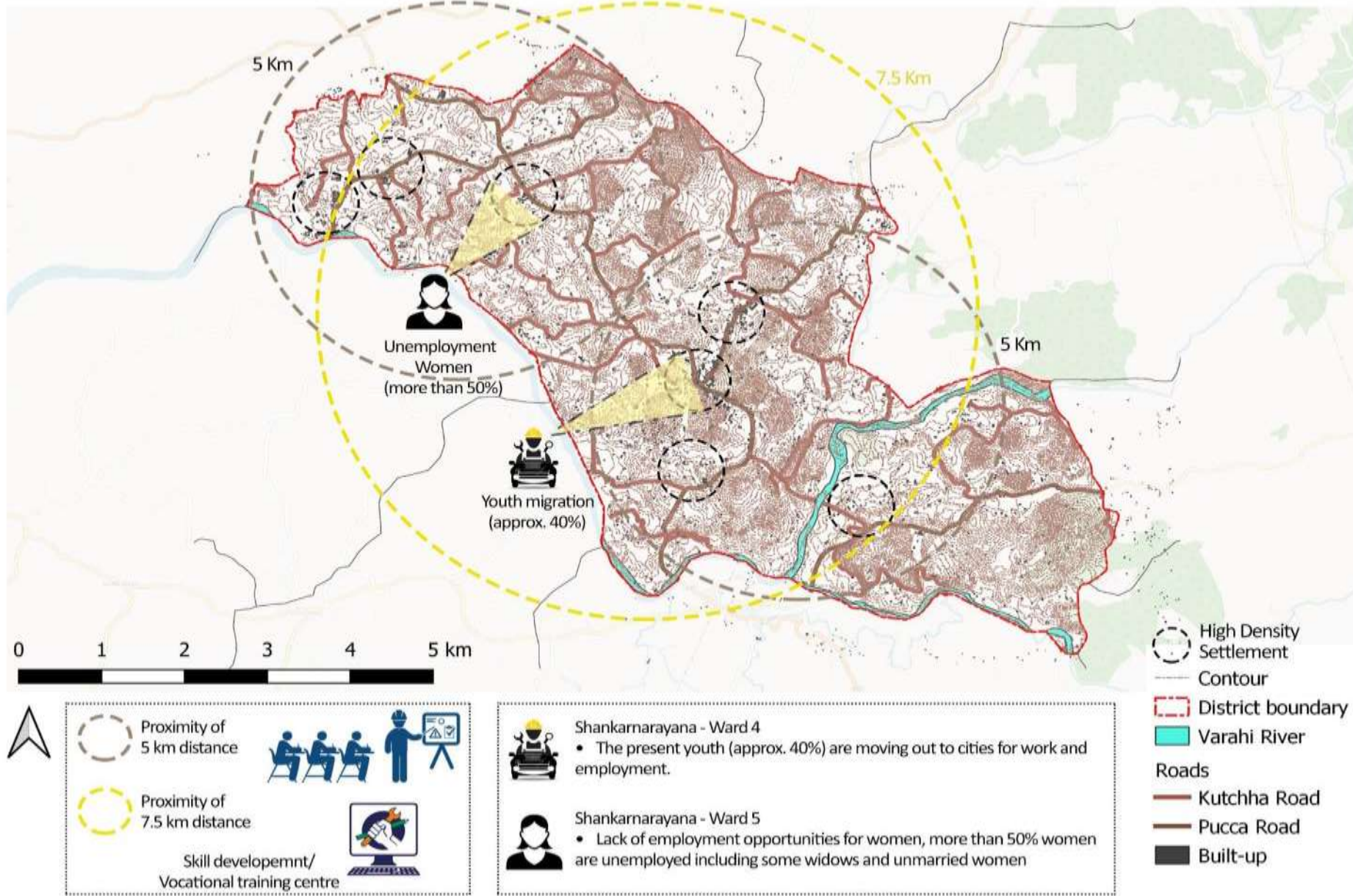
Source: <https://www.youtube.com/watch?v=DP8Yd3AVQA>



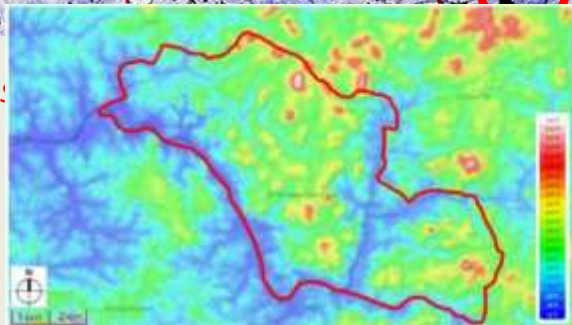
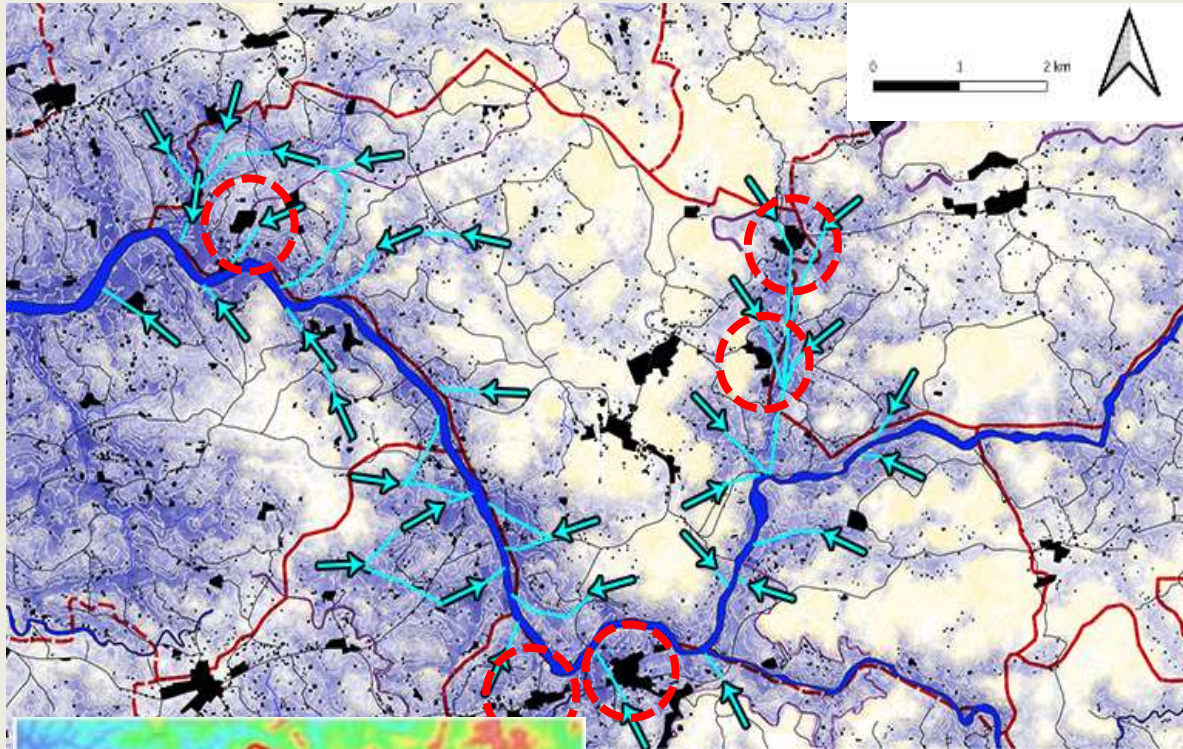
Source: <https://www.seekapor.com/tvet-is-master-key-for-development-nvti/>

Source: Skill development in India, World Bank






# Infrastructure



# Shankarnarayana



## LEGEND

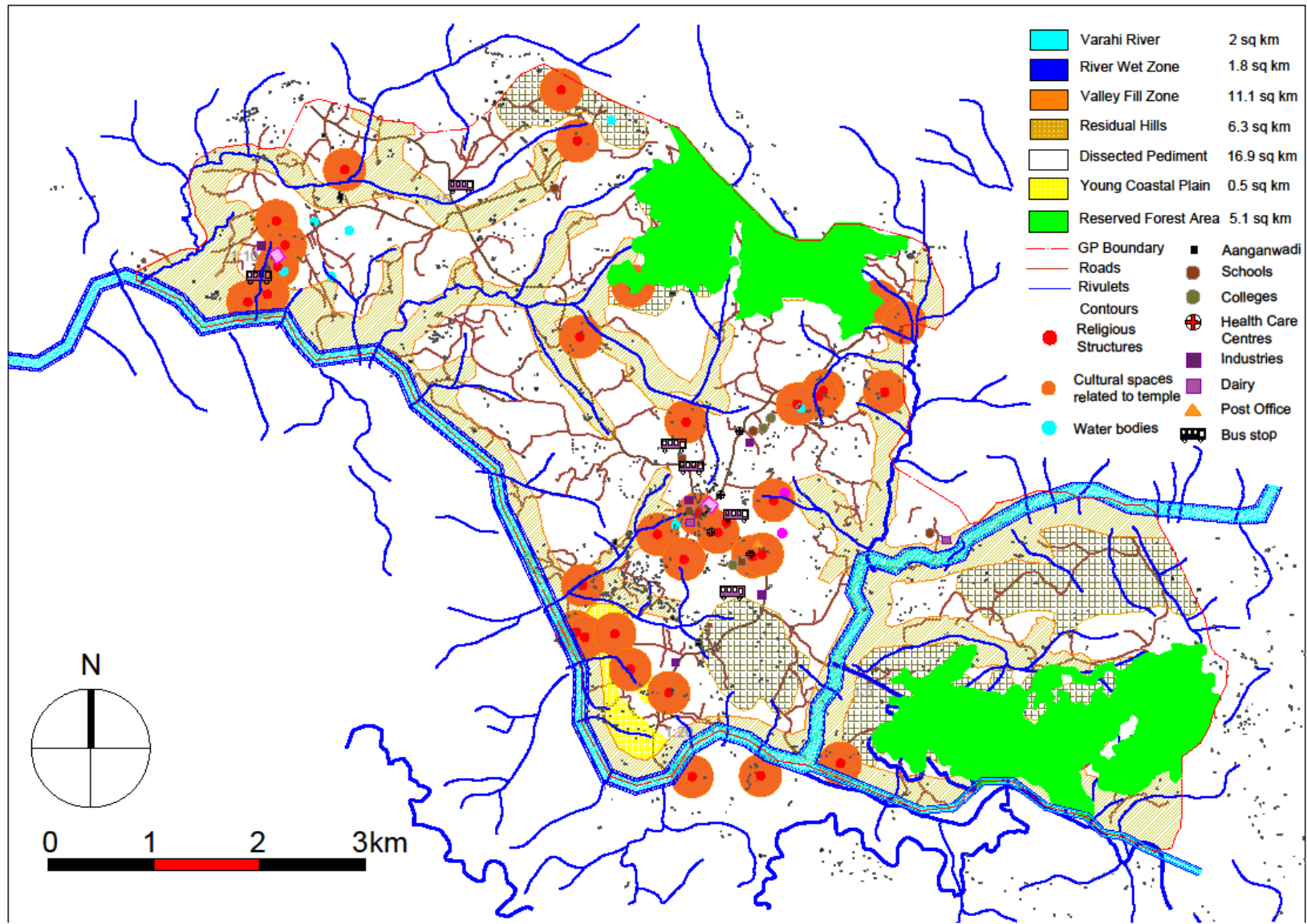
- |   |                  |   |                   |
|---|------------------|---|-------------------|
|  | Conflict areas   |  | Built Forms       |
|  | Flow lines       |  | Main river system |
|  | Village boundary |   |                   |

## Concerns and Needs:


- Women and old people are vulnerable due to difficulty road access scattered development, some isolated houses, very poor mobile connectivity
- Difficulty for employment other than agriculture. High labour cost makes it not profitable
- Drinking problem and child labour a problem in low-income group
- Very less healthcare facility. Sparce education facility
- Skilled. Educated members migrate to bigger towns or abroad for education as well as employment
- Many successful entrepreneurs and businessmen come from this village but no base here.
- No solid waste management and no guidelines for development and land conversion may lead to flooding, landslides, pollution and encroachment of forest and exploitation of natural resources



# Existing Plan



Map showing the Natural Composite map along with the Social Infrastructure.



## Vision:

**A sustainable village that embraces its natural assets, encourages community development, empowers the people and provides opportunities to improve their livelihood.**

### **Goal 1: Conservation of eco sensitive elements**

To conserve eco sensitive elements and develop them as assets

### **Goal 2: Employment generation**

Create employment and economic opportunity so that people are encouraged to stay within the Gram Panchayat

### **Goal 3: Infrastructure development**

Development of infrastructure to support upskill of people and improve the current scenario

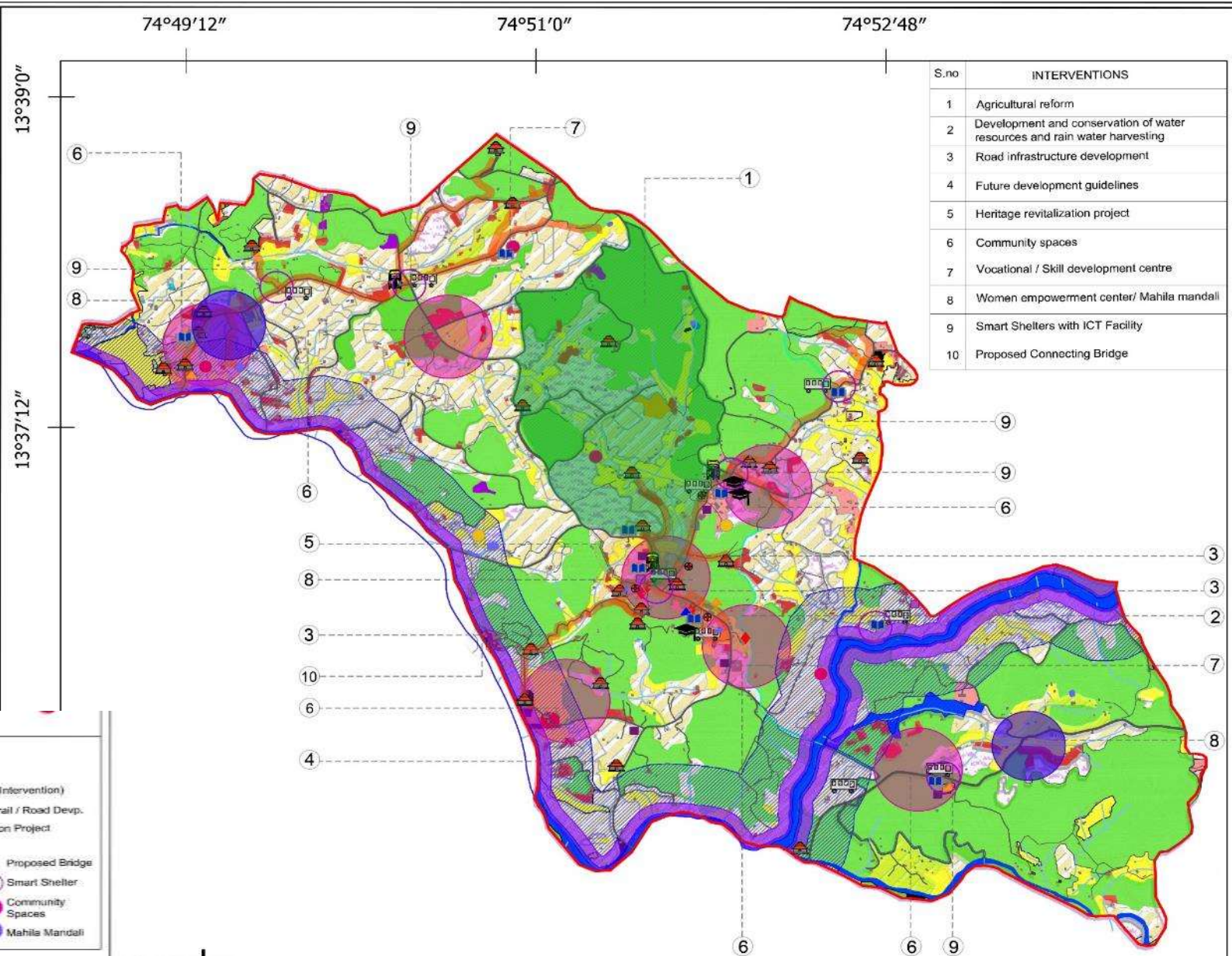
### **Goal 4: Agricultural reform**

Agriculture reform to improve the output & creating a demand for labour





S.no	INTERVENTIONS
1	Agricultural reform
2	Development and conservation of water resources and rain water harvesting
3	Road infrastructure development
4	Future development guidelines
5	Heritage revitalization project
6	Community spaces
7	Vocational / Skill development centre
8	Women empowerment center/ Mahila mandali
9	Smart Shelters with ICT Facility
10	Proposed Connecting Bridge

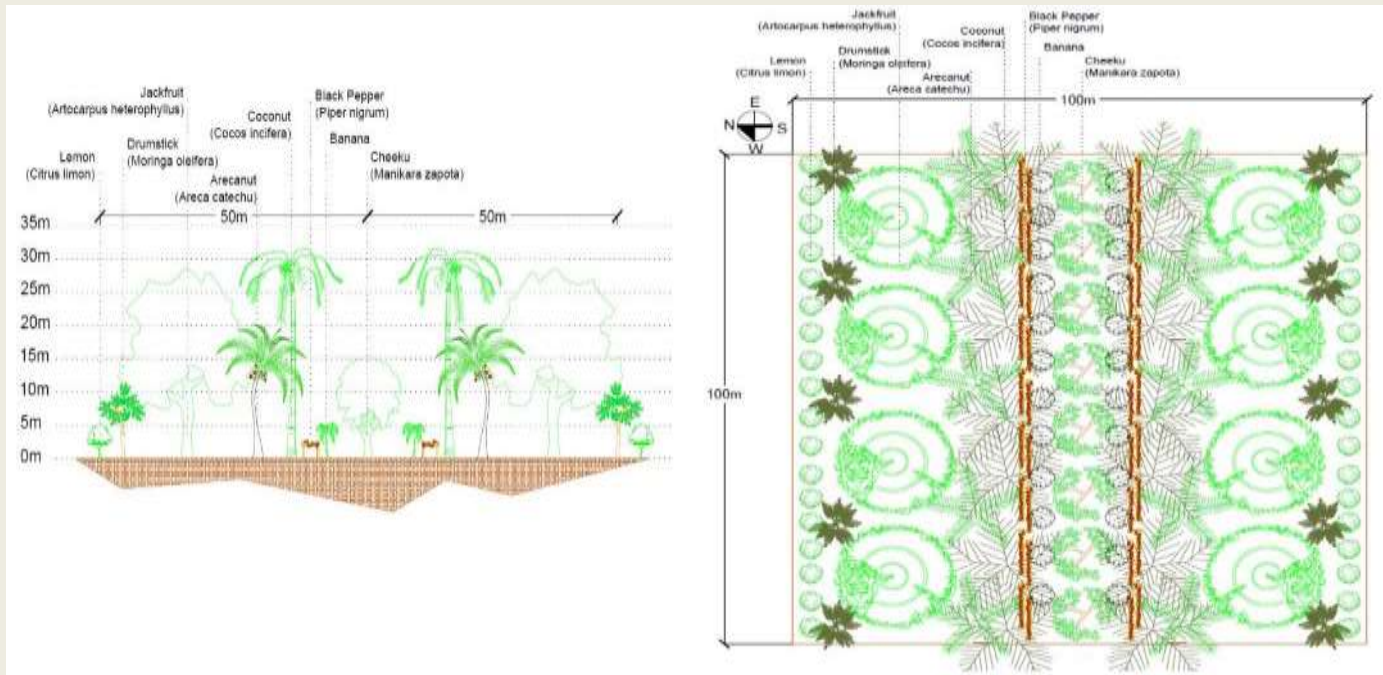


**Legends:**

<ul style="list-style-type: none"> <li><span style="color: blue;">■</span> Lakes/ Ponds</li> <li><span style="color: blue;">■</span> River/Stream</li> <li><span style="color: blue;">■</span> Reservoir/Tank</li> <li><span style="color: green;">■</span> Canal</li> <li><span style="color: green;">■</span> Forest</li> <li><span style="color: lightgreen;">■</span> Forest Plantation</li> <li><span style="color: pink;">■</span> Village</li> <li><span style="color: red;">■</span> Hamlets</li> <li><span style="color: red;">■</span> Built up (Rural)</li> <li><span style="color: orange;">■</span> Mixed Settlement</li> </ul>	<ul style="list-style-type: none"> <li><span style="color: yellow;">■</span> Crop Land</li> <li><span style="color: lightgreen;">■</span> Agriculture Plantation</li> <li><span style="color: black;">■</span> Transportation</li> <li><span style="color: brown;">■</span> Barren rocky</li> <li><span style="color: pink;">■</span> Scrub land dense</li> <li><span style="color: lightgrey;">■</span> Scrub land open</li> <li><span style="color: blue;">■</span> River Wet Zone (NDZ) 25.0 M</li> <li><span style="color: purple;">■</span> River Regulation Zone-1 (HIZ) 100.0 M</li> <li><span style="color: grey;">■</span> River Regulation Zone-2 (MIZ) 375.0 M</li> </ul>	<ul style="list-style-type: none"> <li><span style="color: red;">+</span> Health Care Facilities</li> <li><span style="color: blue;">■</span> Schools</li> <li><span style="color: black;">■</span> Colleges</li> <li><span style="color: pink;">■</span> Anganwadi</li> <li><span style="color: yellow;">■</span> Crematorium</li> <li><span style="color: purple;">■</span> Dairy</li> <li><span style="color: brown;">■</span> Industry</li> <li><span style="color: orange;">■</span> Post Office</li> <li><span style="color: blue;">■</span> Police Station</li> <li><span style="color: red;">■</span> Administrative Offices</li> <li><span style="color: brown;">■</span> Religious Places</li> </ul>	<ul style="list-style-type: none"> <li><span style="color: grey;">■</span> Built forms</li> <li><span style="color: lightgrey;">■</span> Valley Fill Area</li> <li><span style="color: green;">■</span> Agriculture Reform (Intervention)</li> <li><span style="color: orange;">■</span> Heritage / Temple Trail / Road Devp.</li> <li><span style="color: lightgrey;">■</span> Heritage Revitalization Project</li> <li><span style="color: black;">■</span> Auto Stand</li> <li><span style="color: black;">■</span> Bus Stand / Bus Stop</li> <li><span style="color: black;">■</span> Drains / rivulets</li> <li><span style="color: red;">—</span> GP Boundary</li> <li><span style="color: black;">—</span> Contours</li> <li><span style="color: black;">—</span> Roads</li> </ul>
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13°33'36"





Multi-layer farming method. Source: Author

## FOREST PROTECTION

Reserved forest areas to be protected and no activity should be allowed as they help prevent soil erosion and storm water infiltration systems. Buffer zones should be supported with native trees such as wild Mango and Wild jack, at higher density of 350 trees per hectare. Deep rooted native trees and shrubs to be planted to provide slope stability. Restricted forest cover which coincides with residential or commercial land use to be treated as an asset – no felling of trees to be allowed.

## AGRICULTURAL REFORM

Integration of decentralized storm and water management systems for horticulture and Madagas for agriculture

- In multi-layer farming, a farmer grows plants of different heights on same field at the same time to optimize the use of land
- Farming extension service centre should be encouraged. The criteria's are: Farmer aid, Farm schools / training center, Local storage point for fertilizers and crop as an intermediate between farms and market.

### B. Discouraging Monoculture Plantations

- Crop diversification may be targeted with special emphasis on high value crops such as vegetables, vegetable seeds, orchids, mushrooms, spices – Cinnamon, Black pepper Star anise all may be cultivated.
- Bamboo plant may be harvested and used in construction, repair and even processed in small scale industries





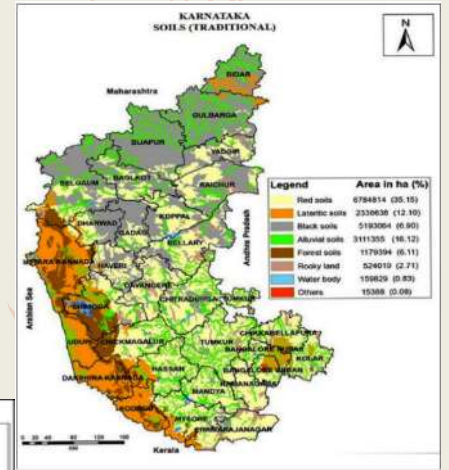
## Introduction

Moderating the tropical climate of the region, the site presents one of the best examples of the monsoon system on the planet.

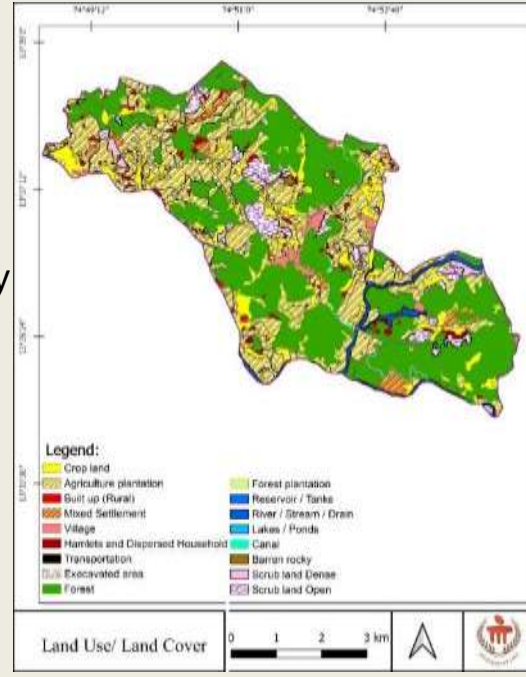
- exceptionally high level of biological diversity and endemism
- one of the world's eight 'hottest hotspots' of biological diversity
- At least 325 globally threatened species occur in the Western Ghats (IUCN India Red Data List, 2019).
- Neighboring villages of Shankaranarayana GP fall under eco-sensitive zone

## Parameters

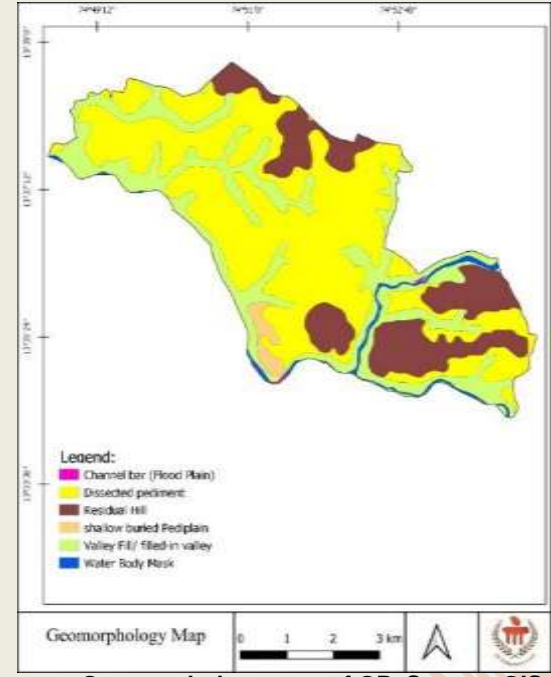
1. Agriculture: Soil, vegetation & Ground water Quality
2. Climatic and meteorological data
3. Soil
4. Geology
5. Geomorphology
6. Flora and fauna
7. Land use and land cover
8. Ratio of cultivated land
9. Drainage network
10. River network
11. Slope



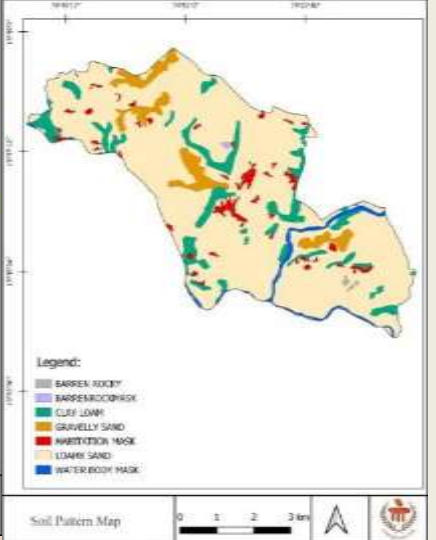
Soil map of Udupi district, Source: District NRDMS Center



Land utilization map 2019, Source: GIS data provided by NRSC



Geomorphology map of GP, Source: GIS data provided by NRSC



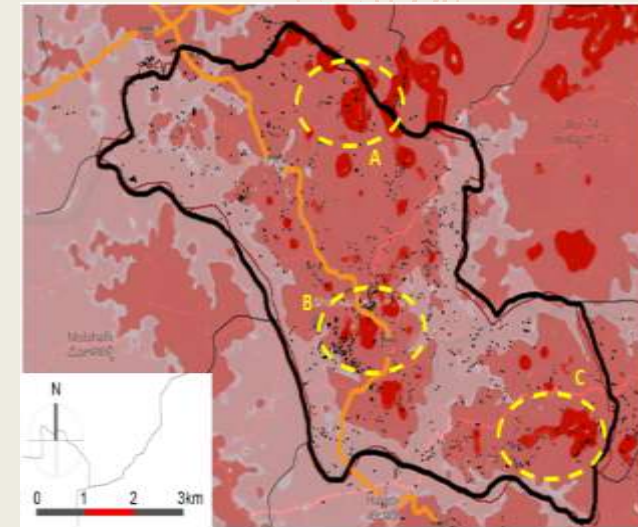
Soil pattern map, Source: GIS data provided by NRSC





### Guidelines

1. Ridge Area Treatment
2. Drainage line treatment with a combination of vegetative and engineering structures
3. Development of water harvesting structures
4. No fill shall be placed on native topsoil.
5. Land Development including in-situ soil and moisture conservation and drainage management
6. Crop demonstrations for popularizing new crops/varieties, water saving technologies varieties based on the local germ-plasm may be promoted.
7. Pasture development, sericulture, bee keeping, back yard poultry, small ruminant, other livestock's and other micro-enterprises
8. Veterinary services for livestock and other livestock improvement measures
9. Fisheries development in Kulanje village along the river, farm ponds etc.
10. Promotion and propagation of non-conventional energy saving devices
11. Permissions for removal of sand from the river bed in Category III stretches
12. Industries as well as polluting activities like land fill, dumping of municipal and other solid (construction debris) and liquid wastes, disposal of hazardous substances etc
13. The Reserve forest areas shown in the GP map will be governed by KFD.



Future development areas and conserved forest areas.

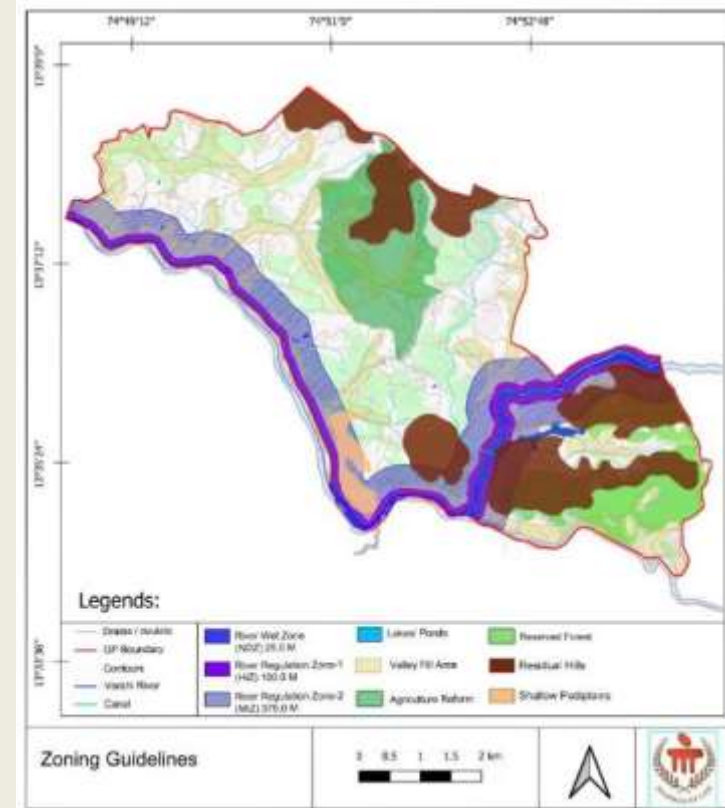
	Slope	Area	Recommendation	Agricultural Practice
	17% – 25%	Steep terrain	Restriction on construction, Buffer vegetation area (trees with large root spread – mango, jackfruit) to control soil erosion	Forested reserve area – NOT to be harvested. (Provides food source for wild animals)
	15% - 17%	Agricultural and Residential (Dissected pediment substratum)	Gentle slope, Low rise construction	Agriculture can be practiced along with increasing built up
	5% - 15%	River and River bank + Residential (Alluvial plain substratum)	River wet zone to be demarked and restricted of permanent construction.	Agriculture can be practiced in proximate land, Mainly paddy.

The major zones of slope in Shankaranarayana

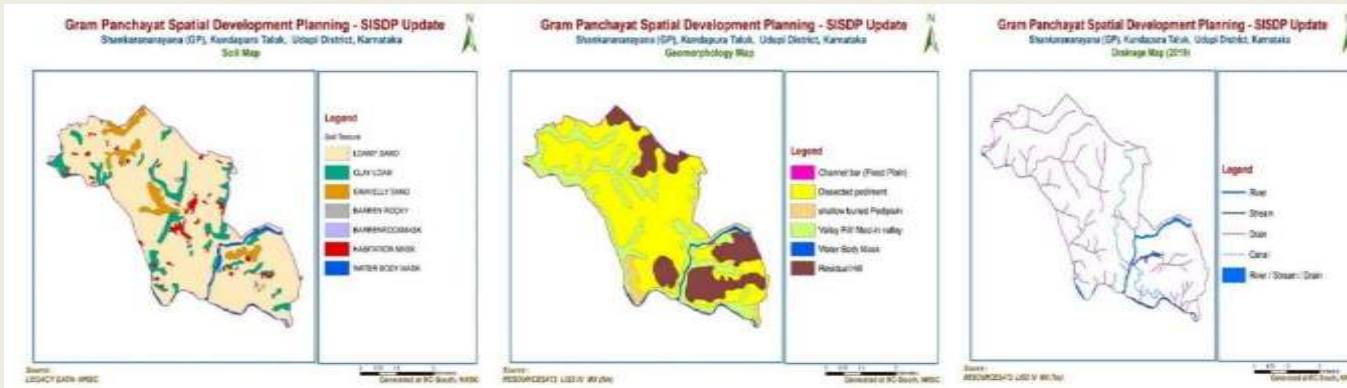


## Proposal

1. Valley fill zones are rich in Sandy loamy soil which should be best reserved for cultivation
2. Residual hills should be dealt with sensitively as the areas are prone to landslides and proper attention should be given to the advised guidelines.
3. No Development Zone: As per studies a NDZ of 25m on either bank Varahi river has been proposed at 50m from the center of the river.
4. High & Medium Impact Zones
5. No permanent construction of residential, industrial, commercial, recreational and public semipublic (PSP) nature shall be permitted within No Development Zones (NDZ) and also the High Impact Zones (HIZ) of river stretch.



Zoning Guidelines



Slope analysis. GIS data provided by NRSC

Zone	Soil Type	Note	Note 2	Best suitable for
(A)	Loamy skeletal	have 35 percent by volume fragments coarser than 2 mm	consists of sand, clay, and silt. It also contains enough hummus. It has a good water-holding capacity. It has sufficient aeration. It is well suited for cultivation.	Can grow sugarcane, cotton, pulses, and oilseeds tomatoes, peppers, green beans, cucumbers, onions, and lettuce
(B)	Fine Loamy	have a loamy particle size that has 15 percent or more by weight of fine sand (0.25-0.1 mm)		
(C)	Fine	silty soils have a loamy particle size that has less than 15 percent of fine sand (0.25-0.1 mm) + 18 and 35 percent clay	water holding capacity is very high. Wet clay soil is very sticky, it contains very little air. The size of soil particles in clay size is less than 0.2mm, rich in organic matter.	Can grow only paddy
(D)	Clayey skeletal	consist of the fine earth with 35 percent or more clay by weight and coarse fragments are less than 35 percent by volume		





# NATURAL SETTING

# WATER MANAGEMENT

- Shankarnarayana is located on the foothills of Western Ghats. The annual average rainfall is 3500 mm. In past couple of years, the average rainfall has increased with highest rainfall increasing from 148mm on June 2018 to 415 mm in June 2019.
- The GP has natural water draining from its western periphery flowing towards the Varahi river which is along the S-W boundary.
- The storm water network is designed keeping in mind the following points:
  - Controls storm water run-off from the source, so that the filtered water can be directly sent to the river.
  - Controls water-logging during heavy rains.
  - Improves slope stability by reducing infiltration.
- There are about 7 small to large ponds, locally called as '**Madagas**' (for the location of all Madagas refer annexure of report) which are distributed throughout the GP. They can act like points for storm water collection and recharge.



Madga in ward-6



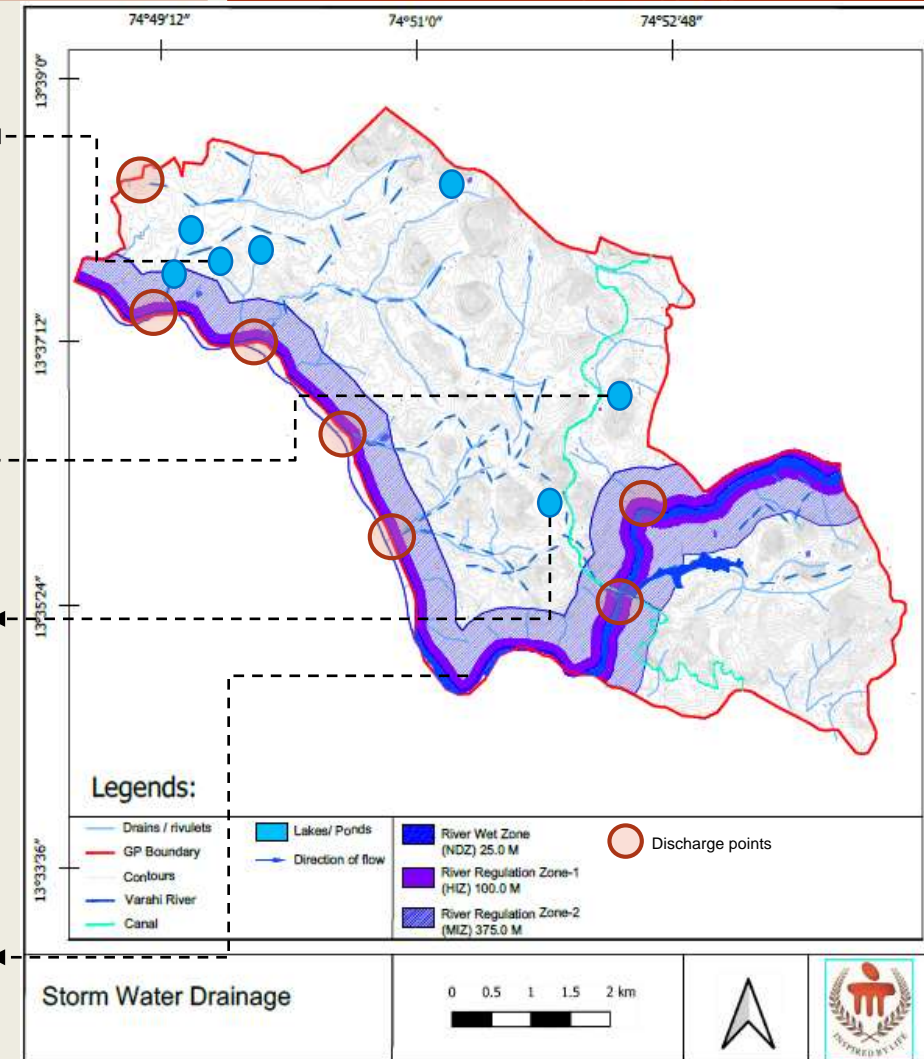
Madga in Kulanje ward-1



Madga in ward-5



Varahi River



Map showing Varahi River and existing water bodies in Shankarnarayana Panchayat. Source: NRSC with added layers by author





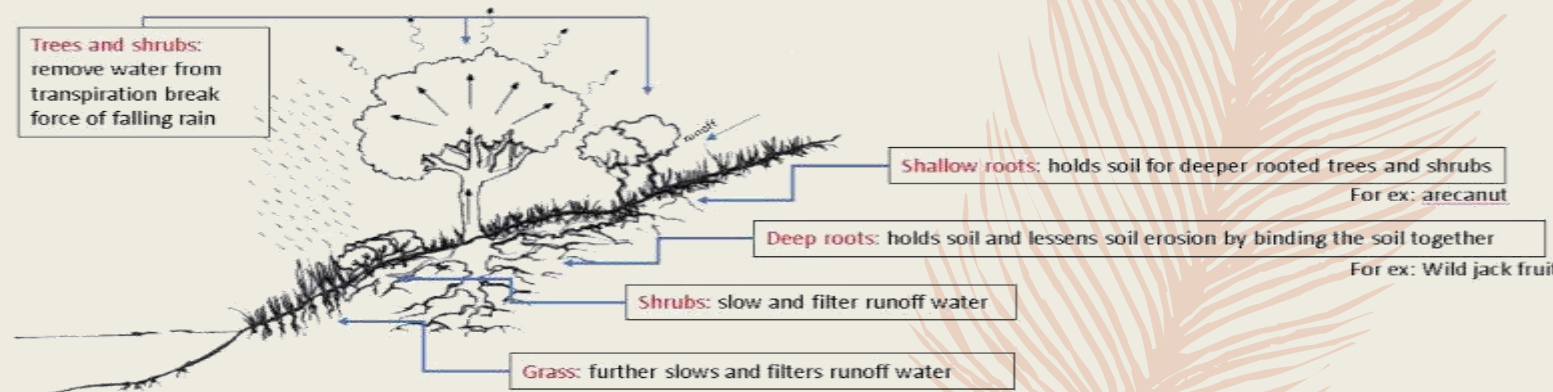


## Guidelines For Improving Water Network & Quality

- Encroachment and utilization of river wet zone for habitation, agricultural and grazing activities must be prohibited.
- The river regulation zone 1 marked 100 meters from the edge of the river is to be maintained for soil erosion and restricted activities of only temporary nature. Dumping of solid waste, land reclamation, animal grazing activities are not permitted.
- The groundwater is found to be acidic; it is suggested to implement the use of surface water along with groundwater.
- Analysis reveals that the groundwater of the area, needs certain degree of treatment before consumption for drinking and irrigation purposes. It needs to be protected from contamination.

## Guidelines For Restoration Of Madagas And Water Bodies

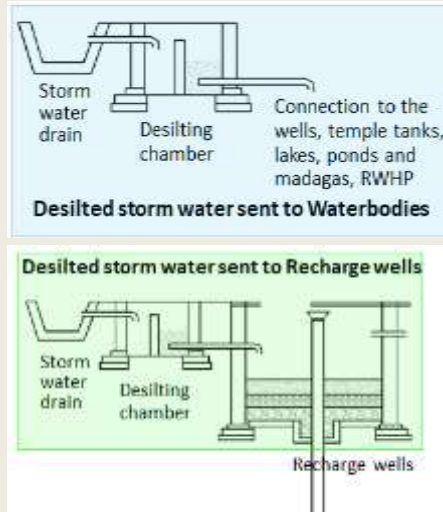
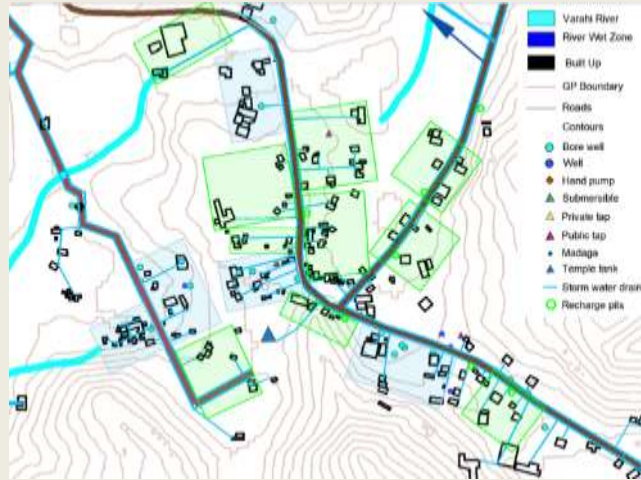
- De-weeding: By means of Biological controls.
- Stabilization of earthen embankments, shoreline protection with vegetative or rock riprap to avoid soil erosion.
- Buffer Zone of at least 10m periphery around the pond should be maintained as green belt zone or no activity zone.



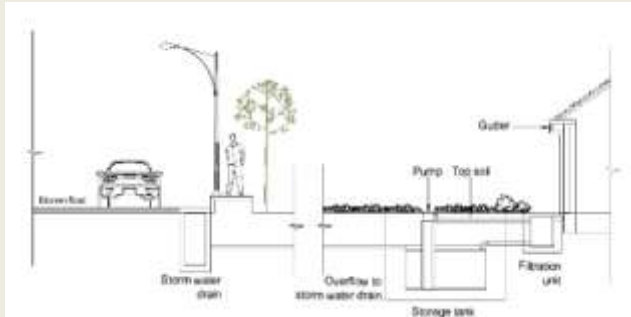
Source: ESRD,2012. Shoreline Stabilization



## DESILTING OF STORM WATER

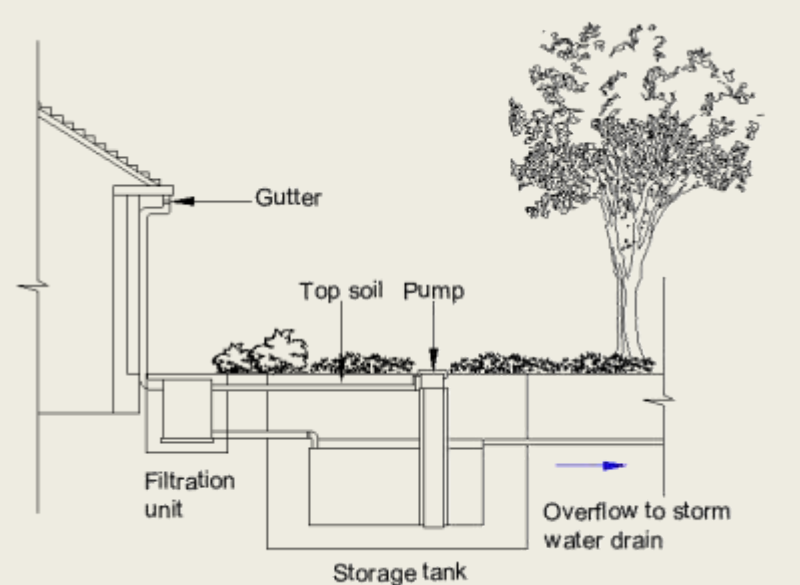


Schematic section showing detail of Recharge well. Source: Author



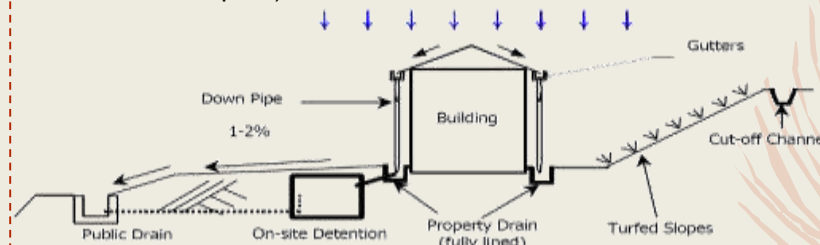
Schematic section showing detail of Rainwater harvesting pit at household. Source: Author

## ROOF TOP HARVESTING

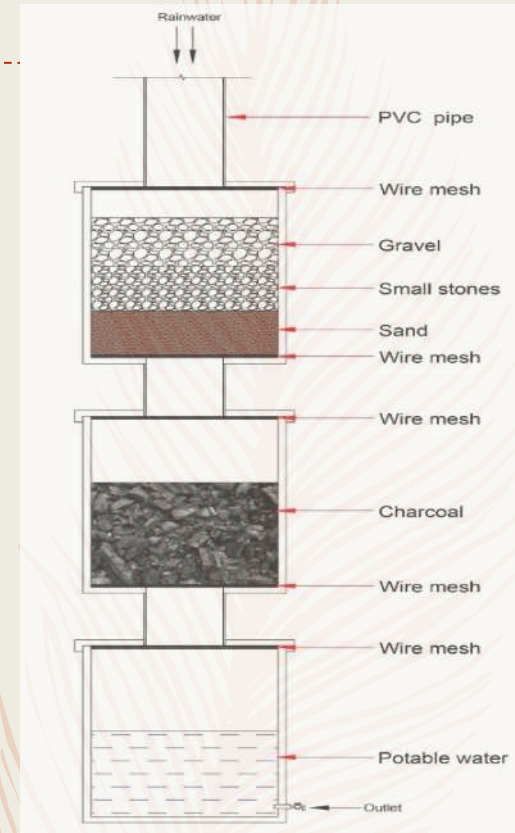


Roof top Rainwater harvesting. Source: Author

(For details of Rain water Storage Tanks-Refer pg no. 113 of the report.)



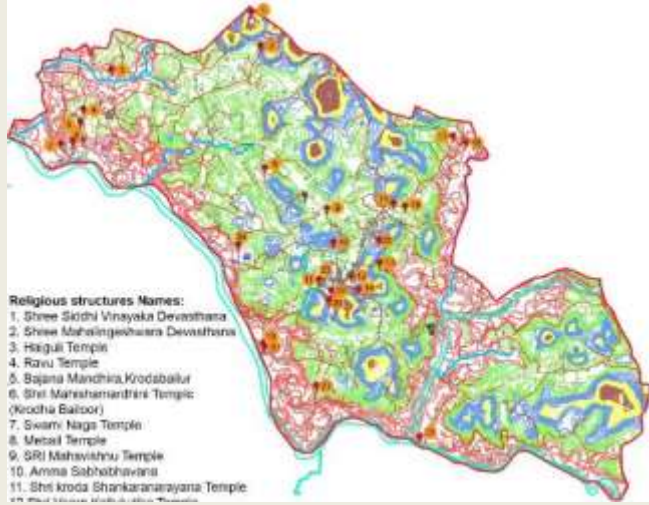
Storm water drain network at a household level. Source: Author



Low Cost RWH system at household level using DIY methods. Source:

<https://www.thebetterindia.com/240601/how-to-build-a-rainwater-harvesting-system-at-home-cheap-bore-water-bills-low-cost-diy-bengaluru-ros174/>

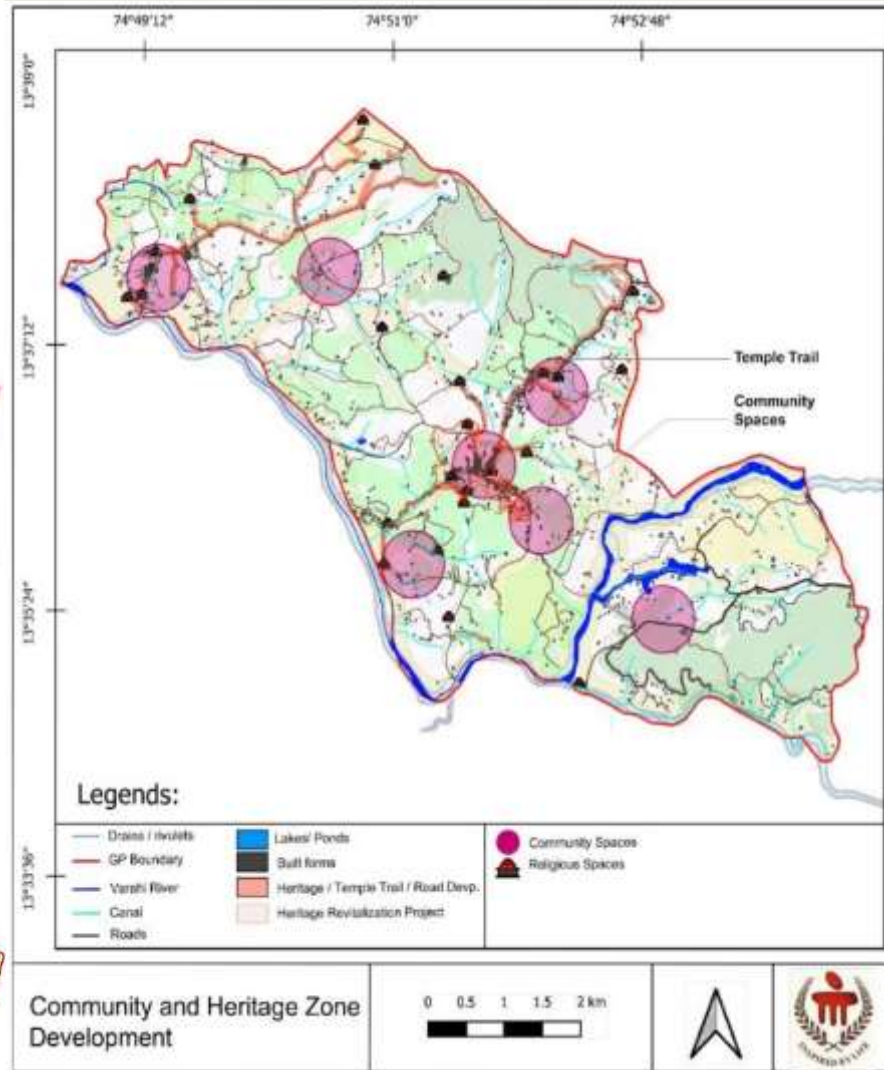




Maps showing Religious Structures. Source: NRSC and Author



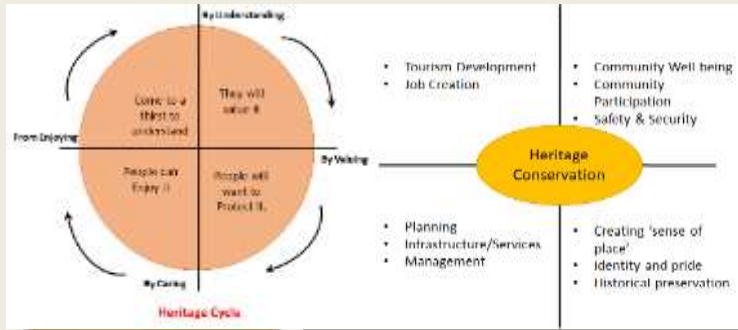
Maps showing Natural Sites. Source: NRSC and Author



Source: NRSC and Author

The map shows an overlay of religious, cultural and natural sites within the Shankaranarayana Gram Panchayat. We observe many religious and traditional structures are located along the Kundapura – Agumbe Highway in Ward no. 4; and along the bank of Varahi river. Within the village boundary two major water bodies are located, one is 'Koti-tirtha' (temple tank) and 'Bettadakera Lake'. The village is flanked with temple tanks in the east, madagas in the north and Varahi river in the south. The residual hills could be treated as a spot to appreciate sunrise/sunset in a natural trail due to its altitude potential. Beginning from Krodha Giri hill to the forest area in the North-east side of the village, has all major landmarks in a linear stretch of 5 to 7 kms. (refer pg. nos. 59-61 of the report)





Conservation of Natural Resources	<ul style="list-style-type: none"> <li>• Awareness about mythology, history and culture of Koti-tirtha and Krodha-giri hill to hold its importance</li> </ul>
Connecting with people	<ul style="list-style-type: none"> <li>• Enhancing spaces having cultural &amp; social importance</li> <li>• Temple management (e.g. financial, cultural)</li> </ul>
Tourism & Income Generation	<ul style="list-style-type: none"> <li>• Enhancement &amp; Conservation of Social structure and Cultural Spaces</li> <li>• Heritage Zone development (e.g. heritage walk)</li> </ul>
Enhancement of Key features / Events	<ul style="list-style-type: none"> <li>• Preservation of Food, local art, Folklores, Folkdance, ritual practices, etc.</li> </ul>

Key goals of Heritage Development. Source: Author

Guidelines proposed for development of the heritage zone (Model Heritage Regulations, 2011):

- Protection of Visual landscape & surroundings
- Heritage as a tool for development and employment generation
- Signs, Outdoor Display Structures or Including Street Furniture on Heritage Sites
- Surface treatment of Walls based on mythological stories in the temple precinct and within the heritage zone for image upliftment of the Gram Panchayat
- Adaptive re-use of the residence (Brahmin family) and Sub-registrars office
- Development Permissions for Heritage Precincts / Natural Feature Areas
- Heritage Fund

There are 2 government schemes identified for implementation of these strategies:

- Seva Bhoj Yojna
- Scheme for Financial Assistance for Seminars, Festivals and Exhibitions on Cultural Subjects by Not-for-Profit Organization's or the Cultural Functions Grant Scheme (CFGs)

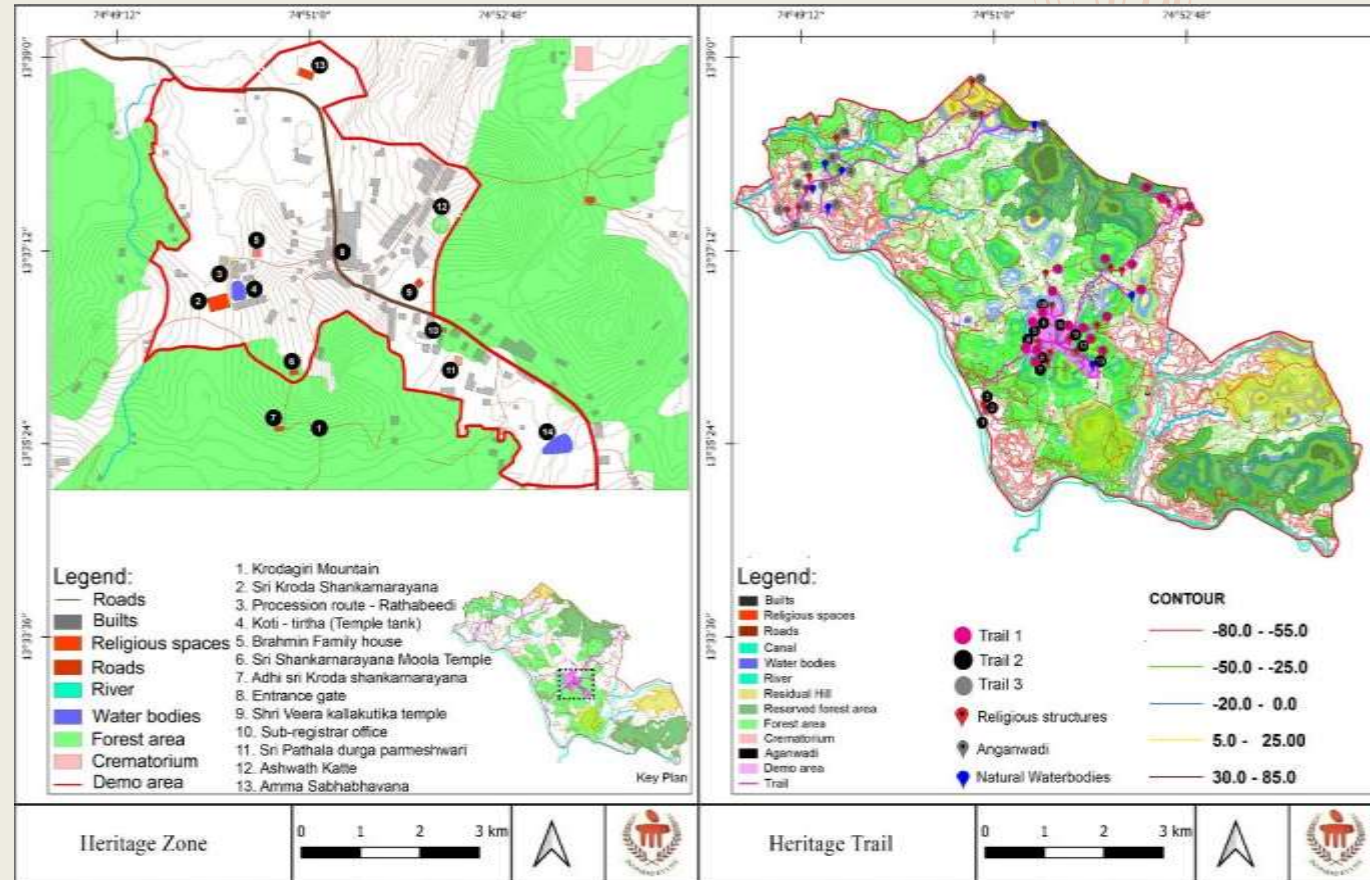
(refer pg. nos. 105, 106 of the report)





There are 4 main parts to this project:

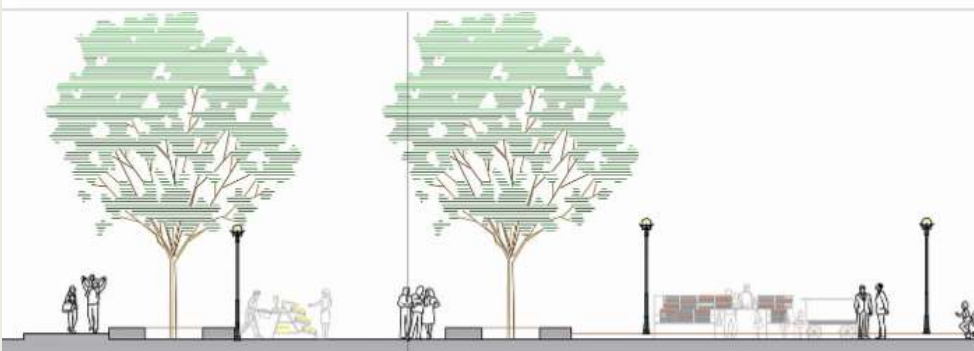
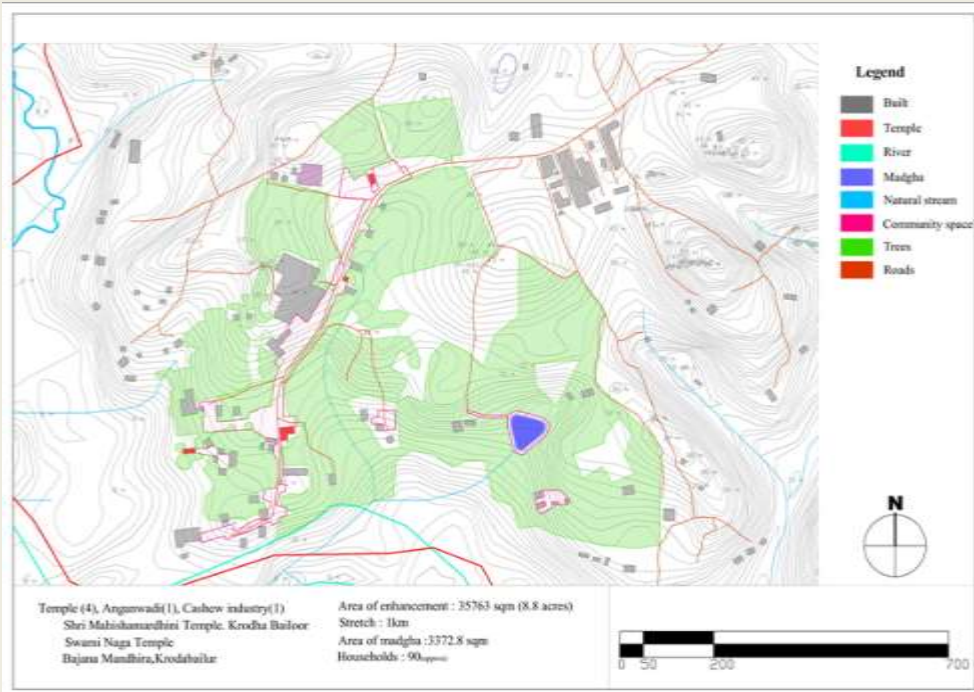
- **Heritage Zone Development:** This intervention looks into the historical preservation of temples, old existing structures, conservation and protection of Hills, temple tanks, madagas and the mangroves.
- **Rural Tourism:** Any form of tourism that portray the rural life, art, culture, and heritage at rural locations which will be benefiting the local community economically and socially as well as provide the relation between the tourists and the local people for a more augment tourism experience can be termed as rural tourism. (Raut, 2019)
- **Farm - Home Stay:** Traditional knowledge sharing will be encouraged between the farmer community and the guests, by engaging them with first hand experiences in their agricultural lands
- **Management Centre:** This centre will cater to the management of finances of all temples located within the Gram Panchayat. Main objective of this system is to connect Shankaranarayana village with other taluk and district level tourism hotspots.



Source: NRSC and Author

**Heritage Trail:** It is a part of the heritage zone, where each of the above trails would be conducted on separate three days. Trail 1 and 2 are 7 kms each while Trail 3 is 5 kms (refer pg. nos. 122-125 of the report)





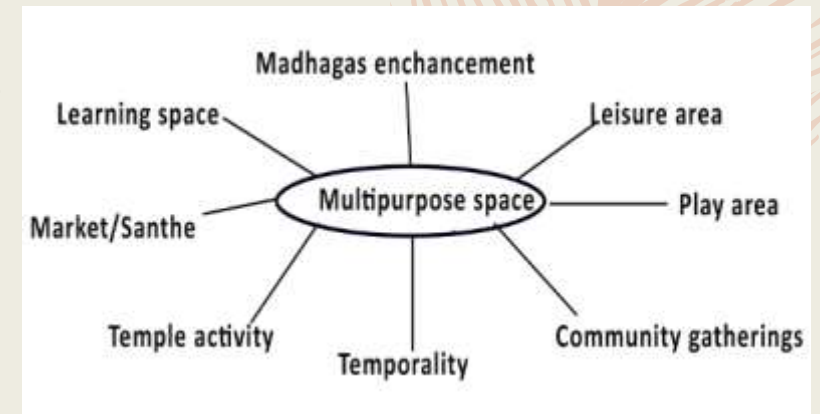
(U) Demo area near Krodha Bailoor Temple.

(B) Multiple scenario – informal market, seating area, play area for kids. Source: Author

The space has the potential to transform from santhe (market) in the morning, outdoor learning space for the anganwadi activities in the afternoon and activities associated with the temples in the evenings. This temporality of space could be developed by enhancing the edge conditions. The spaces near the madagas can be developed for leisure activities retaining the importance of the resource, which would provide for a community space to the residents of the village and also uplift the identity of the gram panchayat. (refer pg. nos. 107, 126-128 of the report)

Design guidelines are proposed considering the following attributes (Source: Design Guidelines, Building Neighbourhoods to thrive in, 2018) -

- Entrances & Exits
- Pathways & Edge conditions
- Signages & Street furniture
- Clear sightlines
- Planting
- Shaded spots
- Mobile food stall



Framework for Quality of Space for Community. Source: Author



# SOCIO-ECONOMIC-POLITICAL STRUCTURE- DESA

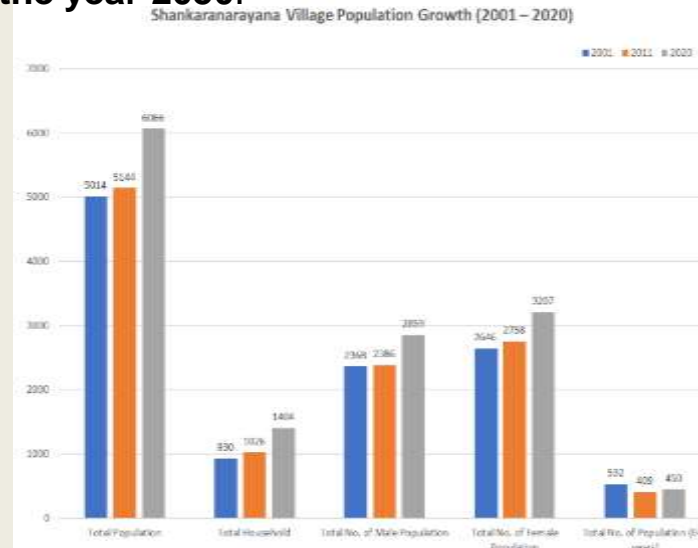
# DEMOGRAPHY

The total population of Shankarnarayana Village is 5144 (male 2386 & Female 2758) as per census 2011.

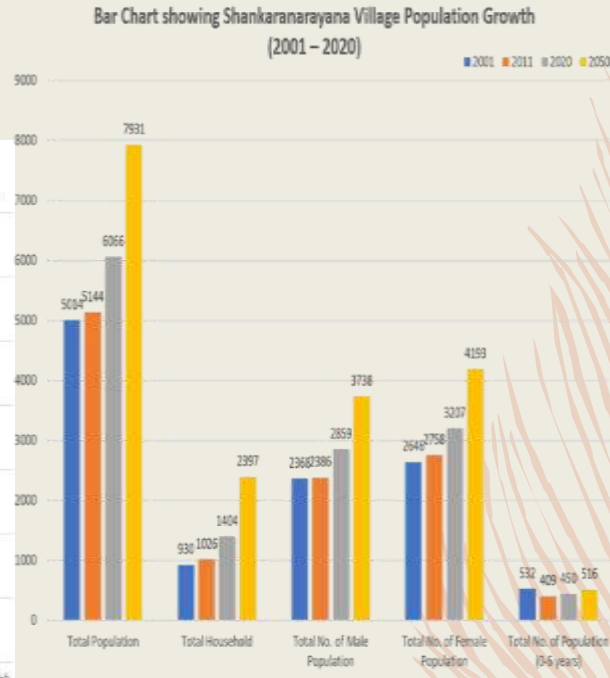
- Growth rate calculated from 2001-2011 is 2.59% and the population growth rate from 2011-2020 is 17.92%, where the average population growth rate can be calculated – 10.25%.
- The Population can be projected for the next 30 years using the average growth rate of two decades which is **7931 by the year 2050**.
- Area of the village is 2312.48 Ha. with a total of households of 1026 as per 2011 census and 1404 as per 2020 panchayat records.
- The Literacy rate is 76.32% where 49.06% are Male and 50.94% are female.

S.N	CATEGORY	TOTAL	MALE	FEMALE
1	No. of Population Age group (0-6 years)	409	210	199
2	Scheduled Castes Population	303	151	152
3	Scheduled Tribes Population	500	252	248
4	Literate Population	3926	1926	2000
5	Illiterate Population	1218	460	758
6	Working Population	2899	1492	1407
7	Non-Working Population	2245	894	1351
8	Total Population of Village	5144	2386	2758

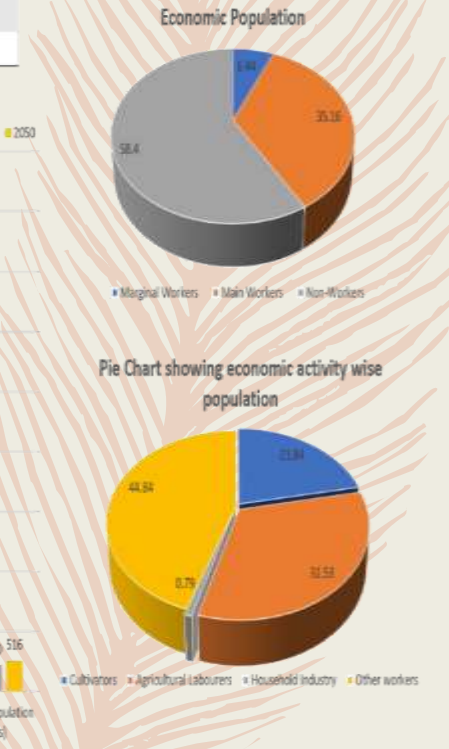
S.N	CATEGORY	TOTAL	MALE	FEMALE
1	Cultivators	633	331	302
2	Agricultural labourers	943	372	571
3	Household Industries	23	13	10
4	Other	1300	776	524
5	Total	2899	1492	1195



Graph Showing Shankarnarayana Village Population Growth over 3 decades – 2001, 2011 & 2020



Graph Showing demographic division of Shankarnarayana village (Source: Office records of GP)



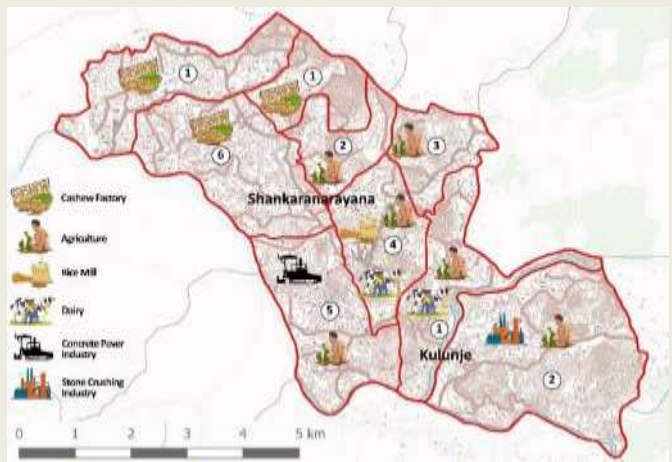


# SOCIO-ECONOMIC-POLITICAL STRUCTURE- DESA

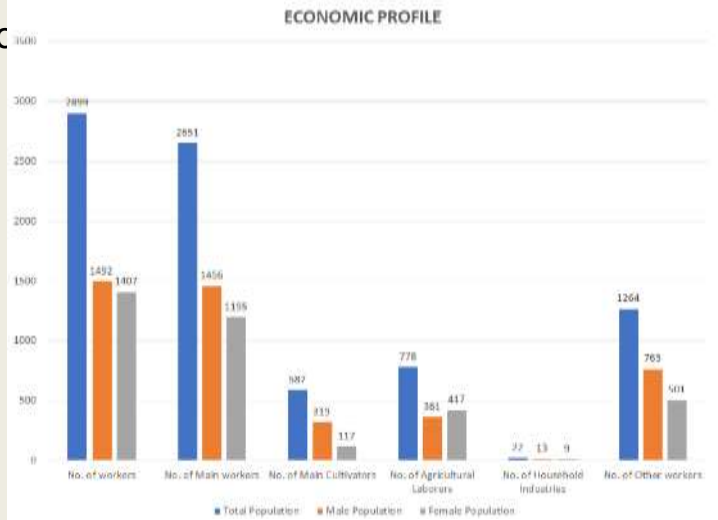
# WORKING POPULATION

The classification of working population in Shankarnarayana village

- **47.68%** of working population in Shankarnarayana village is engaged in various other means of employment.
- **29.35%** are engaged in Agriculture
- **66.53%** is the share of marginal workers engaged in agricultural activity who remain unemployed for more than 6 months in a year.
- This indicates the need for Skill development to promote employment which can further improve income generatic amongst these people.



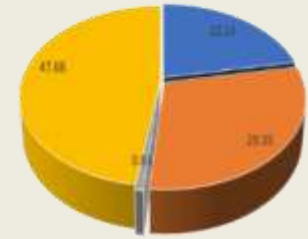
Map Showing GP Ward wise occupational engagement



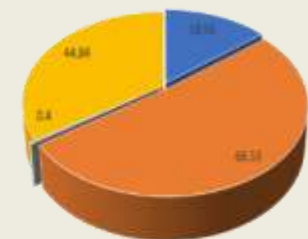
Graph Showing the gender wise economic profile of Shankarnarayana village (Source: Office records of GP)

S.N	CATEGORY	TOTAL	MALE	FEMALE
1	Cultivators	633	331	302
2	Agricultural labourers	943	372	571
3	Household Industries	23	13	10
4	Other	1300	776	524
5	Total	2899	1492	1195

Pie Chart showing Main Workers Population



Pie Chart showing Marginal Workers Population



S.N	CATEGORY	TOTAL	MALE	FEMALE
1	<b>Cultivators</b>	633	331	302
	Main Cultivators	587	319	268
	Marginal Cultivators (3-6 months)	34	5	29
	Marginal Cultivators (0-3 months)	12	7	5
2	<b>Agricultural labourers</b>	943	372	571
	Main Labourers	778	361	417
	Marginal Labourers (3-6 months)	144	6	138
	Marginal Labourers (0-3 months)	21	5	16
3	<b>Household Industries</b>	23	13	10
	Main Household Industries	22	13	9
	Marginal Household Industries (3-6 months)	1	0	1
	Marginal Household Industries (0-3 months)	0	0	0
4	<b>Other</b>	1300	776	524
	Main other workers	1264	763	501
	Marginal other workers (3-6 months)	30	11	19
	Marginal other workers (0-3 months)	6	2	4
	<b>Total</b>	<b>2899</b>	<b>1492</b>	<b>1195</b>

Graph Showing economic division in Shankarnarayana village (Source: Office records of GP)







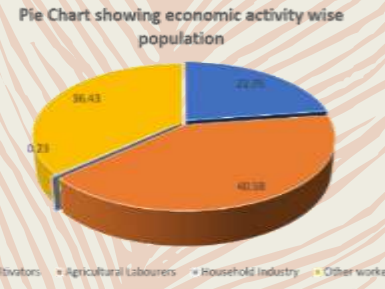
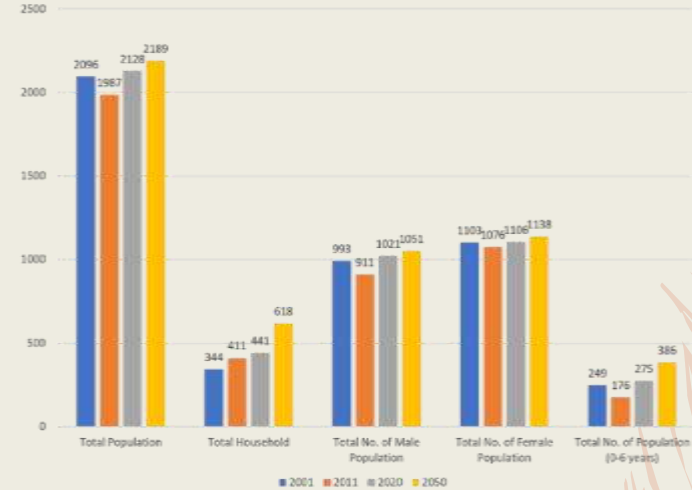
The total population of Kulunje Village 1987 (male 911 & Female 1076) as per census 2011.

- The geographical area of the village is 1440.7 Ha. With a total number of households of 411 as per 2011 census and 441 as per 2020 panchayat records.
- The Literacy rate is 67.69% where 49.22% are Male and 50.78% are female.
- As per studies Kulunje village has a negative decadal growth of -0.95% which can be an indicator for Rural-Urban migration.

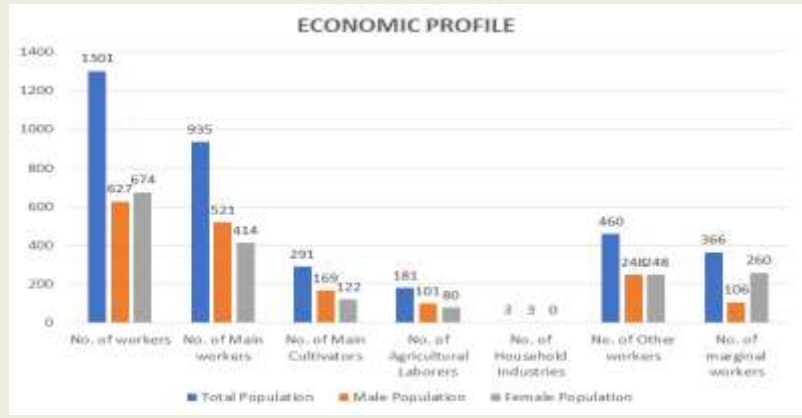
S.N	CATEGORY	TOTAL	MALE	FEMALE
1	No. of Population Age group (0-6 years)	176	100	76
2	Scheduled Castes Population	43	21	22
3	Scheduled Tribes Population	505	247	258
4	Literate Population	1345	662	683
5	Illiterate Population	642	249	393
6	Working Population	1301	627	674
7	Non-Working Population	686	284	402
8	Total Population of Village	1987	911	1076

S.N	CATEGORY	TOTAL	MALE	FEMALE
1	Cultivators	296	172	124
2	Agricultural labourers	528	196	332
3	Household Industries	3	3	0
4	Other	474	256	218
5	Total	1301	627	674

Bar chart showing Kulunje Village Population Growth (2001 – 2020)



Graph Showing demographic division of Shankaranarayana village (Source: Office records of GP)



Graph Showing the gender wise economic profile of Kulunje village (Source: Office records of GP)

## The classification of working population in Kulunje village.

- 49.2% of working population in Shankarnarayana village is engaged in various other means of employment.
- 31.12% are engaged in Agriculture
- 94.81% is the share of marginal workers engaged in agricultural activity





## Policies Identified

1. Skill Development Mission Policy for Karnataka
2. Gram Panchayat Skill Mission
3. National Rural Livelihood Mission
4. Training of Rural Youth for Self-Employment (TRYSEM)
5. Role of TVET in Rural Development
6. Key areas to be taken care for Gram panchayat Development
7. Special focus on Gram panchayat local economic development plan

## Recommendations

Data Capturing

Gap Identification

Facilitate Formal Sector & Integrate Informal Sector

Facilities for Shankaranarayana & Kulunje

Information and Communication Technologies (ICT) Integration

Vocational/Skill and Economic Development Centre

## Proposals- **Symbiosis Model , Skill Development Centre, Women Empowerment Centre**

The Proposed Vocational/skill development center consists of two prototypes I) Centralized model and II) Decentralized model

- The Pradhan Mantri Kaushal Vikas Yojana(PMKVY) & Jan Shikshan Sansthan (JSS) are the two schemes targeted for both centralized and decentralized Vocational/skill development centre
- The Centralized model has an integration of E-Governance, E-Commerce, Tele-medicine, ICT (Information and communication technology), Vocational courses, and economic symbiosis model.



## Why

- Present youth (approx. 40%) are moving out to cities for work and employment.
- Less opportunity to retain people with higher qualification
- Lack of employment opportunities for women, more than 50% women are unemployed including some widows and unmarried women

## What

- Vocational training for employment
- Digital Learning centre

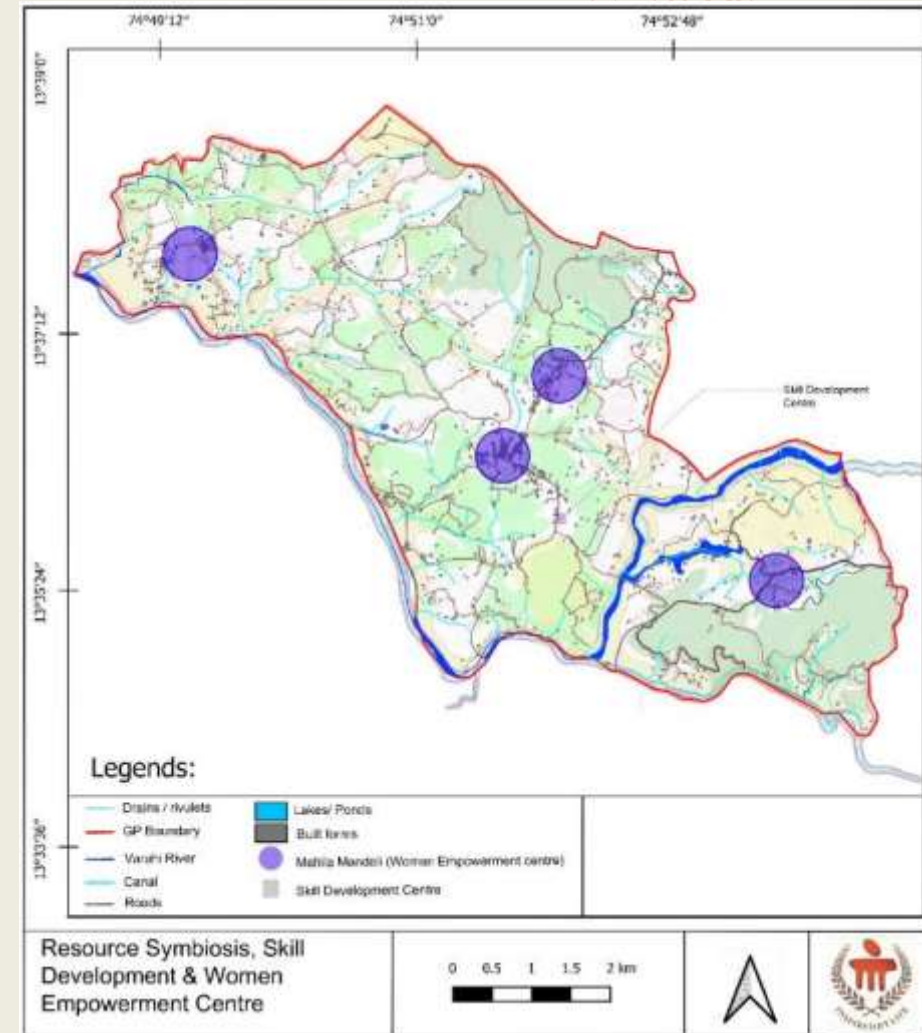
## How

- ICT integration for education and work
- E- Learning platform to continue higher education & promote digital literacy

## Location

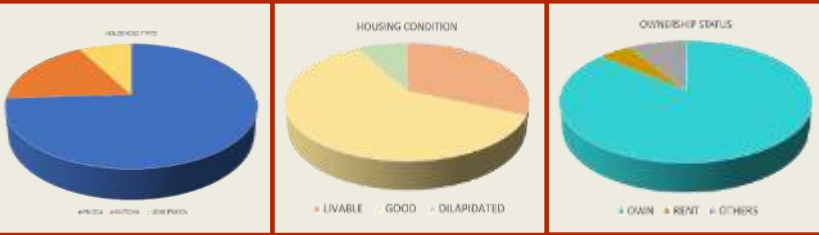
The demo area 1 is located in Kulanje ward-01 along with the SH 27 and to the proximity of Shankaranarayana bus stand- 1km approx.

Demo Area -02 (Decentralized Model) to be integrated with Govt.Primary schools and Anganwadi



Resource Symbiosis Model, Skill Development Centre, Women Empowerment Centre





Percentage of Household types	Percentage of Housing Condition	Percentage of ownership status
37.8% pucca 13% Kutchha to semi pucca house	90% houses in good and livable condition	8% houses in dilapidated state

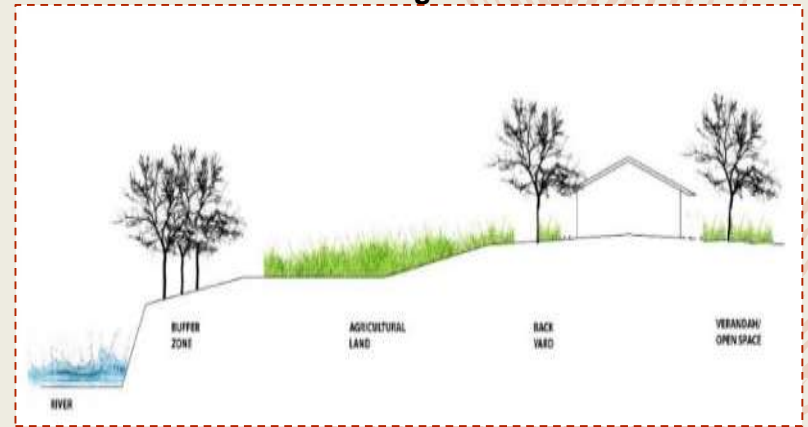
Source: Household Survey- MSAP

## SETTLEMENT PATTERN IN THE GRAM PANCHAYAT

**Settlement 1:**  
Near the State Highway 27 and commercial Centre

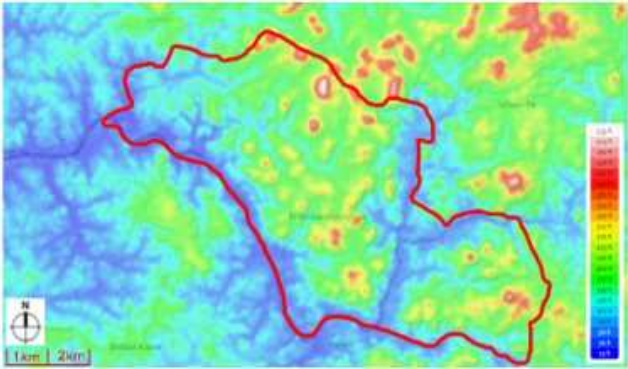


**Settlement 2:**  
Near the River and Agricultural Land.



- The built spaces are coarse-grained. It has commercial and institutional typologies surrounded by residential typologies.
- Residential plots have open spaces around them which act as an extension of the house for small gathering.
- Residential structures range from G to G+4, Commercial range from G to G+3, and Institutes from G to G+2.

- The built spaces are fine-grained and scattered. It has residential typologies surrounded by cropland or agricultural plantations.
- Open spaces are seen as agricultural lands or vacant lands around residences.
- Mostly residential structures of G to G+1



Source: <https://en-gb.topographica-map.com/maps/a58g/Shankarnarayana/>

Level Gradient Map Max Value= 535 ft. Min. Value= 13 ft.

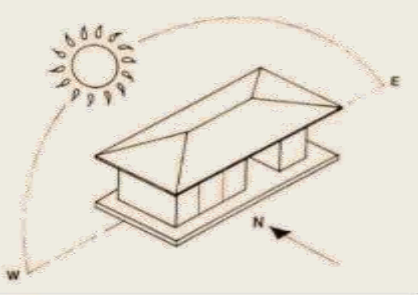
Green (Except Forest)	Developable area
-----------------------	------------------

The development should be focused more towards N and N-E and in some parts of the S-E region across the river system.



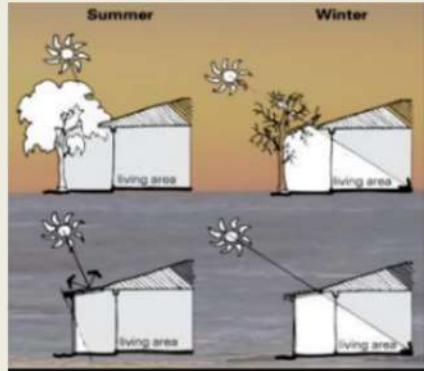


## Design Guidelines:

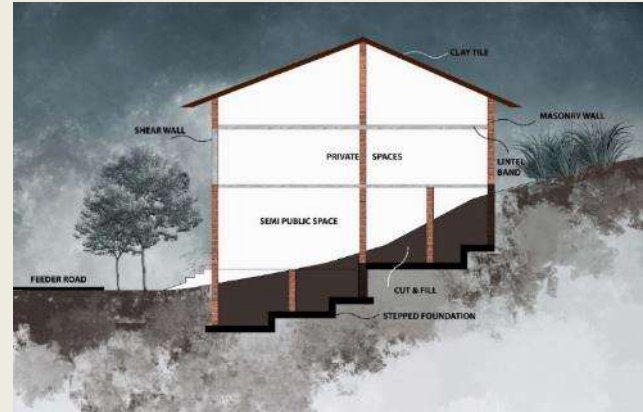


House with hipped roof, elongated in E-W direction provides best shading

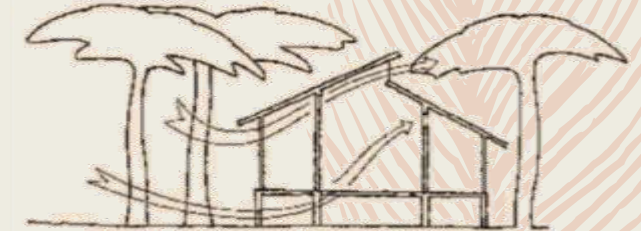
**Traditional Housing Techniques.**  
Source: (Shetty D. D.)



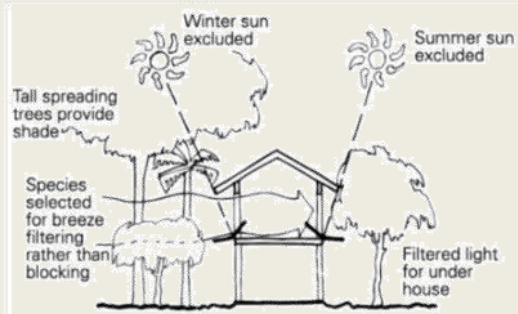
Verandah is used for ventilation and protection from sun radiation and rains. Semi open spaces like these can be used for day time activities.



**Typical Section for future house construction.**  
Source: (Timmeriaiah)

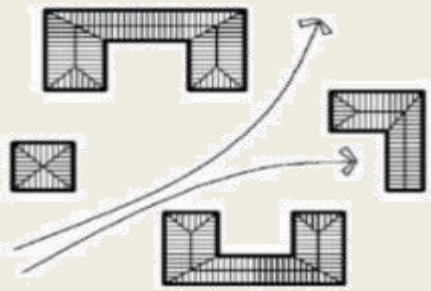


Ventilation can be increased by use of vegetation around the house.  
Cross ventilation with large openings for unobstructed air path.



Deep overhangs and vegetation around helps in controlling the indoor climate.

**Orientation & Site setting for ideal micro-climate.**  
Source: (Koenigsberger, 1975)



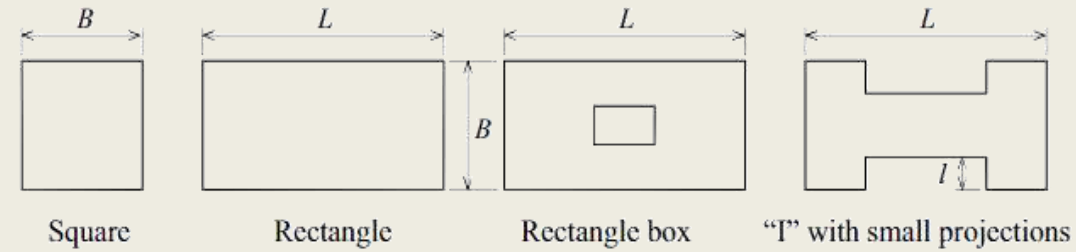
Buildings spread out with large open spaces in between for unrestricted Air movement.

- Courtyard planning with front verandah which acts like a semi-public space.
- Pitched roofs with overhangs 0.7m-1m to protect walls and interiors from rain & sun.
- Use of light colors for external walls roofs to reduce heat absorption.
- Constructed boundary walls to be avoided and trees or other native vegetation should be used for demarcation boundaries, which facilitates ventilation and cool breeze.
- GP has major two type of soil i.e. Clayey soil & Loamy soil.
  - Foundation suitable for Clayey soil: Deep foundation beyond 1200mm depth. Strip foundation or stepped foundation with damp proofing for sloping sites.
  - For Loamy soil, a deeper foundation with isolated pad footing is suitable.

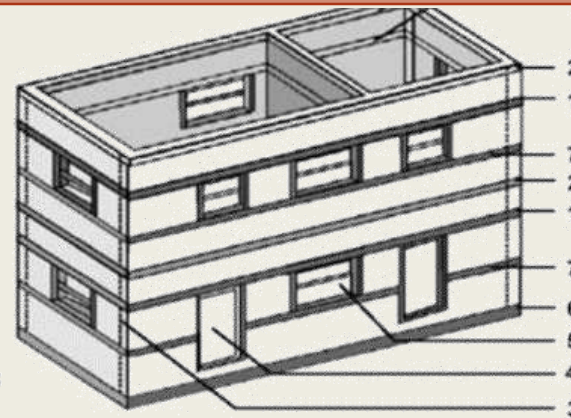




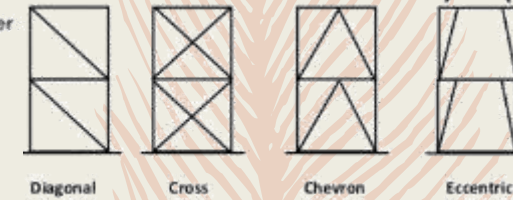
## Design Guidelines for Disaster Management



Symmetrical desirable plans. Source: EQ Tips by IITK



Seismic bands at different levels



Different types of cross bracing

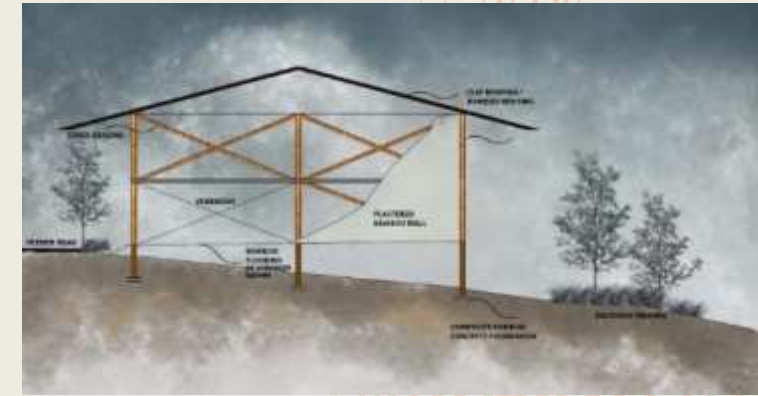
- Buildings with simple plan geometries are preferred. The length of block should be restricted to three times its width.
- To prevent short column failure, Ductile detailing to be done especially near the ends of the column.
- Door and window openings shall be at least 45 cm from the wall corners. The distance between the two openings shall be not less than 60 cm.
- Large openings should be reinforced with a mesh of gauge 13 with wires at 25mm in a width of 250mm around the opening.
- Seismic bands in brick walls should be provided through all external and internal walls at all the levels.
- The bars for the seismic bands should have a minimum cover of 25 mm below and above them. The cover to any bar (main or distribution) should be kept 15mm minimum and 20 mm maximum in concrete slabs used as floor or roof.
- The cover in beams to the main bars should not be less than 25 mm and to the stirrups not less than 15 mm.
- Shear walls and cross braces can be used to transfer the load to the foundation. Bracing can be provided in between columns.





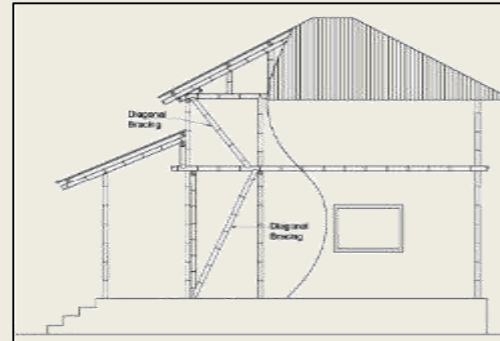
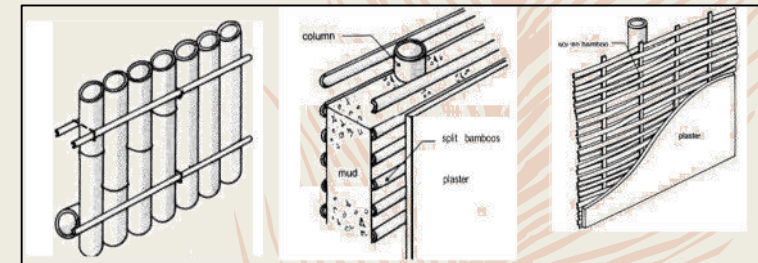
## Design Considerations - Alternate material for Construction: Bamboo

- Bamboo is fastest growing plant that can be cultivated in Shankarnarayana and is quickly replaced after harvesting.
- Cultivation in the village saves transportation and fuel costs and provides local employment at the plantation, treatments, and processing centers.
- Use of only a mature variety of bamboo. All structural bamboo should be treated chemically to conform to Indian Standards.
- The distance between the two posts shall be not more than 1.2 m c/c. The unsupported height of the post shall be not more than 3.0 m. If the height of the post is longer, a horizontal tie of the bamboo shall be provided.
- A 30 cm deep and 100 mm dia. hole shall be made in the plinth beam and the foundation pile/pier below to embed and fix the bamboo post.
- Diagonal bracing between the posts in each wall at the corners from plinth level end to attic level end shall be provided.

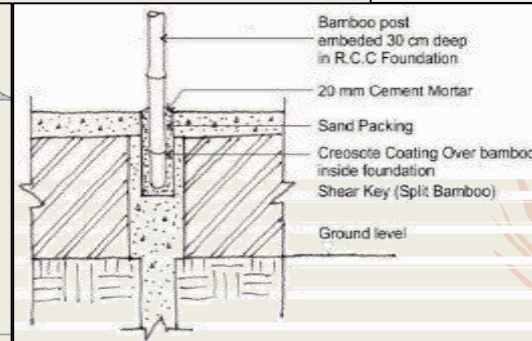


Typical Section of house construction with Bamboo.

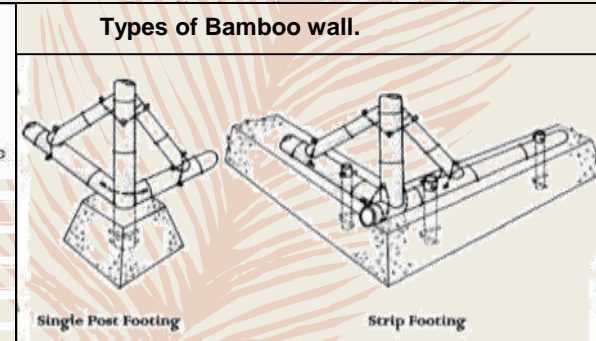
Source: (Timmeriaiah)



Diagonal Bracing



Foundation detail - Bamboo Construction



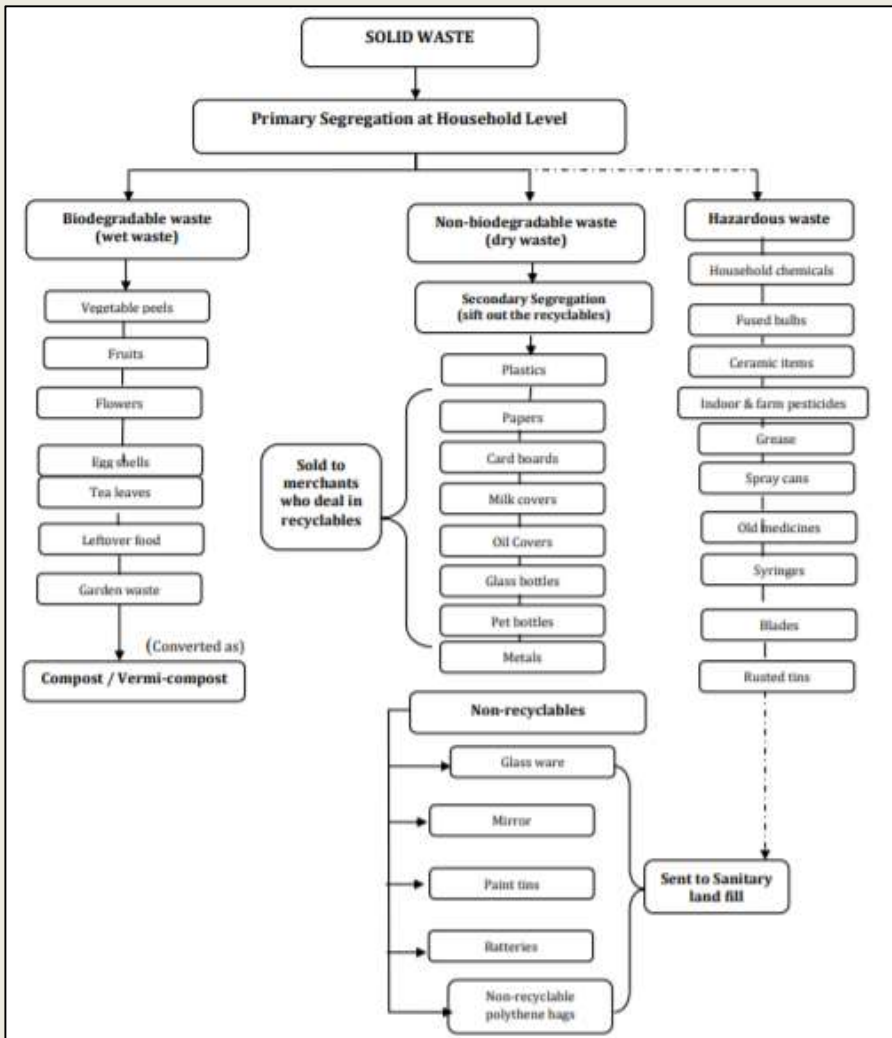
Types of Bamboo wall.

Single Post Footing

Strip Footing

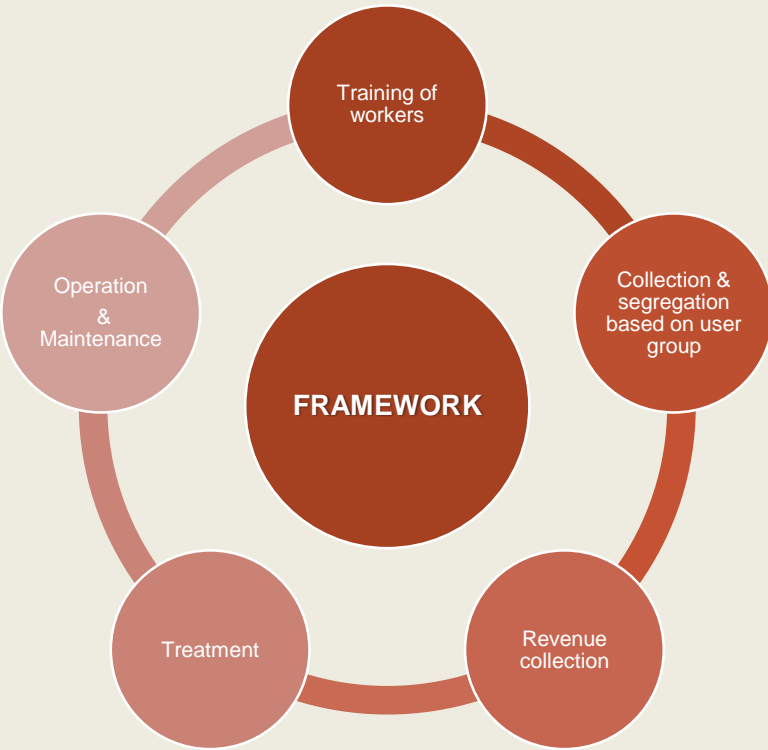
Bamboo Footing.





Flowchart of Solid Waste Management

## SWM AT PANCHAYAT LEVEL



Framework showing SWM at Gram Panchayat Level. Source: Author

## SWM AT HOUSEHOLD LEVEL

- Segregation at source- wet waste (kitchen waste) and dry waste (other waste) and
- Levy of fines incase found defaulter.
- Non-veg waste can be fed to cats or dogs or wrapped in a newspaper and handed to sanitation workers.
- Vegetable peel, food waste can be composted using a pit or a tank or else, be wrapped in a newspaper or plastic bag without knotting it.
- Use of plastic bags for knotting for disposing of sanitary pads, diapers etc. should be avoided, rather to be wrapped in a newspaper.
- The sanitation workers in uniform shall visit each household daily for collection of waste in a tricycle having two compartments (dry & wet waste) and shall alert the residents by blowing whistle.



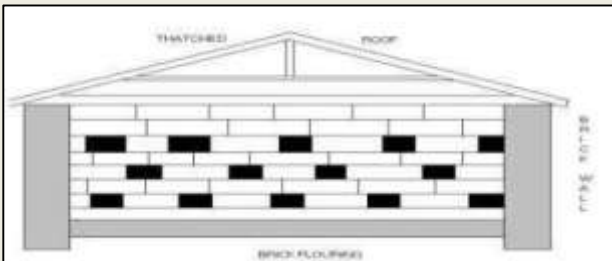




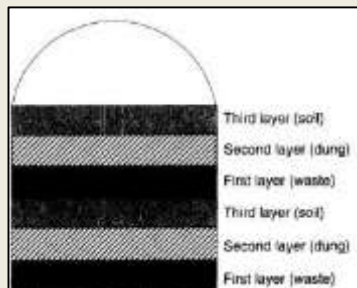
## Management of biodegradable: (Domestic waste)

### Composting of Bio-degradable wet waste.

- At individual household level
- At Community Level.



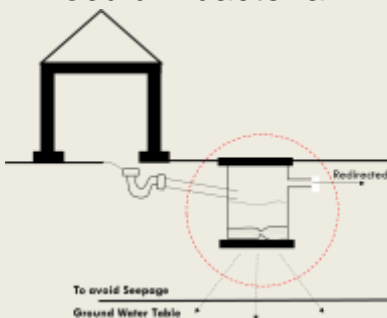
A. Schematic Section of the Compost Tank. Source: [www.engineeringforchange.org](http://www.engineeringforchange.org)



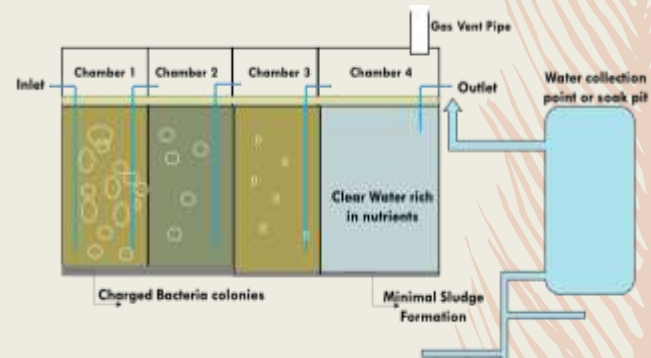
B. Layers of tank

## Management of biodegradable waste: (Toilet Waste)

The toilet waste generated from the GP in the present scenario lacks appropriate system of treatment. Bio-digesters are efficient way to digest the human waste by means of inoculum bacteria.



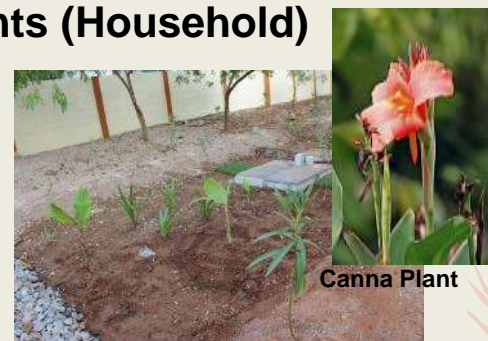
Schematic representation- toilets connected to inlet of bio-digesters



Bio-digesters with respect to the capacity and the outlet that is linked with the garden. Source: (Author)

## Treating Grey Water- Using Canna Plants (Household)

- Using simple plumbing system channelizing the water to soil beds with Canna Lily Plants, which can purify grey water
- A garden space with an area of 2.5 sq.ft. can captivate up to 50-60 liters of greywater.



Preparation of Soil Bed Source: <https://www.thehindu.com/news/cities/chennai/a-guide-to-greywater-recycling-in-your-backyard-with-canna-plants/article28319205.ece>

Sl. No	No. of Users	*Volume of Septic Tank (m <sup>3</sup> )	Volume of Bio digester (m <sup>3</sup> )
1	5	1.12	0.7
2	10	1.8	1.2
3	15	2.34	1.7
4	20	3.28	2.3
5	50	10	6
6	100	19.87	9
7	150	30	12
8	200	39.6	14
9	300	60	17

Size of the Bio- Digester Source- (Vasudhevan)

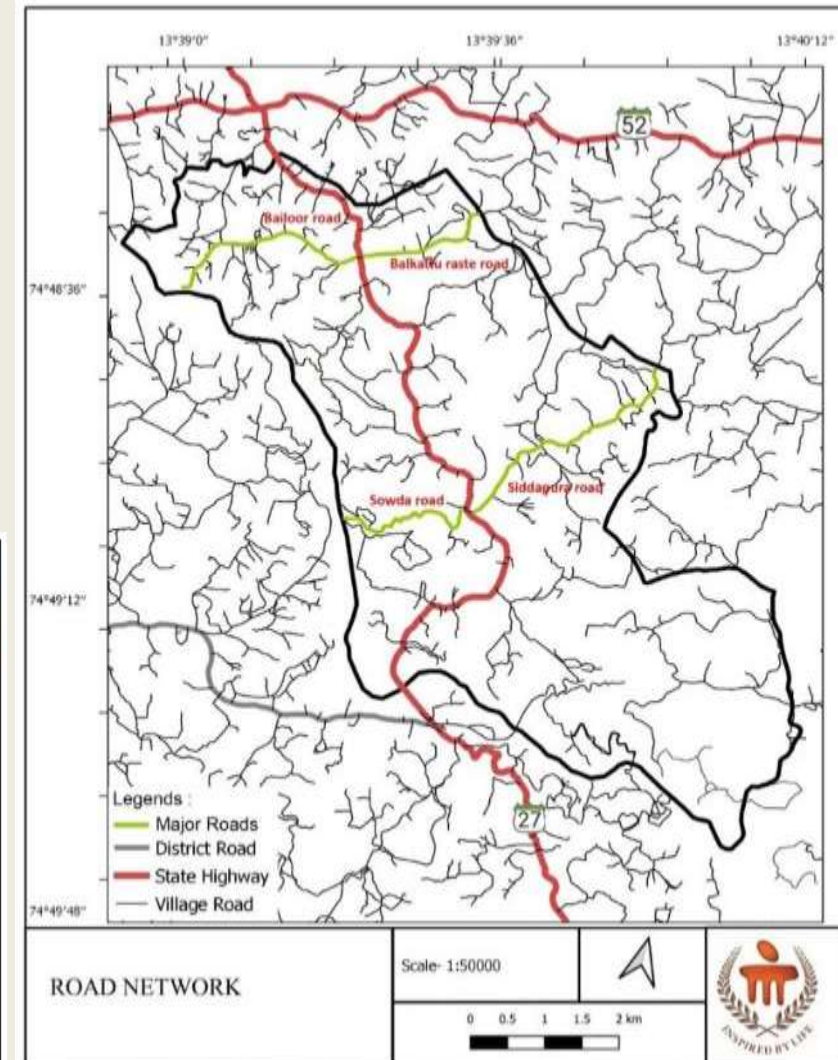




# PHYSICAL INFRASTRUCTURE

- The State Highway 27 passes through Shankarnarayana Gram Panchayat.
- It covers a length of almost 11 km within the Gram Panchayat limits crossing through ward no. 1,2,4,5 and 6.
- The SH 27 road is a Two-way, Two-Lane bitumen road of 7.5 meters width.
- Internal roads leading to village interior are Kutcha roads.
- The village roads proportionately one fourth is bitumen and concrete roads where the remaining are mud roads.

# ROAD INFRASTRUCTURE



Map shows the Major Road network at Shankarnarayana, Source: NRSC

<b>SH 27 Kundapur-Agumbe Highway</b> 13° 35'38.54823" N 74° 51'42.15384" E	<b>Kondalli Road</b> 13° 38'1.42152" N 74° 50'29.28552" E	<b>Bailoor Road</b> 13° 37'56.05"N 74° 50'18.63"E	<b>Haleagrahara Road</b> 13 37'35.16132"N 74° 49'36.0408" E	<b>Ward-5</b> 13° 35'16.44828"N 74° 51'24.70104" E	<b>Ward-5</b> 13° 37' 39.0"N 74° 49' 15.0" E	<b>Ward 1</b> 13° 37' 48.40"N 74° 49' 20.32" E
Condition: Good	Condition: Surface course eroded	Condition: Potholes	Condition: Intermediate course exposed	Mud Road leading to block making factory	Narrow internal mud road leading to madaga	New concrete road leading to bailor poultry farm

Showing the existing condition of roads at Shankarnarayana Gram Panchayat. Source: Author





## Issue Identification

- After monsoons, people face extreme difficulty travelling through the mud roads.
- Water logging along roads due to absence of storm water drains.
- Extremely narrow road to accommodate two-way traffic.
- No streetlights along internal roads.
- Large dependency on private vehicles due to lack of frequency in bus service in the interior areas.
- Lack of bus facilities during the evenings, affects travelling of working women.
- Lacks connectivity to surrounding villages like Molahalli and Sowda.



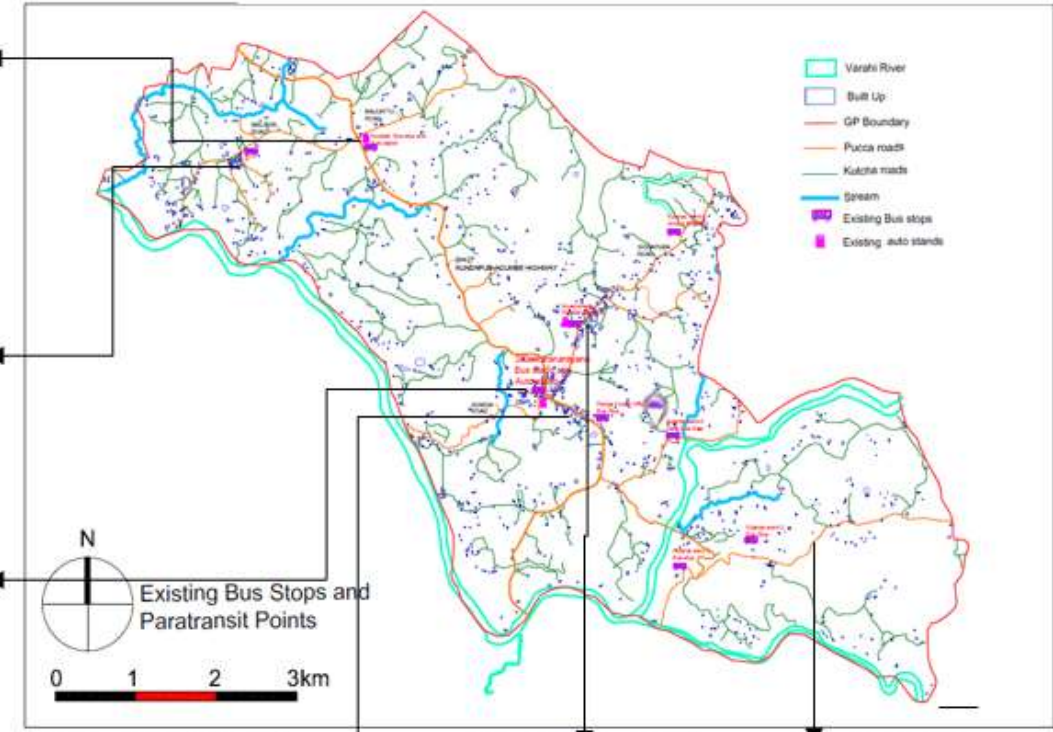
Bailoor Cross Bus Stop



Kroda Bailoor Bus Stop



Shankarnarayana Bus Stand and Auto Stand in Ward no.4



Shankarnarayana Post office Bus stop, Ward no.4



PHC Bus stop, Ward no.3



Kulanje Ward no.2

Map showing the location of Transport facilities in Shankarnarayana. Source: NRSC and Author





## Proposals:

### 1. Development of Siddapura Road:

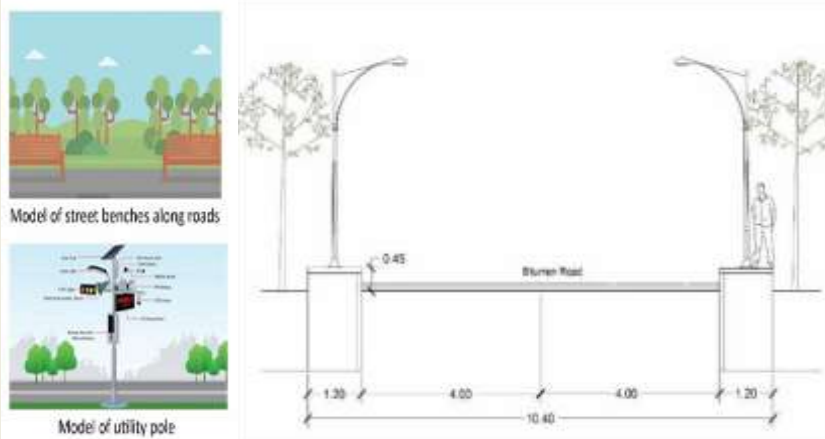
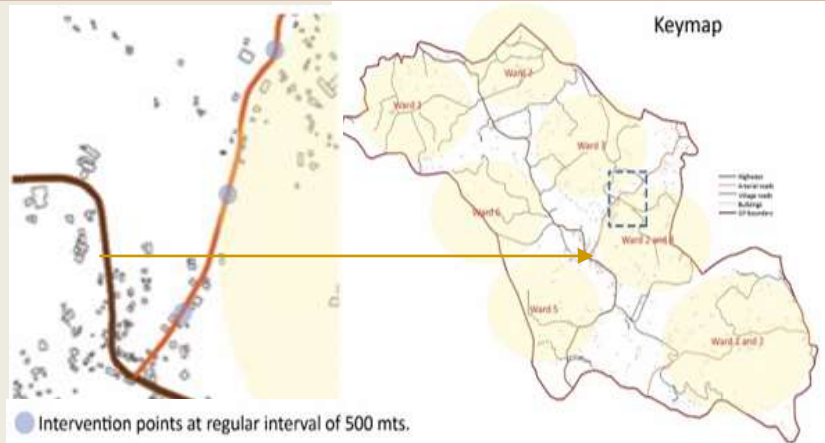
The identified road for development is the Siddapura Road (13 36'28.08792"N 74 51'45.17208"E). The criteria of selection of road is based on its

hierarchy and density. It is the next major road subsequent to the state highway which connects

Shankarnarayana and Siddapura.

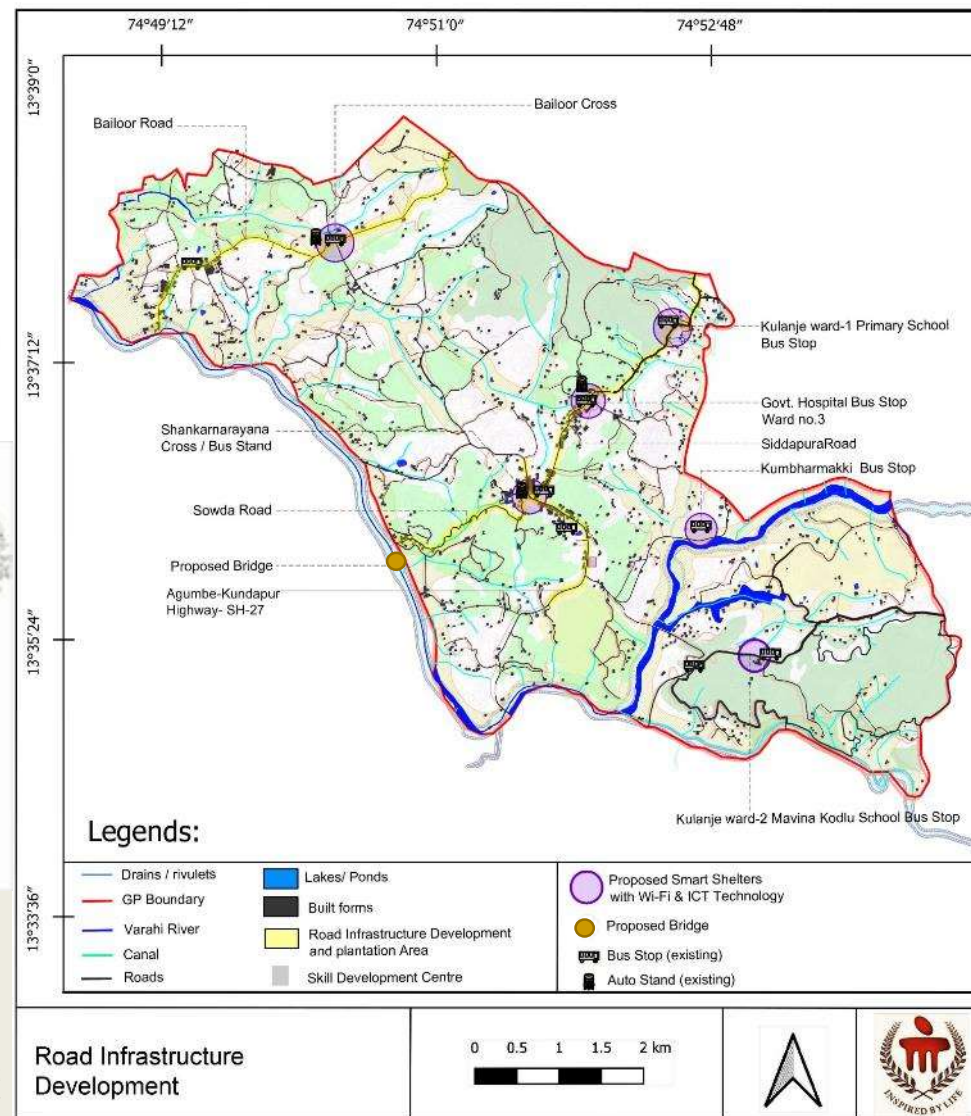
Shankarnarayana and Siddapura.

- Placement of utility poles at every 500 m interval.
- Provisions of street benches for pedestrians' ease.
- Provision of waste bins with colour coding along the footpath.



Map showing proposal for road infrastructure development along Siddapura Road. Source: Author

Map showing proposal for road infrastructure development at Shankarnarayana Source: NRSC & Author





## 2. Proposal for connecting Shankarnarayana to Molahalli & Sowda through a new Motorable Bridge connection.

The Haladi or Varahi River separates Shankarnarayana from Molahalli, which is located towards the west across the river.

Shankarnarayana to Molahalli-

- existing route through Haladi Bridge is 15 Km.
- After construction of a motorable bridge -7.5 Km.

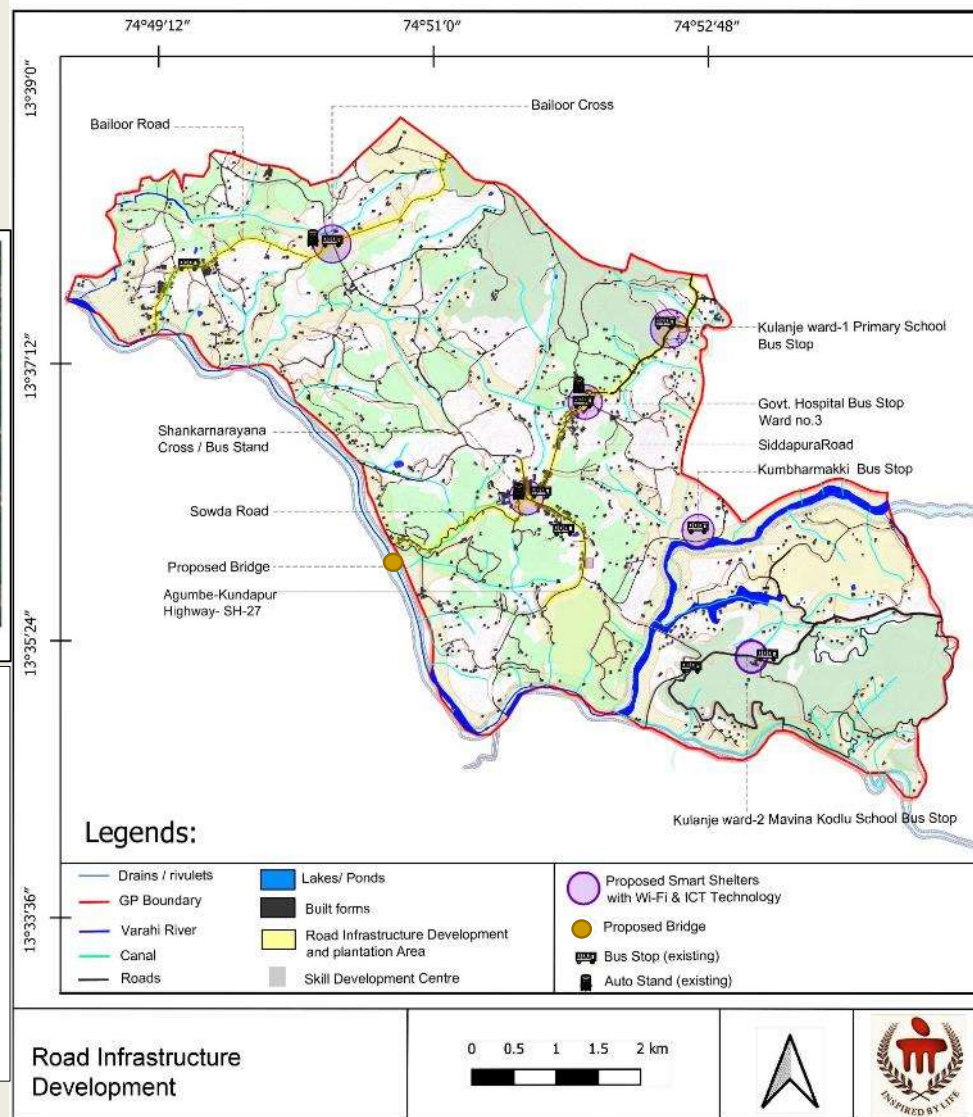
The construction of the bridge will reduce the travel distance and time for daily commuters from either place can be greatly reduced.



## 3. Proposal for Smart Shelters with WiFi & ICTs

- Proposed in 7 locations across the GP near major landmark locations like education institutions to cater to a larger crowd.

(For location of the Shelters refer Map or Report pg no. 116)





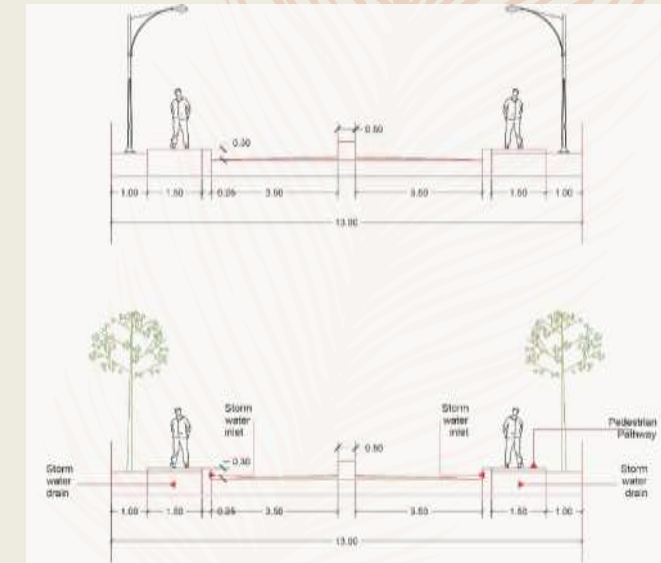
## Guidelines for Road Infrastructure Development at Shankaranarayana GP.

### Road Safety:

1. In hill roads, blind curves are a safety hazard. Suitable vision berms may be cut at such locations.
2. Passing places must be provided at convenient locations particularly on hill roads.
3. Providing adequately designed road humps or rumble strips, where the roads pass through habitations and school.
4. The junction of rural roads with a main road is always a point of conflict and an accident-prone zone. Such junctions must be designed scientifically by providing minimum turning radii, flaring of the side road with taper, acceleration/deceleration lanes and adequate sight distances.
5. Traffic signage, incorporating warning and regulatory signs, near habitation areas and dangerous locations.

### Plantation Guidelines along Roads: (For details refer Annexure of report)

1. Plantation of native trees of Western Ghats.
2. Trees shall be placed at a minimum distance of 10- 12 m from the centre line of the extreme traffic lane.
3. The spacing of Avenue Trees- Will depend on type and growth characteristics of trees.



Proposed section of the major model roads (6m-13m),  
Source: Author

### Guidelines for Model Roads: (For details refer Annexure of report)

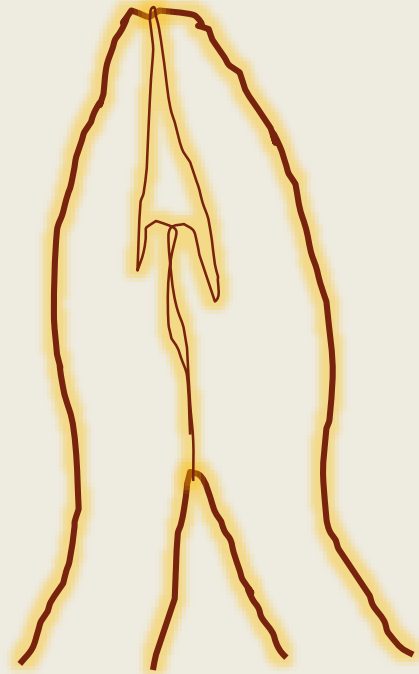
1. Provision of streetlights along roads.
2. Plantation along the road with native trees.
3. Provision of Utility Poles with Wi-Fi and street benches for seamless walkability.





# Thank you

*Benchmarking of Gram Panchayat should be with Need to look at them as economic drivers and future of development*



**Namaskar is the meeting of mind and soul in harmony**

