

## ASSESSMENT OF INFRASTRUCTURE FACILITIES IN RURAL AREAS: A CASE STUDY OF NIZAR TALUKA, TAPI DISTRICT, GUJARAT, INDIA

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**Abstract:** *Backwardness is a relative concept and differs from time, space and nature. The problem of regional balance and of backwardness has attracted the attention of planners, academicians and decision makers. Nizar Taluka of Tapi district is one of the most underdeveloped tribal dominated sub region already identified by state government. The present paper attempts to analyze the infrastructure gap at the Taluka level and provide data base for various departments concerned with the development of the area to facilitate implementation of the Geo Spatial Plan. The physical, socio economic infrastructure covering health, education, safe drinking water, road connectivity and employment generation are the main determinants of Geo Spatial blue print for the study area, to meet the goal set for the upliftment of the backward tribal region. The study also focused on preparation of a sustainable Taluka Development plan to achieve Millennium Development Goals and Human Index as per UNDP by analyzing the hierarchical settlements at Villages/Towns level and to find out the infrastructural gap and co-ordinating the various Government schemes for proper channelizing the utilization of available funds and finally to reduce the poverty/ backwardness of the region and to uplift of the livelihood of the villagers. The study is based on primary as well as secondary data.*

**Keywords:** *Rural Development, Infrastructure Gap Analysis, Backwardness, GIS, E-Governance*

### INTRODUCTION

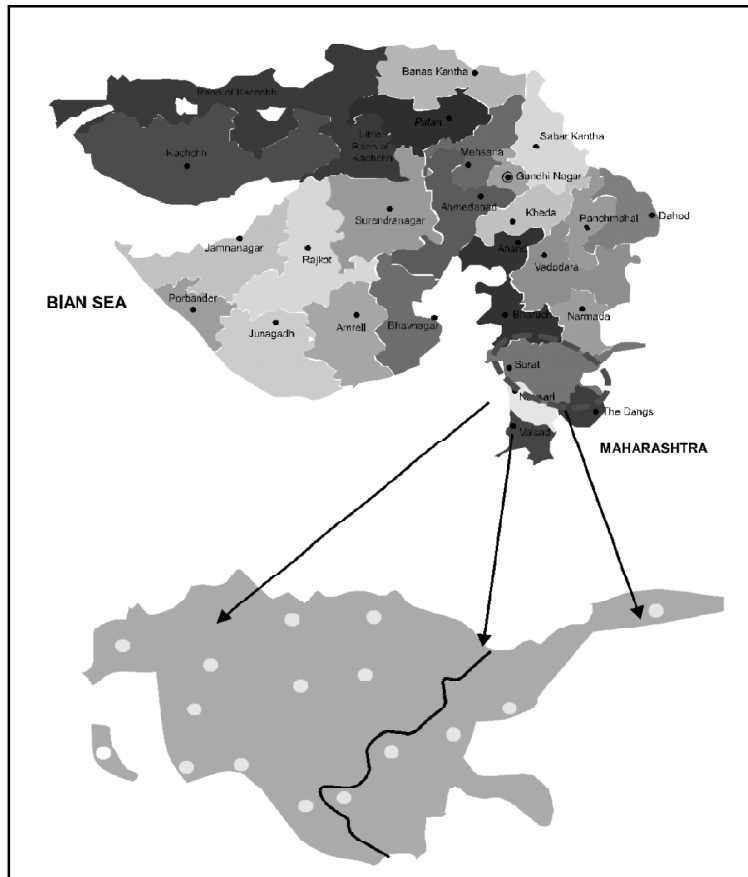
Backwardness is relative, multi-dimensional, and perceptual. It differs in time, space and nature. Also, it refers to spatial as well as structural disparity. Hence, because of its complex characteristics, there is no universally agreed definition or measurement technique of backwardness. In the modern world, governments make huge investment in development projects and regulate development. Hence, their policies leave considerable impact on the nature and degree of social and spatial inequalities. Nevertheless, the free play of market forces favors the polarization of economic growth at certain favorable locations, resulting in regional inequalities in development. The backwardness of a place and that of the people living there get impacted upon each other. This is so because the people and places are inter-woven in symbiotic relationship. All parts of a country are not equally endowed with rich natural and human resources. Resource-rich areas leave behind their poor counterparts on the path of development. Gradually the gap widens and as a result disadvantaged places and people conscious of the widening gap, demand the measure the mitigate disparity.

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## TAPI DISTRICT

On 27th September 2007, the district of Surat was bifurcated into two new districts, viz. Surat district with its headquarter at Surat and Tapi district with its headquarter at Vyara. The newly constituted Tapi district (Fig. 1); consists of five talukas viz. Vyara, Songadh, Uchhal, Nizar and Valod. Tapi district with a population of 661739 as per 2001 with 69206 populations below poverty line which is almost 11%. while Nizar, Uchhal, and Songadh dominance with Tribal population declared as Tribal region of this district. The rural development is conceived as a dynamic process directed towards transforming an entire society enmeshing together its economic, social political and administrative aspects for an all around balanced and upward change.



## OBJECTIVE OF THE STUDY

The main objectives of the study are to analyze the infrastructure gap at the Taluka level and provide data base for various departments concerned with the development of the area to facilitate implementation of the Geo Spatial Plan.

**Table 1**  
**Demographic Details of Tapi District**

<i>Taluka</i>	<i>Population</i>	<i>Popula- tion (in %)</i>	<i>BPL Family</i>	<i>BPL Family (in %)</i>	<i>Literacy</i>	<i>Literacy (in %)</i>	<i>S.T. Popula- tion</i>	<i>S.T. Popula- tion (in %)</i>
NIZAR	105385	15.93	20297	29.33	45013	13.25	83843	14.15
UCHHAL	36827	5.57	10095	14.59	27402	8.06	71084	12.00
SONGADH	181839	27.48	12528	18.10	82047	24.15	164392	27.75
VYARA	249810	37.75	19025	27.49	136884	40.28	208916	35.27
VALOD	87878	13.28	7261	10.49	48453	14.26	64120	10.82
TAPI DISTRICT	661739	100.00	69206	100.00	339799	100.00	592355	100.00

*Source:* Statistical Handbook, 2008-09, Tapi District

- **Sustainable Taluka Development Plan:** The study also focused on preparation of a sustainable Taluka Development plan to achieve Millennium Development Goals and Human Index as per UNDP by analyzing the hierarchical settlements at Villages/Towns level and to find out the infrastructural gap and co-coordinating the various Government schemes for proper channelizing the utilization of available funds and finally to reduce the poverty/ backwardness of the region and to uplift of the livelihood of the villagers.
- **Development of the Village or Village-cluster:** The foremost objective of developing a Model Village is to provide infrastructural facilities and other public amenities to create an atmosphere needed to accelerate pace of development of the village.
- **Creation of Centre:** The other equally important objective of developing a Model Village to create rural development focal centres attractive enough for the inhabitants to stay put in the village by providing urban-like civic amenities and livelihood avenues. This would also help minimize the problem of proliferation of urban slums with their sub-human living conditions.
- **Showcasing the Development Programme:** Another objective is to showcase the various schemes of the government as effective instruments of rural development and Panchayati Raj governance through a process of prioritized implementation and optimized management of these schemes which would reflect in the development of the village concerned as beacon lights and success stories for others to see and emulate.
- **Creation of a Positive Attitude/Behaviour:** The other objective is to bring about necessary attitudinal and behavioural changes in the rural mindset through community mobilization so that real and meaningful change in quality of life, life style and community participation in local development works and governance become feasible and get realized in the desired degree.
- **Creation of Demonstration Effect:** Another important objective of the Model Village Development Programme is to achieve holistic development of selected villages to create a model which can be replicated. Field visits to Model Village by villagers from

neighbouring areas would expose them to the best practices in rural development and local governance and motivate them to implement these viable strategies and doable interventions to uplift the quality of life in their own case too.

**STUDY REGION**

Nizar Taluka of Tapi district is one of the most underdeveloped tribal dominated sub region already identified by state government (Fig. 2).

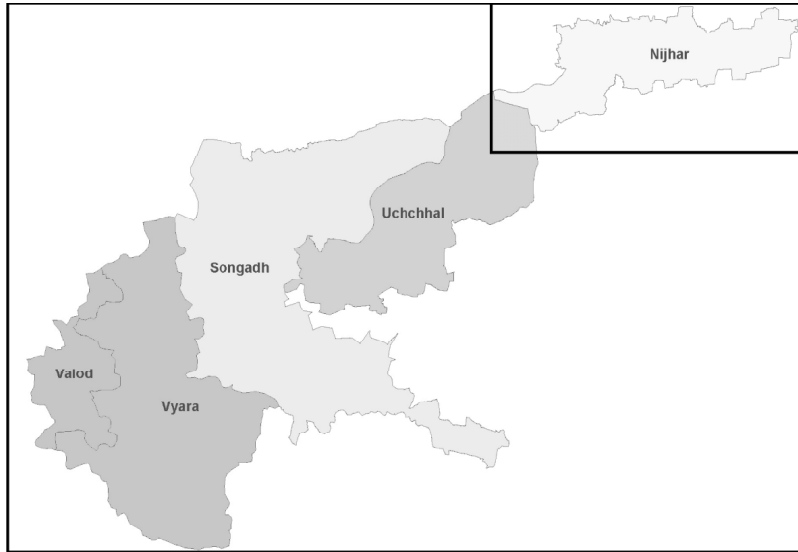


Figure 2

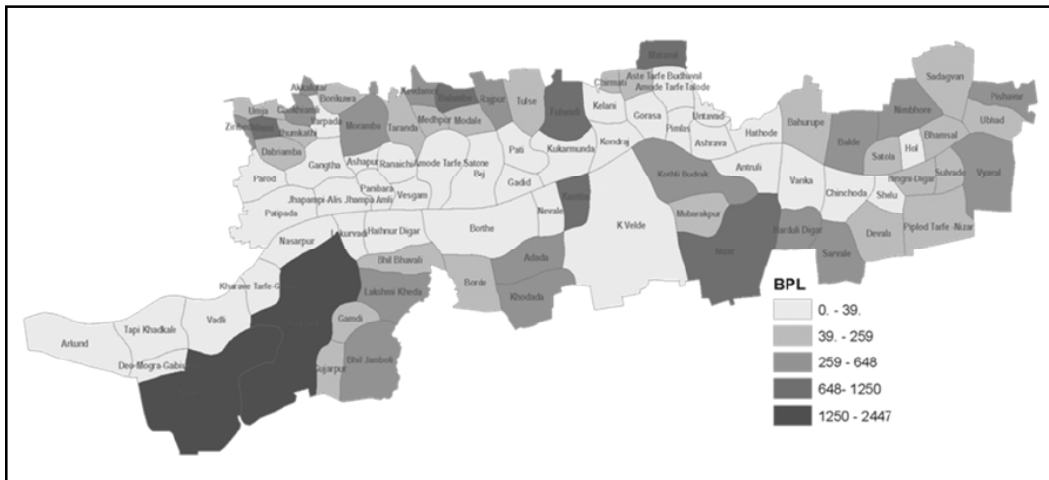


Figure 3: Map Showing BPL Population in Nizar Taluka

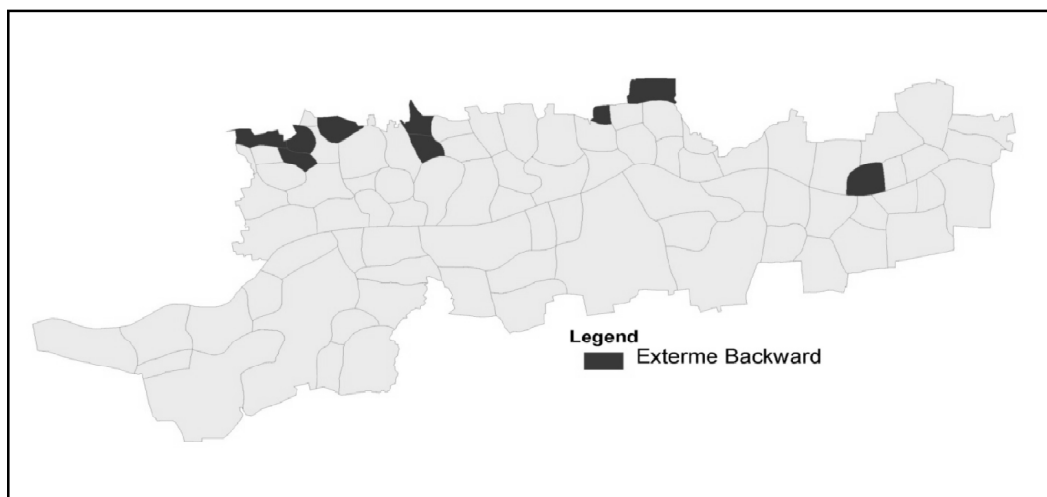
## METHODOLOGY

The backwardness of a place and that of the people living there get impacted upon each other. This is so because the people and places are inter-woven in symbiotic relationship. All parts of a country are not equally endowed with rich natural and human resources. Resource-rich areas leave behind their poor counterparts on the path of development. Gradually the gap widens and as a result disadvantaged places and people conscious of the widening gap, demand the measure to mitigate disparity. To identify the backwardness index parameters are subdivided into four categories and analysis in GIS platform of secondary data collected Village wise by various government departments and Primary survey of Nizar taluka

- (i) Demographic Indicators
- (ii) Social Indicators
- (iii) Economic Indicators
- (iv) Infrastructure Indicators

**Table 2**  
**Backwardness Index of Nizar Taluka**

<i>Backwardness Index:</i> <i>Weightage</i>	<i>Backwardness</i>
>120	Extreme
100-120	Moderate
<100	Low



**Figure 4: Location of Extreme Backward villages in Nizar Taluka**

## **SETTLEMENT HIERARCHY**

A settlement hierarchy is a way of arranging settlements into a hierarchy based upon their population or some other criteria. The higher population in a settlement, large geographic area and high status requires higher level of services. Position in a settlement hierarchy can also depend on the sphere of influence.

## **PLANNING AND DEVELOPMENT OF RURAL SETTLEMENTS**

These have been divided into following categories:

- (i) Growth Centres
- (ii) Growth Points
- (iii) Basic Villages

A growth centres will serve an area between 200 and 300 sq km and 1.5 lakh to 2 lakh population. These centres being of higher order will naturally perform higher order functions and activities, mainly of non-agriculture nature, with all centralized amenities and facilities in the field of education, medical, public health, wholesale and retail shoppings, civic, cultural and recreational facilities including organized industrial estates. These centres should have the following facilities:

- (i) Shopping on a bigger scale, mandi (collecting and distributing centre);
- (ii) Post office with telegraph facilities;
- (iii) Primary, middle and higher secondary schools, colleges;
- (iv) Dispensary / Hospital;
- (v) Office of P.W.D., irrigation departments, state governments and municipalities;
- (vi) Police station or police post;
- (vii) Banks;
- (viii) Cinema / community hall with auditorium;
- (ix) Library with reading room facilities / club ;
- (x) Parks / play grounds;
- (xi) Bus terminals connecting the growth points, and district centre with major roads;

Growth Point will serve a radius of 3 to 4 km, with an area of about 50 to 80 sq km and a projected population between 20,000 and 40,000. All the growth points will have a mixed primary and secondary economy and will provide following service facilities for the basic villages;

- (i) Shopping on a medium scale;

- (ii) Post / telegraph office;
- (iii) Primary, middle and higher secondary school;
- (iv) Library / club and adult education centre;
- (v) Seed / grain / fertilizer storage;
- (vi) Cooperative societies management office;
- (vii) Police post / police station;
- (viii) Veterinary centre / veterinary hospitals;
- (ix) Community workshop for repair and house hold industries and work centre;
- (x) Primary health centre / dispensary ;
- (xi) Access roads from the growth points to the basic villages;
- (xii) Playgrounds/gathering places/religious places;
- (xiii) Drinking water ;
- (xiv) Electricity;

From the existing demographic pattern and location of higher order socio economic facilities, it's observed that the settlement hierarchy already established the Nizar Taluka. Planner's job in the above context is to develop Nodal Villages with following principles;

- (i) Threshold Population (20000-25000)
- (ii) Development of Market/Amenities centers for higher order goods and facilities (APMC, Hospitals, and Colleges etc.)
- (iii) Transportation Principles (travel distance – 10 km)

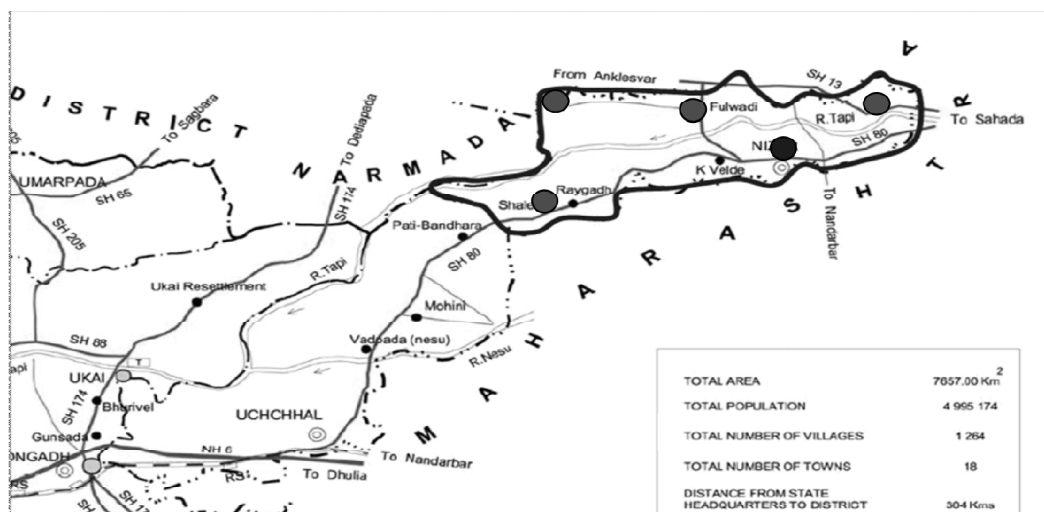


Figure 5: Location of Nodal Villages in the Nizar Taluka

## RESEARCH FINDINGS

### Existing Conditions: An Overview

Out of five talukas Nizar is one of taluka of Tapi district which is located in Eastern side of Tapi district which is also acting as boundary line between Gujarat and Maharashtra. It is connected with Maharashtra state from three sides. As per the geographical location River Tapi bisect Nizar taluka in two parts i.e. Northern and Southern side of River Tapi. As per census, 2001, there are 86 villages with a population of 105 Lakhs with dominance of Schedule Tribe population (70%). Out of which two villages are no population village. Total geographical area of Nizar taluka is 40079 Ha (400 Sq km). As maximum part of Nizar comes under Ukai Dam affected area. There are 38 gram panchayat in Nizar taluka. Total geographical area of Nizar taluka is 40079 Ha. Out of which 21561Ha. Area comes under are agriculture area and 332 Ha. Area is forest area. As per the agricultural census form agricultural department more than 50% area is Non Irrigated area. As per the infrastructure available from department there is one APMC market is available at main yard, Nizar. Total area of APMC market is 10 Acers. Other two sub yard is also available at Kumarmunda and Rumkitalav village. Godown, office building, road, wall compound, community hall and shop cum godown are also proposed in APMC market. At present 4 godowns, wall compound and office building work are in progress.

### Infrastructure Gap Analysis

Before the development of new infrastructure facilities we need to carry out the Infrastructure Gap Analysis on GIS platform using Arc GIS 10. This we can find out by comparing the existing facilities and facilities needed as per the norms. The Table 3 reveals the infrastructure gap of Nizar taluka.

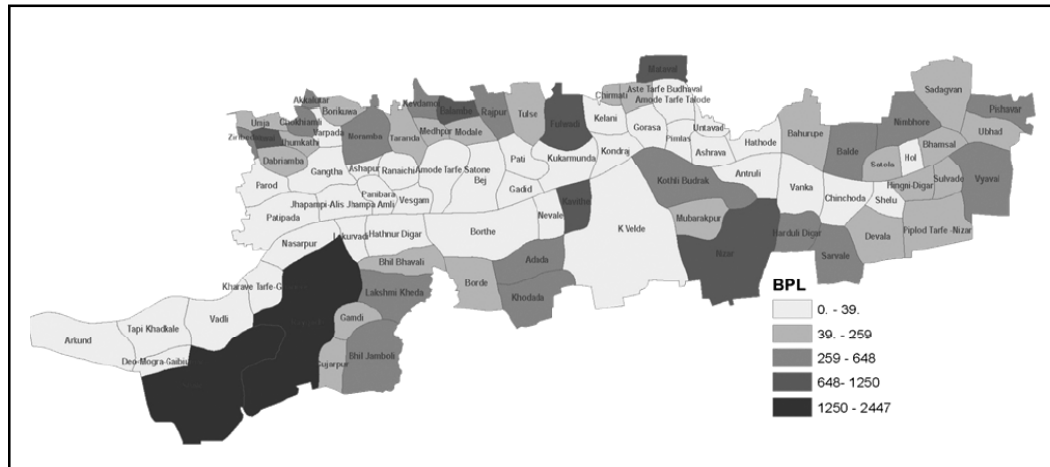


Figure 6: Map Showing BPL Population in Nizar Taluka



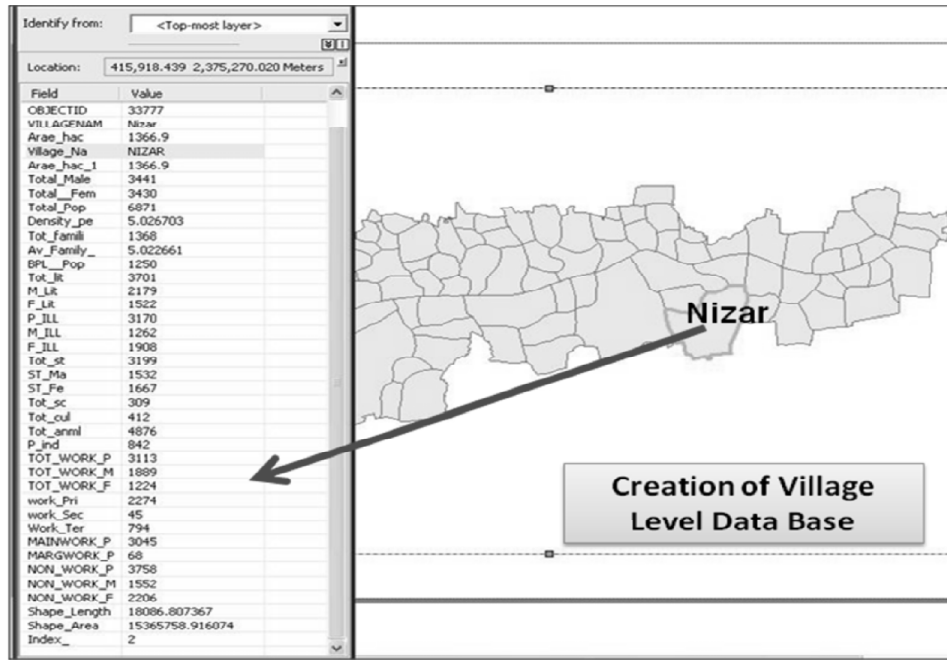


Figure 7: Creation of Village Level Geo Data Base of Nizar Taluka on ArcGIS10

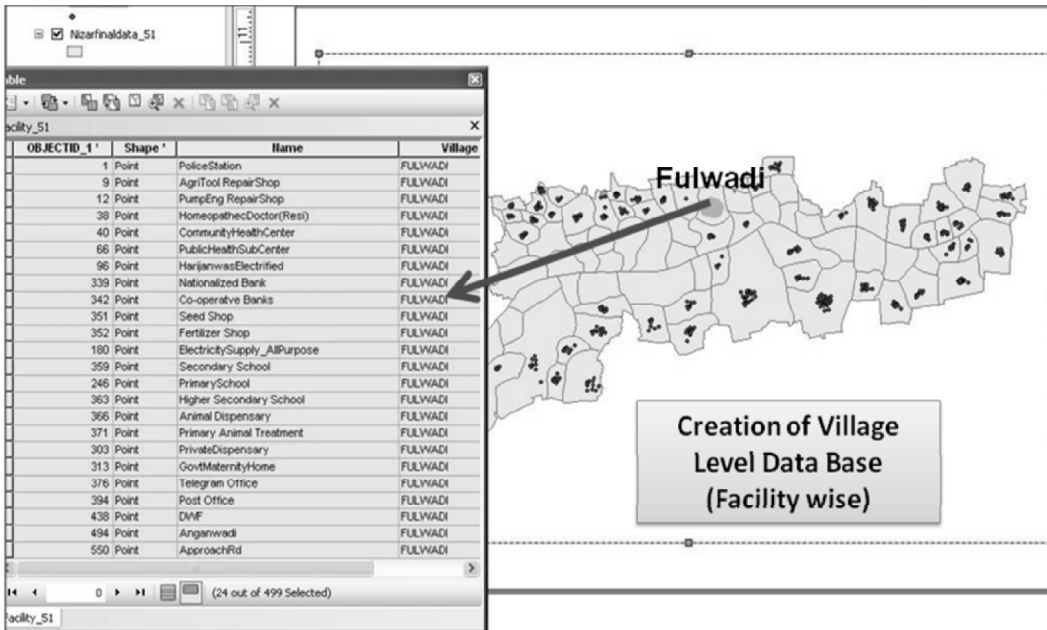


Figure 8: Creation of Village Level Geo Data Base Infrastructure wise of Nizar Taluka on ArcGIS10

**Table 3**  
**Infrastructure Gap Analysis of Nizar Taluka**

<i>Facilities</i>	<i>Existing</i>	<i>Required as per Norms</i>	<i>Gap</i>
Education			
Anganwadi	49	51	2
Primary School	50	51	1
Secondary School	9	16	7
Higher Secondary School	2	8	6
College	1	1	0
Tech. Training Institute	0	1	1
Agriculture Research Centre	0	1	1
Medical Facility			
Govt/Panchayat Dispensary or Sub PHC or Health Centre	36	51	15
PHC & CHC	5	6	1
Child Welfare and Maternity Home	6	12	6
Hospital	4	1	Nil
Transportation			
Pucca Village Approach Road	49	51	2
Bus/Auto Stand provision	30	51	21
Drinking Water	51	51	0
Public Latrines	11	51	40
Cremation Ground	4	6	2
Post Office	25	12	Nil
Gram Panchayat Building	21	37	16
APMC	2	1	Nil
Fire Station	0	1	1
Police Station	7	8	1
Community Hall	28	12	Nil

## INFRASTRUCTURE ASSESSMENT DEPARTMENT WISE

### Agriculture Department

Total geographical area of Nizar taluka is 40079 hectare, out of which 21561 hectare comes under agriculture comes area and 332 Hectare is forest area. As per the agricultural census form agricultural department more than 50% area is Non Irrigated area. As per the infrastructure available from department there is one APMC market is available at main yard, Nizar. Total area of APMC market is 10 Acers. Other two sub yard is also available at Kumarmunda and Rumkitalav village. Godown, office building, road, wall compound, community hall and shop cum godown are also proposed in APMC market. At present 4 godowns, wall compound and office building work are in progress.



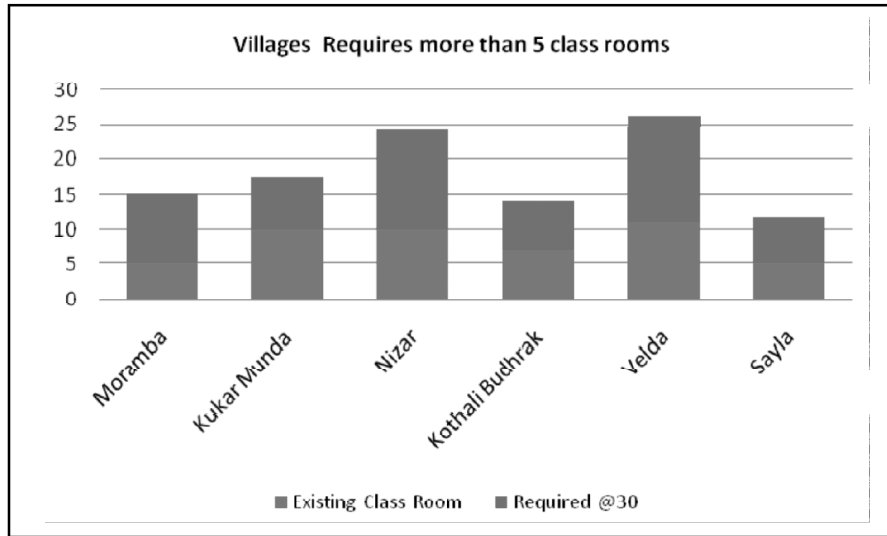
As per the requirement for APMC infrastructure Cold Storage facility are required which is unavailable in Nizar APMC. Other facility required in main yard Nizar such as C.C. flower, Shed, Solar Light system and mini cold storage for sub yard at Kukarmunda and rumkitalav godown with construction of compound wall.

**Education Department**

Based on education statistics provided by the concern department is originate that there are 152 anganwadi in Nizar Taluka and total 10690 nos. of children in aganwadi. As per the infrastructure in aganwadi it is estimated that ,Out of 152 aganwadi 14 anganwadi has not its own building and that anganwadi running at someone house, in helper’s house, in school or in rent building. And 6 anganwadi’s buildings are in very bad condition, which needs to be rebuild entire or relocate. Approximate 44% anganwadi has not drinking water facility, 60% anganwadi has not toilet facility and 85% anganwadi has not compound wall. 30 anganwadi has not kitchen facility and 42 anganwadi running without electricity. All anganwadi should have all facility like drinking water, toilet, compound wall, electricity etc. Even some anaganwadi has not proper stationary that also required. Total 152 cupboards, chairs and tables are required in aganwadi.



In Primary School infrastructure existing condition is better as compare to anganwadi in Nizar. For 13578 nos. of students 84 primary school is available in all villages. With a



ratio of per 162 students 1 primary school .All primary school having its own building in good condition. Drinking water facility, kitchen facility and electricity is available in all primary school.

As we analysis the class room and student ratio room with a capacity of 30 students per room, thus there is need of construction of 90 class rooms.

But in case of toilet facility infrastructure there is lacking as 22 primary schools have not toilet facility and 17 primary schools have not compound wall. Total 27 more rooms are required in 9 primary schools. Details of School wise nos. of students and nos. of class rooms and other detail are shown in (Annexure attached).

In Secondary School, there are total 8 Secondary and higher secondary schools are available at Nizar and 2715 total nos. of students. Secondary and higher secondary schools are available in villages namely Rumkitalav, Velda, Kukarmmunda, Nizar, Bhiljambholi and Raygadh. Out of 8 schools 2 schools are in Nizar and 2 schools are in Kukarmunda. Almost all schools have drinking water facility, toilet facility and electrification. In Raygadh School condition is very bad. It has not its own building and school is running at rent building. They use hand pump water for drinking purpose. Toilet facility is also not available in school. Due to the rent house electrification is not done. For Raygadh school whole school building is required with facilities of class rooms, office rooms, library, science lab, staff room, computer and computer room, boys and girls toilet, electricity, drinking water facility etc. In Nizar Sardar Vallabhbbhai Vidhyalay is also running in rent building so it also required new building. In Bhiljambholi school more class rooms and separate ladies toilet is required. In Nizar Shri. R.G. Patel Vidhyalay required electrification in some rooms, auditorium hall and prayer rooms is required. In Kukarmunda at Shri Saraswati Vidhyalay drinking water facility, toilet facility and compound wall is not available so it required. It also required 3 more rooms for science room, computer room and office. Science lab instrument, books for library and Sound system for programs is also required. At Velda School compound wall is required.

There is only one college in Nizar taluka for commerce and arts streams. At present 281 students and 14 rooms are available in college but still more 4 more rooms are required. At present they divide one big hall in four different rooms with partition wall and used as class room. Toilet facility, Drinking water facility and Electrification is available in college. Bench, Tables and Chairs for Library, and Hostel for Schedule Cast Student is also required.

### **Health Department**

Medical Health facility is fairly fine in Nizar taluka. Health department includes public health centers, sub public health centers and CHC. In Nizar taluka 27 sub public health centers, 5 public health center and 1 CHC is available. Existing condition of sub public health centers, public health centers and CHC is described as follows.

There are about 27 sub public health centers (Sub PHC) are available in Nizar taluka at villages namely Vadpada, Zampa amlī, Modal, Bej, Rajpur, Fulwadi, Kukarmunda, Metawal, Aasrava, Chiramati, Bahurupa, Nibhora, Pishawar, Piplod, Sarwala, Vanka (Sajipur), Nizar, Khodda, Borda, Bhil jamoli, Lakshmikheda, Raygadh, Sayla, Vadli, Kherva and Rumki Talav. Out of which 5 Sub PHC does not have its own building and Out of remaining 22 only 4 Sub PHC have drinking water facility and 5 Sub PHC have not electricity. Minimum required beds are not available in all Sub PHC and ambulance is also not allotted to sub PHC. Doctors are also not appointed in sub PHC they are appointed only for PHC. Patients are not coming everyday in sub PHC. Sub PHC building is required at Kukarmunda, Piplod and Nizar. For the Villages namely Gangtha, Chokhi Amlī, Sadgvan, Mubarkpur and Raygadh construction grant is permitted for sub PHC building. Village wise detail of sub PHC is attached in (Annexure attached).

There are only 5 Public Health Centers (PHC) at village namely Gangtha, Kukar Munda, Vanka (Sajipur), Velda, Raygadh in Nizar taluka. Out of which 2 PHC at Gangtha and Vanka (Sajipur) have not its own buildings. Doctors are not available at Gangtha and Kukar Munda center and at Vanka (Sajipur), Velda, Raygadh center 1 doctor is appointed. An average 50 patients per day are coming in each PHC and 6 nos. of beds are available in each PHC. In Vanka (Sajipur) drinking water facility, toilet facility and ambulance is not available. One Vehicle (Van) is allotted to Vanka (Sajipur) center on monthly contract bases. At Gangtha, Velda and Raygadh center 1 Jeep is allotted as ambulance. For new PHC building at Gangtha and Vanka (Sajipur) grant is allotted and tender is already out. Village wise detail of PHC is attached in (Annexure attached).

There is one CHC available in Nizar taluka with 30 beds facilities. At present 1 doctor is available and permission is given for 1 senior and 3 assistant doctors. Daily average 70 patients OPD are coming to CHC. 1 Ambulance facility is also available in CHC. Toilet facility and electrification is available but drinking water facility is not available in CHC.

### **Road and Building Department**

Total road length of Nizar taluka is 176.34 km out of which 72.71 km road is coming in to state highway department and remaining 104.13 km road is coming in to Panchayat department.

Approach road is available almost in all villages expect three villages namely Khanora, Nevala and Juna Utavad which does not have approach metal road. Length of approach road for 3 villages is 1.20 km, 2.20 km and 6.40 km respectively. Existing condition of road is very poor. There are 56 government buildings coming in to Road and Building Department in Nizar taluka. It includes animal husbandry building, postmortem buildings, Government clinics, family planning center and sub centers, staff quarters etc. Out of which only 50% buildings are in good condition. Remaining buildings are in Poor condition, in bad condition or required immediately maintenance. Village wise detail of all building and its existing conditions are shown in (Annexure attached).

To develop road and building government uses various schemes. In Nizar taluka work is progress in 8 different schemes. Scheme wise detail off on going work and upcoming work is attached in (Annexure attached).

### **Water Supply Department**

At Nizar almost all villages have drinking water. Main source of drinking water is hand pump, Boring or Bore Well and those villages which coming in to "South Nizar group Scheme" they uses river filter water. Another scheme is "Independent Group Water Distribution Scheme" through which water is distributed to another villages with Pipe Network, Hand Pump or Well. At present Testing and repairing work in progress in AC pressure line from Gamdi village to Hathnur village. In other villages repairing and maintenance or required new pipe line, storage cum stand post, tank work in progress under "Colagi Samiti" 2011-2012". At present old AC pressure line is available so new DC pipe line required so will reduce linkage and provide pure drinking water to village people. Detail of required new pipe network, Storage Stand post, repairing of old work, new water tank replacing old n very poor condition water tanks attached in (Annexure attached).

### **CONCLUSION**

Nizar Taluka is the most backward area with 70%. It needs Integrated Rapid Rural Development Programe. The project developed on GIS platform aims to build the employment potential, greater social transformation, participation of Panchayat Raj Institutions to have effective balanced urbanization and to achieve millennium Goals. Various field surveys and inventory data provided the platform for the Geospatial analysis of the area as under;

- (i) Infrastructure gap analysis
- (ii) Prevailing Socio-economic status
- (iii) Demographic profile of villages in Taluka
- (iv) Backwardness index analysis of villages

Participation of villagers with reference to the infrastructure facilities did provide certain notable inputs into the project. In addition to the normal physical and social infrastructure the focus was on also other aspects like provision of domestic and agricultural electrical connections, marketing facilities irrigation facilities and milk cooperative society functioning etc. Nine villages in the Taluka are found as the most backward on the basis of high ranking score of backwardness covering the attributes such as BPL, education and infrastructure facilities. Five villages namely Shale, Nizar, Fulwadi, Moramband, Balde are identified as nodal villages to support cluster villages. Scope for developing horticulture, and flower cultivation is also probed into. Thus the whole Geospatial Planning of the Taluka needs strong GIS platform.

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