INFRASTRUCTURAL DEVELOPMENT PLAN FOR A RURAL REGION: A CASE STUDY

RUCHITA PANDYA[1] & DR. ROOPALI GOYAL[2]

[1]RESEARCH SCHOLAR, DEPARTMENT OF CIVIL ENGINEERING, SARDAR VALLABHBHAI PATEL INSTITUTE OF TECHNOLOGY, GUJARAT TECHNOLOGICAL UNIVERSITY, GUJARAT, INDIA
[2]ASSISTANT PROFESSOR, DEPARTMENT OF CIVIL ENGINEERING, SARDAR VALLABHBHAI PATEL INSTITUTE OF TECHNOLOGY, GUJARAT TECHNOLOGICAL UNIVERSITY, GUJARAT, INDIA

ABSTRACT: *This paper discusses methods to reduce and eradicate the urban-rural divide by bringing in urban lifestyle patterns and services in rural system to ensure furnishing of quality lifestyle and livelihood whilst keeping the rural essence intact. By studying the village life with respect to delivery of basic needs, the main aim is to reimagine, redesign, rejuvenate and strengthen the community life. After analyzing all the data, we found that village needs some new facilities and some facilities need maintenance. A design for a village community hall is proposed to fulfil the requirement of existing population.*

KEYWORDS:

Rural development, Ideal Village Surveys, Techno-Economic Survey of Village, Smart village survey, Gap analysis, Design Provision.

1. INTRODUCTION

Approximately 70 % of Gujarat state's population resides in a rural environment. The hindrance in the growth of the State's economy is directly influenced by the lifestyle of the people that occupy it. Many urban facilities aren't easily accessible by the rural people and hence undermines their potential and work efficiency. The detrimental effects of poverty, lack of infrastructure and basic amenities leads to the accumulation of slums in urban areas and also rise to socio-economic disparity which manifests into economic deprivation and urban poverty.

1.1 NEED OF STUDY

- In present India, the population is growing very fast so the need for development like education facilities, employments, increasing living standards are providing only in cities or an urban area. Hence, the people of the village must have to migrate to the cities due to a lack of all amenities. This causes population density in cities are increasing, so we have to think about providing the all-infrastructural facilities required in the Rural area.
- In the current scenario, the ratio of migration in the rural area to urban areas is increased and it is necessary to provide all primary requirements to rural areas so they have benefits/satisfy of all needs because more than 70% of the population in India is lives in villages.

1.2 OBJECTIVES

- Creation of infrastructure - connectivity, civic and social infrastructure along with provision of alternative Economy generation.
- Due to lake of facilities in rural area, it causes migration to urban area so it is need to provide better facilities and all primary requirement to rural area.
- Infrastructure development in rural area and connect all with social and civil facilities.
- Reduce migration from rural to urban area due to sufficient facilities are not available.
- Electricity connections like street lighting that is energy efficient and eco-friendly.

2. STUDY AREA

- Name of place: Ranu
- Taluka Name:Padra
- District Name:Vadodara
- Latitude: 22.209390°N
- Longitude: 73.026890°E

- Feature description: Village
- Population: 6062.

According to Census 2011 information the location Ranu code or village in Padra Taluka in Vadodara District of Gujarat State.

- Ranu Village is located in Padra sub-district of Vadodara district in the state Gujarat in India. The total geographical area of Ranu village is 9 km2 and it is the 21st biggest village by area in the sub-district.
- The population density of the village is 710 persons per km2.

3. DATA COLLECTION METHODS

3.1 GENERAL METHODS FOR DATA COLLECTION:

Collection of data of Ranu village near Padra, dist. Vadodara was conducted by following methods;

- Door-to-Door information collected from villagers of Ranu.
- Collection of Information from Talati Mantri, Sarpanch, Gram Sevak and School Principal.
- Techno- Economic survey of allotted village Ranu.
- Gap analysis as per collected data.
- From internet and Census 2001 & 2011 records.
- From self-exploration of village by doing survey

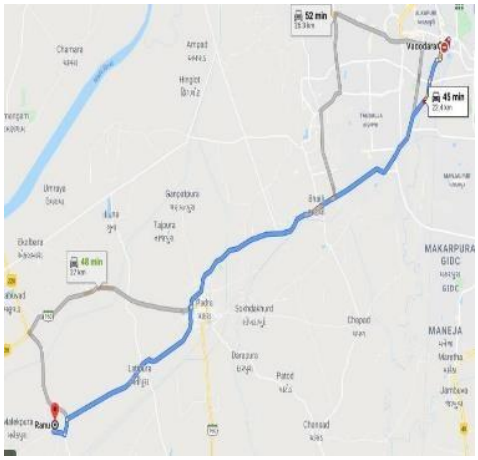

Fig:3.2 DemographicDetails

Fig 3.1 Google map of Ranu village

4. Gap Analysis

Infrastructural Facilities	Planning Commission/UDP FI Norms	Village Name:	RANU		
		Population:			6092
		Existing	Required as per Norms	Smart Village / Cities / Heritage Future Projection Design	Gap
Social Infrastructure Facilities					
Education					
Anganwadi	Each or Per 2500 population	6	0	0	**6**
Primary School	Each Per 2500 population	2	0	0	**2**
Secondary School	Per 7,500 population	2	0	0	**2**
Higher Secondary School	Per 15,000 Population	1	1	0	**0**
College	Per 125,000 Population	0	0	0	**0**
Tech. Training Institute	Per 100000 Population	0	1	1	**-1**
Agriculture Research Centre	Per 100000 Population	0	1	1	**-1**
Skill Development	Per 100000 Population	0	1	1	**-1**

Centre					
Health Facility					
Govt./Panc hayat Dispensary or SubPHC or Health Centre	Each Village	1	0	1	**1**
PHC & CHC	Per 20,000 population	1	0	0	**1**
ChildWelfare and Maternity Home	Per 10,000 population	0	0	1	**0**
Multispecialty y Hospital	Per 100000 Population	0	0	0	**0**
Public Latrines	1for50families(iftoiletisnot therein home,speciallyfor slum	0	2	3	**-2**

	pockets & kutcha house)				
Physical Infrastructure Facilities					
transportation		**Adequate**	**Inadequate**		
Pucca Village Approach Road	Each village	YES	-	-	KUTCHHA
Bus/Auto Stand provision	llages connected by PT (ST Bus or Auto)	-	YES	-	**1**
Drinking Water (Minimum 70 lpcd)		**Adequate**	**Inadequate**		
OverHead Tank	1/3 of Total Demand	YES	-	-	**-**
U/G Sump	2/3 of Total Demand	YES	-	-	**-**
Drainage Network		**Adequate**	**Inadequate**		
Open	-	YES	-	-	**Good Condition**
Waste Management System		-	YES	-	**Not Good Condition**
Electricity Network		YES	**-**		-

Socio- Cultural Infrastructure Facilities					
Community Hall	Per 10000 Population	0	1	0	**-1**
community hall cum Public Library	Per 15000 Population	0	1	0	**-1**
Cremation Ground	Per 20,000 population	0	1	0	**-1**
Post Office	Per 10,000 population	1	0	0	**1**
Gram Panchayat Building	Each individual/group panchayat	1	0	0	**1**
APMC	Per 100000 Population	0	0	1	**0**
Fire Station	Per 100000 Population	0	0	1	**0**
Public Garden	Per village	0	1	1	**-1**
Police post	Per 40,000Population	0	0	0	**0**
Any Smart Village Design					
NIL					
		ESR cap	81226.66667		
		Sump cap	162453.3333		
		Lat	30.46		

5. RECOMMENDATIONS FOR DESIGN: Various infrastructure & guidelines/Norms for Villages for the provisions of different infrastructurefacilities

According to UDPFI norms:

- Secondary School: According to URDPFI norms per 7500 population, one secondary school is required so its recommended providing one secondary school.
- PHC or Health Centre: According to URDPFI norms, per village one PHC or Health center is required, so the provision of one PHC should be there.
- U/G Sump: According to URDPFI norms two U/G sumps of 12000L and 10000L capacity tanks are required.
- Public Toilet Block: According to URDPFI norms there should be one public toilet per 50 families.

- Community Hall: According to URDPFI norms, one Community hall is required per village, so the provision of one PHC should be there.

5.1 COMMUNITY HALL DESIGN

The proposed Design of the Village Community Hall is shown here. The measurement and abstract sheet is attached on the following page. The community hall can be useful in many functions like marriage, meetings etc.

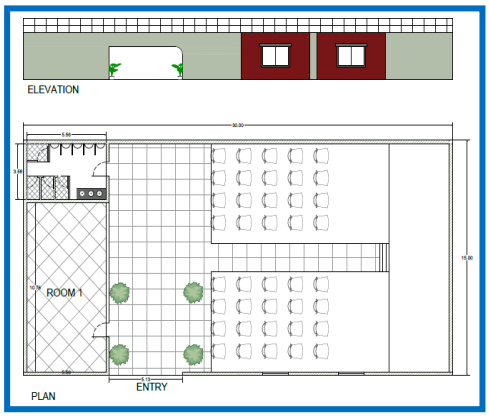

Fig 5.1 Proposal Planning & Design of Community Hall

MEASUREMENT SHEET (ROOM)

Sr. No.	Items	No.	Length	Width	Height	Quantity	Total Quantity
1	Excavation for foundation in ordinary strata	1	10.78	0.9	1.1	10.6722	10.6722 m^3
2	Providing and laying B.B.C Work (1:4:8)	1	10.78	0.9	0.3	2.91	6.5716 m^3
	1st Layer	1	10.78	0.6	0.2	1.2936	
	2nd Layer	1	10.78	0.5	0.2	1.078	
	3rd layer	1	10.78	0.4	0.3	1.29	
3	Total BM in Foundation						1.98 m^3
	BM in Plinth	1	10.78	0.23	0.8	1.98	
	Total BBC + BM Footing						0.675 m^3
	Providing and Laying Floor	1	3	3	0.075	0.675	
4	Estimate of super structure						0.743 m^3
	Providing constructing BM CM (1:6)	1	10.78	0.23	3	0.743	
5	RCC Work						8.99 m^3
	RCC (1:1.5:3) Slab Work	1	10.78	5.56	0.15	8.99	
6	Deduction of opening in structure						0.434 m^3
	door	1	0.9	0.23	2.1	0.434	
7	Providing and Laying CM (1:4) 10mm Thick for Plastering						
	Long wall	2	10.78	1	3	64.68	101.7982 m^3
	Short Wall	2	5.56	1	3	33.36	
	Top Face	1	16.34	0.23	1	3.7582	

ABSTRACT SHEET (ROOM)

Sr. No.	Item	Quantity	Rate	Per	Amount
1	Cement	16.73	310	Bag	5,186/-
2	Sand	33.47	800	m3	26,776/-
3	Aggregate	66.95	1000	m3	66,950/-
4	Brick Masonry	6.3846	2746.7	m3	17,524/-
5	Steel (Beam)	1678	50	Kg	83,900/-
6	Steel (Column)	6701	50	Kg	3,35,050/-
7	Steel (Slab)	8469	50	Kg	4,23,450/-
	Total				Rs.9,58,836/-

MEASUREMENT SHEET (HALL)

ABSTRACT SHEET (HALL)

No.	Item	Quantity	Rate	Per	Amount
1	Cement	1470	310	Bag	4,55,700/-
2	Sand	102.85	800	m3	82,280/-
3	Aggregate	205.71	1000	m3	2,05,710/-
4	Brick Masonry	39.87	2746.7	m3	1,09,511/-
5	Steel				
	Beam	2269	50	Kg	1,13,450/-
	Column	9326	50	Kg	4,66,300/-
	Slab	11500	50	Kg	5,75,000/-
7	Carpet	129.36	200	m	25,872/-
8	Chairs	100	55	Piece	5,500/-
	Total				Rs. 20,39,323/-

No								Total Quantity
1	RCC (1:1.5:3) Slab Work	1	15	24	0.15	54	54 m³	
6	Deduction of opening in structure							
	Door	1	5.13	0.9	2.1	9.6957	13.90 m³	
	Windows	2	1.3	0.9	1.8	4.212		
7	Providing and Laying CM (1:4) 10mm Thick for Plastering							
	Long wall	2	24	1	3	144	271.8 m³	
	Short Wall	1	15	1	3	45		
	Top Face	1	360	0.23	1	82.8		
	Total plaster work after deduction	0						
	Total carpet area					129.36	129.36	
8	Seats in the hall/Sitting area					100	158.862 m²	
	Total stage area					63	63 m²	

MEASUREMENT SHEET (TOILET)

No.	Items	No.	Length	Width	Height	Quantity	Total Quantity
1	Excavation	1	19.44	0.9	1.1	19.24	29.74 m^3
2	Foundation Concrete	2	19.44	0.9	0.3	10.49	
3	BM for foundation up to plinth						
	For 0.70m offset	1	19.44	0.7	0.2	2.72	74.84 m^3
	0.60m offset	1	19.44	0.6	0.2	2.33	
	0.50m offset	1	19.44	0.5	0.2	1.94	
	0.40m offset	1	19.44	0.4	0.2	1.55	
	0.30m offset	1	19.44	0.3	0.6	3.49	
	DPC	1	19.44	0.3	0.1	5.83	
	Earth Filling	1	5.56	3.56	0.1	19.79	
	Water Proofing	1	5.56	3.56	0.1	19.79	
	B M for Super Structure	1	19.44	0.3	3	17.4	
4	Partition wall						
	Toilet 1,2&3 wall 1	3	1.5	0.2	3	2.7	4.97 m^3
	Wall2	3	0.9	0.2	3	0.62	
	Toilet 4 wall 1	1	1.16	0.2	3	0.69	
	Wall 2	1	1.61	0.2	3	0.96	
5	Deduction						
	Door 1	1	0.9	0.2	2.1	0.37	1.70 m^3
	Door 2	4	0.7	0.2	2.1	1.17	
	Ventilation	4	0.45	0.2	0.45	0.16	
6	Urinals	5					
7	Kamods	4					
8	Basins	3					

ABSTRACT SHEET (TOILET)

No.	Item	Quantity	Rate	Per	Amount
1	Cement	85	310	Bag	26,350/-
2	Sand	5.983	800	m3	4,787/-
3	Aggregate	11.683	1000	m3	11,683/-
4	Brick Masonry	17.496	2746.7	m3	48,056/-
5	Damp Water Proofing	5.832	350	m3	2,041/-
6	Steel (Beam)	3260	50	Kg	1,63,000/-
	Steel (Column)	6050	50	Kg	3,02,500/-
	Steel (Slab)	9000	50	Kg	4,50,000/-
7	Kamods	4	2300	Unit	9,200/-
8	Urinals	5	1300	Unit	6,500/-
9	Basins	3	3000	Unit	9,000/-
				Total	Rs.10,33,117/-

ABSTRACT SHEET (HALL + ROOM + TOILET)

Sr. No.	Description	Amount
1	Hall	Rs. 20,39,323/-
2	Room	Rs. 9,58,836/-
3	Toilet	Rs. 10,33,117/-
Total Amount		Rs. 40,31,276/-
10% contractor charges		Rs. 4,03,127.6/-
5 % extra charges like painters, mixer, transport & labour charges		Rs. 2,01,563.8/
Overall Cost		Rs. 46,35,967.4/-

5. CONCLUSIONS

The above study concludes the following:

1. The mentioned village of Ranu was chosen for employing urban methods whilst retaining the rural essence to improve the standard of living as well as to uplift the economic standards of the residents.
2. In order to do so, surveys were conducted to extract the necessary infrastructural information, which then were worked upon.
3. After the survey was done, a GAP Analysis was conducted to observe the lacking facilities in comparison to those of a smart model village.
4. Design of a Community hall has been proposed by the author to fulfil the various needs of the residents.

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