Socio-economic Analysis for Selection of Potential Peri-Urban Village in SUDA, Gujarat

Pooja M. Roopawala[1], Bhasker Vijaykumar Bhatt[2]

[1] M. E. Student, Sarvajanik College of Engineering & Technology, Surat, Gujarat, India
Email: pooja.roopawala.tcp@gmail.com

[2] PG in-charge (ME-TCP), Sarvajanik College of Engineering & Technology, Surat, Gujarat, India
Email: bhasker.bhatt@scet.ac.in

Abstract—**In developing countries as India, the probable population lives in and around metropolitan areas and large cities, including the peri-urban areas. This paper is about studying six selected peri-urban villages outside the Surat Municipal Corporation (SMC) but included in the regulatory limits of the Surat Urban Development Authority (SUDA); in the absence of a specific Village Development Plan. This study is carried out for the suburban area of Surat city looking at the physical development pressure on the Eastern parts of Surat with changing variables as the demographic pattern, land-use, and infrastructure. The socio-economic analysis led to the conclusion of a potential village seeking appropriate planning and management to solve the problems of future development.**

Keywords— **Parameters, peri-urban, potential village, socio-economic, Surat.**

I. INTRODUCTION

MORE than a moiety of the world's population lives in areas that are urban towns or cities. In 2016, an estimated 54.5 percent of the world's population lived in urban settlements. By 2030, urban areas are proposed to accommodate about 60 percent of citizens globally whereone-third people will be residing with at least half a million inhabitants [1]. Essentially, in the developing countries like India, the substantial and growing proportion of people lives in, or nearby metropolitan areas and large cities, including the areas, called peri-urban villages. As the city limit expand so as the urban and suburban region increases. The peri-urban are in the state of rapid change; once agricultural land can turn to an urban area in no time. Consequently, all farming activities suffer and at large the land is wasted upon for the urban use.

Increasing urbanization has encroached upon the village land by converting the agricultural land to non-agricultural land and random building without prior land-use planning and policies. Land in the peri-urban area is of vital importance but often falls beyond the purview of planners. The unexpected development is because of the absences of any Urban Planning Policy in India. Also, due to the Institutional conflicts, development of certain amenities becomes a dilemma. So, there is a lack of proper guideline and managing systems at the institutional level of peri-urban areas.Unlike the urban areas comparatively having a stable development control regulations, planning guidelines, and monitoring systems.Such systemsattract developers to concentrate and invest in these regions, especially in the peripheral areas of the urban settlement.

Surat is located in the northern part of Gujarat having 35 km long coastal line on its west boundary. The two most important development cells working in Surat are Surat Municipal Corporation (SMC) and Surat Urban Development Authority (SUDA). The majority of the urban areas are covered under SMC while 95 villages remain outside SMC under SUDA. This paper is about the six selected villages out of the 95 villages outside the SMC area according to Development Plan 2004. Further, in the nest section, the study area is delineated followed by the various parameters of the socio-economic survey. The third section compares the scenario of each village, and finally, the outcome drawn from the study.

II. STUDY AREA AND LOCATION

This study is concerned with the Surat city having more than 4.5 million of the population engaged in a massive Textile and Diamond business and one of the major economic hubs of Gujarat [2]. In 2001, Surat Urban Agglomeration (UA) was 2,811,614 (2.8 million) residents, whereas in 2011 it increased to 4,591,246 (4.5 million) [2]. With a population of more than 4.5 million, Surat UA qualifies as 9th among the 53 million plus cities in India enumerated in the 2011 census. It is rapidly urbanizing with a 42.2 percent annual growth rate over the 1990s. The SMC covers a total area of 326.515 km^2 and SUDA limits to 715.00 km^2 excluding SMC. The SUDA area comprises of 95 villages.

The purpose of current research is to examine the socio-economic parameters of the peri-urban region of selected villages. Certain parameters are applied to understand the planning strategies for development of suburban areas. Also, the study of variables of change like the demographic pattern, land-use, and infrastructure are essential. Therefore, it is significant to examine the appropriate strategies of planning and management to solve the future problems of development.
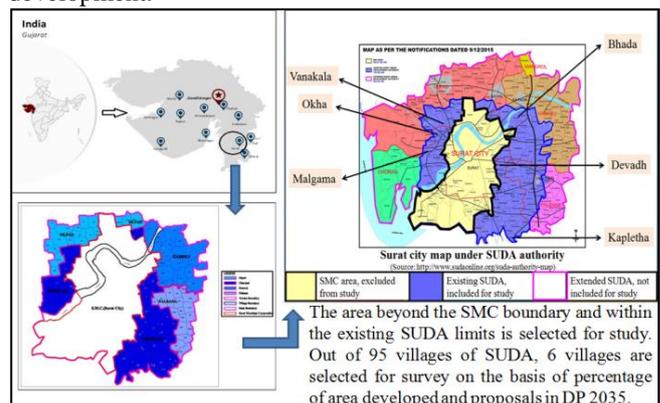

Surat city map under SUDA authority
(Source: http://www.sudaonline.org/suda-authority-map)

The area beyond the SMC boundary and within the existing SUDA limits is selected for study. Out of 95 villages of SUDA, 6 villages are selected for survey on the basis of percentage of area developed and proposals in DP 2035.

Fig. 1.Study area and its Location

The study is aiming to understand growth and development of peri-urban area, as follows;
1) It helps in defining and delineating the peri-urban areas;
2) Study helps in understanding the nature of peri-urban village;
3) The study evolves the concept of potential peri-urban community for planned future development.

The research methodology starts with delineation of study area followed by deciding of parameters for the selection of a potential village by surveying/ interviewing the Talati and Sarpanch of each of the six villages. The further step of analysis is carried out using simple weightage method and the one potential village is selected seeking future development.

III. STUDY AREA AND ITS GROWTH DYNAMICS

A. *Delineation of study region*

SMC is the center of economic activities in the Surat Urban agglomeration, and the city forms the core of Surat Urban Development Authority i.e. SUDA [3]. The city development lack keeping pace with increasing population and expanding urbanization as such the public activity has transcended the limit [3]. The peripheral area of the SMC is experiencing a faster growth rate than the rate of increasewithin the ULB's core area [3]. In SUDA area the villages around the SMC are emerging as urban fringes. The periphery villages are experiencing rapid growth with significant density variations [3].
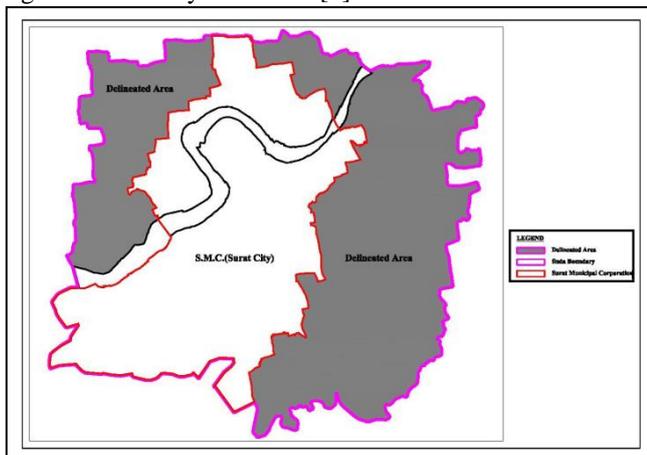
Fig.   2.Delineated area for study. Fig. 2 shows the map which includes the villages of SUDA which are considered under the survey.

B. *Delineation approach of peri-urban area*

Out of the 95 villages in SUDA, six peri-urban villages are selected as a case study from its population, the percentage of the area developed and proposals in the upcoming Development Plan 2035 (DP 2035). Excluded village for this study are the villages which are saturated more than 50 percent. The major assumption for the

selection of potential village is that the village where need has arrived and so the facilities to improve the lifestyle of villagers are provided. Thus, it attracts stakeholders and other builders to buy the agricultural land randomly and to build concrete jungle.
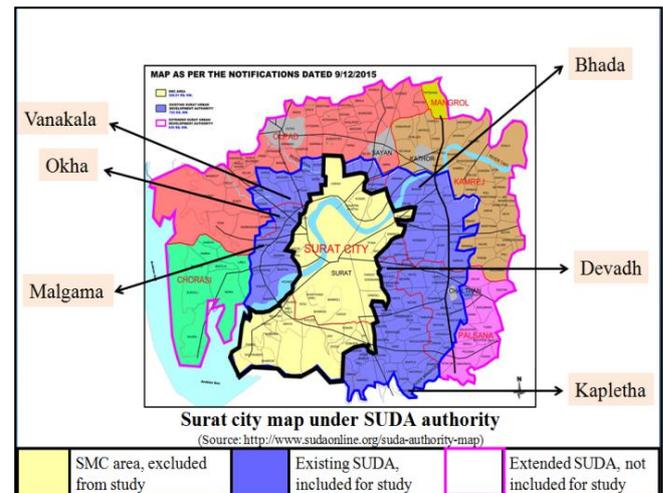
Fig.   3.Selected villages under SUDA authority for the survey

The Fig. 3 shows the six villages chosen for the further survey. For the selection of potential village simple weightage analysis is used after the data from secondary as well primary sources are collected. The detailed method of selecting is mentioned in the following section.

IV. SELECTION OF POTENTIAL VILLAGE

The parameters used for selection of potential village are based on the study carried out by [4] in Indore for calculating the urbanity index. The parameters are:
1) Density
2) Literacy rate
3) Sex ratio
4) Decadal growth
5) Percentage of cultivators
6) Percentage of agricultural laborers
7) Percentage of household industry workers
8) Percentage of other workers
9) Housing condition
10) Road condition
11) Physical Infrastructure
12) Social Infrastructure
13) Green Infrastructure
14) Land utilization
15) Average property value (Jantri rates)

All the parameters mentioned above are studied for the six villages with the help of socio-economic survey with the Talati and Sarpanch of villages. The analysis of each parameter is as indicated below.

A. *Density, Literacy rate, Sex ratio, Decadal growth, Percentage of main workers*

TABLE I
Demographic data for selected villages

Village name	Population 2011	Area (km²)	Density 2011	Literacy rate	Sex Ratio	Cultivators	Agricultural laborers	Household Industry Workers	Other workers
Devadh	1168	3.751	311	75.86%	963	16.18%	0.24%	0.24%	61.59%
kapletha	3312	3.4549	959	58.88%	960	4.26%	19.53%	0.74%	74.80%
Malgama	960	2.8825	333	84.06%	1025	31.39%	8.52%	1.22%	55.47%

Village name	Population 2011	Area (km²)	Density 2011	Literacy rate	Sex Ratio	Cultivators	Agricultural laborers	Household Industry Workers	Other workers
Okha	63	2.9079	22	63.49%	575	0.00%	0.00%	0.00%	84.00%
Vanakala	277	3.4641	80	84.12%	965	0.00%	0.00%	1.16%	97.67%
Bhada	1770	7.85	225	61.30%	991	31.81%	50.08%	0.46%	11.57%
Average district rural area	5,92,049	4,040.39	305	85.53	925	15.48%	42.41%	0.93%	28.88%

(Source: Primary Census Abstract Handbook of Surat, 2011)

The weightage given to each parameter is based on the average district rural demographics. Accordingly, the weightage for value more than average is 1 and less than average is 0.

B. Housing and road condition
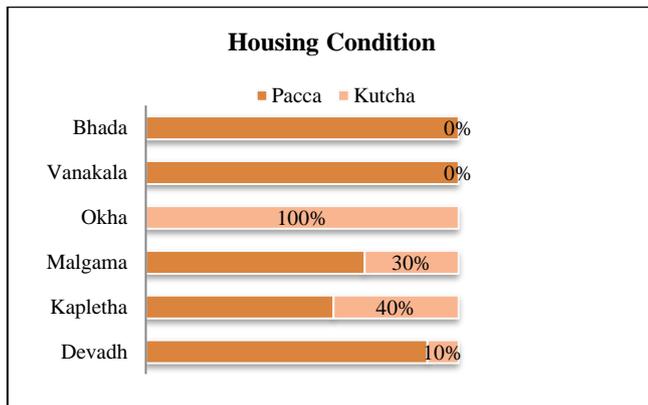
Fig. 4.Condition of houses in the village. The houses may be Pacca (RCC and brick) or Kutcha (Temporary structures).

The weightage given to the type of housing is based on the percentage ranging from 100% to 10% as 10 to 1 respectively.
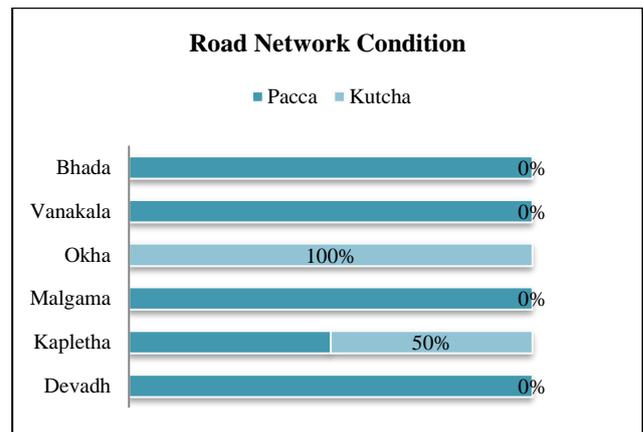

Fig. 5.Condition of road surface in the village. The road surface may be Pacca made up of RCC or WBM or Kutcha.

The weightage given to the type of road surface is based on the percentage ranging from 100% to 10% as 10 to 1 respectively.

C. Physical Infrastructure

TABLE II
Existing Physical Infrastructure of selected villages

№	Village name **Parameters of Adequacy**	Devadh	Kapletha	Malgama	Okha	Vanakala	Bhada
1	Tap Water	√	√	√		√	√
2	RO Plant	√	√	√			√
3	Well		√	√		√	
4	Hand Pumps	√	√		√	√	√
5	Tube Well/ Bore Well	√	√			√	√
6	Lake/Canal/River		√	√	√	√	
7	Overhead Tank	√	√				√
8	Underground Sump			√			
9	Drainage	√	√	√		√	√
10	Road Network	√	√	√	√	√	√
11	Railway Station						
12	Bus Station						√
13	Local Transportation	√	√	√	√	√	√
14	Electricity Distribution	√	√	√	√	√	√
15	Public Latrine Blocks						
16	Community Bath			√			
17	Solid & Liquid Waste Disposal System	√				√	
18	Waste Collection from Roads	√	√	√			

(Source: Primary data collection through survey form)

The above Table II specifies the 18 physical infrastructures to be available in every potential village. After the survey, the above results are obtained, where the villages with maximum facilities are Kapletha (12), Devadh (11) and Malgama (11).

D. Social Infrastructure

TABLE III
Existing Social Infrastructure of selected villages

№	Village name **Parameters of Adequacy**	Devadh	kapletha	Malgama	Okha	Vanakala	Bhada
1	PHC/CHC/Government Hospitals						
2	Private Clinics	√	√			√	
3	Anganwadi	√	√	√			√

4	Primary School	√	√	√			√
5	Secondary School						
6	Higher Secondary School						
7	College / Vocational Training Centre						
8	Community Hall	√	√	√			√
9	Public Garden			√			
10	Village Pond		√	√			
11	Birth Death Registration	√	√	√	√	√	√
12	Post Office	√	√				
13	General Market						
14	Shops	√	√		√		√
15	Panchayat Building	√	√	√	√	√	√
16	Pharmacy/Medical Shops						
17	Bank & ATM Facility	√					
18	Agricultural Cooperative Society						
19	Milk Co-Operative Society			√			√
20	Small Scale Industries						
21	Internet Cafes/ Wi-Fi	√	√			√	
22	Commercial Establishment	√				√	

(Source: Primary data collection through survey form)

The above Table III specifies the 22 social infrastructures to be available in every potential village. After the survey, the above results are obtained, where the villages with maximum facilities are Devadh (11), Kapletha (10) and Malgama (8).

E. Green Infrastructure

There is the inadequacy of green infrastructure in each selected village. The green infrastructure required for villages are Biogas plant, adoption of nonconventional energy sources or renewable sources, solar lights and rainwater harvesting system.

F. Land utilization

The land of all the six villages is majorly divided into four categories i.e. agricultural land, Non-agricultural Land, Wasteland and Water bodies. The percentage distribution of each is shown in this section.
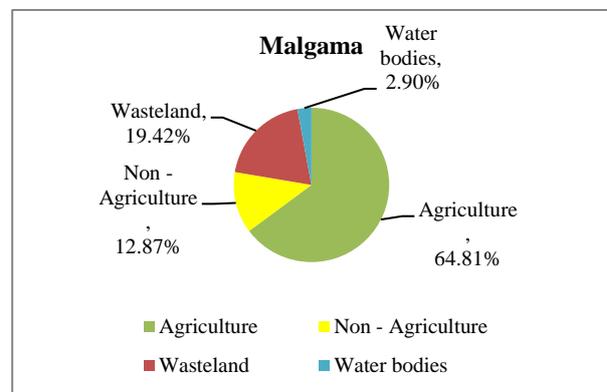
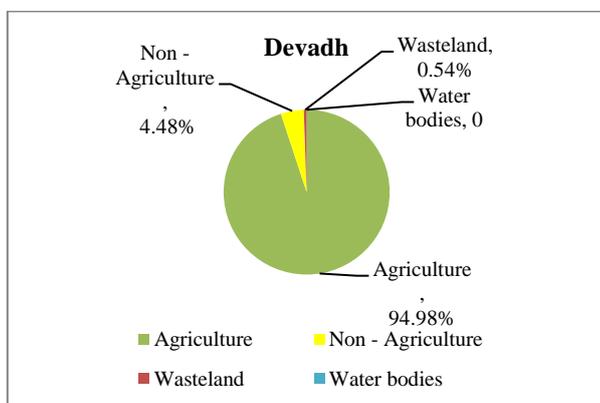

Fig. 8.Existing land use of Malgama
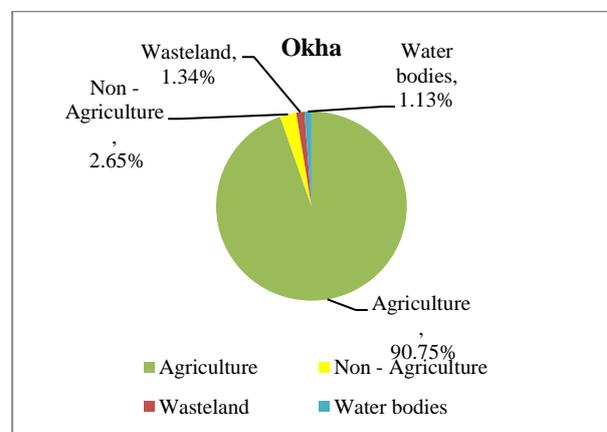

Fig. 6.Existing land use of Devadh
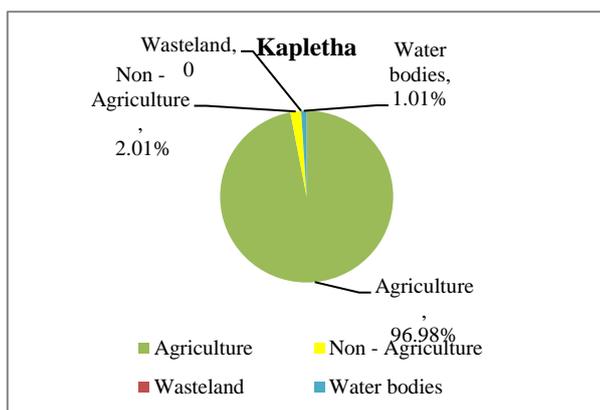

Fig. 9.Existing land use of Okha
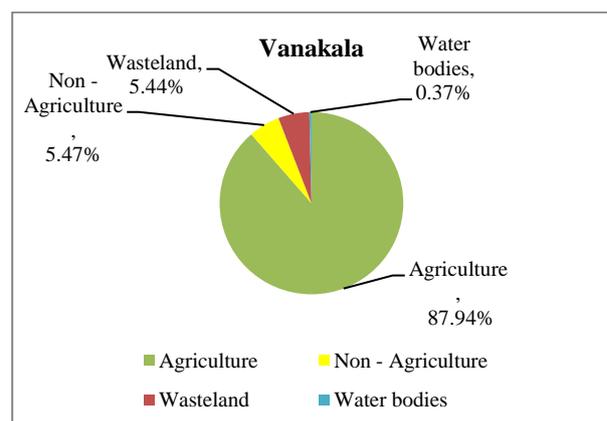

Fig. 7.Existing land use of Kapletha
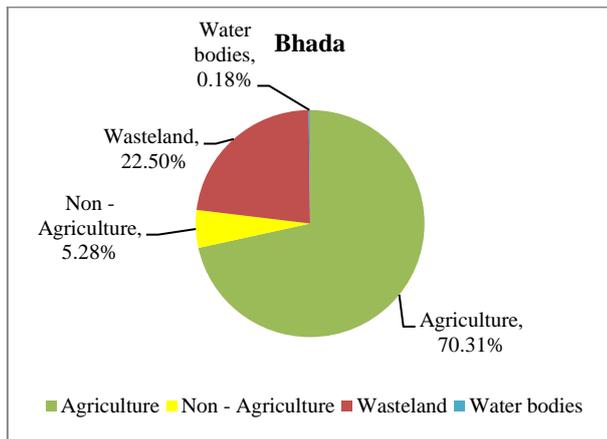

Fig. 10.Existing land use of Vanakala

Fig.   11.Existing land use of Bhada

From the above six village land use distribution, the comparative is made, which is then given scoring as the one having more percentage of agricultural land is scored 1 and the least is scored 6. Also for non-agricultural (NA), wasteland and water bodies, the scoring is reversed. The highest is given 6 and least is given 1, as the preference is given to the Khar or waste land, which need not be converted to NA and the existing NA land can be used for future development without randomly using the main cultivable land.
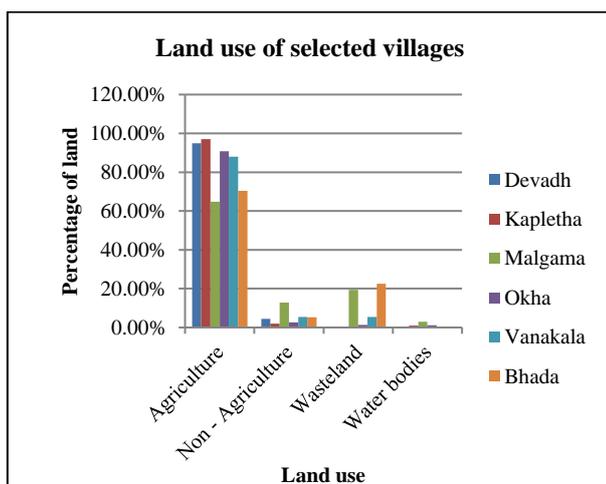

Fig.   12.Existing land use of all six villages

G. Average land value

The property value of each block of each village was acquired from the Revenue Department of Government of Gujarat. The standards of values are determined to have clear property rates. The primary four classifications of land use are taken such as Agricultural, non-agricultural, residential and industrial.

TABLE IV
Value of land as per jantri

Land Type village name	Agricultural Rs. Per m²	Non – Agricultural Rs. Per m²	Residential Rs. Per m²	Industrial Rs. Per m²
Devadh	1283.33	1125.00	2816.67	2816.67
Kapletha	1600.00	1450.00	3000.00	3000.00
Malgama	1830.00	1450.00	2073.53	1616.67
Okha	2350.00	2042.86	3113.24	3266.67
Vanakala	2850.00	1650.00	5500.00	5500.00
Bhada	2310.00	1600.00	1750.00	1900.00

(Source: Revenue Department, GoG)

Here for the land values, the weightage given is in the range of 1-5 where, 1 is the least value, and 5 is highest. The weightage is provided by interpolation taking the intermediate values. So accordingly, the least score suggest the best village. The villages are Malgama (6), Kapletha (6) and Bhada (7).

V. RESULTS & CONCLUSION

The simple weightage analysis method is used to give weights to each parameter and accordingly the average values of the district are considered as standard. Out of the three analysis i.e. Socio-economic, land utilization and land value, the best three villages for first analysis is Devadh (45), Malgama (41) and Bhada (40), from second analysis it is Malgama (23), Bhada (17) and Okha (16) and from the third, the villages are Malgama (6), Kapletha (6) and Bhada (7). Calculating the above scores as adding the first two analysis and subtracting the third analysis, score results as Malgama (58) and Bhada (50).Thus from the results, it is noted that the potential village selected is Malgama with the highest score seeking future development.

REFERENCES

[1] United Nations, The World's Cities in 2016 - Data Booklet, United Nations, Department of Economic and social Affairs, 2016.

[2] Directorate of Census Operations, District Census Handbook, Census of India, 2011.

[3] A. G. Pandya and p. S. S. Bhagat, "Planning Strategies for development of urban fringe of Surat city," *International Journal of Emerging Technologies and Innovative Research,* pp. 1519-1527, 2015.

[4] D. Singh and P. A. Vyas, "Planning Strategies for the Development of Peri-Urban Area," *IJSER,* vol. 5, no. 7, pp. 27-32, 2015.

[5] AUDA, "Revised Development Plan 2021," 2016. [Online]. Available: http://www.auda.org.in/uploads/Assets/rdp/Basemap-36X36.jpg.

[6] SUDA, "SUDA Proposed land use plans," 2013. [Online]. Available: http://www.sudaonline.org/development-plans/proposed-land-use-plans/.

[7] N. Goel, "Dynamic Planning and Development of Peri Urban Areas : A Case of Faridabad City," no. September, pp. 15-20, 2011.