ASSESSMENT OF GROWTH IMPACT ON REGION BY EXPRESSWAYS- A STUDY OF PILLU KHERA, HARYANA

Satyam[1], Manpreet Saini[2]
Student[1], Assistant Professor[2]
LSAD (Lovely school of architecture and design)
Lovely Professional University, Phagwara (Jalandhar), India.

Abstract: The frequent phenomena in Indian cities and towns are that they are developing along existing roadways as these areas undergo a quick trend of urbanization, resulting in the quick production of a series of urban complexes, which in turn degrades the healthy environment.

Pillu Khera is a village and Sub-tehsil in Jind district in Haryana. The Government of India proposed two roads first one being NH152D that will connect Narnaul to Chandigarh, other is Delhi-Katra expressway, connecting Delhi to Amritsar and Katra, and both are Interchanging at west of Ratoli village in Pillu Khera Sub-tehsil. Since the pace of development will increase because of mobilization of resources and traffic The Govt. is planning to develop an Industrial Corridor around NH152D so as to the delight of industrialist, its be locational advantage reduce the pressure on Delhi. So, area has great potential to developed. Since the primary occupation of locals is agriculture and due to associated costs of urbanization as compared to their agricultural income, people might shift from agriculture to other occupation. This will result in conversion of land for other purposes and subsequent unplanned development. People start moving to the area and it will pressure on the existing infrastructure.

1. INTRODUCTION

Development Control Regulations are a set of rules that are planned to ensure the proper and effective development of a city, as well as the general welfare of the public. Regulation is necessary to ensure planned development. It depends on a "plan-led system" whereas development plans are made and the public is consulted.

The common phenomenon prevalent in Indian cities and villages is found that these are expanding along the existing roads as these centres are undergoing rapid trend of urbanization which is leading to generation of series of urban complexes at a faster pace which in turn degenerate the healthy environment. Various developers, businessmen and investors find roadside as the most lucrative location for setting up of commercial and industrial establishment in order to extract more and more returns in relatively lesser time span.

Problems evolves namely: overloading of infrastructural facilities, certain Physio - socio and economic problems and overcrowding of city leading to congestion and chaos along the major roads thereby affecting the free flow of traffic. Though there are number of competent authorities who are functional at various levels namely national namely national level. But there has been little or no affect to rationally understand the cause of development along road and a result nothing has been done on ground and the situation is worsening day by day due to which the travel time has increased manifolds on account of series of accesses, mixed traffic etc. Hence there evolves need to carry out surveys and studies in order to know the factual position so that necessary strategies may be formulated for controlling the development.

1.1. Introduction To Pillu Khera

Pillu Khera (पीलू खेड़ा), is a village and Sub-tehsil in Jind district in Haryana. It is a newly-established tehsil (previously this village was part of Safidon tehsil). Some villages of Safidon tehsil were mingled with Pillu Khera tehsil and hence, the new tehsil came into existence. It is situated 18km away from sub-district headquarter Safidon and 24km away from district headquarter Jind. As per 2009 stats, Pillu Khera is the gram panchayat of Pillu Khera village. The total geographical area of village is 733 hectares. Pillu Khera has a total population of 3,761 peoples. There are about 697 houses in Pillu Khera village. As per 2019 stats, Pillu Khera villages comes under Safidon assembly & Sonipat parliamentary constituency. Safidon is nearest town to Pillu Khera and it is connected to Safidon and Jind via state highway 14(SH14)

1.2. NEED OF THE STUDY

Ratoli is village with population of 3738 people with an area of 1091 hectare and most of the population dependent on agriculture only. 60% people do agriculture in the village and Govt. proposed two transport links

I. Delhi-Amritsar-Karta expressway

The National Highways Authority of India has decided to construct a six or more lanes expressway between Delhi-Ludhiana-Amritsar-Karta with connectivity to Chandigarh It having an approximate length of 600 km (the "Project") including spurs through Public Private Partnership (the "PPP") on Design, Build, Finance, Operate and Transfer (the "DBFOT") basis. In this project govt. is going to take 5000 acre and 14000 acre of agriculture land in Haryana and Punjab respectively. It is going to pass near to Kilayat city and going to interchange with NH152D with Ratauli. Currently, govt. is giving compensation of land which they are going to taken

II. NH152 D (Narnaul to Ismailabad)

National Highway 152D (NH 152D) Expressway (also known as Trans Haryana Greenfield Expressway and Ambala-Narnaul Expressway) from Gangheri to Narnaul is a barrier-free access controlled tolled 6-lane (extendable to 8-lanes) Expressway in Haryana state of India. This 230 km long diagonal expressway through Haryana state, from Kurukshetra in northeast to Narnaul in southwest, it will start from the junction of NH152 near Gangheri and Ismailabad, pass through Kaul, Pundri, Dhatrath, Lakhan Majra, Kalanaur, Charkhi Dadri, and terminate at junction with NH148B at Narnaul bypass. Its straight-line Greenfield alignment will reduce the distance from the state capital Chandigarh to Narnaul and Jaipur while decongesting NH44 and NH48. Area around it is being developed as an industrial corridor.

Both links are going to meet in west of Ratauli village (as shown in Fig. 3) due to this the impact is going to be seen are-

- The pace of development will be increased so it is required to control the development
- It can be developed as industrial area because it connects the major cities (Delhi-Amritsar-Ludhiana-Chandigarh-Narnaul)

1.3. Advantage and need

Easy accessibility: The growth has a basic characteristic feature of a convenient accessibility, such as development generally abuts major circulation corridors and thereby provides straight access from the major road

Reduced trip length: The development constitutes of direct access from major roads, thus reduces the time consumed in travelling long distances to the reach their destinations.

Enhanced land value: the land value of such establishments abutting major roads increases as a very fast pace as compared to the hike in the land value of core areas. Soon after the development takes place the land values start on the increasing and hence become the best option for investment of real estate developers and the other promoters.

Conveniences for the road users: The development along the roads caters to the basic travelling needs for the road users; as such establishments provide services to them without travelling or leaving the major roads.

Both roads will act like the bypass of Delhi so the movement is going to be increased which will not only attract industrialist but also real estate's developers too. So Ratauli will be the prime location for developers.

1.4. Disadvantage and facts

i. **High cost of infra-structure**: the development leads to lengthy developed stretches which need to be provided with basic infra- structural facilities. As the linear distance increases the overall cost of the infra-structural facilities become expensive, thus making these provision un-economical and un-feasible. As a result, these areas are generally lacking in the infra- structural facilities which in turn hampers the equality of leaving of the area.

ii. **More prone to traffic hazard**: Development is more prone to traffic hazards as it has a direct concern with high-speed traffic and the establishments having direct access on the major roads without proper design measures prove to be quite un-safe.

iii. **Mixing of land use**: Development is generally not in accordance to the design proposals, as such developments arise out of the need and is according to the will of the developer. Since the development is not in a planned manner thus leading to mixing of various land uses and in turn gives birth to numerous problems associated to non-compatible land uses.

iv. **Speculation:** Development is the root cause of the increment in land values on the peripheral areas as the initial land prices in such areas are comparatively quite less. The speculation plays a negative role in hampering the development of any area.

v. **Urban sprawl and conurbation**: Urban sprawl and conurbation are the most prominent outcomes of ribbon development, which in turn affects the overall development of the area. Such as development becomes curse for planned development as neither considering such development for integrated development nor eliminating or bulldozing it at later stage seems feasible. Due to the construction of the linkages, people start moving via these linkages and there is no development regulation for the area. It means the resulting development will be Haphazard with no development control

2. Policies for development along roads

Towns and cities causing traffic and other issues with the development of cities traffic is increases. Parking vehicles along roadsides. Roadside encroachment large number of advertisement cause driver distraction and resulting in accidents. The loss of food producing land.

2.1. Policy Regarding External Development Charges, Change of Land use License Fees (17august 2007)

Funds are required to developed and maintain the infrastructure. But this policy proves to be against private developers as the amount of fees charged as development charge is very high, thus they opt not to pay these charges and go for un-authorized development. The policy is thus playing a negative role is in turn promoting un-authorized development along the roads.

2.2. Approval of Residential Colonies and Commercial Project Less Than Requisite Minimum Area (3april 2008)

The policy is good from infra-structural development point of view since funds are required to develop and maintain the infrastructure. Also beneficial for the private developers as they can get their unauthorized development regularized by merely depositing certain amount of fees. The policy. Promotes development since developers are of the view that they can develop colony anywhere and then will get it regularized.

2.3. Minimum Area Requirement for Setting Up of Residential/ Commercial Colony (18 June 2009)

The policy proves to be very beneficial for the private developers since area of the project reduced to 25 acres. Also good from the point of view of planning principles since concept of integrated township to be followed. The policy promotes development since tract of 25 acres is easily available for developers to develop it as a town ship along major road.

2.4. Conclusion for government policies in Haryana

The different type of acts like according to "The Haryana scheduled roads and controlled areas restriction of unregulated development act, 1963" the development will not come up to the 50 meters along the road and 150 meters along the by-pass but on the ground reality the act was not implemented on the ground because some policies and act are promoting the ribbon development along the road with the payment of some charges like EDC and CLU for the development purpose. The development along the road is restricting by the national highway act at national level and it's demarked the boundary line to control the ribbon development. Some policies are promoting ribbon development since developers are of the view that they can develop any sort of project anywhere and then will get a regularized and to regulated the development along the road. In case of Panipat the Delhi roads are maximum development is industrial and maximum residential colonies are coming and developed in this. Takes care of the ribbon development in the context of Haryana No person shall or re-erect any building or make or extend any excavation or layout any means of access to a road (within 100m on either side of the road reservation of a bye pass or within 30m on either side of the road reservation of any scheduled road not being a bypass.)

3. Factors impacting the growth in Pillu Khera

3.1. Land price

In Ratoli and its surrounding villages or area had priced of 15 lacs. Per acer for agriculture land and 2000rs per gaj. After the proposal of NH152 d and Delhi-Katra Expressway, land price of the area has increased and interchange of both linkage is in west of Ratoli which increased the price of land like for agriculture it is 3o lacs and for residential plot it is 5000rs per gaj when we start moving away from interchange land price start decreasing from 30lacs to 25 lacs for agriculture and for Residential, it is from 5000rs to 4000rs per gaj. Similarly

Surrounding the WYC canal is high and as we start moving away from it, it start decreasing (as shown in fig 3). Red circle is showing the area which has highest value of land like for agriculture it is 30 lacs Rs. per acre and for residential it is 5000rs per gaj when we start moving out from it the land price start decreasing. Land price show the impact of development on the area means, the area whose land price is increased, that area is going to impact from that development or project so similarly in this case, the area whose land price is increased can be taken in Controlled area as shown in Fig 2.

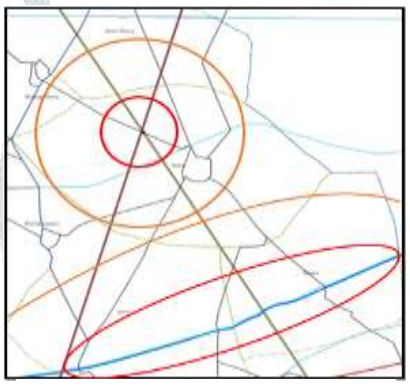
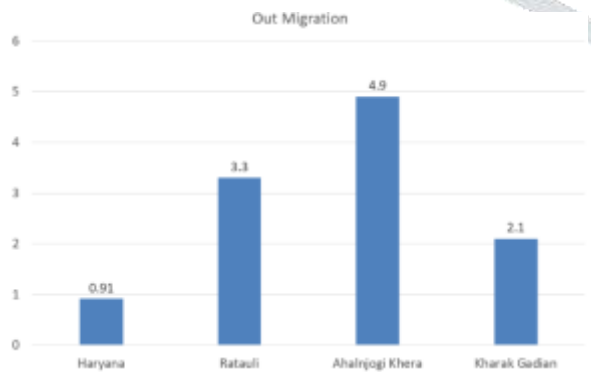


Figure 1 - Showing land price

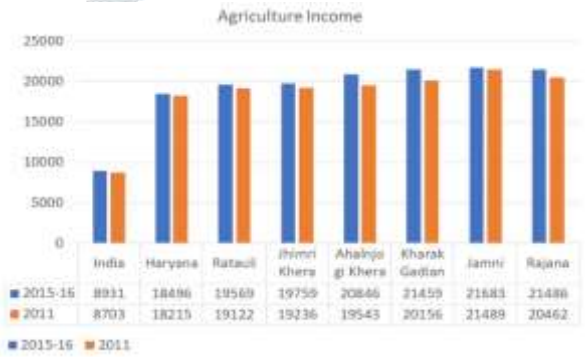
3.2. DEMOGRAPHIC PROFILE

In the controlled area total population is 7357in which only Ratoli has 3728 and in Kharak Gadian and Ahalnjogi is 1989 and 1056 respectively and other three villages Rajana, Jamni and Jhimri Khera has agriculture part only in the controlled area as shown in fig. 2. In addition, population growth theses villages are showing is 20%. And S.C population in Ratoli, Ahalnjogi and Kharak Gadian is 642, 354, and 420 respectively.

No. of Household in Ratoli is 662 and 327, 381 in Ahalnjogi size and population.



Graph 1 showing the out migration



Graph 2 showing the agriculture income of people in the village with respect to surrounding villages and Haryana

3.3. Land use

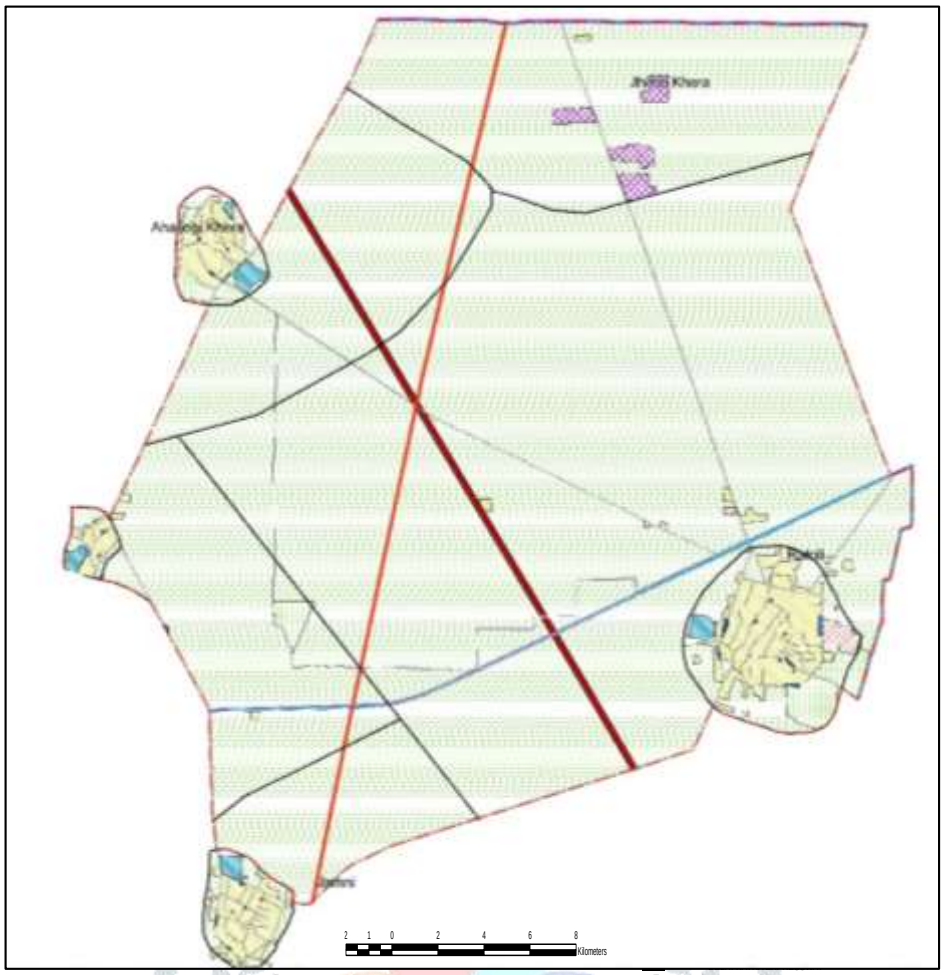


Figure 2 Land use of control area

Total area of the controlled area is 2697 Hectare or 26.97 sq. km and the control area have five villages as shown in Fig. 11 and

Table 1: - Showing the area of villages in Controlled area

Village Name	Area(Hectare)	Area In controlled area
Ratoli	1091	1091
Jhimri Khera	489	329
Ahalnjogi khera	305	96
Kharak Gadian	638	128
Jamni	964	594
Rajana	795	459
Total	4282	2697 or 26.97 sq. km

Table 2: - Showing Land Use Distribution

Land use	Area(Hectare)	Percentage
Residential	183.39	6.8
Barren land	97.09	3.6
commercial	0.53	0.02
religious	8.09	0.3
institution	13.48	0.5
ponds	32.36	1.2
Canals	80.91	3
Agriculture	2043.7	75.78
Circulation	196.8	7.3
other	40.45	1.5

Table 1 and Ratoli is the village which consist more area than other villages which is 1091 Hectare and as shown in Table 2, Agriculture is the prominent land use which is 82.88% in the Controlled area as shown in Table 2 then followed by circulation. Agriculture is income source for the villagers.

3.4. ENVIRONMENT

Humans, animals, and plants live in the natural world, which includes soil, air, and water. According to the CGWBR (Central

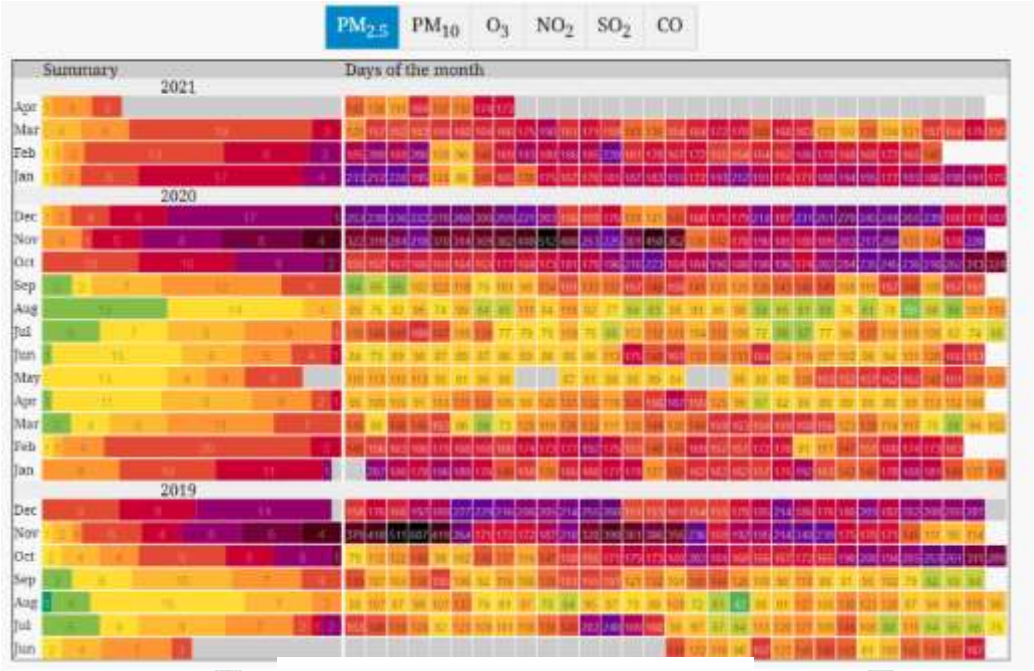
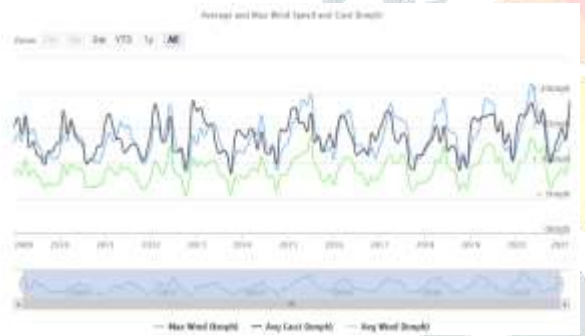
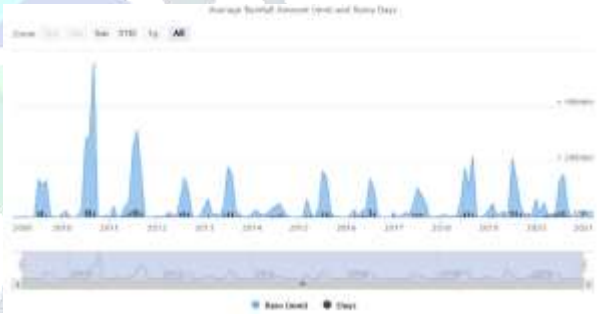


Figure 3 Showing air pollution level in the

Ground Water Board report 2013), underground water in three blocks, Alewa, Narwana, and Safidon, is over-exploited. Ground water is critically depleted in just one block, Jind; and semi-depleted in three blocks, Julana, Uchana, and Pillu Khera. None of the district's blocks are considered secured. The values of electrical conductivity (EC) are measured. According to the standards of the Central Ground Water Commission, 40% of the samples were fresh groundwater with a scale of 1500S, and 60% of the samples were salt water. Ground water is mostly useful for irrigation, though in certain regions, it is also suitable for drinking.
The pollution is the major problem in the area because due to the bad road condition and construction activity which put the Jind on the 12th most polluted city in the world.



Graph 3 Graph Showing the wind speed



Graph 4 showing average rain fall 2009-21

Graph 4 showing the rain pattern in Pillu Khera which indicates the decrease in rain fall like in 2010 it was more than 500mm but 2020 it decreases to 210mm which indicates the change in environment which is due to increase in pollution in the area as shown in Fig 3 and it will impact on the vegetation of the area, ground water also and people will have to focus on alternative recourse of water. Graph 3 showing the wind speed which has the average of 15 Kmph.it will help the Finding of location for the industries and STP, ETP and solid waste management center.

3.5. GROWTH PATTERN

It means the change in the boundary of area it can be city or village due to the facilities inside those area or outside of it. It also

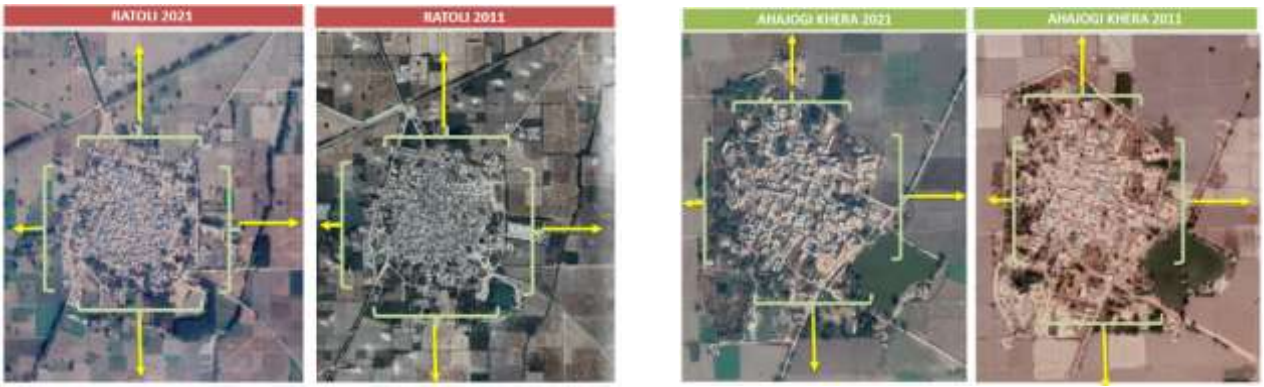


Figure 4 Showing growth pattern of villages

impacts on the population of the area. In the urban area it is due to because of facilities and people are moving from rural to urban area because of the facilities same with the rural area if a facility comes near to a village the growth of direction will be towards it and people from the nearby area start migrate to that village

Fig 4 is showing the growth in all direction. The villages don't have any special direction of growth because of the location of villages is far away from any facility that's why they are not showing any particular direction of growth but after the construction of interchange of NH152D and Delhi- Katra expressway, the growth direction will be towards it because of the job which will created by the interchange due to movement of traffic in these routes

3.6. Transport

The transfer of people, livestock, and goods from one place to another is known as transportation. To put it another way, a transport activity is described as a certain movement of an object or entity

from point A (a location in space) to point B. Air, land (rail and road), power, cable, pipeline, and space are all modes of transportation. Study area is connected with village roads only whose width is 8m, the main MDR are at around of 9 to 10 km from Ratoli village.

The poor condition of Roads puts Jind on 12th most polluted city in the world which is at 12 km away from the study area which result in poor transportation of goods leads which takes lot of time.

Mode of transportation is private around 67% people are dependent on it and 33% is dependent on public, there is bus stop in the village via this people travel from here to another destination. There is no other source of public transport the nearest railway station is at 8 Km which is in Pillu Khera.

The upcoming transport network will increase the connectivity and will connect study area with major cities (Delhi-Chandigarh-Ludhiana-Narnaul)

Figure 5 Showing 8m wide road in Bad condition

3.7. Industry

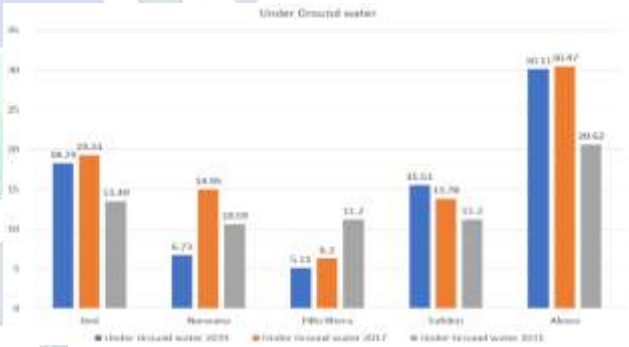
A collective of suppliers or companies who produce a certain type of product or service is referred to as an industry. In the study area there is only 4 bricks clin which is in the North direction of Ratoli which comes in the small industries and these industries are contributing in the pollution of the area.

Figure 6 showing bricks Kiln

3.8. Water availability

Water is main part of our daily life and in Ratoli, the source of the water is underground water and WYC canal which is located around 3km away from the villages in Jamni villages and other then WYC, there is also small canal in Ratoli itself which is basically the sub-branched of the WYC and also the other branched is also going to different part of the controlled area.

Underground water is available in this area is around at 5.11m depth as shown in graph 6. In addition, graph is showing the increase in the ground water because of WYC canal the underground water is recharging. In 2011, Pillu khera was the part of Safidon block and water level in Safidon was low which 11.2 because of it, the water level was low in Pillu khera but when Pillu khera become block, there you can see a huge difference in underground water and in 2019 water level reach to 5.11m depth because of it. now it lies in semi critical area



Graph 5: - Showing underground water

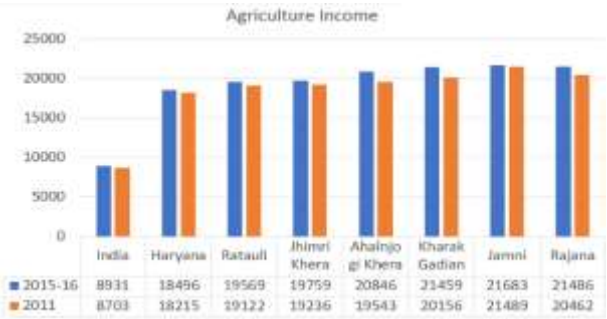
According to the CGWBR (Central Ground Water Board report 2013), underground water in three blocks, Alewa, Narwana, and Safidon, is over-exploited. Ground water is critically depleted in just one block, Jind; and semi-depleted in three blocks, Julana, Uchana, and Pillu Khera. None of the district's blocks are considered secured.

The values of electrical conductivity (EC) are measured. According to the standards of the Central Ground Water Commission, 40% of the samples were fresh groundwater with a scale of 1500S, and 60% of the samples were salt water. Ground water is mostly useful for irrigation, though in certain regions, it is also suitable for drinking.

3.9. AGRICULTURE

Agriculture means growing the crops for livestock and in the study area, which is Ratoli, 60% of the population is dependent on the agriculture means it is source of income for them and in the controlled area, 75% land is agriculture land.

The area is highly suitable for agriculture because of the water availability in the area which come from underground water and WYC and 42% of people use canals water and rest of them 58% use underground water. Because of the favorable condition in the area, the cropping intensity is 199and people use to grow crop like rice, which require lots of water before the construction of WYC, people used to grow crops like Bajra, Chana etc. that require less water.



Graph 6: - Showing the agriculture income compared to India and Haryana state

In the Ratoli use to do monoculture and live sock farming and 59% of people use certified seeds in the agriculture and 85% people use tractor as agriculture toll but rest 15% people use tradition tools to do agriculture but due to the increase in family size, the land holding is decreasing as shown in graph 4 which results in people are leaving this sector and start moving in another sector. In the study area, the income of people is high compared to whole Haryana as shown in graph 8.Acc. To govt. report, there is increased in income of agriculture but in reality, due to increase in family size its increase is negligible.

STRENGHT

- The area Agriculture income is more then state
- More than 60% people depend on agriculture
- slope is less then 5% means area is flat
- There is green so development will be easy
- Resources are available in sufficient amount like waster labor.
- There is SH in north and south direction and railway station is also there so there is good connectivity
- Due to construction of NH152d, land price has increased

OPPORTUNITY

- Flexibility in mobility in workforce
- Development of local industry, agriculture and handicrafts
- Better approach to Medical & Educational services
- Untapped potential rural markets offer a great potential
- Employment opportunity to people.
- Opening up of opportunities for new occupations
- The development of agricultural belt and agro-based industries will help in reduction in migration from rural to urban area by strengthening the rural economy.

WEAKNEENS

- Due to construction , its impacting the area with air and noise pollution.
- Income in agriculture is not increasing but cost of living is increasing so there is out migration.
- There is no regulatory framework and polices
- Industries will impact the agriculture area

THREATS

- Due to increase in land price, effecting the rent price that's its become for LIG to take or earn money.
- In the upcoming time, green field will convert into brownfield which environment.
- Industries will impact on water.
- Theft of panel and equipment

4. SWOT ANALYSIS

4.1. PROJECTION

Table 3 Showing population projection for 2041

Population 2041	Water Requirement		Solid waste generation		Sewage generation	
	Standard	Required	standard as per CPCB		Standard as per CPCB	
14382	135 LPCD	1.94ML/D	0.1 per person for small city	1438.2 Kg per person per day	80 % of water used by person	1.56 ML/D

acc. To 2011 the total population is 7303 and population growth is 12.13 and by doing the A.P and G.P method for population and average of both is coming 11063 but due to project, the population is going increase by 30% in reference to Gurugram which face the total boost of 70% in the population and the final population for Ratoli will be 14382 in 2041

Table 4 showing the requirement of water and solid and sewage generation

Village name	2011	%age growth	2001	%age growth	1991	A.M (2041)	G.M(2041)	Average (2041)	Expected increases in growth rate	Final Population
Ratoli	3728	12.13	3325	21.36	2740	5340	5891	5615	30%	14382
Ahalnjogi Khera	1295	12.15	1155	21	952	1855	2047	1951		
Kharak Gadian	2280	12	2033	21.5	1675	3268	3607	3497		
Total	7303		6513		5367	10463	11005	11063		

as per the standard, the requirement of water for one person is 135lpcd so requirement of water in Ratoli will be 1.94ML/d and as per standard of CPCB, 80% of water will be sewerage so the sewerage generation will be 1.56 ML/d and solid waste generation will be 1438.2 Kg as per CPCB standard, 0.1Kg per person for small city

Table 5 Electricity Requirements

Electricity			Required electricity
Consumption @ 1.76 KW Per persons	14382		1.76*14382 =25312 KW
Total substation required		Population required (2041)	Substation required as per population required
One electric substation @11 KV for 15000 Population		14382	14382/15000=1

Figure 6: Projection for Public Toilets

Sr. No.	Name	Population	Public Toilet			
			No. of Existing Infrastructure	Norms and stands of banks with encounter and atm / Served population	Required as per total population	Deficiency /surplus
1.	Ratoli	14382	0	300 to 500		28

as per the standards, consumption of electricity is 1.76Kw so electricity requirements will be 25312 and to complete the requirements there is need of one substation and same for public toilets there is requirements of 28 Public toilets as per URDPFI standards

Table 7 Projection for Health care infrastructure

Sr. No.	Name	Population	PRIMARY HEALTH CENTRE				DISPENSARY			
			No. of Existing Infrastructure	Norms and stands of banks with encounter and atm / Served population	Required as per total population	Deficiency /surplus	No. of Existing Infrastructure	Norms and stands / Served population	Required as per total population	Deficiency /surplus
1.	Ratoli	14382	1	1000-5000	3	-2	1	15000	0	-1

As per standards there is requirements of 2 primary health center and 1 dispensary because one primary health center and dispensary is already in Ratoli

Table 8 Projection for Fire station and Sub station

Sr. No.	Name	Population	Fire station				Sub Station	
			No. of Existing Infrastructure	Norms and stands of banks with encounter and atm / Served population	Required as per total population	Deficiency /surplus	Standard	Required
1.	Ratoli	14382	0	2 LAKH	0	0	15000	1

as per the standards, there is the requirements of one substation which is for the population of 15000.

Table 9 projection for Police station, police line and police chowki

Sr. No.	Name	Population	POLICE LINE				POLICE STATION				POLICE CHOWKI			
			No. of Existing Structure	Norms and standards / Served population	Required as per total population	Deficiency /surplus	No. of Existing Structure	Norms and standards / Served population	Required as per total population	Deficiency /surplus	No. of Existing Structure	Norms and standards / Served population	Required as per total population	Deficiency /surplus
1.	Ratoli	14382	0	20 LAKH	0	0	0	90000	0	0	1	20000	1	1

As per the standards, there is no the requirements for police chowki in the controlled area

Table 10 Projection for Banks and ATM

Sr. No.	Name	Population	BANKS				ATM			
			No. of Existing Infrastructure	Norms and stands of banks with encounter and atm / Served population	Required as per total population	Deficiency /surplus	No. of Existing Infrastructure	Norms and stands / Served population	Required as per total population	Deficiency /surplus
1.	Ratoli	14382	0	15000	1	-1	2	1500	10	-8

As per the standards of URDPFI, there is requirements of one bank and 8 ATM in the controlled area

4.2. SOLUTIONS

Development Control Regulations are a set of rules that are planned to ensure the proper and effective development of a city, as well as the general welfare of the public. Regulation is necessary to ensure planned development. It depends on a "plan-led system" whereas development plans are made and the public is consulted.

so, by providing regulations, unplanned development can be restricted. a controlled area can be marked in which zones are divided on the basis of the characteristics of the area which will provide a place for developer to established their business instead

of spreading in large area because by developing area, migration of people from Rural to Urban area can be checked. It will act as counter magnet to people who are moving to NCT for Jobs.

5. CONCLUSION

Ratoli is a small village which has limited resources and most of the population is dependent on the agriculture that's why people are moving out of the village and the upcoming projects NH152D and Delhi Katra expressway will put the pressure on the resources Like this area will the prime location for investors and DCR will regulate the development so that it will not put the pressure on the resources because Development Control Regulations are a set of rules that are planned to ensure the proper and effective development of a city, as well as the general welfare of the public. Not only Ratoli, it the common phenomenon prevalent in Indian cities and villages is found that these are expanding along the existing roads as these centers are undergoing rapid trend of urbanization as a result the environment gets completely deteriorated by coming up of ugly structure

6. REFERENCES

- Baltri, M.S., (1963), Cities and Spaces-The Future Use of Urban Land the Johins Hopkins press,1963
- Catherine B.W., (1976)' The Form of Structure and Future Urban Complex," in lowdon wingo
- Kahir sagar/ Pawan kumar, J.B., (2007), Peri Urban Area Spatial Planning For 56 Town Country Planning Congress, ITPI
- Urban area and their implications on Urban growth 56 national town and country planning congress ITPI
- Indian roads congress;(1996) development along and highway its prevention-new Delhi
- Development along highway and U.S. prevention (1974) Indian road congress new Delhi
- Rangwala, R.S. (1989) Land Use Planning In Urban Area, State institute for urban development
- Wilfes, R.I., (1964), Development and Traffic Flow; traffic quarterly volume1
- Wilfes R.I (1964) Development and Traffic Flow; traffic quarterly volume2
- Policy Regarding External Development Charges, Change of Land use License Fees (17august 2007)
- 3april 2008, Approval of Residential Colonies and Commercial Project Less Than Requisite Minimum area
- 22 December 2010, Policy of Minimum Area Required For Setting of Residential/ Commercial Colony Outside GMANDA