Smart And Sustainable Indian Village - Urbanizing Achheja Buzurg

Arvind Kumar[1*], RameshBabu Chandran[2], Deepak Kumar Soni[3]

[1]Research Scholar, School of Civil Engineering, Galgotias University, India
[2]Professor, School of Civil Engineering, Galgotias University, India
[3]Head of the Department, School of Civil Engineering, Galgotias University, India
*Correspondence: E-mail: karvind151@gmail.com

A B S T R A C T

The 69% population of India lives in villages and 31% in urban areas. The population from villages is migrating towards urban areas in the view of quality education, infrastructure, employment, sophisticated life and modernized living. Also the villagers move towards the urbanization facing problems in transportation, insufficient water supply, poor drainage system and health related problems due to lack of sanitation. This could be prevented only when the villages are urbanized and the development of rural areas could be attained only when Aadarsh gram (ideal village) and Swaraj (self-reliance) are implemented as stated by Mahatma Gandhiji. The rural – urban gap was first addressed in India by Dr. Abdul kalam who framed a system of PURA (Providing Urban Amenities in Rural Areas) for urbanizing rural areas along with IIT(Indian Institute of Technology) professors in 2004. Based on this initiative, the Uttar Pradesh Government had proposed “Smart Village” in the area of NCR. This article narrates the urbanization of the village Accheja Buzurg in NCR (National Capital Region) located in Yamuna Expressway. The research paper further describes the transformation of the infrastructure and facilities using the schemes “I-SPARSH Yojana”, “Janeshwar Mishra Gram Yojana” and “I-CHAUPAL”. The village stands as an ideal as sustainable and smart in the YEIDA locality where the schemes are being implemented to other villages of Uttar Pradesh,

1. INTRODUCTION

The word SMART has no clear and established definition, although it has been pointed out to be the development along with ideology of sustainability to provide the occupants with high living standards and quality services enabling the usage of personal and working time (Balco et.al, 2021). In the process of transforming the cities and towns to intelligent ones, most of the municipalities fail to transform the villages into smarter. To upgrade the social, economic, and political support of the villagers, it is essential to show interest in converting them to smarter ones as the smart rural environment will lead to country's economic growth as the researcher (Balco et.al,, 2021) urges. The European commission suggests that SMART villages would be the communities that would expose smart solutions to the challenges faced by all age groups living in villages. The end of disparity between the urban and rural areas had been the modernized trend as per world social report in 2021 thereby improving the quality of the living standards. The rural development had been the priority of Indonesia's development plan in 2020 – 2024 (Hilmawan et.al, 2023). The government developed village fund policy for community development and empowerment. The Indonesian government further creates an index to monitor the rural development. The index score would categorize the status of the village as stated by independent, advanced, developed, and under developed. The researcher (Hilmawan et.al,2023) points out that more money need not be more development. Further planning and execution is necessary for the utilization of village fund and development of index. The integration of green environment and digitalization for developing sustainable village is a challenge to human resources, economy, sustainability, and corporate growth (Ayu et.al, 2023). Further the author states that the corporate has the responsibility for sustainable development of the smart village after digitalization. The digital village may stay as a responsibility in enhancing the knowledge and make them compete with business and welfare of the occupants. The author narrates that Indonesia had emerged as a nation of gaining 6% growth in economy within 15 years by support of industrialization. The financial economy had been recovered. About 20.7% economy had been contributed by the industrial development which had put the nation as the 10^{th} largest power in purchasing. The rural communities are generally meant for food production, developing natural resources, sustainable activities on protecting the land resources, natural

landscapes and recreation .(Jakobsen et.al,2023). The rural communities face challenges due to globalization and urbanization leading to lowered GDP and infrastructure thereby leading to failure in access to employment. There exists eight SMART technologies (Jakobsen et.al,, 2023) i.e., smart city, smart community, smart health, smart farming, smart tourism, smart mobility, smart governance and smart energy. (Bogataj et.al.,2022) The smart villages would be the future solutions in European rural areas and to reverse the depopulation. Since the younger people start migrating towards cities and towns owing to employment and other reasons, it is a necessity to prevent this and protect the rural population. There exist a need for research on rural age-friendly environment. (Bogataj et.al, 2022). Subsequent research must be done for developing SMART village including benefits for older age population and attractive scenario of the younger population with improved educational infrastructure and employment opportunities. The IoT has influenced the cities which improves the citizen's experience along with economy, environment, governance, and mobility. (Pedro Flores – Crespo et.al, 2022) The researchers claim that the smart tourism had been dominating fields such as health care, transportation, and logistics. Some of the regions may be susceptible to over tourism leading to harmfulness. The ICT impacts the daily life of citizen and promotes betterment (Pedro Flores-Crespoet.al, 2022). Small villages face challenges due to reduced size and defective infrastructure which needs to be upgraded with SMART village concepts. (David Bogataj et.al, 2022) The European researchers state that the smart village of European concern would be based on revitalizing the rural areas with digital transformation using sensors, robotics, block chain, AI and ML. Further the author elaborates the silver villages would be provided with digital platform for ageing rural populations and provide a boom in silver economy of rural areas. The development in energy infrastructure, digitalization, and modernized agriculture would be a boon to older population in rural areas. The technology of SMART village would enhance the older adults in villages who experience difficulties in using everyday technologies and upgrade them with smart tools (David bogataj et.al, ,2022). Smart rural health care would be provided for the dispersed rural populations and may be at par with WHO age-friendly villages. (David Bogataj et.al, 2022). The inclusive economic growth and social justice had been the main priority by the successive governments in India as studied by Navaljit Kapoor

et.al.,(2021). The information provided by the author elaborates that the tribal population in India accounts for about 15% as categorized. The tribal community development had become the target of the government planning authority to preserve their traditional living, dispersion of population etc., as stated. The ministry setup on 1999 accounted for development of the ST, by various acts and rules laid upon. The Ministry of Tribal affairs (MoTA) had been involved in development of North Eastern region for overall policy, planning, and coordination of the programmes. It identified the 1,50,000 tribal villages to be brought under development , protecting and sustainability of the tribal population. (Navaljit Kapoor et.al, 2021). The climate smart agriculture (CSA) (Renata et.al.,(2019) would be an achievable sustainability ending up with zero hunger, protecting land degradation, terminating poverty and sufficient methodologies to handle climate change globally. CSA would pronounce enhanced food productivity as well as keeping the village with developed facilities. It would further provide food security and lead to sustainable development in productivity and income of the villages. This CSA global phenomenon had led to reduced greenhouse gas emissions as researched by Renata et.al, 2019. The idea of smart villages and smart cities in India emerged from past decade by model proposed by Dr.Abdul Kalam. The urbanization of villages leading to smart villages or smart cities had become the celebrated idea of 20th century as quoted by the researchers (Varghese, 2016) in the following context. A vast population from villages migrate toward the cities leading to urbanization and the major reasons being secondary and tertiary developments. The global urbanization would be 70% by 2050. But in Indian context the value stands around 31% only. But India still has a pride from villages as the nation has agriculture as basic livelihood. Varghese (2016) further states that the migration to urban regions from villages may be due to polluted air, poor water supply, poor electricity facilities, health problems, poor hospital facilities, lands becoming sterile and other natural calamities such as flooding and convenience for residents in cities. Hence to prevent this migration, the late President of India Dr. Abdul kalam proposed the concept of “Providing Urban Amenities in Rural Areas” (PURA) along with IIT professors (Varghese, 2016). The centralized idea was to provide urban facilities in Indian Villages leading to smart villages. The progress of PURA establishes development of physical connectivity and electronic connectivity along with basic amenities such as 24/7 potable water, sanitary and solid

waste disposal and basic infrastructure (Varghese, 2016). This article narrates the transformation of the Indian village Achheja Buzurg in Uttar Pradesh by urbanizing plans of the Government.

2. INVESTIGATED AND NOTIFIED AREA

The total area of NCR (National Capital Region) is 55083 km^2. In UP (Uttar Pradesh),the NCR includes the areas of eight districts like Meerut, Ghaziabad, Bulandshahar, Bagpat, Hapur, Shamali, Muzaffar Nagar and Gautham Budh Nagar. In Gautham Budh Nagar, three Industrial Development authorities (Noida, Greater Noida, and YEIDA) are under infrastructure development. The total area of YEIDA (Yamuna Expressway Industrial Development Authority) is 274493 hectares which covers the districts Buland shahar, Mathura, Agra and Gautham Budh Nagar. The YEIDA area has about 1188 villages. The infrastructure building with sustainable environment and development of industries is processing at a fast pace. Fewer agricultural lands are utilized for industries, commercial and residential development leading to urbanization. The past villages were in between rural and urban life style. The existing infrastructure is an unplanned one and the village faces unemployment problem apart from agriculture. To resolve the addressed problem, the development authorities like Delhi Development Authority and Haryana Development Authority of NCR along with YEIDA has framed sustainable projects in the region chosen.

3 URBANIZATION

3.1 Preliminary Investigation

The villages chosen for the investigation and urbanization, lie along the Yamuna Expressway on either side, located in the Delhi National Capital Region (NCR). These villages had been under the frame of planned sectors of the YEIDA. The village Accheja Buzurg is located in the YEIDA Expressway as represented by the following figure 1.

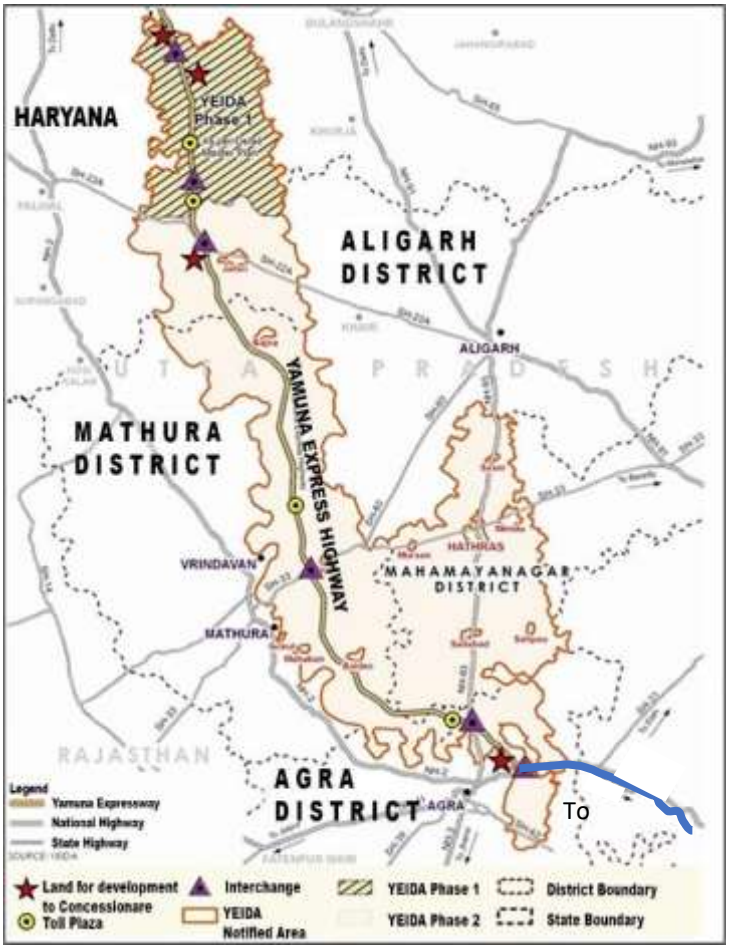

Figure 1 Districts under YEIDA

The profile of the villages under YIEDA was investigated in detail by the government authority and a Detailed Project Report (DPR) was made framing Project development, base map preparation, drone survey, infrastructure gap assessment, utilities and facilities plan, landscape plan, project identification and project cost estimation. The DPR included the existing situation analysis based on implementation of the structure which focussed on primary data and secondary data, field investigations and surveys, demand projections for assessment of current and future requirements, review of policies to assess if there is any need for policy level change for the implementation of the proposed project in the village. Apart from these, detailed project report included project overview, project cost, funding, internal revenue projections, service levels, implementation model, infrastructure requirements and work plan.

3.2 Existing Infrastructure of Accheja Buzurg

The Accheja Buzurg is located in the right side of the YEIDA as represented in the figure.1 . The existing population index and the predicted one are represented in the following table 1.

Table 1. Population Index

Achheja Buzurg	
Year	Population
2011	2110
2018	2134
2021	2144
2031	2179

The decadal growth of population was estimated to be 1.63% as per the latest sensex report. Achheja Buzurg has no existing networks of the physical iinfrastructure components as water supply, sewage, sanitation, drainage, solid waste management, parks, playgrounds and street lighting etc. However, electricity and an essential road network has been provided to all the villages. The villagers are dependent on ground water for all their daily needs. Unchecked use of bore wells in the village is leading to depletion of water table. Few households have installed RO systems to purify water for drinking. There is no effective system for drainage. The villagers are dependent on septic tanks for the disposal of sewage as there are no sewage lines. Untreated wastewater is disposed in the open spaces that would infiltrate and contaminate the groundwater. There are insignificant cases of open defecation, as villagers seem to be aware of basic hygiene. There is absence of community toilets in the village. The village receives an irregular and low voltage supply of electricity through the network of open cables as depicted in figure 2. Most of the installed solar lights are not functional, leading to poorly lit streets.

Figure 2. Transformer

There has been no effort to manage Solid Waste which is thrown or dumped in the corners, streets and other vacant sites. The area is connected through a basic network of roads accessed through Yamuna Expressway. The interior roads of the village are laid using cement concrete interlocking pavers, flanked by open drains. There are very basic market facilities in the village which are run by the villagers themselves. There is no Government Primary Health Center operational in the village. Also, no private clinics are there which can offer first aid to the villagers. The village has operational Government Primary and Middle Schools. The toilets in most of the schools are not functional and were found vandalized in most places due to the absence of the school boundary walls. Government child care centers called “Anganwadis” are operational in the village as represented by figure 3. These are being run from school buildings. Other basic healthcare facilities required for the maternity services were not found in the village.

Figure 3. Anganwadi facility

The Anganwadi scheme was launched in 2012 by the Uttar Pradesh government with an aim of equipping rural areas with better infrastructural facilities. The salient features of Janeshwar Mishra Gram Yojana are discussed in table- 2.

Table 2 Janeswar Mishra Gram Yojana

Year	**Essential infrastructure facilities for rural area**	**Villages Selected**
2013	Cement Concrete Roads	1488
2014	Drainage System, & Drinking water facilities	1458
2015	Electricity & Solar Panels	2015

3.3 Existing and Prevailing Schemes

The process of developing smart villages require assessment of existing policies and requirements of the villages. The

policies drafted by the central and state government are discussed as follows:

It has been stated in the government order that the needs of the villages, notified under I-SPARSH, shall be fulfilled by the use of basic and advanced solutions. Work is allotted to UPDASP (Uttar Pradesh Diversified Agriculture Support Project) on a mission mode basis. The Government order is based on the I-SPARSH Yojana launched in the state of Uttar Pradesh on 2016 to create a smarter and sustainable model for its villages, to maintain a direct synergy between the villages and the government UPDASP shall undertake the "I-SPARSH Yojana" launched in Uttar Pradesh on 30th March, 2016, for understanding the relation of smart, sustainable modern villages and help maintain synergy between village stakeholders and the government. The primary focus of the scheme " Janeshwar Mishra Gram Yojana**",**is on rural development as it aims to increase the rankings of the Human Development Index (HDI) across numerous villages in UP along with qualitative enhancement of the standard of living in rural areas. Eight villages in Gorakhpur district of Uttar Pradesh were selected initially under the scheme. This scheme was launched in 2012 by the Uttar Pradesh government with an aim of equipping rural areas with better infrastructural facilities. Under this scheme, each village is sanctioned 40 lakh rupees for various development projects. All villages will be covered under I - SPARSH Yojana launched by the Government of Uttar Pradesh.

4. RURAL INNOVATION DEVELOPMENT: TECHNOLOGIES FOR SMART VILLAGE

The proposals for developing Achheja Buzurg as a smart village or an urban village, are in the form of smart interventions which would use digital technologies to provide villagers with access to many things such as medical and transport facilities, skill development opportunities, etc. These interventions are to be done largely at a social level, for which Yamuna Expressway Industrial Development Authority (YEIDA) does not have in-house capability. It is therefore suggested that these be implemented through a smart agency monitored by a Non-Governmental Organizations (NGO) or the Corporate Social Responsibility (CSR) arm of a large company, whose objectives are aligned with these proposals. A tentative costing is given with each of these smart interventions. However, the sizes, location, quantity, specifications will vary as per the implementing agency. Monitoring parameters and

benchmarks will need to be set up and reviewed every 5 years with a minimum operation cycle of the same period. Moreover, these interventions require use of smart technologies which are changing or being updated every two years. Overall costing for interventions has been minimized by sharing of facilities with other villages and sectors. Cluster based approach has been adopted for economies of scale. It is hoped that all villagers can become self-reliant in 10 years.

4.1 I - Chaupal

The flowchart of I-CHAUPAL is shown in figure-4 and its features are: I-CHAUPAL will be the centre of information gathering and sharing. It will monitor various activities like Solid Waste Management, Water network, linkage, easy commuting, medical facility, recreation, employment, etc.. I - CHAUPAL will be equipped with computers, printers, internet service , projector, UPS and will be manned by a technical staff. I- CHAUPAL will also provide information about Wi-Fi and CCTV coverage in the village. I-CHAUPAL will provide information about mobile medical van facility in village clusters, various government offices, banks, train ticket booking, etc. I-CHAUPAL will also enable the Skill Development Council and its affiliated organizations to reach out to the youth in the village for their skilling, training and employment program. I-chaupal is also like a central information system for a village. It will also globally connected to other many village I- chuapals. It will provide information regarding school, college, hospital, banks, technical education, training programme and vacancies in different Industries, which will help villagers for different activities, education, Health and employment.

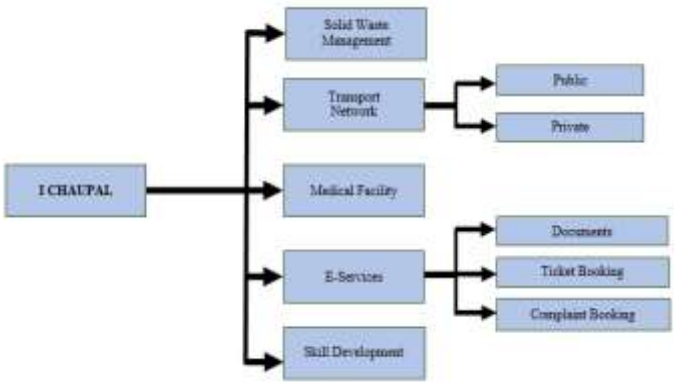

Figure 4- Flow chart of I-CHAUPAL

4.2 Barat Ghar

A community hall / barat ghar will be very useful for the villagers. The space can be in the center or at the periphery of

a village. The building should have a large multipurpose hall with toilets, cooking area and store. Some rooms on the first floor can be rented out during a wedding or an event. For the upliftment of the villagers, following activities could be conducted here – 1) Skill development workshops, 2) Extra education modules for school going kids, 3) Family or community functions, 4) Disaster management / relief center and 5) Performing arts or Crafts workshops. The rent for the facilities could be arrived at based on the usage and paying capacity of the people in the area. This way, the expenses for maintenance of the hall can be recovered.

4.3 Sanitary Pad Packaging Unit

The total population of villages is 76,067 and the expected female population is 34,230(45%) and females at menstruating during adolescence is around 22,592(66%). These numbers do not justify the setting up of a manufacturing unit. Hence it is proposed that fully compostable sanitary pads are procured and packed using a packaging unit. Packaging unit of sanitary napkins will be installed in the villages for maintaining hygiene and health of the women. This unit can be established for the village cluster, enabling easy availability of the sanitary pads at affordable rates. The approximate cost of one sanitary napkin will be ₹5 to ₹6 (Sanitary Napkin Making Machine and Industrial Moulding Machines Manufacturer (Jai Shree Industries, New Delhi. This will also create employment for the villagers both for packaging and sale. A sustainable unit for making fully compostable and biodegradable sanitary pads had been developed. It is free of any kind of harmful chemicals and it becomes manure within 90 to 180 days in composting conditions.

4.4 Solid Waste Management

As per the policy and the desired objective, an agency will be set-up to handle the Solid Waste. The agency will do the following: D2D collection of segregated waste. The collected wastes are segregated into recyclable or saleable waste, Collection of user charges from each household, shops, schools, etc. Bio-degradable waste is fed into bio methanation plant maintaining the bio-methanation plant will be done as per the installation and operation guidelines. The entire process will be monitored by I – CHAUPAL. The sizing and the selection of technologies of Bio-methanation and/or Incinerator shall be decided by the agency managing the Waste. To set up the Bio-methanation plant, about half an acre

of land will be needed. It will have a shed, parking for collection vehicles, open space for drying the fertilizer, small office, gate and perimeter wall and gas compression facility / electricity generation unit. The collection vehicles will collect the segregated waste from households and bring it to the plant. Where it will be fed into the plant. The by-products of this process - gas and fertilizer will be sold as per market demand. Fertilizer will need to be dried before being sold off in bulk. Bio-Gas and the related equipment for transmission and distribution is a specialized job (BIOTECH INDIA, 2022). This cannot be handled at village level. Hence it is recommended that the gas produced should be used by any of the following: An industry that needs a ready and cheap source of fuel. A power producer agency that can generate electricity and feed it to the grid. A City Gas Distribution agency that can compress the biogas and feed it into a piped network in the nearby houses/ sectors. They will need to have a 24x7 maintenance / call center + metering and billing set up. Supply of CBG to a retail fuel outlet - the CBG can replace CNG in automotive use. The gas produced will be sold off in bulk from the outlet of the bio-methanation plant. The sale price has been reduced accordingly. However, the gas will be produced and sold for replacing fossil fuel as an energy source. This enables the project to claim carbon credits or subsidies from the Govt. of India. The schematic diagram for waste segregation is shown in figure 5. The location of the SWM plant will be based on availability of the land from the government. The costing and further workings are based on an approximation. Further, to drive economies of scale, this will cater to a group of villages. Whereas the schematic diagram of bio-methanation is shown in figure-6.

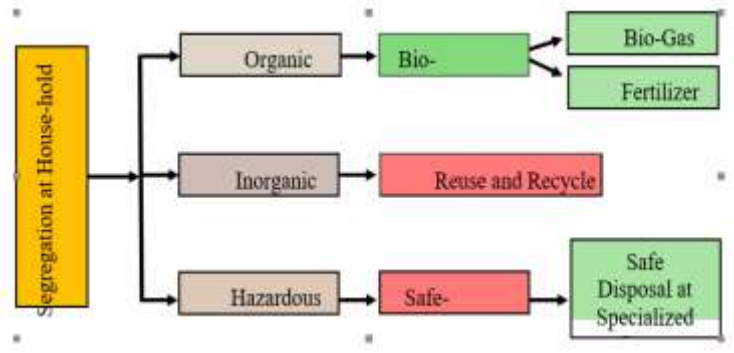

Figure 5 Schematic Representation of Waste Segregation

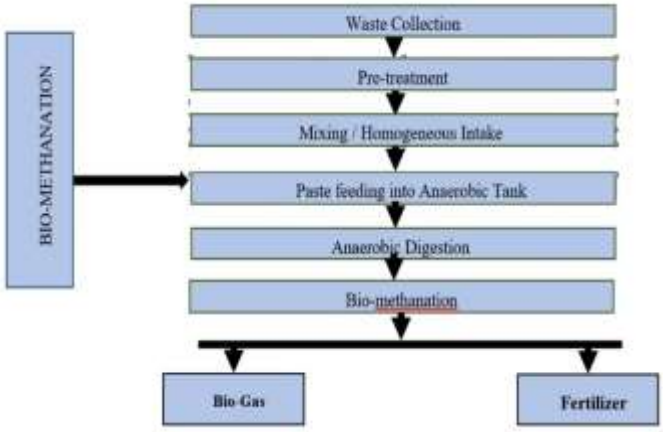

Figure 6 Bio Methanation

The summary expenditures of all the smart interventions that are proposed in Achheja Buzurg is shown in table- 3.

Table 3 Expenditure on Smart Interventions

CAPEX - SMART INTERVENTIONS						
S.NO.	**ITEM**	**CAPEX**	**FACTOR**	**CAPEX - ALL VILLAGES (₹)**		
1	I-Chaupal	23,81,797	1	6,90,72,113		
2	Barat Ghar	1,79,76,344	1	52,13,13,976		
3	Sanitary Pad Packaging Unit	35,400	29	35,400		
4	Solid Waste Management	1,31,23,118	5	7,61,14,084		
	Costing for a cluster of villages		29	66,65,35,573		
	Costing for 1 village (Rounded off)		1	**2,29,83,985**		
OPEX AND REVENUE - SMART INTERVENTIONS						
S.NO.	**ITEM**	**OPEX**	**REVENUE**	**SURPLUS (₹)**		**SURPLUS FOR ALL VILLAGES (₹)**
		ANNUAL				
1	I-Chaupal	1,09,200	1,17,300	8,100	1	2,34,900
2	Barat Ghar	1,92,000	3,36,000	1,44,000	1	41,76,000
3	Sanitary Pad Packaging Unit	24,96,000	28,80,000	3,84,000	29	3,84,000
4	Solid Waste	32,88	43,08,432	10,20,432	5	59,18,50

	Management	,000				6
	Annual Potential Surplus for cluster of villages				29	**1,07,13,406**
	Annual Potential Surplus for 1 village (Rounded off)				1	**3,69,428**

4.5 Infrastructure Interventions

All infrastructure interventions for development of road, drainage, sewage system, water and street lights are to be supervised by the engineering team of YEIDA. This is to be done on a work contract basis by a competent agency, selected through a bidding process. Approximately 95% of all roads of all the villages are either paved or made of concrete blocks. Most major roads are in good condition. Internal roads will need to be almost completely reworked since the laying of water and sewage systems will necessitate extensive digging for laying of pipes. The Road Network Map of each village clearly delineates the typology of roads. An Over Head Tank will be constructed and fed from the water treatment plant. The supply would be monitored by a smart meter linked to the server at I – CHAUPAL. Each household will be fed from this water tank and will be billed as per the water meter reading. The household will be encouraged to install rainwater harvesting systems in place of the existing bore-wells. To inculcate a habit of waste conservation and rainwater harvesting, a system of net metering may be introduced for water. This may be at village level or household level. Each household is using a septic tank for sewage disposal. Faulty and ill-maintained septic tanks can lead to contamination of groundwater. To avoid this, every household will be connected to a sewage network. This network in turn will be connected to the sewage trunk lines of the sector, which will feed into the sewage treatment plant. To increase the sense of security and provide comfort of movement outside the house from dusk to dawn, street lights may be installed on every street. These may be at an interval of 24 to 30m each. The power for these can be derived either from batteries charged by solar panels or with electricity generated from waste. This will help to save money required to pay electricity bills for street lights on a recurring basis. The cost estimates of infrastructure interventions like- roads, drinking water, sewage and street lights are shown in table-4.

Table 4- Summary of infrastructure interventions

S.No.	ITEM	ESTIMATES	
1	Sewage Network	2,12,78,811.85	
2	Drainage	1,57,01,820.00	
3	Drinking Water Supply (including OHT)	1,33,31,115.98	
4	Street Lights (option 1) - All new	1,47,84,350.00	
	Street Lights (option 2) - Using existing poles		1,01,12,547.00
5	Road Network	2,25,59,251.20	
GRAND TOTAL		**8,76,55,349.03 (8.76 cr)**	**8,29,83,546.03 (8.29 cr)**
6	Pokhar - 1 Beautification	40,31,454.18	
7	Pokhar - 2 Beautification	13,23,433.00	
GRAND TOTAL (Including Pokhars)		**9,30,10,236.21 (9.30 cr)**	**8,83,38,433.21 (8.83 cr)**

5. CONCLUSIONS

The villagers do not have to travel to the nearby cities for every small work. To cope up with this issue of unavailability of essential services within the village boundaries, villages need to be upgraded in terms of infrastructure. A typical case of Achheja Buzurg could serve as a prototype for this required transformation from villages to “smart villages”. Smart interventions that are proposed for villages are- I-Chaupal, Barat Ghar, Sanitary pad packaging unit and Solid waste management unit. After the infrastructure and smart interventions in the village Achheja Buzurg, it will be transformed to a smart village. The smart interventions like I-Chaupal & Barat Ghar are proposed individually for Achheja

Buzurg, whereas Solid waste management unit may be shared intervention among 5 villages. Sanitary pad packaging unit is also a shared intervention among villages in the YEIDA region. All these amenities would serve in better accessibility and increase convenience for the villagers while transforming the village towards a more transitioning urban settlement. The smart proposals were being proposed based on the opinions of the officials and villagers conveyed to the team through the contacted person in Achheja Buzurg. This would lead to higher acceptance of the new amenities by the residents of Achheja Buzurg as their concern have been paid heed to in this process The I-CHAUPAL would solve all their information gathering and sharing concerns and would make the village self-reliant in terms of all e-facilities. Barat ghar would enable them to perform small ceremonies and wedding rituals in the village itself. It would ease their travelling effort as well as provide them a dedicated space for cultural gatherings. Sanitary pad packaging unit would make the distribution of sanitary pads easier in the villages, hence making them accessible. The solid waste management unit would make the village independent in terms of managing of solid waste at the local village level itself. All these interventions would definitely increase the quality of life in the villages and uplift the living conditions of the villagers. These interventions could be proposed in other transitioning villages by sustainable methodologies proposed in this research study. The study came up with the ideology of PURA by late Dr. Abdulkalam and was planned to extend to other villages of the Yeida region of Uttar Pradesh. The huge population of youngsters migrating towards the urban region for employment had been curtailed by urbanizing the villages. The government's plan on SMART village had proved to be an ideal for other states of India.

6. ACKNOWLEDGEMENT

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7. CONFLICT OF INTEREST

The authors propose no conflict of interest in publishing the manuscript and the plagiarism has been checked.

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