



Ministry of Panchayati Raj
Government of India

Village Kalonda

Gram Panchayat Development Plan (GPDP)



Apeejay Institute of Technology
School of Architecture and Planning
Greater Noida



Abdul Kalam Technical University
Lucknow

A Note from the Director's Desk

On the submission of the report for Kalonda - Village in Dadri, District G B Nagar, a great step towards an empowering future for our country, I wish to congratulate the Ministry of *Panchayati Raj* for bringing about a reworking of the planning thought and architecture of the region. I am happy that under the aegis of Dr. Abdul Kalam Technical University (AKTU), we could bring out planning solutions for this small village and complete the immense job responsibility entrusted to us, even in the challenging times of a pandemic.

The gap between the villages and the cities is continuously increasing and it is not an easy life. Our villages are ready for a transformation. A truer picture of our country rests in the villages rather than the metros. Hand holding them towards the future is our responsibility towards a better country, towards unity, and towards a more sustainable economy.

It is a great moment for all the institutions which have, despite Covid 19, tried their best to contribute to the research endeavor as guided by the Jt Secretary Shri K S Sethi and his teams from ISRO and NICS. The efforts of our Union Minister of Rural Development and *Panchayati Raj*, Shri Narendra Singh Tomar in the digitization of land records program - DILRMP is a great beam of light, according to which the efforts on research on rural areas and villages will also get implemented. These organized efforts will open the doors for new thinking and better practices in the country.

A word of praise is due for the Research Cell - Team leader Prof. Anand Khatri who worked tirelessly, taking all responsibility in person, from household surveys to collecting secondary data, and organized a select faculty (Ar. Yogesh Yadav, Ar Akshita Nagar, Ar Jitendra Das, Ar Kamini Singh, Ar Kirti Gupta, Ar Jyotsana Gaur, and Ar Christopher Paul), and an intern (Ar. Zoya Kidwai) to associate in different stages of the process.

I am thankful for the clearances that we received from our stakeholders, local *Panchayati Raj* officials, the Gram *Pradhan*, the district, and the state *Panchayati Raj* office at various stages of the report presentations. Our proposals which have been formulated with their approvals will find a better tomorrow from their diligent execution of the planning strategy.

Director Prof Vivek Sabherwal

Apeejay School of Architecture & Planning

Greater Noida

Foreword

India has been an agriculture-based country. With its inhabitants settled across villages, India's vision through *Panchayati Raj* was a statement for its future urbanization ahead of the time. Its focus on developing local self-government in districts, zones, and villages gives the key to understanding the "local-needs" as an addendum to the generic prescribed policy for growth. The growth of people living in different areas in our country is based primarily on a generic footprint described through policy. Awareness, education, technology, and aspirations of people from different walks require that we look into the "local areas for planning" and not impose a generic outline or an anticipated growth definition through inert policy.

The human population in our country, which has for ages lived with the earth - using it for cultivation and for building their housing, using the abundance of solar power and of fresh potable water from rains must again be reminded of the virtues of our traditional knowledge systems. Rainwater and Solar energy should be harnessed in village life to keep the village free from urbanizing trends. With the tropical seasons where the climate does not run into unmanageable extremes and rich vernacular knowledge of construction in mud, thatch, and bamboo which is abundant in villages, it is only the lack of patronization of free-energy and urbanization-free trends because of which the villagers do not look towards the lessons in our heritage. The village life has been till date hit by urban and industrial economics. More thinking through policy and action will make them self-sufficient with water harnessing, solar-powered, and sustainable mud-based construction villages.

The address of villages by the term "rural", a direct financial implication of being rural, and being seen as a blight, is forcing a mass conversion of villages to rurban, destroying their nature. This needs careful handling. The lifestyle, attitude, and thinking of people have changed greatly in rural areas and they are ready to embrace better economies. The assistance they need is as to how agriculture and forestry can be managed along with the birth of secondary and tertiary economies and how in the light of the growing population, employment, and growth can be sustained and benefits shared with all the citizens of the country and not just those settled in the urban areas.

Instead of the urban-centered, metro-centric model of growth India is blindly pursuing today, it would have been better had we focused on growth based on villages. With its villages managed to be sustainable settlements, India could have provided a homogenous development model, for its future citizen. For our growth, we have copied western thoughts and their planning models which they have themselves given up as early as the 1960s. The definition of development which we follow in the policy

frameworks of the “Uttar Pradesh Urban Planning and Development Act, 1973” and “the Town and Country Planning Act” and the “Uttar Pradesh Industrial Area Development Act, 1976” has not been inclusive of the issues pertinent to the environment, forests, ecological balance, and sustainability. The Town and Country planning act talks about the town, but not the country. Development only means building; it only means “urbanization”. The world today knows that despite all growth, technology, and automobile-based advancements, we can survive only through agriculture, forests, and ecological balance. Our "villages with agriculture" is the only growth model that can sustain the needs of “urbanization” and provide for "growth for all" and "nutritional security for the future citizen" in our country. They are the only crucibles for containing sustained change and growth. Agricultural land must thus be declared as of national importance.

The Rurban areas, the loose urban sprawl, and the urban villages surrounded by development are all areas that are the un-resolved outcomes of not being able to understand, address and provide for the needs of the people in the villages through our "development" definition. It is apathy when in the face of development the agencies resort to just land plotting, allocation of land uses road-building sewer development, and often electrification. Socio-economic and cultural solutions need to be given importance. The intangible needs to be included in the definition of development as much as the open areas, the greens, and agriculture. The district of G B Nagar is on the verge of losing its last few villages in block Dadri and thus the termination of agricultural land abutting its SEZs in Kalonda. This is call for action and the MoPR has taken up the task at the right time.

Architect Anand Khatri

Apeejay School of Architecture & Planning

Greater Noida

GPDP Kalonda

Submitted to Shri K S Sethi

Ministry of *Panchayati* Raj

The enclosed report “GPDP Kalonda” is a guideline for the growth of the village of Kalonda for the next 25 years. This report is prepared from the data shared with us by MoPR, ISRO, NRSC, NIC, secondary sources and household surveys to the best capability of the Research Cell at Apeejay School of Architecture and Planning (AKTU).

Signed for Submission by

Team leader research cell

Approved for Submission by

Director Apeejay School of Architecture and Planning

Prof Anand Khatri

Prof Vivek Sabherwal

Contents

A NOTE FROM THE DIRECTOR'S DESK	II
FOREWORD	IV
LIST OF IMAGES	X
LIST OF FIGURES.....	XI
LIST OF TABLES	XVII
LIST OF ABBREVIATIONS	XVIII
LIST OF LOCAL TERMINOLOGIES USED	XIX
APEEJAY SCHOOL OF ARCHITECTURE AND PLANNING TEAM	XX
ACKNOWLEDGMENTS.....	XXI
INTRODUCTION	1
1. The context for Planning at Gram <i>Panchayat</i> as per Manual for GPDP MPR GOI	4
2. Aim for Rural Planning: Kalonda.....	5
3. Methodology.....	11
4. About Kalonda Village.....	14
5. Dronography	29
REGIONAL CONTEXT	32
1. Understanding the Regional Context of Kalonda.....	34
2. Regional Connectivity	36
3. Neighbouring Villages and Towns	37
ENVIRONMENT AND RESOURCE MANAGEMENT	40
1. Introduction	41
2. Land Use and Land Management (LULM)	41
3. Village Hydrology.....	50
4. Conservation of lakes	54
5. NIC data on water bodies in Kalonda	55
6. Proposal for Lake Conservation and development under 25 year Plan.....	60
7. Interlinking of Lakes.....	63
8. Conservation of Agricultural Area	64
9. SLWM: Solid Liquid Waste Management	64
ECONOMIC OPPORTUNITIES AND LIVELIHOOD	74
1. Introduction	75
2. Working population distribution in Kalonda.....	76
3. Regional Forces and Economic opportunities	77
4. Agro-dependent livelihood opportunities	78
HUMAN RESOURCE, EDUCATION AND CAPACITY BUILDING	84
1. Introduction	85
2. Education and Human Resource.....	86
3. Capacity building	88
INFRASTRUCTURE AND HOUSING POLICY	90

1. Introduction	91
2. Design based Planning: an approach to Rural Development in India	92
3. Housing Policy	93
VISION FOR KALONDA: GPDP.....	160
1. Statement of Vision	162
2. Vision 2021.....	164
3. The vision of the Gram <i>Panchayat</i> Kalonda.....	169
REFERENCES.....	183
ANNEXURES.....	185
A. An approach to design based planning – through the eyes of charter for new urbanism	185
B. Meetings with the Stakeholders	191
C. Data analysis and GIS mapping in the progress report	210
D. Water Test Results.....	217
E. Household surveys	226
F. Derivation of Indices from Different Sections of the Household Survey Document.....	231

List of Images

Image 1 Aerial view of Village Kalonda	5
Image 2 Deteriorating condition of the village	6
Image 3 Mud houses of the Village.....	7
Image 4 Lakes of the Village	8
Image 5 Art and Craft of the village	9
Image 6 House in Kalonda.....	14
Image 7 Houses of Kalonda Village	24
Image 8 Aerial view of the nodes of the village.....	29
Image 9 Aerial view of the <i>Puliya</i>	29
Image 10 Aerial view of the village	29
Image 11 Aerial view of the village	29
Image 12 Commercial Node.....	30
Image 13 Lake view	30
Image 14 The Apeejay SAP team in the village	30
Image 15 People of Kalonda	39
Image 16 Lakes of Kalonda	54
Image 17 Domestic Garbage dump at the backyard	65
Image 18 Cattle washing in the water body	65
Image 19 Dilapidated buildings.....	65
Image 20 Cattle shed and organic waste	65
Image 21 Polythene and plastic waste on green field	65
Image 22 Waste dump at a vacant plot	65
Image 23 Polluted water from tube well	65
Image 24 Waste dumped at the open drains.....	65
Image 25 Deep Marginal.....	66
Image 26 Floaters.....	67
Image 27 Fully submerged oxygenators	67
Image 28 Emergent/Marginal	67
Image 29 Algae.....	68
Image 30 Liquid waste management: Wastewater treatment technologies,	71
Image 31 Loss of crops observed along Cholas road in August flooding of excess rainwater	80
Image 32 Cattle waste mixed with plastic dumped along the road instead of composting.....	89
Image 33 A picture showing the meeting held with Raju Nambardar at his house	191
Image 34 Picture of the village showing us walking in the Hindu quarter	192
Image 35 Picture of the meeting with village locals	193
Image 36 A picture with the college officials.....	194
Image 37 Meeting with the villagers	196
Image 38 A picture of the meeting held with the locals.....	199
Image 39 A meeting at the paith <i>chowk</i>	202
Image 40 Houses of village	204
Image 41 Dumping of garbage in the village	204
Image 42 Virtual Meeting with block development officer, Ankit Tomar	205
Image 43 Virtual meeting with deputy director	207
Image 44 Virtual meeting with Kunwar ji	208
Image 45 Virtual meeting with Dr. Amit	209

List of Figures

Figure 1 Existing character of village versus unplanned growth	4
Figure 2 Interdependency of metropolis/ administrative centre and Villages	10
Figure 3 step by step process.....	11
Figure 4 Stakeholders.....	12
Figure 5 Methodology.....	13
Figure 6 Regional context of Kalonda	15
Figure 7 Average household size	15
Figure 8 Distribution of religion in the village.....	16
Figure 9 Age-sex ratio female	16
Figure 10 Age sex ratio: male.....	16
Figure 11 Education breakup of the village	17
Figure 12 Literacy rate of Kalonda	18
Figure 13 Occupation of age group 18 to 60 years.....	19
Figure 14 Lakes and Canal lines of Kalonda	20
Figure 15 Hydrological study of Kalonda- catchment areas	20
Figure 16 Sources of water in the village	21
Figure 17 Water supply availability in the village	21
Figure 18 Agriculture land of Kalonda	22
Figure 20 Electrical connections of the village.....	23
Figure 19 Average electrical supply duration per day in the village.....	23
Figure 21 Available Solid waste management and solid waste disposal	23
Figure 22 Positioning of the religious spaces, burial grounds and shamshans in the village	24
Figure 23 Housing typologies available in the village	25
Figure 24 No of available floors in the houses.....	25
Figure 25 Roof types of houses.....	25
Figure 26 Housing construction type	25
Figure 27 Village Kalonda along with Panchayat boundaries	27
Figure 28 Transportation analysis.....	28
Figure 29 Availability of toilets in the houses	28
Figure 30 Plan for 25 years of regional growth and future opportunities.....	33
Figure 31 Regional connect of the village.....	34
Figure 32 increasing interdependency of neighbouring villages creating an Urban Sprawl	36
Figure 33 Map showing regional connectivity	37
Figure 34 Present context of development around Kalonda.....	38
Figure 35 Map Showing Kalonda Village and its connectivity with surrounding settlements.....	39
Figure 36 Land-use distribution of Village Kalonda	42
Figure 37 Existing LULM of the village	44
Figure 38 Proposed LULM of the village	45
Figure 39 Ward wise division	46
Figure 40 Impact of the development on neighbourhood	47
Figure 41 Village at the junction of urban growth and agricultural area	50
Figure 42 Connect between Lake and human settlement.....	51
Figure 43 Lakes and Canal lines of Kalonda	52
Figure 44 Hydrological study of Kalonda- stream order	53
Figure 45 Hydrological study of Kalonda- catchment areas	53

Figure 46 Map showing the position of NIC documented lakes in Kalonda	56
Figure 47 Position and names of water bodies in Kalonda.....	57
Figure 48 Change in the boundary of Peer Wala Talab	58
Figure 49 Change in the boundary of Mata Wala Talab	59
Figure 50 Change in the boundary of Pokhar Jatav Valmiki Talab.....	60
Figure 51 Lakes in Kalonda – Today	61
Figure 52 Lakes after 5 years- 25 years GPDP.....	61
Figure 53 Lakes after 10 years- 25 years GPDP	61
Figure 54 Lakes after 15 years- 25 years GPDP.....	62
Figure 55 Lakes after 20 years- 25 years GPDP.....	62
Figure 56 Lakes after 25 years- 25 years GPDP.....	62
Figure 57 Proposed interlinking of lakes.....	63
Figure 58 Proposed economic opportunities and livelihood for Kalonda	75
Figure 59 Literacy rate in Kalonda as per Census 2011 data	77
Figure 60 Working population in Kalonda	77
Figure 61 Type of workforce in Kalonda as per Census 2011 data	77
Figure 62 Regional forces and their future economic potential for 25 years.....	78
Figure 63 Sustainable agriculture reforms.....	79
Figure 64 Distribution of crop types	80
Figure 65 Regional forces and the vocational training required for the same	85
Figure 66 Front forecourt open house.....	94
Figure 67 Multi Storeyed Linear house along a lane	95
Figure 68 Modern Urban houses	95
Figure 69 Mixed-use houses on commercial node	96
Figure 70 Cattle pro houses	96
Figure 71 Multi Court houses.....	97
Figure 72 Central courtyard house	97
Figure 73 Average household size on ward map of Kalonda.....	98
Figure 74 Plan of Ward 1 with house numbers	99
Figure 75 Plan of Ward 2 with house numbers	100
Figure 76 Plan of Ward 3 with house numbers	101
Figure 77 Plan of Ward 4 with house numbers	102
Figure 78 Plan of Ward 5 with house numbers	103
Figure 79 Plan of Ward 6 with house numbers	104
Figure 80 Plan of Ward 7 with house numbers	105
Figure 81 Plan of Ward 8 with house numbers	106
Figure 82 Plan of Ward 9 with house numbers	107
Figure 83 Plan of Ward 10 with house numbers	108
Figure 84 Plan of Ward 11 with house numbers	109
Figure 85 Plan of Ward 12 with house numbers	110
Figure 86 Plan of Ward 13 with house numbers	111
Figure 87 Plan of Ward 14 with house numbers	112
Figure 88 Plan of Ward 15 with house numbers	113
Figure 89 Agriculture fields with Abadi areas.....	121
Figure 90 Festival spaces of village Kalonda	122
Figure 91 Existing lakes of village Kalonda.....	123
Figure 92 Peer vala Talab.....	124
Figure 93 Peer vala Talab.....	124

Figure 94 Painth vala chowk	124
Figure 95 Existing plan	125
Figure 96 Existing Section	125
Figure 97 Existing Section	125
Figure 98 House with FAR 0.12	126
Figure 99 House with FAR 0.4	126
Figure 100 Updated elevation	126
Figure 101 Updated section	126
Figure 102 House with FAR 1	126
Figure 103 Existing section.....	127
Figure 104 Existing section.....	127
Figure 105 Existing House plan	127
Figure 106 House with FAR 0.4	128
Figure 107 House with FAR 0.5	128
Figure 108 Updated elevation	128
Figure 109 Updated section of the house.....	128
Figure 110 House with FAR 1	128
Figure 111 Existing section.....	129
Figure 112 Existing section.....	129
Figure 113 Existing plan	129
Figure 114 House with FAR 0.5	130
Figure 115 House with FAR 0.3	130
Figure 116 House with FAR 1	130
Figure 117 Updated elevation	130
Figure 118 Updated section XX'	130
Figure 119 Updated section YY'	130
Figure 120 Existing section.....	131
Figure 121 Existing section.....	131
Figure 122 Existing Plan	131
Figure 123 Updated Elevation	132
Figure 124 Updated section	132
Figure 125 House with FAR 0.8	132
Figure 126 house with FAR 1	132
Figure 127 Existing Plan	133
Figure 128 House with FAR 1	134
Figure 129 House with existing FAR.....	134
Figure 130 House with FAR 0.5	134
Figure 131 Existing plan	135
Figure 132 Existing section.....	135
Figure 133 Existing section.....	135
Figure 134 House with FAR 0.7	136
Figure 135 Updated section	136
Figure 136 Updated elevation	136
Figure 137 House with FAR 0.8	136
Figure 138 House with FAR 1	136
Figure 139 Existing Plan	137
Figure 140 House with FAR 1	138
Figure 141 Updated section	138

Figure 142 Updated section	138
Figure 143 Updated Section.....	138
Figure 144 Updated elevation	138
Figure 145 House with FAR 0.7	138
Figure 146 Existing Plan	139
Figure 147 Updated House	140
Figure 148 Updated Elevation	140
Figure 149 House with FAR 0.3	140
Figure 150 Updated Section.....	140
Figure 151 Housing typologies in Kalonda.....	141
Figure 152 Existing Peer vala Talab node.....	142
Figure 153 Existing Peer vala Talab.....	143
Figure 154 Peer vala Talab node after 5 years.....	143
Figure 155 Peer vala Talab after 5 years.....	144
Figure 156 Peer vala Talab node after 10 years.....	144
Figure 157 Peer vala Talab after 5 years.....	145
Figure 158 Peer vala Talab node after 15 years.....	145
Figure 159 Peer vala Talab after 15 years.....	146
Figure 160 Peer vala Talab node after 20 years.....	146
Figure 161 Peer vala Talab after 20 years.....	147
Figure 162 Peer vala Talab node after 25 years.....	147
Figure 163 Peer vala Talab after 25 years.....	148
Figure 164 Existing scenario of Purani Pradhan Ki Baithak.....	148
Figure 165 Purani Pradhan Ki Baithak after 5 years	149
Figure 166 Pradhan Ki Baithak after 10 years.....	149
Figure 167 Purani Pradhan Ki Baithak after 15 years	150
Figure 168 Purani Pradhan Ki Baithak after 20 years	150
Figure 169 Pradhan Ki Baithak after 25 years.....	151
Figure 170 Proposed One way traffic movement, entry/exists and parking.....	152
Figure 171 Proposed development at entry/exit	152
Figure 172 Sample approval document	159
Figure 173 A diagram illustrating the imbalance, if all become urban and if natural resource, agriculture and villages are lost.....	162
<i>Figure 174 this figure explains a shift needed. Development focus on village will give sustainability</i>	<i>163</i>
Figure 175 The increasing interdependency of Kalonda and Gesupur	164
Figure 176 Before and after of Kalonda streets after installing street lights	164
Figure 177 Present condition of lakes.....	165
Figure 178 Lake after clearing the encroached area	165
Figure 179 Planting of orchards, introduction of Aquaculture and Kalonda crafts.....	165
Figure 180 After desilting.....	165
Figure 181 A sample of approval plan as expected from the villagers	166
Figure 182 Carpentry	167
Figure 183 Naturopathy.....	167
Figure 184 Civil and Draftsmanship	167
Figure 185 Electronics.....	167
Figure 186 Tooling and Machinery	167
Figure 187 Agriculture.....	167

Figure 188 Garbage collection in the Village	167
Figure 189 Milk co operatives that can be introduced in the village.....	168
Figure 190 Grey water treatment	168
Figure 191 Addition of a bank.....	168
Figure 192 Police check post.....	168
Figure 193 Addition of ATM.....	168
Figure 194 Population growth	169
Figure 195 SLWM	169
Figure 196 integrated development	169
Figure 197 LULM	170
Figure 198 Influence of development on nearby areas.....	170
Figure 199 Housing densification.....	170
Figure 200 Housing cluster	171
Figure 201 Densified node	171
Figure 202 Existing node	171
Figure 203 Densification of housing clusters	171
Figure 204 Existing lake.....	172
Figure 205 Entry/exit development.....	172
Figure 206 Developed lake.....	172
Figure 207 Proposed development in the lake	172
Figure 208 Existing condition of the lakes	172
Figure 209 Economic dependence.....	173
Figure 210 Literacy rate projection.....	173
Figure 211 Projected population	174
Figure 212 Integrated development	174
Figure 213 SLWM	174
Figure 214 LULM	175
Figure 215 Cluster densification	175
Figure 216 Entry/Exit, One way traffic movement and parking	175
Figure 217 Lake development.....	175
Figure 218 Projected population	176
Figure 219 Integrated development	176
Figure 220 SLWM	176
Figure 221 Node densification	176
Figure 222 LULM	176
Figure 223 Entry/Exit development	177
Figure 224 Lake development.....	177
Figure 225 Economic interdependency	177
Figure 226 Education rate Projection	177
Figure 227 Projected population	178
Figure 228 Integrated development	178
Figure 229 LULM	178
Figure 230 SLWM	178
Figure 231 Node densification	179
Figure 232 Entry/exit	179
Figure 233 Cluster densification	179
Figure 234 Lake development.....	179
Figure 235 Projected population	180

Figure 236 Integrated development	180
Figure 237 SLWM	180
Figure 238 LULM	180
Figure 239 Cluster Densification	181
Figure 240 Projected Literacy rate.....	181
Figure 241 Densified node	181
Figure 242 Densified node	181
Figure 243 Developed lake.....	181

List of Tables

Table 1 Census data	14
Table 2 Distribution of caste in Kalonda	16
Table 3 Availability of social infrastructure in and around the village.....	26
Table 4 Kalonda Village Summary.....	27
Table 5 Land-use distribution for Village Kalonda, Source: Census of India 2011.....	42
Table 6 Proposed LULM breakup for village Kalonda for next 25 years	49
Table 7 Calculations of the ponds in the village according to NIC data.....	55
Table 8 Change in the boundary of Peer Wala <i>Talab</i>	57
Table 9 Change in the boundary of Mata Wala <i>Talab</i>	58
Table 10 Change in the boundary of <i>Pokhar Jatav Valmiki Talab</i>	59
Table 11 Comparison of our purification system with STP	69
Table 12 Liquid waste management: Wastewater treatment Technologies,.....	70
Table 13 Waste Category (bin it right)	72
Table 14 Stages of waste management	73
Table 15 the projected population of different age groups for next 25 years	87
Table 16 Occupation of people of Kalonda as per census 2011	87
Table 17 Projected Occupation by 2031	88

List of Abbreviations

- DRDA - District Rural Development Agency
- DIFC- Dedicated Integrated Freight Corridor
- GoI - Government of India
- GP - Gram *Panchayat* (Village *Panchayat*)
- GPDP- Gram *Panchayat* Development Plan
- HH - Household
- MDWS - Ministry of Drinking Water and Sanitation
- MoPR - Ministry of *Panchayati* Raj
- MoRD - Ministry of Rural Development
- MGNREGS - Mahatma Gandhi National Rural Employment Guarantee Scheme
- NIRD&PR - National Institute of Rural Development and *Panchayati* Raj
- ODF - Open Defecation Free
- PPHa- People per Hectare
- SLWM - Solid and Liquid Waste Management
- SLRM - Solid and Liquid Resource Management
- SWM - Solid Waste Management

List of Local Terminologies Used

- *Abadi*- Population
- *Abadi area*- Rural land used for residential purpose
- *Aangan*- Courtyard
- *Aanganwadi*- Type of rural child care centre in India
- *Baithak*- A seating area generally used for meetings
- *Chowk*- Road Junction
- *Dalaan* - Verandah
- *Doab*- the tract of land lying between two confluent rivers. It is similar to an interfluve.
- *Gher*- a temporary boundary made before constructing a house to specify the plot
- *Kharif*- summer or monsoon crop
- *Kacha*- Temporary
- *Lal Dora* - refers to land that is part of the village '*Abadi*' (habitation) and is used for non-agricultural purpose only
- *Mitti chulha*- A stove made up of mud
- *Nala* - big runnel which passes through the city
- *Panchayat*- a village council.
- *Pokhar*- Puddle
- *Pradhan*- Leader/ Prime person
- *Pucca*- Permanent
- *Puliya*- a small bridge over a canal or stream
- *Rabi*- Spring or winter crops
- *Roshandaan* - Light ventilator
- *Talab* - Pond

Apeejay School of Architecture and Planning Team

Director - Prof Vivek Sabherwal

Research Cell (team leader) - Prof Anand Khatri

Faculty team for HH Surveys and site meetings

Ar. Yogesh Yadav

Ar. Akshita Nagar

Ar. Jitendra Kr Das

Ar. Kirti Verma

Faculty for GIS support analysis

Ar. Jyotsana Gaur

Ar. Christopher Paul

Literature organization & Report support for Team leader

Ar. Kamini Singh

Ar. Zoya Kidwai (Intern)

Illustrations for Housing Policy (Students)

Ms. Shivanshi Goel

Ms. Urvi Sharma

Mr. Bhanu Solanki

Ms. Disha Varshney

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Mr. K. S. Sethi (Jt. Secretary Ministry of *Panchayati Raj*)

Ms. Praveena Chaudhary (Deputy Director MoPR - UP)

Mr. Kunwar Singh Yadav (District officer for MoPR, G B Nagar)

Gram *Pradhan* Smt Nek Akhtar represented by Shri Raju Nambardar

District Administration

SDM Dadri and the SSP of G B Nagar

RRSC- North

Ms. Khushboo Mirza, RRSC-North

Mr. Shankar Ram N R, RRSC-North

Dr Vinod Kr Sharma, RRSC-North

Mr Akash Goyal, RRSC-North

NRSC

Overall Technical Guidance

Dr. C S Jha, Outstanding Scientist & CGM, RCs, NRSC

Dr. V M Chowdary, Scientist 'SG' & DGM, RRSC-North

Dr K Chandrasekar, Scientist 'SG' & Head, NRSC

Introduction

Project Process

- *The Gram Panchayat of Kalonda (one of the few villages practicing agriculture in the Block Dadri, District Gautam Buddh Nagar) is selected by the Ministry of Panchayati Raj through a notification by the Jt. Secretary Shri K. S. Sethi. The village was selected by the district Panchayati Raj officer Shri Kunwar Singh Yadav as **a pilot project to initiate a 25-year plan for the Spatial Development of villages in India.***
- ***Apeejay School of Planning and Architecture** represented by Director Prof Vivek Sabherwal, being a premier institute under the aegis of University of **AKTU** (Dr Abdul Kalam Azad technical University) was appointed to make a 25 years GPDP for village Kalonda.*
- *The research cell at Apeejay School of Planning and Architecture, headed by Prof Anand Khatri (the conceptualizer and architect-planner responsible for the Kalonda project) and comprising of selected faculty members, conducted the Household Surveys. With the help of data generated **by HH Surveys and in co-ordination with ISRO, NIC, Block Development office, Dronography and Water testing reports** has prepared proposals for the village.*
- *This is one of **the first village master plan in the district of Gautam Buddh Nagar** and is aiming towards a holistic development. The report was accepted in principle through a presentation made to a panel of MoPR on 9th Dec 2020.*

Article 243G of the Constitution of India acknowledges *Panchayats* as institutions of local self-government and mandates them to prepare plans for economic development and social justice. **The governance of the villages in modern India (as in the 73rd amendment act) is primarily through the MoPR (Ministry of Panchayati Raj).**

GP development plan looks into the lives of the people in the villages and matches peoples' needs and priorities with the surrounding development. It checks the available resources of land, soil types, economic practices, and regional interconnections and through them works on a plan which would sustain the growth of the people in the years to come. Prepared through a fair, inclusive, transparent, and participatory process, it should be broken down into smaller plans achievable annually and as five-year composites. The complete 25-year plan realigns the goals achieved and new challenges identified after the execution of each year's plan. The focus should be on local development issues, local perception of need and priority, local analysis of problems and solutions, local resources management all within a collective National vision for village areas, and holistic urbanization. **There has been**

continuous planning for immediate needs in the last few years for the villages, but a systematic vision and direction adopted to address the perspective of the development of villages through planning has been missing.

The number of villages in the district of Gautam Buddha Nagar with active agricultural practices and cultivation of crops is continuously falling. Kalonda is one of the last villages in the district which along with the other three or four around engage in agriculture. The developments in the region are such that this village shall also be soon listed out from the hold of *Panchayati Raj* and transferred to “Nagar”, whereby through the definition of development in the UP Industrial Area Development Act 1976 and Uttar Pradesh Urban Planning and Development Act, 1973, fertile agricultural lands would be acquired, plotted and sold for different land uses and through a master plan by notifying them as a Development Area under section 3, by their definitions as defined in the objects of the Authority in the Uttar Pradesh Urban Planning and Development Act, 1973. While rural centres that fall out of the list of agriculture or rise to a human population above 10000, get listed under the “Nagar”. The structure of *Panchayat* with a *gram pradhan* does not apply anymore and as a result of blind development practices, their connection to agriculture and socio-cultural practices of the village is permanently subjugated and erased.

The Development authorities find dealing with the village *Abadi* areas and rural confusion challenging. They neither are prepared to understand nor to administer and improve the conditions of these areas. The result is that most of the rural, peri-urban, and urban villages lie unattended while the newer developments take shape on fields and lands taken from agriculture and planned by the myopic Development Authorities with automobile invasive roads and with registered allocations of land as against the human-invasive-automobile restrictive construction of villages over self-selection of land plots and design processes. Innumerable examples of these *Abadi* areas within *Lal Doras* and extended *Lal Doras* that lie unattended can be seen within our cities.

With the crumbling sanity and orderliness of urban centres due to unchecked expansion and the mass migration of the people from villages to the urban, the disbelief on agriculture to be a value worth economy or as a path of life to pursue, even with the lack of employment and opportunities for the people who have continued to live in villages, adds to the misery of the situation today. It thus is important to help villages develop. With foresight, we may also wish to say that the cause of villages is important to bring stability to the nation, economy, and society at large. When we see the villages and urban villages of developed nations, we have hope that there is a direction. The development of Modern India as we see it today, cannot carry a metro bias. It must have the strength of villages, the roots of rural belts with the agenda of holistic, sustainable, environment inclusive, and ecological urbanism, benefiting agriculture, forests, and countryside.

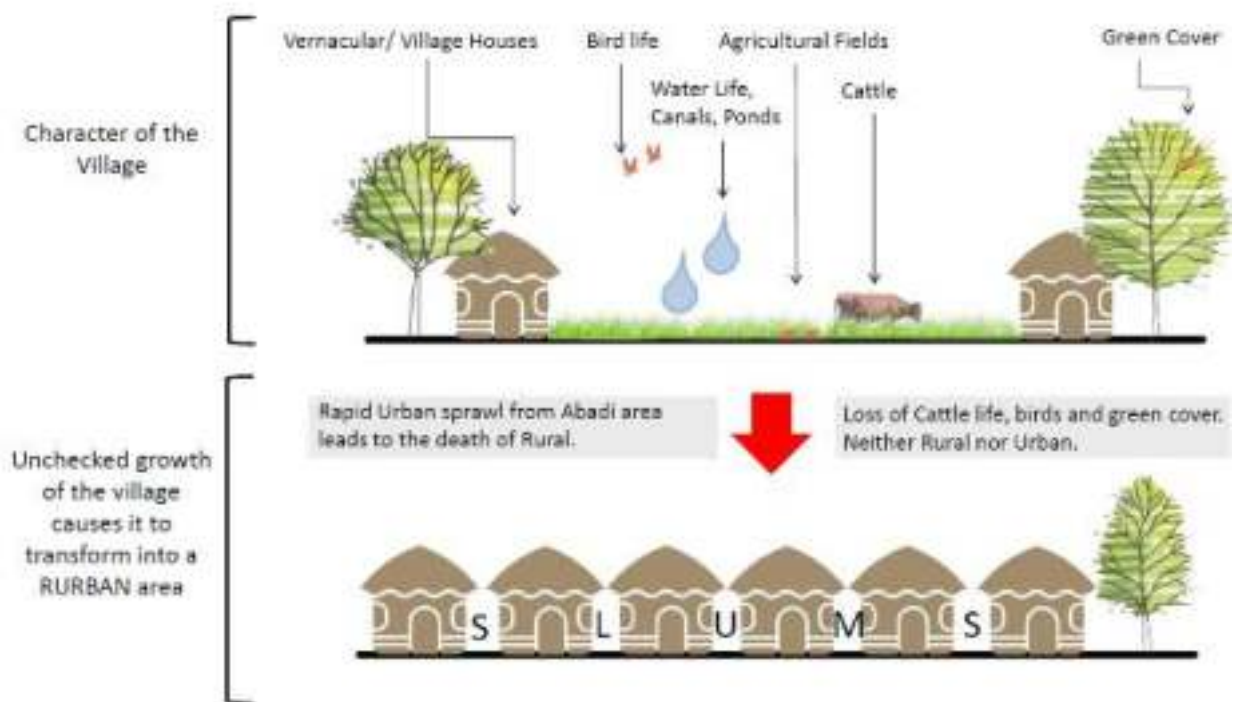


Figure 1 Existing character of village versus unplanned growth

1. The context for Planning at Gram *Panchayat* as per Manual for GPDP MPR GOI

The gram *Panchayats* as local government (Article 243G of the Constitution of India acknowledges *Panchayats* as institutions of local self-government and mandates them to prepare plans for economic development and social justice) are responsible for the delivery of basic services to Indian-local citizens and address the vulnerabilities of poor and marginalized. This can only be achieved through the implementation of well thought out plans through efficient and responsible utilization of available resources. Hence, an efficient and robust planning process as part of GP's core functioning becomes necessary. GP development plan should ideally match peoples' needs and priorities with available resources. It should be prepared through a fair, inclusive, transparent, and participatory process. The focus should be on local development issues, local perception of need and priority, analysis of problems, and solutions with a focus on local reality, resources management all within a collective local vision.

2. Aim for Rural Planning: Kalonda



Image 1 Aerial view of Village Kalonda

District G B Nagar like many others in India will soon lose its last set of villages to mindless development in the next 5 years. This will follow the abolition of the institution of *Panchayati Raj*, agriculture, and will lead blind the mind of the Urban Dweller to “village-sensitivities” and “right to the countryside”.

After a generation who believed in luxury as the prime achievement in life, the new age humanity believes in principles of wellness, cure, balances, aesthetics, and cultural rootedness for disease-free, normal, healthy living. Green net-zero and biophilic are the new aims. Countries of Europe, Japan, UK, USA, are trying to follow this model. A better quality of life is possible for them at a national level only when they saved their villages, through their society, culture and the housing character, and the agricultural connection of lives. A similar effort in villages of India and Kalonda is needed. The rules underlying planning must now recognize the basic values and must re-orient the outlook for which it has stood through the ages. The correct balance of life embedded in village life should be highlighted. We must have a more united effort at all levels (small-scale industry /investors /stakeholders /village communities) is aimed in the proposal for the village of Kalonda in the proximity of unchained urban pressures of the NCR.

a) Green Spaces

The village of Kalonda and others in G B Nagar must develop as the new destination for green living for the urban dweller who is often “stressed by concrete”. Rural tourism, aging and special need

communities, therapy, yoga, etc. offer possible cues for uses that can be adapted into village planning. A reverse flow of economy from metros to villages is possible. Integration of strategies will give a framework for achievements.

b) Conservation of Agricultural Land

Strict enforcement must be made to prevent the active conversion of land from agriculture to other rational use of land as residential, industrial, etc. This is a source of revenue for the district. The district must maintain the agricultural belts as a National resource for the nutrition security of the future citizen of our Nation.



Image 2 Deteriorating condition of the village

c) Planning

The measure of planning as understood and adopted by the world in the international agendas taken up in the Charter for New Urbanism offers the vision of “Design-first” to the world. Formulation of Rural specific planning norms, through a case-specific agenda per village, should be taken up to find a comprehensive, multifaceted, multidisciplinary, non-centered solution for saving the village of Kalonda as a village and a repository of agriculture, nature, and environment lest we lose them to the concrete desert of cities and mindless stretches of expressways. Our planning methodology in this proposal is Local Area-based and not an orthodox approach blinded by guidelines.

d) Economy, Environment, and Education

Agriculture is to date the most economic and beneficent human activity that sustains environmental balance. It also gives birth to secondary and tertiary economies in our system. An educated approach to agriculture, with more focus on crops, better farming techniques to reduce unpredictability and human struggle, will give better economics & hence reasons to maintain it and maintain open lands for agriculture. Planning by Design must aim at upholding the resource of land & social inclination to agriculture. Changes in policy accompanied by institutional partnering must be adopted. The village must be the new economic centre and give definitions to growth and development.

e) Equality

The Indians living in the villages have not yet received the beneficence of the modern, global, and inter-connectedness and are deprived of basic nutrition, education, health, gender-justice, shelter, and employment. They thus migrate and lose their connections with their roots.



Image 3 Mud houses of the Village

f) Natural features and geomorphology–

Lakes in Kalonda form the reason for the existence of life since the inception of the village. They are the reason for the growth of the villages. The dumping of grey water and polluting of lakes is now polluting the groundwater resource and bringing in life-threatening diseases. In our approach, we propose that they must be used for aquaculture and to provide a lake-based land use structure, a panoramic setting to the village, and a basis for leisure, recreation & rural tourism.



Image 4 Lakes of the Village

g) Perspectives and Proposals

Planning, adapted to the setting of Kalonda must focus on a SLWM and LULC plan that creates better opportunities through creating partnerships with SEZ and NEPZ in Noida and Surajpur for providing trained labor from this village for employment.

Local art and craft – Local arts and crafts of Kalonda must be cultivated, promoted, and developed through people’s participation. During our surveys, there were many examples of local women working on the assembly of weaving patterns and that of beaded jewellery in the village. On inquiry, it was revealed that the village contractors get bulk work from the Surajpur Industrial Area and the Hosiery Complex and distribute it amongst home-bound women and children, who find it easy to make a small living with the earnings from the assembly and knitting of handicrafts. It may be worthwhile to mention that the village has a need and a potential to evolve as an assembly annexed to the Noida Special Economic zones or other industrial houses of the region.



Image 5 Art and Craft of the village

h) Participatory local planning

Throughout the growth and development of India (in the last 200 years since and before independence from the British rule), the economic wealth of the villages has been continuously drained for the dream of development of the metros and the definitions of the betterment of cities (a concept borrowed from different nations and economies across the world, but not intrinsic to our country). The metros have, as a result, turned out to be magnets for attracting migrants and workers during the post-sowing and pre-harvest seasons and provided stability to the secondary and tertiary sectors of the economy, but they have also led to destabilizing the primary sector of the economy. The farmers of today do not want to continue farming. Their children do not want to be farm owners/cultivators. They all want to sell their lands for quick money and get into easy economies in the safe custody of the cities. They do not keep cattle as the connection between farming and cattle has been shattered and tending to cattle at home as a social practice has been discontinued owing to the hardships associated with it. The destabilizing of villages would eventually cause a mass imbalance in the urban, making it the most unsustainable model for living. The realization that cities could be built on agricultural fields, but they cannot be erased to give way to fields will then dawn upon the unabated trend that has driven us to a meaningless development-stir.

The model shared has been done in light of urban sustainability. Urbanization in India can sustain only if agriculture is safe and only if the villages are safe. The model shared here illustrates that with the more economic stability of villages and rural areas, the metros will become sustainable.

Population Control –rural must become the centre for control of population growth and retain the stability of both land and other resources.



Figure 2 Interdependency of metropolis/ administrative centre and Villages

3. Methodology

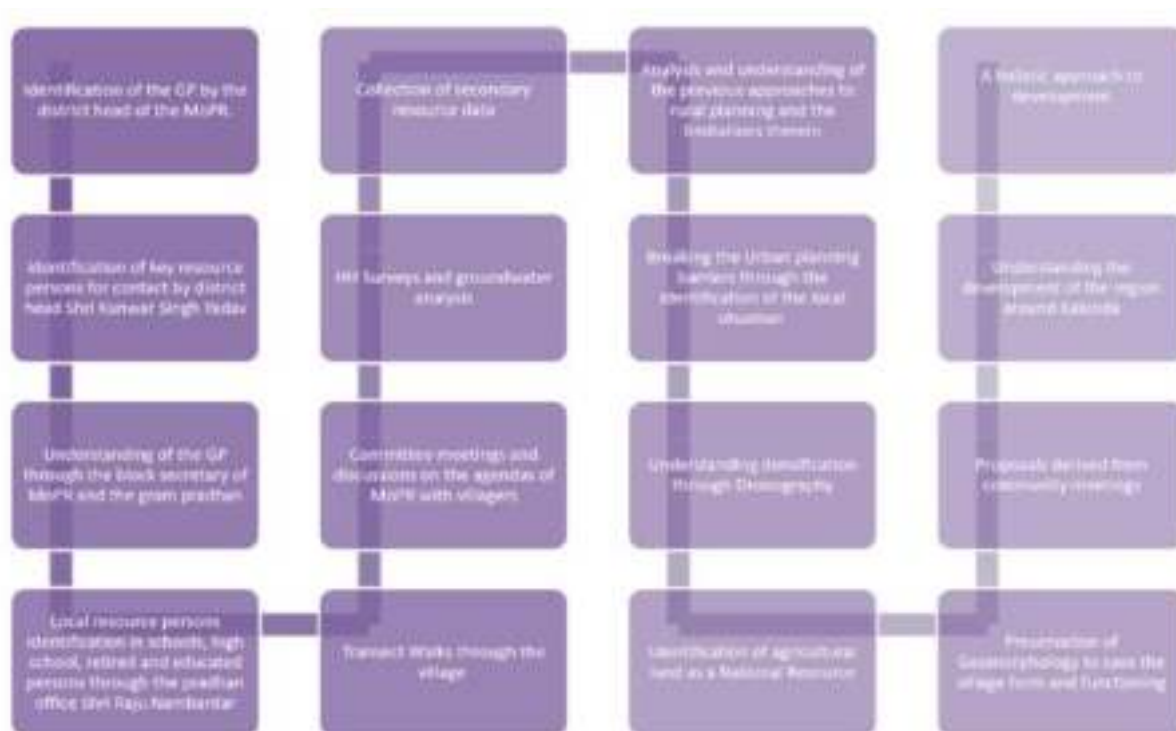


Figure 3 step by step process

In order to develop the GDP of Kalonda, it was important to first understand the village dynamics especially through the eyes of the Locals, the problems that they are facing, and their understanding of change. For the same, we first identified key resource persons for contact by district head Shri Kunwar Singh Yadav. With them, we understood the GP and past developments of the village. With the help of the block secretary of MoPR and the gram *pradhan*, we got a fair understanding of the village and raw secondary data to form the basis of our studies.

The primary data collection is from household surveys to transect walks through the village and community interviews, it all helped in a better understanding of the village conditions. Constant meetings with the villagers and MoPR led to clarity of the shortcomings in the village and the rural planning approach.

With primary and secondary data, we have adopted an exercise in which the Urban Planning barriers had to be broken and the rural development had to be done beyond the norm of the day. For village planning, a village can never be developed in its individuality. It cannot just be an administrative boundary. It's a region. The nearby villages have a major impact on the growth and development of the village. Therefore it was important to understand the development patterns of the nearby areas as well for the better and holistic development of Kalonda. The identification of agricultural land,

understanding the densification of the village, preserving the geomorphology of the village, understanding the development pattern of the nearby villages of Kalonda, and thus following a holistic approach to development is the need of the village Kalonda. We worked on proposals suggested by the primary users themselves, keeping in mind the development of the village and that the character of the village and agricultural land must not be lost.

Constant meetings with the stakeholders helped us to further improvise on our proposals and provided us with a clear thought to what the primary users want. The dovetailing of academic thought to the ground realities, we feel it has lent an appropriate direction to our suggestions. Identification of limitations of definitions adopted in governance policy is the direct outcome of the meetings with stakeholders. Another revelation was the lack of funds for development in villages as compared to funds for areas that emerge out of the status of villages. It is thus requested that parity of per capita funds be maintained in villages and facilities imperative to secure administration must be provided by the government machinery.

Reference to URDPFI, the draft RUDPFI and Urban and Rural Planning programs, policy, books, and standards for the preparation of the project framework has been made.

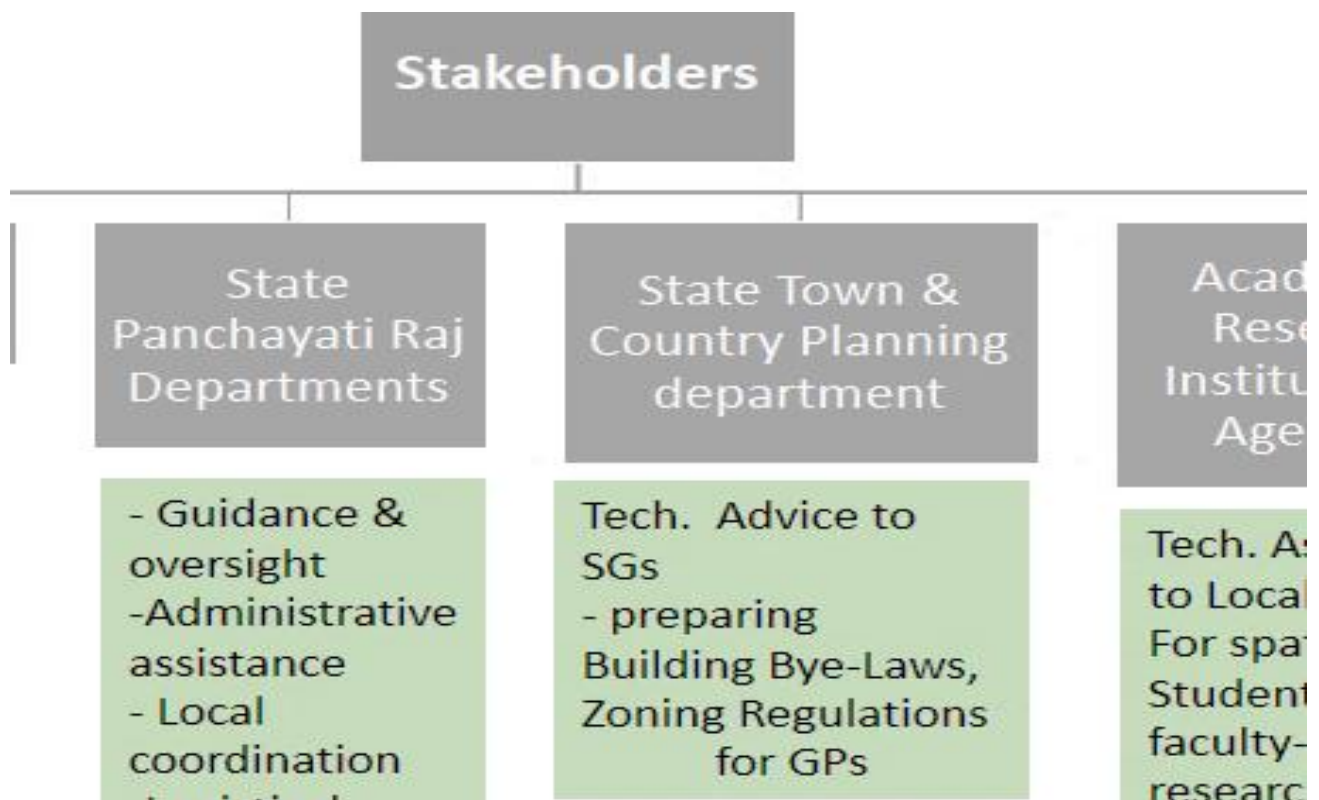


Figure 4 Stakeholders

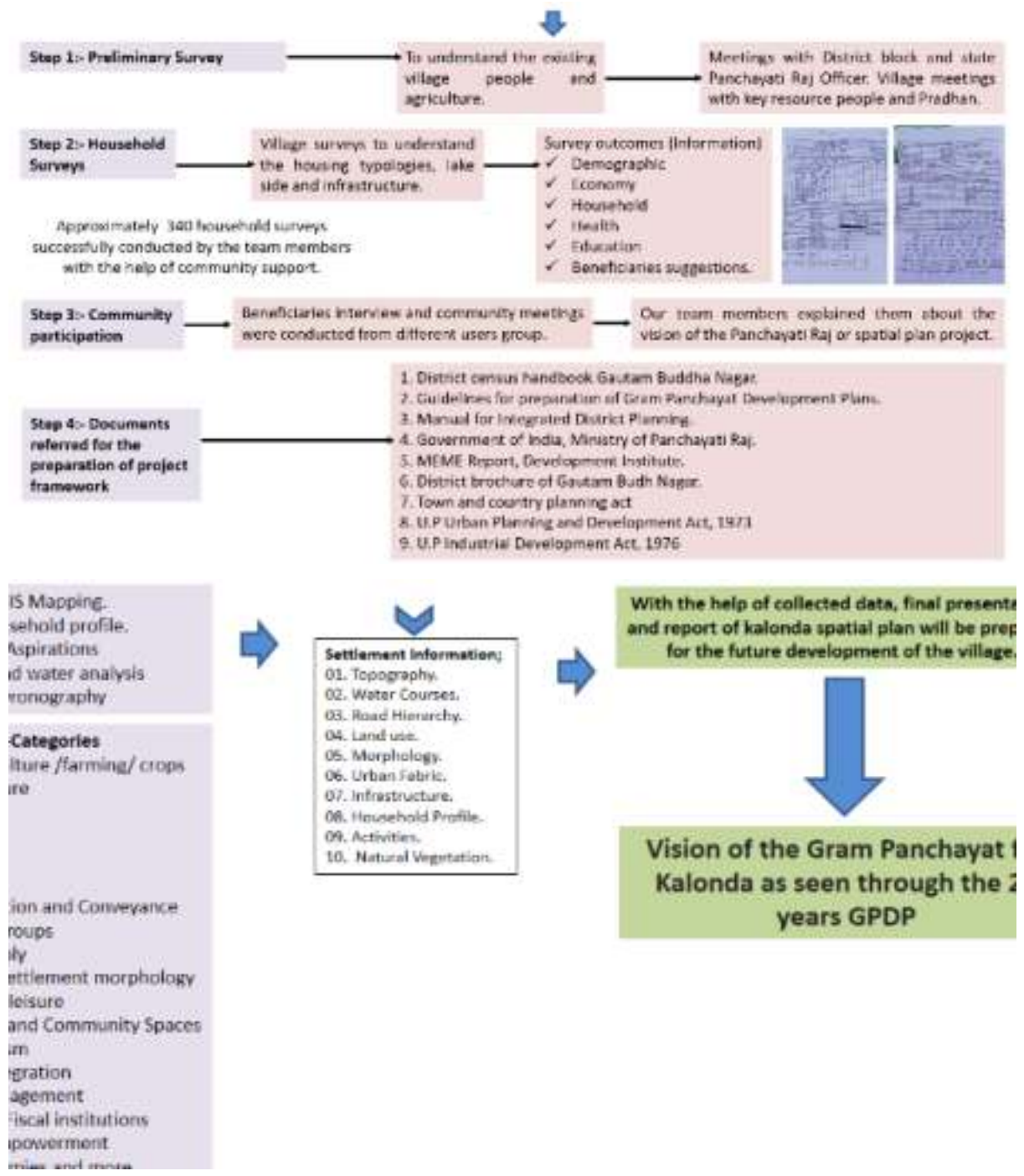


Figure 5 Methodology

4. About Kalonda Village



Image 6 House in Kalonda

Kalonda is a large village located in Dadri Tehsil of Gautam Buddha Nagar district, Uttar Pradesh with total 1371 families residing. The Kalonda village has population of 9910 of which 5143 are males while 4767 are females as per Population Census 2011. Kalonda village has lower literacy rate compared to Uttar Pradesh. In 2011, literacy rate of Kalonda village was 54.29 % compared to 67.68 % of Uttar Pradesh. In Kalonda Male literacy stands at 67.08 % while female literacy rate was 40.54 %.

Kalonda is a village in Block Dadri, District G. B. Nagar, Uttar Pradesh, well connected with the surrounding villages. The village has five *Talab*s and a canal within the settlement.

There are various Agricultural activities, farming of crops (Wheat, rice, maize, jawar, bajra, etc.). The village is located at a distance of 5 km from highway NH 34. At present, the entire settlement is divided into two parts along the canal.

While the majority of the people living in this area are from the Muslim community, the rest are from the Hindu community, yet they maintain similar surnames as they are descendants of Rajputs.

With the rise in population and reduction in agricultural land, the population is in a fix. There is evidence of social unrest, social injustice, migration, and rural poverty. As per census 2011, the total area of the village is 489 HA with a population of 9910 people and 1317 households.

	Census 1991	Census 2001	Census 2011
Total Area(HA)	719	750	489
Total Population	5567	7494	9910
No. of households	795	990	1317

Table 1 Census data



Figure 6 Regional context of Kalonda

i) Demographics

I. Family Size

The average household size in Kalonda is found to be 5.9 to 6, against 4.5 being the national average. This shows that the average family size is *higher* in Kalonda, and thus as the population will increase in further years, the average household size will also increase.

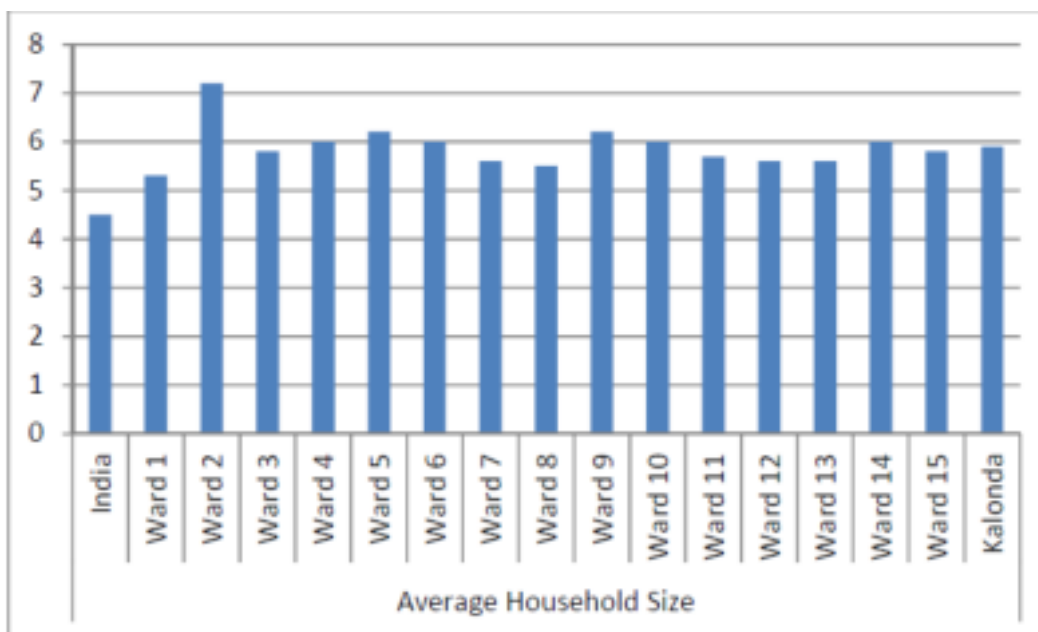


Figure 7 Average household size

II. Religion and Caste

Kalonda sees a mix of believers of Hinduism and Islam. As per the primary survey, 69% of the people follow Islam while 31% follow Hinduism clearly showing the dominance of Muslims in the area. Both Hindus and Muslims use the same surname, as they have come from the same Rajput descendants. Almost 95% of the people are Rajputs, the rest of the population comprises of Brahmins, Jogi, Nai, Saifi, etc.

The people of Kalonda speak Hindi as their local language with a touch of Urdu due to the dominance of the Muslim population. All the major festivals are celebrated there with full enthusiasm due to a mix of religions.

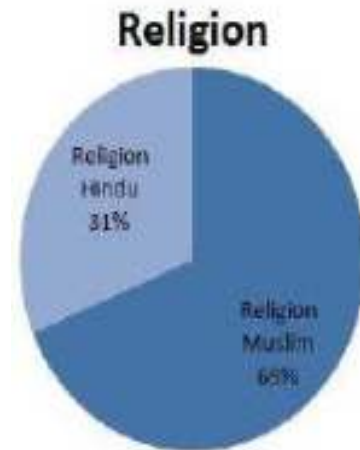


Figure 8 Distribution of religion in the village

Caste								
Badhai	Balmiki	Brahmin	Muslim Rajput	Jogi	Nai	Hindu Rajput	Saifi	Vaishya
0.7%	0.1%	0.7%	25.6%	0.6%	1.8%	69.5%	0.7%	0.3%

Table 2 Distribution of caste in Kalonda

III. Age-Sex Ratio

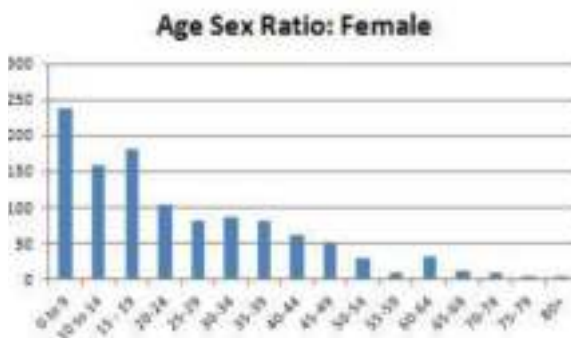


Figure 9 Age-sex ratio female

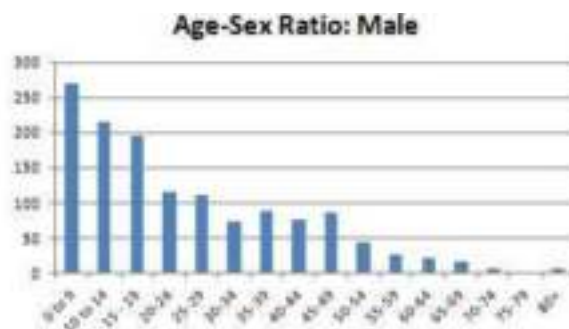


Figure 10 Age sex ratio: male

The age-sex ratio found in the Village of Kalonda is 1000 male to 843 females which is far less than the national average of 940 females over 1000 males. In the age bracket of 0-19 years for both males and females, the population is more than 50% of the total. The least being 4-5% in the age bracket of 60-80 years. In the age bracket of 20-60 years, both male and female population is about 44-46%. This implies that the working population is less than the dependent population to the accord of more than 10%.

IV. Education

A quarter of the population of the village has not received a formal education, even after the presence of a 70-year-old Inter College in the village. Amongst the population that gets a formal education only 11.5% qualify up to the inter-college and only 6.5% pursue graduation or post-graduation. This shows the poor literacy rate of the village. Also as per census 2011, the literacy rate in women is even lower as compared to that of men. Out of the total educated people, only 34% are females while the rest are found to be males.

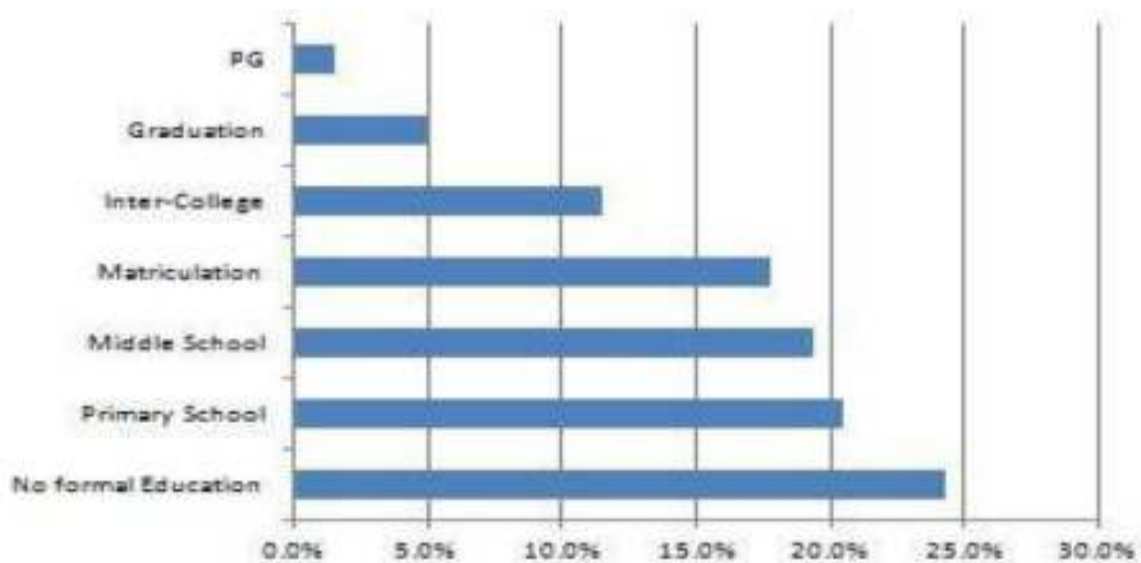


Figure 11 Education breakup of the village

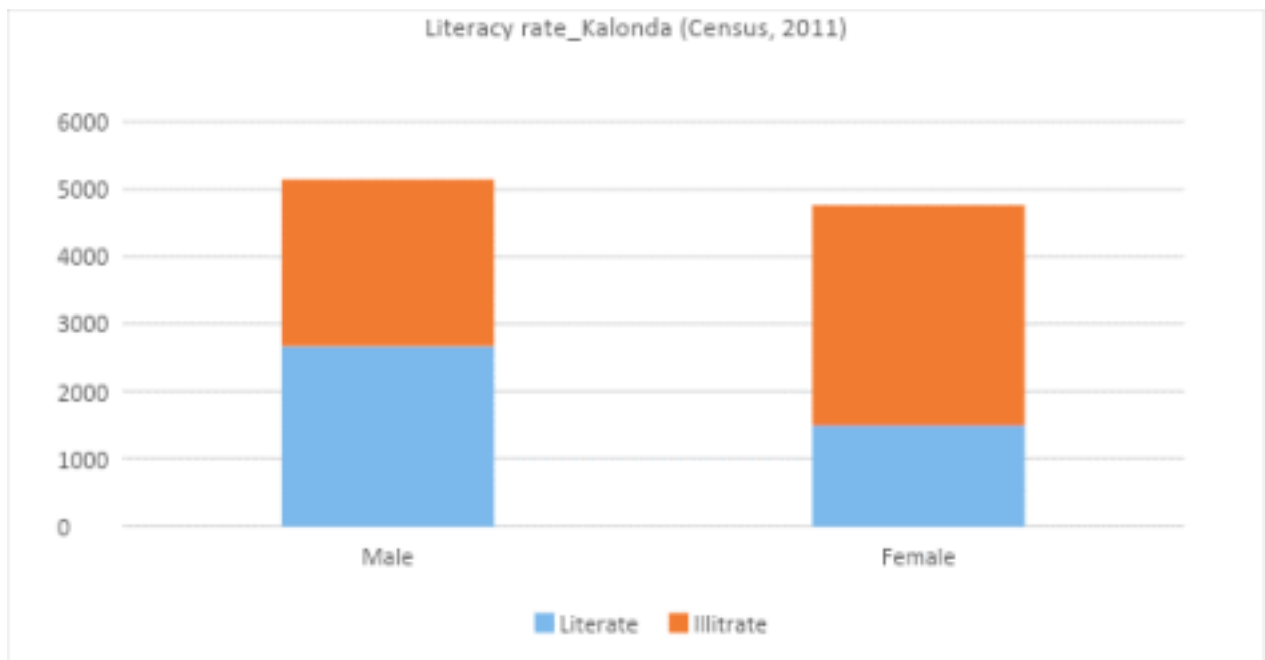


Figure 12 Literacy rate of Kalonda

V. Occupation

The working-age in Kalonda is found to be between 18 to 60 years, amongst which it was found that only 35% of people have a proper income through the primary surveys conducted. 65% of people are either unemployed or have marginal employment throughout the year. It was also found that only a quarter of the total employed people are engaged in the primary sector and about 10% in the tertiary sector. A clear absence of secondary sector implying that the village does not have any kind of cottage or manufacturing industry.

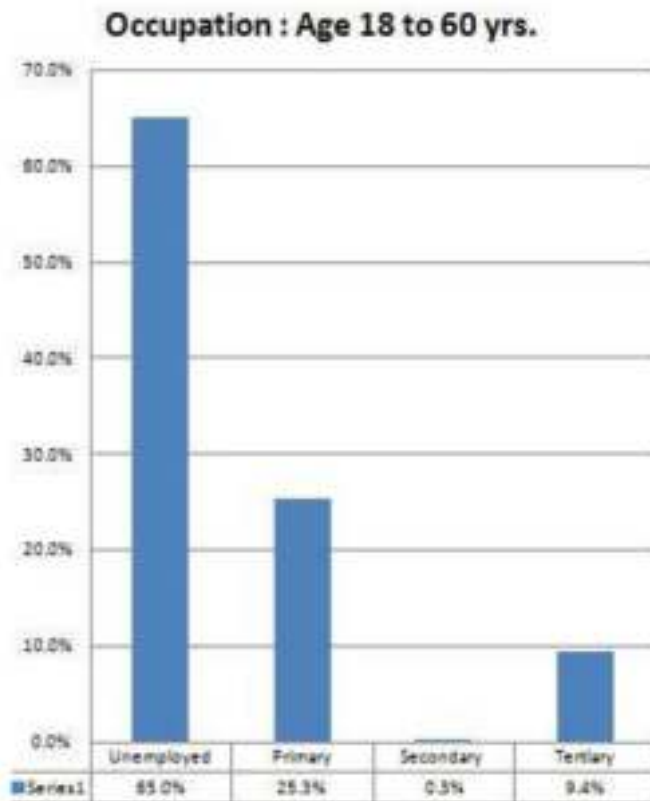


Figure 13 Occupation of age group 18 to 60 years

VI. Geomorphology

Gautam Budh Nagar district, a part of Ganga-Yamuna *Doab* in the vicinity of River Yamuna, forms almost a monotonous plain with the occurrence of dunes, sandy ridges, ravenous tracts, and depressions close to the river system of Yamuna. At places, close to river ravines are developed in the form of narrow gullies on the land surface due to excessive erosion by surface runoff. Ravines form a badland topography along Hindon and Bhuriya Nadi between Bisrakh and Dankaur areas and also in the Jhajhar area. Lenses and beds of Kankar are seen exposed and forms mounds or pinnacles. The flood plain of river Yamuna with remnants of old meander scars, oxbow lakes, and relict drainages is developed along the river in the western part of the district. The terrain has a gentle slope from northwest to south-east with a gradient of 0.2 m/km.

In the case of Kalonda, we can see a minor level difference, with the highest point at 213m and the lowest at 208m. There are 5 documented water bodies in the village, all situated at the lower levels as compared to the *Abadi* area, forming a natural drainage pattern by accommodating the surface runoff. A canal also runs through the village alongside the main road. Most of the village roads are found to be built along the water runoff streams.

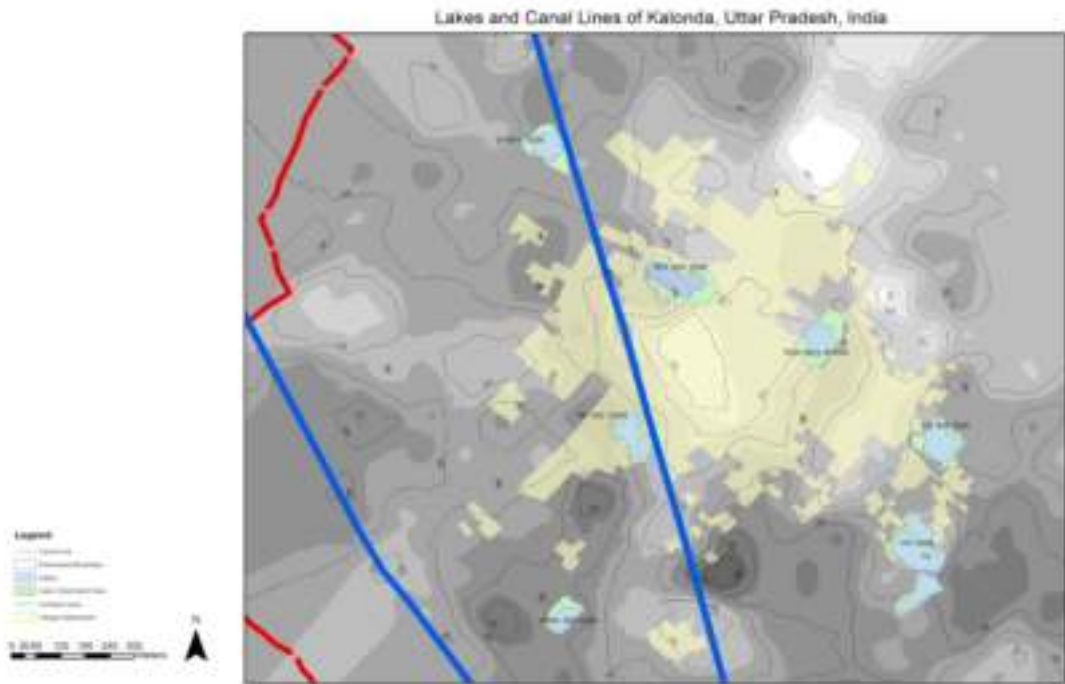


Figure 14 Lakes and Canal lines of Kalonda

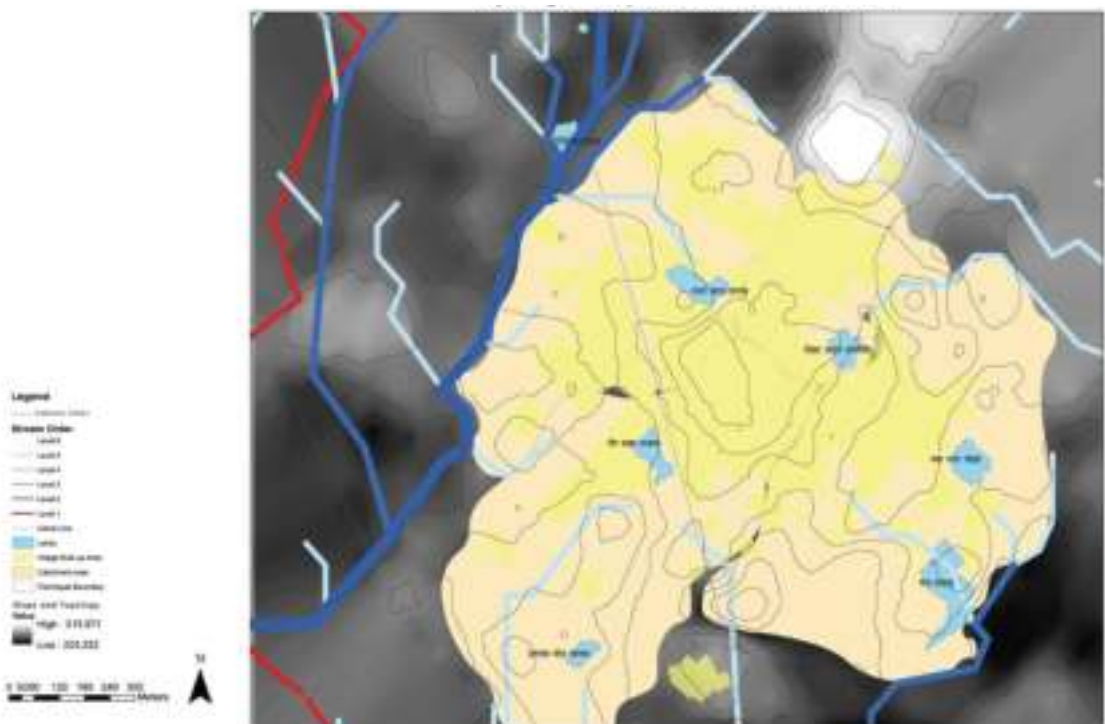


Figure 15 Hydrological study of Kalonda- catchment areas

The area has a variety of trees like neem, peepal, guava, mangoes, dates, etc. but with time they are reducing due to continuous deforestation and no afforestation.

VII. Water Resource

Groundwater is the only source of potable water in the village. A very high TDS causes weakness of bones, digestive diseases, cancers of visceral organs, lung irritation, etc. Findings from HH surveys were substantiated through water testing. Water samples from 10 different places were collected in order to analyze the groundwater quality of Kalonda. The tests were conducted as per IS-10500-2012, under 17 parameters including, Color, Odour, Taste, Turbidity, pH, Total dissolved solids, total hardness, Iron, Chlorides, fluoride, calcium, Magnesium, Copper, Nitrates, Arsenic, Manganese, and Sulphates. From the test results, we could conclude that in general the water quality of Kalonda was found to be good and within the safe limits except at a few locations where the content of calcium carbonate and magnesium was found to be beyond dangerous limits. In the surrounding areas near Mata ka *Talab* and Jatav Balmiki *Pokhar*, it was found that the people living in these areas had more dangerous diseases like partial paralysis because of heavy metals as compared to the rest of the village. By the end of the tests, we could safely conclude that better hydrology, clean lakes, and a SLWM are indispensable to the development of this village.

VIII. Water Supply

The major source of water in the village is the groundwater taken out through handpumps. The other sources include wells, borewell, private taps, etc. With the presence of these water sources and five *Talab*s in the village, there still is not sufficient water supply in 60% of the households. Although the quality of the water is found to be moderate to good in most of the areas.

Water Supply Availability

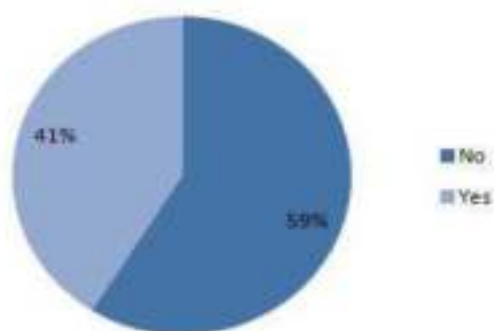


Figure 17 Water supply availability in the village

Source of Water

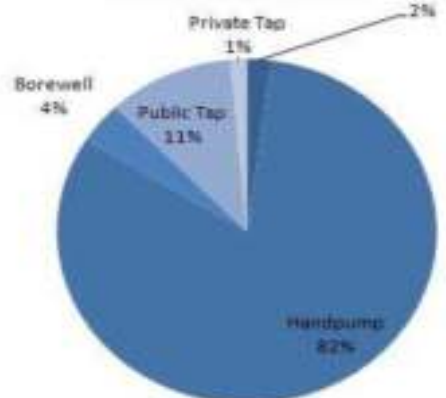


Figure 16 Sources of water in the village

IX. Soil Type-

The soil ranges from pure sand to stiff clays and including all combinations of the two extreme litho units. The pure sand is called Bhur and clay is called Matiar. The mixture of sand and clay in equal proportion forms Dumat or loam, a good agricultural soil. Several subcategories of Dumat are possible depending upon the contents of clay and sand. The badland patches (Kallor) which are ingested with Reh at places do not support any vegetation growth. Alluvial soils occurring in the flood plain of rivers is called Kemp which yields good crops. Kankars invariably associated with clay and at times retards groundwater movement.

X. Crops

Cultivation in the village of Kalonda in both single and multiple cropping pattern systems. Wheat, sugarcane, rice are amongst the few cereal crops that are found in the village. Cash crops and flower cultivation is also found in some areas.



Figure 18 Agriculture land of Kalonda

XI. Electricity

The electrical condition of the household was found to be poor. About 67% of the surveyed houses reported no electrical connection. These households either had no connection or they had borrowed illegal connections from the neighbors. Amongst the houses which have a legal electricity connection, 40% of the houses reported more than 12 hours of no electricity supply on average. 97% of the supplied electricity is used for residential purposes. A negligible amount is used by the street lights which are scarcely distributed around the village.

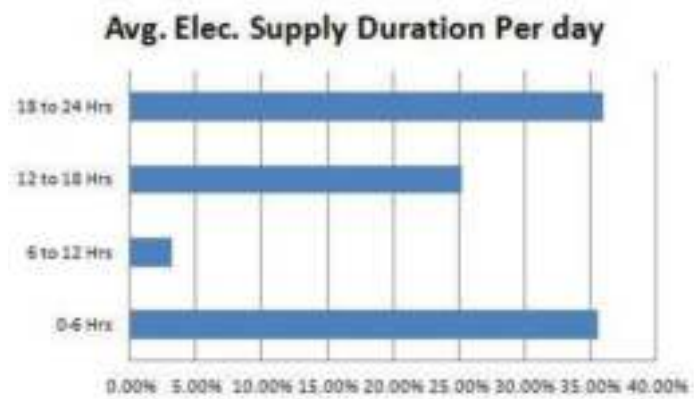
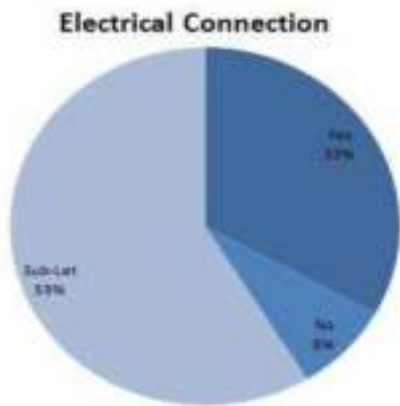


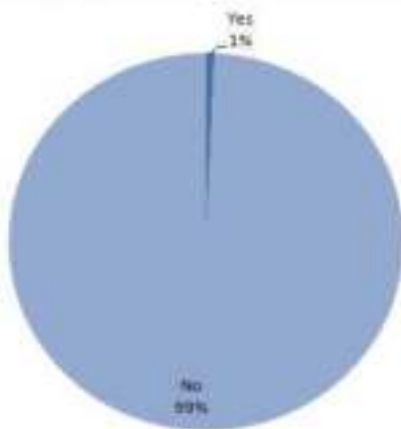
Figure 20 Electrical connections of the village

Figure 19 Average electrical supply duration per day in the village

XII. Waste Disposal

An absence of a proper disposal system is found to be missing from the village. Most of the houses dump their garbage in the open. There is no centralized provision of collection, segregation, recycling, reuse, composting, or disposal of solid waste in the village. A lot of waste disposal is also found to be on the lakeside, which further contaminates the lake water.

Solid Waste Management Available



Solid Waste Disposal

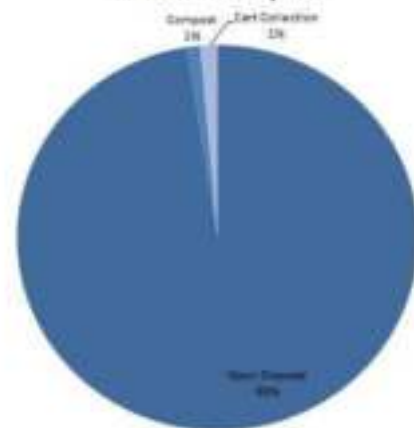


Figure 21 Available Solid waste management and solid waste disposal

j) Infrastructure

i. Burial Grounds

As the village is dominated by the Muslim population, therefore the village has 2 burial grounds at the outer periphery of the village. There also is one Shamshan Ghat towards the eastern periphery of the village serving to the Hindu population.



Figure 22 Positioning of the religious spaces, burial grounds and shamshans in the village

ii. House types

The village of Kalonda has an almost equal distribution in the number of Kutcha, *Pucca*, and Semi-*Pucca* types of houses, with *Pucca* houses being at the highest, that is, 36.6%. Most of the roofs of the village houses are made up of stone and mortar and has only 2.4% rare RCC roofs. Almost sixty percent of the houses in Kalonda have brick walls, most of the other houses have mud-mortar walls while only 5% of the houses here are said to be constructed through any Govt. scheme. From the surveys, we could see that almost 60% of the houses in the village are less than 10 years old. Only about 5% of the houses surveyed were found to be more than 50 years old.



Image 7 Houses of Kalonda Village

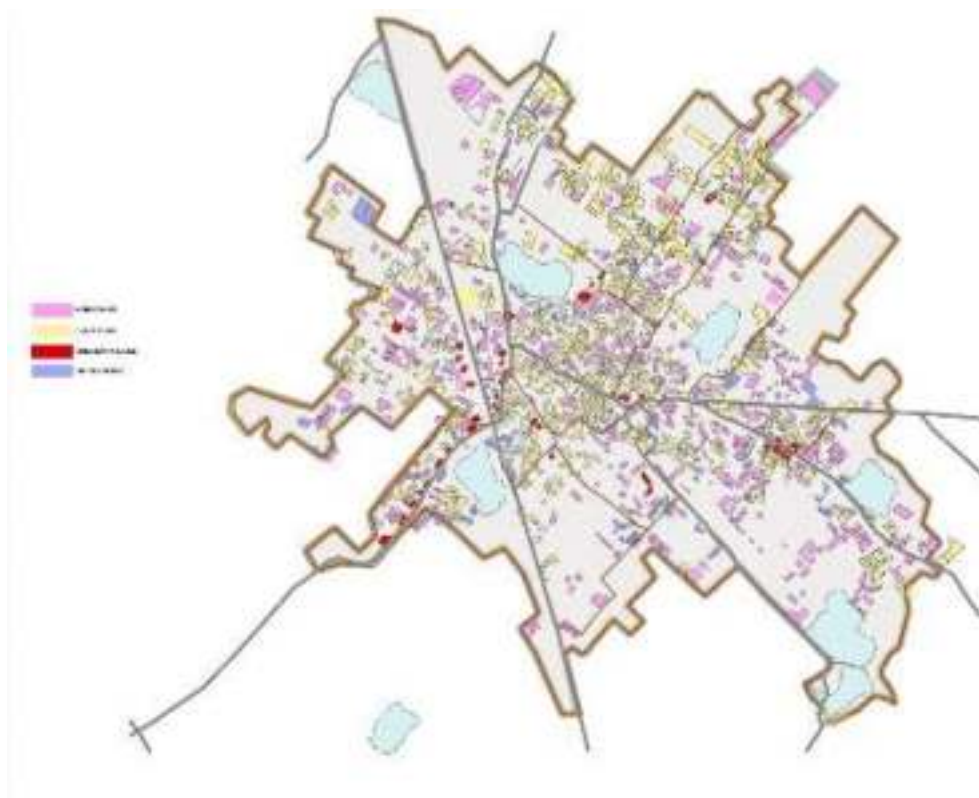


Figure 23 Housing typologies available in the village

Majorly seven different types of houses were found in the village- Front forecourt open house, multi-storeyed linear house along a lane, Modern urban houses, Mixed-use houses on the commercial node, Cattle pro houses, central courtyard houses, and multi court houses. The number of houses having Chabutra was found to be very low, which is evident from the fact that the social interactions among the people have declined considerably. About one-fifth of the houses have courtyards, which suggests that the planning of spaces in a house, in the village, is still very much introverted. Also, it can be identified that the houses that are situated on the outskirts are forecourt houses while moving inside the houses get densified and thus the forecourts convert into a smaller central courtyard to utilize the space fully.

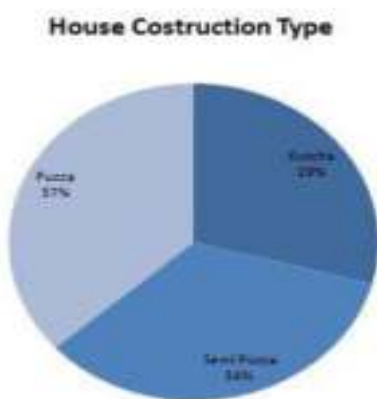


Figure 26 Housing construction type

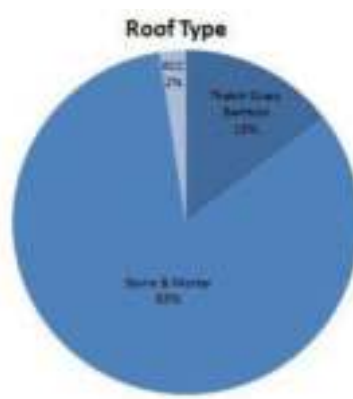


Figure 25 Roof types of houses

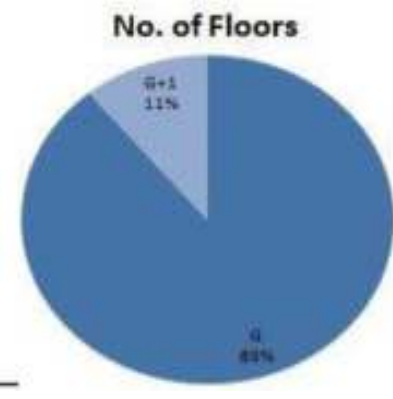


Figure 24 No of available floors in the houses

iii. Roads

The road widths in the village vary from 9.5 m width to 1.5 m width. All the major connecting roads are found to be 9.5m wide followed by village roads to be 4.5m and 3m wide. A lot of *kaccha* and undeveloped roads are also found with a maximum width of 1.5m. The village does not have access to public transport. It is interesting to see that the villagers today use a basic understanding of a one-way traffic system and adopt this to facilitate the movement of heavy vehicles and trolley tractors within the settlement area. The proposal of a unidirectional flow of traffic within the village emerges from the observation of this practice. It is interesting to see that despite narrow lanes, four-wheelers move into the village with ease. The parking of heavy vehicles within the village is either in the courtyards controlled by gates or on empty plots adjoining the houses. These are considered to be within the "*gher*" (The area occupied by the house).

The roads in the newer areas developed in the *Abadi* precinct of the village are wider and have clear areas on the sides, which allow the movement of four-wheelers both ways. The concrete area often is limited to 4 mts, but a *kaccha* sidewalk area of a similar width is there in almost all of the new settlement areas. It is with this understanding of the "indigenous urban" that we have proposed that such *Abadi* areas can function with the given road widths. The limitation in road widths, in turn, slow down vehicles and make them accident-free.

Infrastructure	Availability
Senior Secondary School	Available (2)
Degree College	N A (10 + km)
Primary Health Centre	N A (10 + km)
Tap Drinking water supply	N A
Banks	N A (10 + km)
The approach by <i>pucca</i> road	Available
Bus facility	Available
Community Toilet	N A

Table 3 Availability of social infrastructure in and around the village

There is evidence of social unrest, injustice, poverty, and migration due to lack of livelihood opportunities. Apart from agriculture the National Thermal Power Corporation (NTPC) at Dadari and Surajpur industrial area provide occupation to a few.

Level	Detail
State	Uttar Pradesh
District	Gautam Buddh Nagar
Block	Dadri
Gram Panchayat	Kalonda
Gram Pradhan	Nek Akhtar
Total Area	489 Ha
Total population	9910
Number of households	1371

Table 4 Kalonda Village Summary

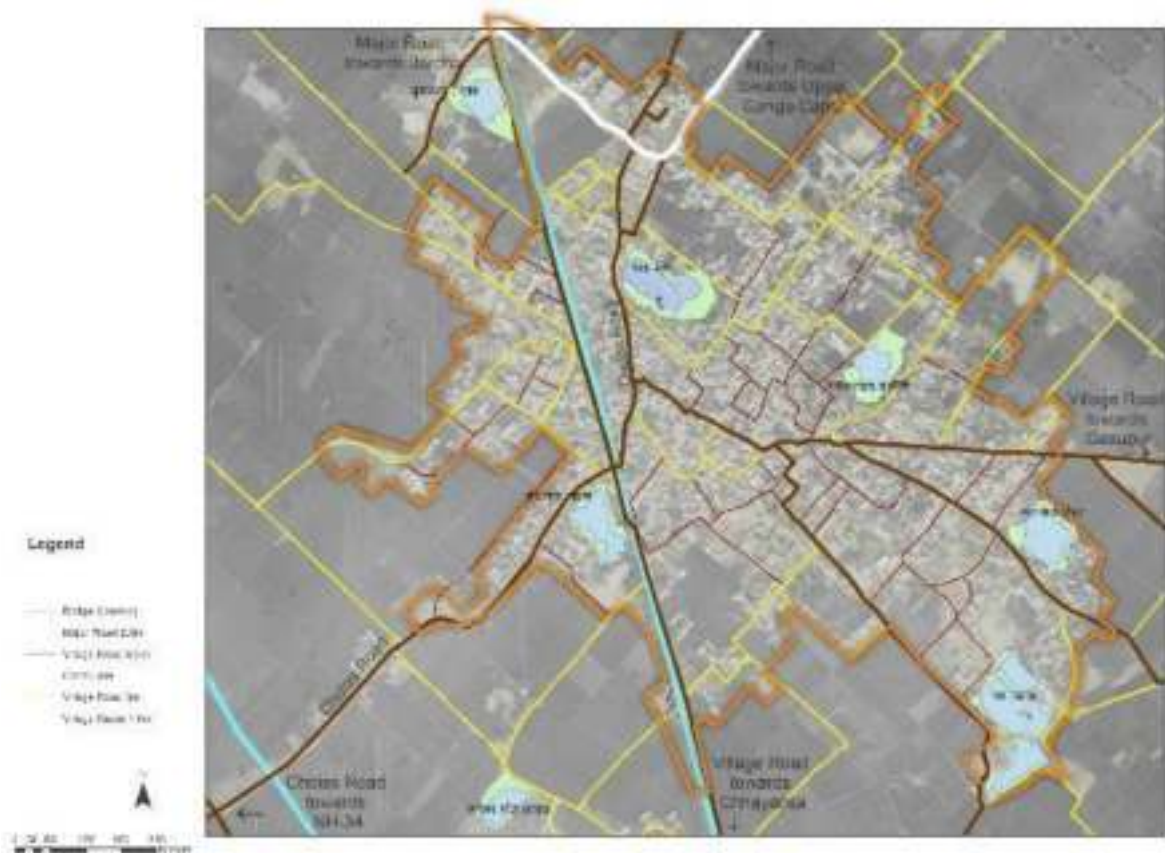
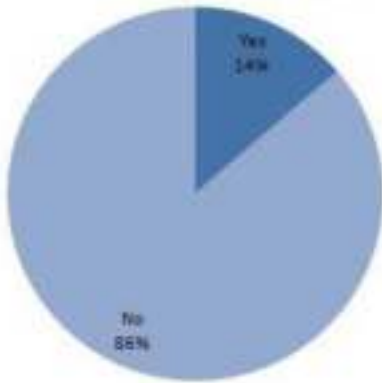


Figure 27 Village Kalonda along with Panchayat boundaries

Access to Public Transport



Transportation Used

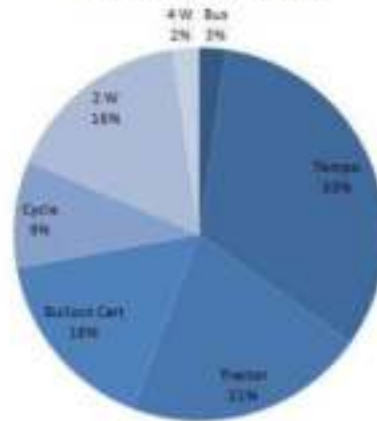


Figure 28 Transportation analysis

k) Miscellaneous

Necessities like an ATM, proper clinic or hospital, police station, etc. are missing. Almost three-quarters of the household neither have their toilets in the house nor have access to the community toilets, thus they go for open defecation, while a lot of them have benefitted from government programs.

Toilet Availability in Houses

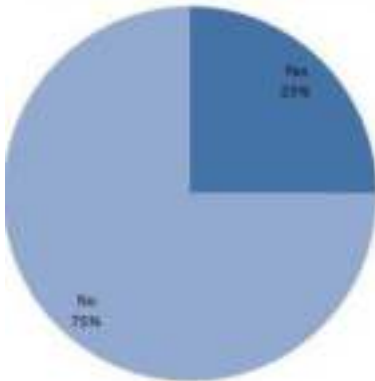


Figure 29 Availability of toilets in the houses

5. Dronography

To attain a clearer picture and a better understanding of the village Kalonda, we got a dronographic survey done of the area. The drone recorded all the major streets, traffic routes, commercial nodes, *Talab s*, buildings, agriculture fields, etc. of the village. The high-quality aerial and street views aided us in identifying the types of houses and analysing the functioning of spaces at large. It also helped us in understanding the cluster planning and reaching out to the places which in general were unapproachable. The dronography video helped us to observe and draw conclusions in terms of the growth of the village. For example, it can be observed from the dronographic aerial view that the village has front forecourt houses on the periphery of the village while on moving inside, the open areas of the houses get smaller and the forecourt starts turning into courtyards. This showed us the current growth and densification pattern of the village. The changing road widths and house heights could easily be identified with the help of the street videos. Also, the study of important nodes of the village,



Image 11 Aerial view of the village



Image 10 Aerial view of the village



Image 8 Aerial view of the nodes of the village



Image 9 Aerial view of the Puliya

drainage patterns, water bodies, and the encroached areas near the water bodies was easier due to the video. The ratio of open to void spaces could be easily observed and thus we also could identify a lot of urban voids that could be used in a better manner. The drone also recorded the connecting roads to the nearby villages and took aerial shots of the nearby villages, which gave us a better understanding of the village Kalonda as a whole, and its connection with the neighbouring areas.



Image 12 Commercial Node



Image 13 Lake view



Image 14 The Apeejay SAP team in the village

Regional Context

Summary

- The present status – Rural area with **strong influence of surrounding urban development**
- The NTPC Dadri and Surajpur Industrial Area lend **economic hope** to the village.
- Easy drive distance from Delhi provide a potential for **rural tourism**.
- The connection of the Western and the Eastern Dedicated Freight Corridor at Dadri and National Highway offers a great opportunity for **agro based production and trade**.
- The Eastern Peripheral Expressway gives Kalonda a very **wide outreach**.
- The policy proposal must address **agricultural belt as a region** and not the village as independent entity.



Figure 30 Plan for 25 years of regional growth and future opportunities

Kalonda sits in the vicinity of rapid changes. In the next 5 years, the village will be on a metro circuit connecting to the Jewar airport and hence will be a potential site for activities like renting of houses to the working population and also a provider of the workforce needed for the activities in the region. In addition to this change, the development of the Delhi–Mumbai Industrial Corridor Project (DMIC) starting from Dadri would have a tremendous impact on this region and a sea of changes would be seen in the villages within the block Dadri. DMIC is one of the world's largest infrastructure projects.

It is conceived as a high-tech industrial zone spread across six states as well as Delhi, the national capital. The investments will be spread across the 1,500 km long Western Dedicated Freight Corridor which will serve as the industrial corridor's transportation backbone. The presence of Kalonda in the vicinity of the DMIC will promote uses like renting, warehousing, the supply of manpower, employment generator for a large working population, processing and packaging units, and even for industries.

In the next 5 years, all signs of agriculture and cultivation will be wiped out from the lands of Kalonda. The population of the village will indeed have work, but working as laborers and small supervisors are no foresight for the village dwellers. The next five years would see Kalonda, next to a world-class Film City and a Patanjali Food Processing Unit which would all need easy, affordable, malleable lands of villages for conducting the lesser economies and high risk or high pollutant processes. Kalonda could participate in a more wholesome matter with these projects if its agro and associated activities are flourishing. The village needs to align itself and the competence of its dwellers in such a way that the growth gets dovetailed into the economic developments all around.

1. Understanding the Regional Context of Kalonda

Each Indian village possesses its unique character and hence before any planning intervention, this uniqueness is to be understood by detailed surveys and public consultation. Every development intervention has both positive and negative impacts, the key goal here shall be to minimize the negative impacts and aiming at holistic social, economic, and environmental development.

The villages located close to metro cities are primarily Rurban (comprising of the rural and urban). Each village has interdependence with other surrounding villages for socio-cultural, economic, and agricultural purposes. A village in India today cannot be seen as a village alone. The outline of the village as a Gram *Panchayat* is merely an administrative boundary, but its functional boundary stretches across 3-4 villages. This is evident in the case of Kalonda Village as well. The village *Panchayat* may be required to administer a set of people or activities, but while

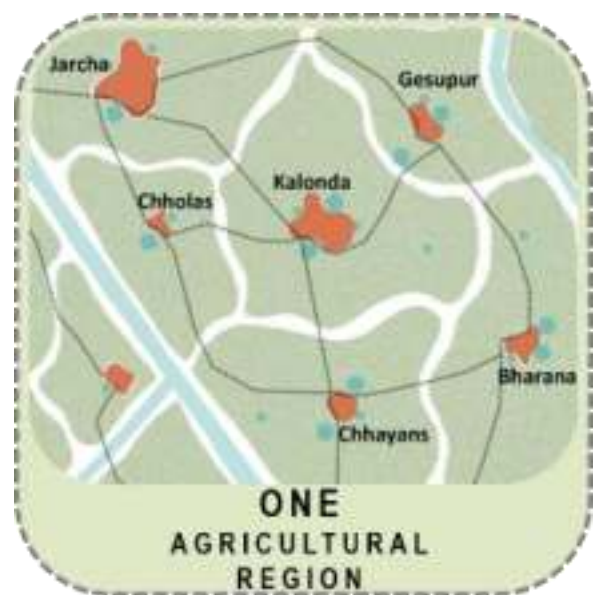


Figure 31 Regional connect of the village

saving a village or planning for a village, the complete region has to be saved. Hence it is recommended that a holistic policy is devised for the region and not the village independently.

The four villages of Kalonda, Jarcha, Gesupur, and Cholas work like a network and are interdependent. The *Abadi* areas may be separated by a distance of 3-5kms, but the agricultural fields of all these villages meet, and hence agricultural equipment, processes, and practices are shared. There is a marked geographic similarity of the soil type causing formation, creation of ponds and water bodies around the villages. They share the same administration and the same geography and hence their problems and the ways to handle them are similar. A common harvester, shared labor during harvest seasons, interdependence due to sharing of labor coming from the landless class amongst the villagers and implements like harvesters, threshers, and supplies of fertilizers and seeds are strong bonds they share for the primary sector of the economy. Social bonding and marriages and the sharing of festivals add to the economic sharing of agricultural processes. Jarcha has a public school to which parents prefer to send their children for primary education. Kalonda has a 70-year-old inter-college to which students from the catchment gather for 10+2 education. There is a bank and an ATM in Jarcha but none in Kalonda. The combined population of these villages acts like one unit force, for cultivation. This is good for activities of the secondary and tertiary sector of the economy, based on agri-produce, but the property speculation dream creates pressure on the agricultural fields and they are undergoing rapid conversion to smaller pieces of land and then to a housing sprawl.

Settlements that are culturally, socially, economically, geographically, and administratively united tend to grow towards each other. There is no check on the growth of their *Abadi* areas. There is a tendency in Indian settlements to grow along the roads. Such is the apathy of sprawl that it goes unchecked along the movement spines and densification of settlements in the core or internal areas keeps becoming impossible as the sprawl towards the outer side, along with the roads increases. This is the reason when we look at giant urban villages where surrounding urban growth has been unchecked since the last 75 years of independence. They all have huge internal open spaces and overcrowding, high FAR construction, and tall buildings along the roads.

The agricultural fields around the village are undergoing a rapid transformation and must be secured by legislation lest the four villages fuse to form a giant rurban slum with no economic solutions and with only diseases, crime, and a huge unemployed, untrained, uneducated, misdirected population dependent around metropolitan centers. A glimpse at the network of minor and *kacchar* roads that spans the agricultural fields explains the process. While the size of agricultural fields is big in between Jarcha and Kalonda and so is it in between Cholas and Kalonda, many small ancillary roads and “*khadanja*” roads can be seen functional between the village of Gesupur and Kalonda. The fields are

being divided into smaller properties and they are getting subdivided, sold, and resold and are forming smaller properties with the result that the two villages are looking at land plotting as an opportunity. The assured principle of growth, through property, land mafia, land acquiring is being replicated here in villages without vision. **It must be remembered in all processes that it may be possible to convert a piece of agricultural land into buildings, but it is impossible to convert devastated relics of urban sprawl built mass into a cultivatable field.** The MoPR must thus take up the conservation of agricultural fields as their prime responsibility for upholding the cause of the villages.

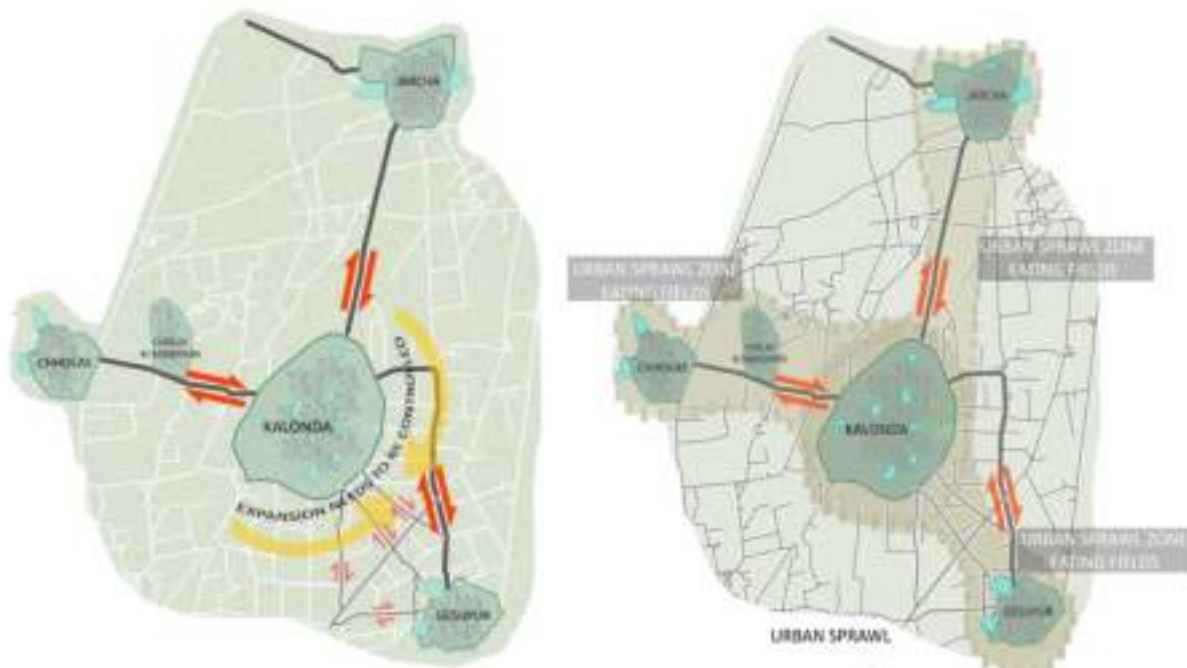


Figure 32 increasing interdependency of neighbouring villages creating an Urban Sprawl

A strong recommendation to prohibit the connection of the villages through multiple roads and to prohibit the conversion of agricultural land into settlement must be made through legislation. The fields may belong in ownership to individuals and not the government, but the green mass cultivation zone must be a national, ecological, and economic heritage for the future citizens.

2. Regional Connectivity

The Village Kalonda is located in Block Dadri, District Gautam Budh Nagar, Uttar Pradesh. It is in close proximity to the National Capital Region of Delhi (50 km), Noida (40 km), Greater Noida (28 km), Ghaziabad (34 km), Meerut (55kms), and Bulandshahar (30 km). The nearest town is Dadari (15 km)

The village is very well connected through the road network and further connected through the Greater Noida expressway, NH 24, NH 34, and Eastern peripheral expressway. The nearest Railway

station is Dadri (15 km) and the nearest Airport is at New Delhi (74 km) (Figure 1). The location census code for Village Kalonda is-120196 (Census of India, 2011).



Figure 33 Map showing regional connectivity

3. Neighbouring Villages and Towns

The presence of strong contextual forces poses innumerable opportunities for agro-based production, processing, manufacturing, and trade. The village is connected through a high-speed Eastern Peripheral Expressway to other towns and cities in the National Capital Region. National Highway 24 and 34 enable connectivity to further north and southern towns and cities. Existing Surajpur Industrial Area, National Thermal Power Corporation Township near Dadri and ICD between Surajpur and Dadri, are sources of secondary and tertiary employment for part of the village population.

Further regional opportunities in near future are the upcoming Delhi-Mumbai Industrial Dedicated Corridor includes proposals for a Multi-modal transport hub, multi-modal logistics hub at Bukadi in the first phase followed by Integrated Industrial Township at Greater Noida. If we look at the opportunities posed in the immediate regional context we find that the urbanized belt in the Noida-greater Noida region is expanding now into the developing region along the greater –Noida extension area till Railway line near Dadri. This development hasn't reached the present agricultural belt in and around the village Kalonda (figure 3). A look at the future possibilities with this trend and the pressure from real estate reveals that it is inevitable to protect the village from such strong regional influence. The only way forward to conserve the ecology and agriculture in the region is through balancing it by

exploring the economic potential of agricultural land by exploring possibilities with non-conventional farming. (Chapter 4 – Economic and Livelihood opportunities)

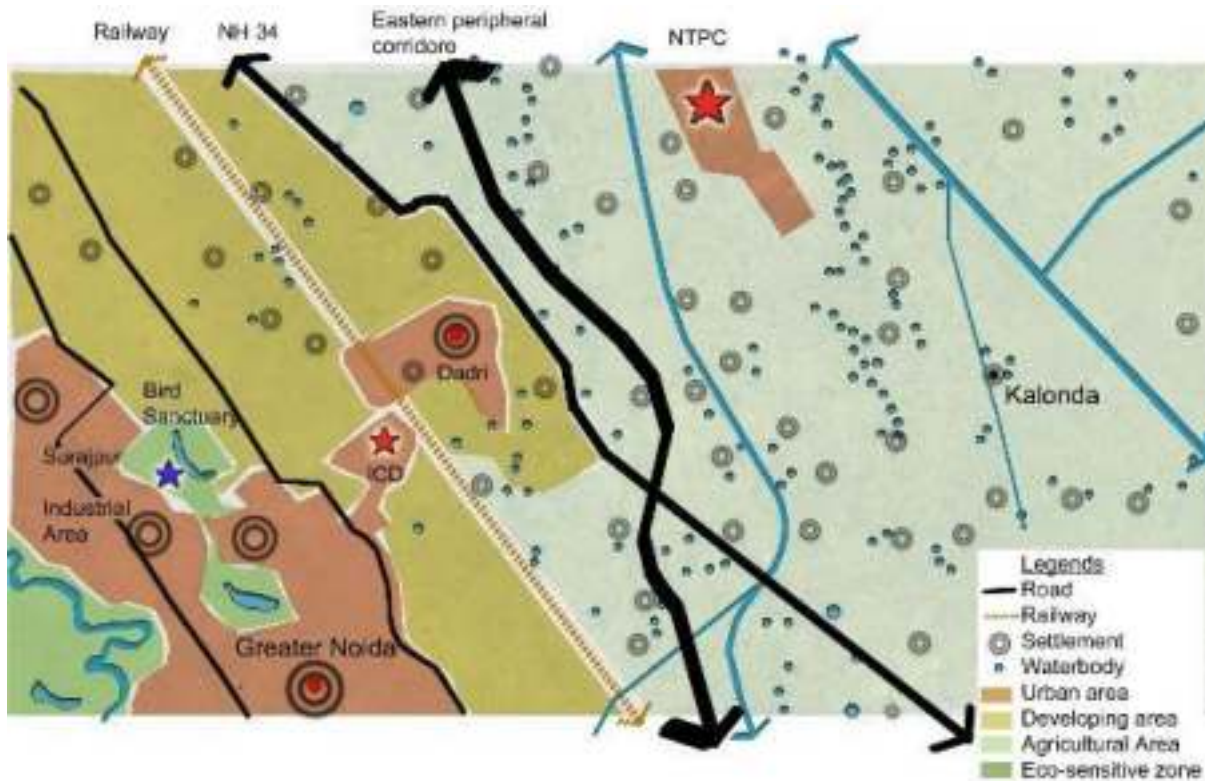


Figure 34 Present context of development around Kalonda

The Village Kalonda is connected to neighbouring villages through a web of narrow metalled roads (4.5 to 1.5 m wide) crossing the agricultural fields to the surrounding villages. The National Highway 34 and Eastern Peripheral Road is located at a distance of 5 km. The Villagers are dependent on neighbouring villages for several amenities that are not available within the Village settlement. There exists a strong social relationship with the villages like Jarcha, Cholas, Chhayans, and Gesupur.



Figure 35 Map Showing Kalonda Village and its connectivity with surrounding settlements



Image 15 People of Kalonda

Environment and Resource Management

Summary

- *A conservative approach towards the natural environment by protecting village agricultural land, water-bodies, vegetation and wildlife/Birdlife.*
- *To prevent encroachment of lake for landfill and development by active recreation along lake edge.*
- *Exploitation of government schemes and funding from SBM on sanitation and SLWM.*
- *The involvement of Ministry of Fisheries in the development of aquaculture in the lakes of Kalonda.*
- *To give a definition to development through the geomorphological layer at the root of the village.*

1. Introduction

Urbanization, backed by the economy, backed by the government will and social aspirations is not easy to control. The general tool adopted by planners was to construct a ring road, to circumscribe the growth and to limit it. This has been time and again tried and tested in different situations. The result always has been unauthorized growth on the other side- allowed as development and later recognized as legal. The village thus must be limited by peripheral land uses which do not allow further growth. The development of institutions with a back to the green fields and with controlled access to the fields is the only method to do this. The diagram illustrates the development of such institutions along the periphery of the village and especially towards the side where the village is racing to merge with Gesupur.

2. Land Use and Land Management (LULM)

Like most of the rural communities in India, the primary livelihood dependency of the community is on agriculture. The Land use data for Village Kalonda indicate that 70% of the village area is under agricultural use. The total area under agriculture use is 347.85 Hectares and is irrigated through wells and tube wells only. The village has mostly small and marginal cultivators with small landholdings. They take additional land on rent to expand the area being cultivated which does not give enough profits. Since the income levels are low, the small landholder is unable to purchase mechanized tools

and tractors for agriculture and hence depends on renting the tractors which is a recurring expenditure.

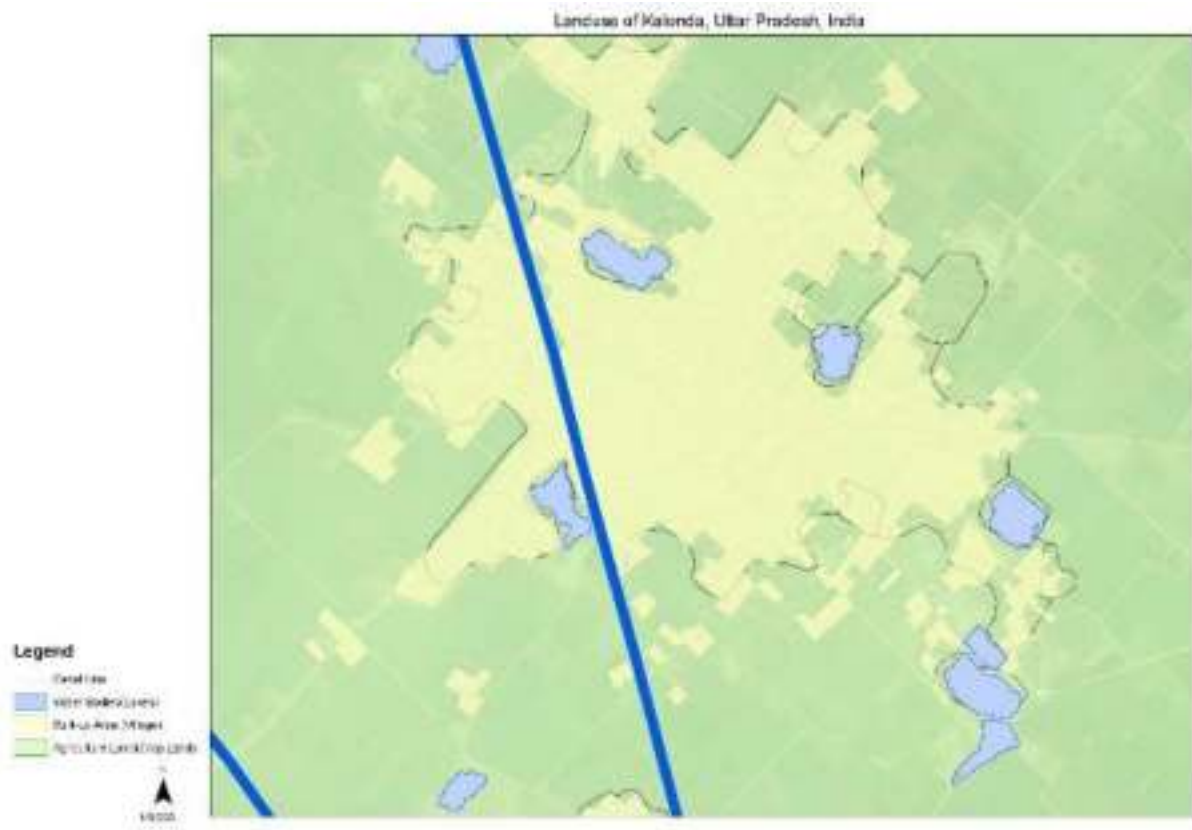


Figure 36 Land-use distribution of Village Kalonda

Particular	In Hectare
Total Area	489.6
The total area under non-agriculture	70.45
Barren and uncultivated land	11.2
Culturable wasteland	4.55
Fallow land other than current fallow	51.42
Current fallows	4.11
Net sown area	347.85
Net irrigated agricultural area	347.85

Table 5 Land-use distribution for Village Kalonda, Source: Census of India 2011

In the existing mapping of the LULM, a disconnect between the water bodies and settlements is observed. Commercial land use is limited to a few *chowks* and squares and is not evenly distributed. Almost all houses are mixed land use and are in indigenous typologies (discussed separately in the housing policy chapter). The Proposed Land area of the village is divided into agriculture and the *Abadi* area. It is felt by us that the scope of the LULM for villages must be restricted to the *Abadi* area. In the present LULM, the density of the population is close to 220 ppHa (as projected through census data and understood through household inventories), which would rise to 450 ppHa in the next 25 years.

The increase in the density is demonstrated through a densification plan of indigenous housing typologies recognized as need-based self-designed agricultural connect typologies. To manage the increase in the need for commercial and institutional, the model of Lake Centric Development has been used.

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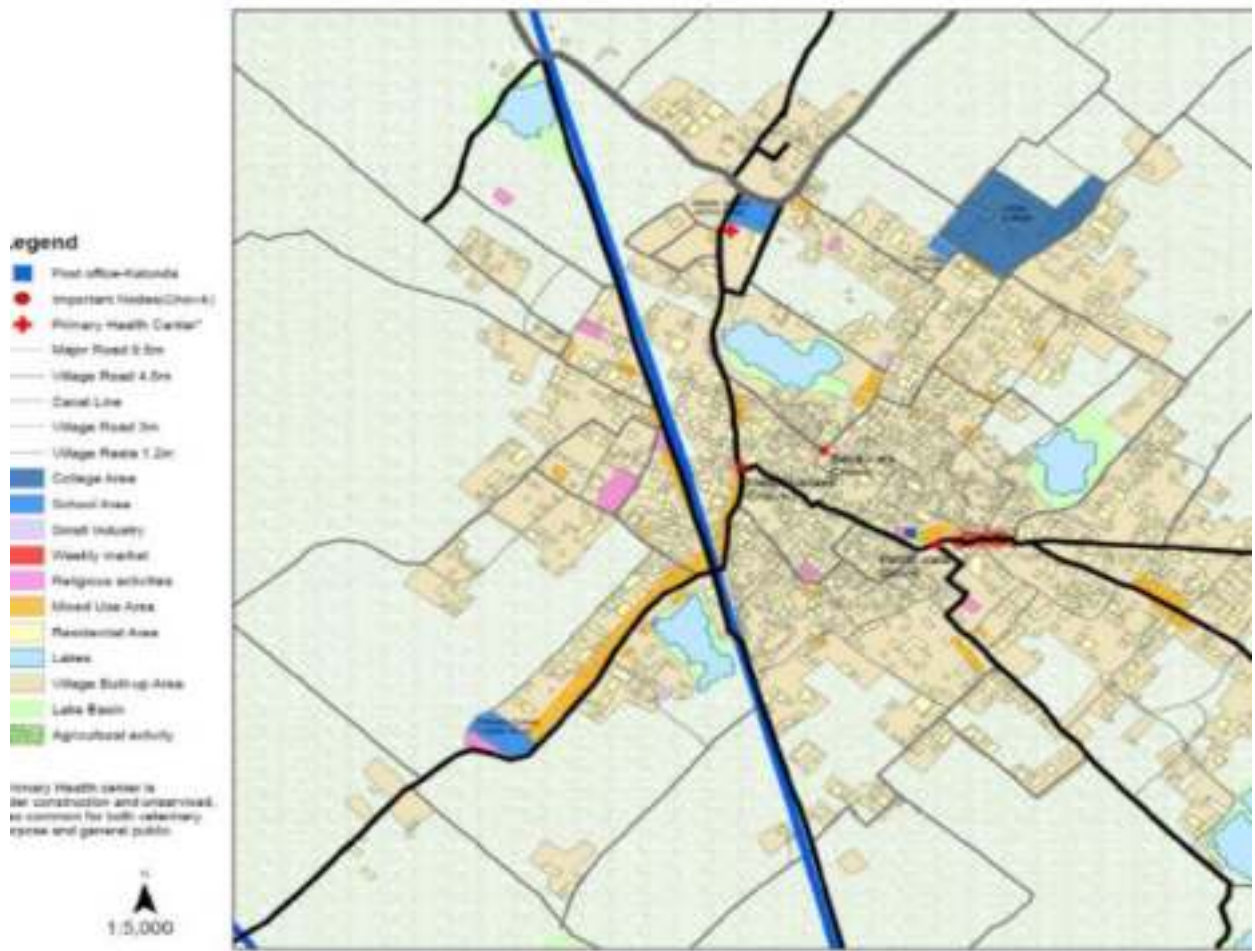


Figure 37 Existing LULM of the village

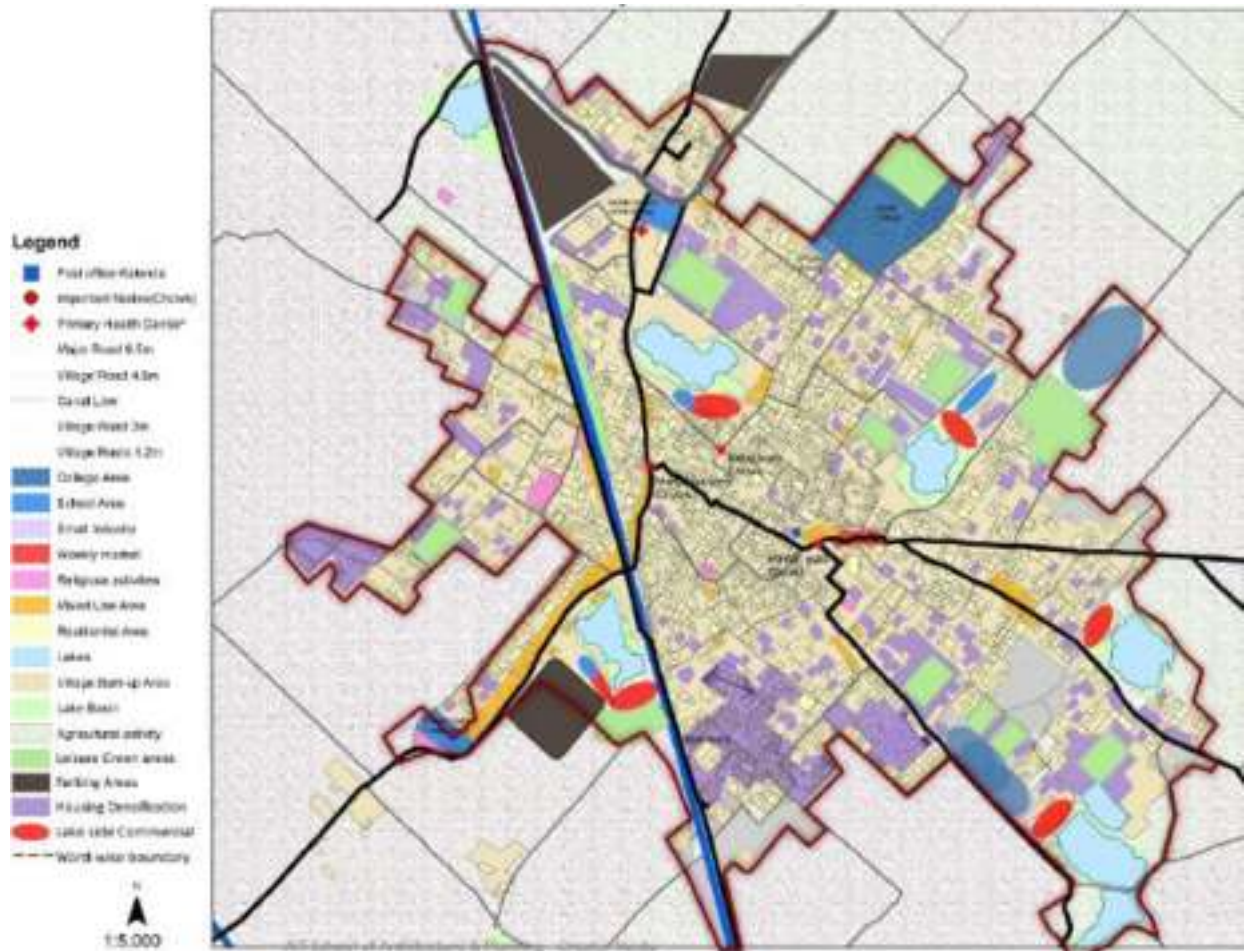


Figure 38 Proposed LULM of the village

The Proposed Land area of the village is divided into agriculture and *Abadi* area. It is felt by us that the scope of the LULM for villages must be restricted to the *Abadi* area. In the present LULM, the density of the population is close to 179 pph, which would rise to 450 pph in the next 25 years. The increase in the density is demonstrated through a densification plan of indigenous housing typologies recognized as need-based self-designed agricultural connect typologies. To manage the increase in the need for commercial and institutional, the model of Lake Centric Development has been used.

Lake centric development **LCD** -

Each lake is a resource for:

- a) Fish farming
- b) Water resource - hydrological recharge area (rain shed drainage)
- c) SLWM grey water from the housing area
- d) A pleasant site for the development of lakeside and leisure activities and hence must serve as the

e) Connecting point of the village and the new economies suggested in the village example old age home, Kalonda crafts and exhibition areas, etc.

With the LCD approach, the different wards of the village can get balanced growth and this approach can be used for the conservation of lakes and ponds as opposed to the current urbanization and development trends where unrecognized lakes and ponds are encroached by land mafia and sold as a commodity for development. While as a part of the plan the lakes of Kalonda may be interconnected for better hydrology through swales and covered drains to help the runoff and avoid flooding of one pond in monsoon. This connection as reported in Kalonda existed in the past but has now been lost due to a lack of thought in road building.

As a part of the LULM, it is proposed that the agricultural areas must be retained as a **National resource - green fields**. There must be an effort to develop trees, orchards, and associated green typologies in the village *Abadi* area also. It has been observed that although the village area is surrounded by green fields, the village roads are deprived of green cover.



Figure 39 Ward wise division

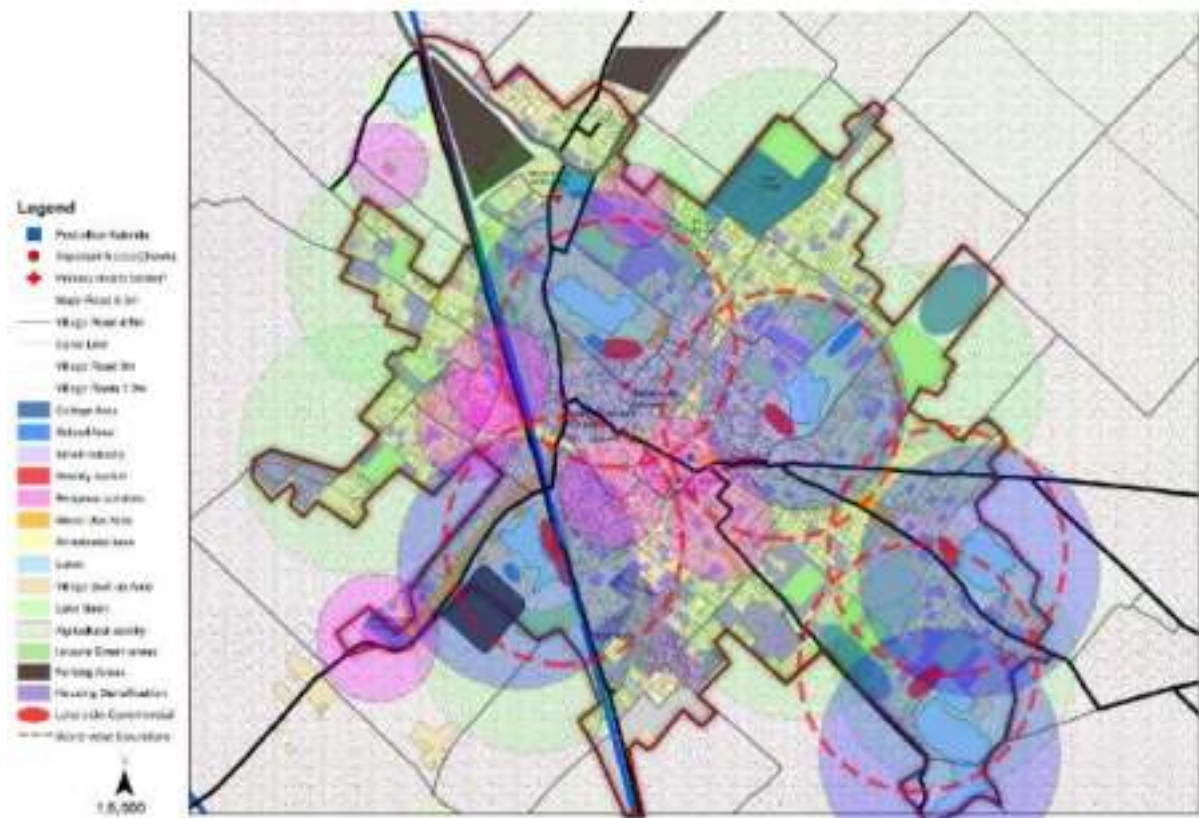


Figure 40 Impact of the development on neighbourhood

The issues identified for inner cities by URDPFI (page 163) are also the issues of Village Kalonda.

Common issues associated with the inner cities:

- Out migration of local residents and release of residential spaces for commercial use,
- Dilapidated buildings (as building owners only repair their buildings, while little or no reconstruction is takes place) and vacant properties,
- Narrow roads- not planned for vehicular movement,
- Unorganized on-street parking at various locations,
- No prominent public transport system present in the city,
- Presence of cottage or household industries and polluting industries
- Prominence of on-street encroachments for informal markets & hawkers,
- Due to shift from residential to commercial land use, emergence of warehouses, go-downs, workshops or other non-compatible activities,
- Old water supply distribution network and in non-metric sizes, difficult to maintain
- Repeated excavation of roads damaging the underground utilities and disturbed road levels
- Overall lack of social infrastructure facilities compared to the density of the inner cities

- Outcrop of Slum like conditions in the open areas surrounding historical properties or on old recreational open spaces

Henceforth practices recommended by URDPFI for inner city areas apply here. FAR, in-situ development/design, façade design, development conserving building footprints, mixed landuse, building heights control, evolving social infrastructure through a competent agency dedicated for the village.

A plan itself is toothless to bring about a change in the area. It must be supported by public policy and development practices akin to history, and geomorphology:

1. Neighbourhoods must carry a semblance and an interdependence. With multiple ponds, it can develop as a pond-village.
2. Roads and movement passages must allow pedestrian and car transit, as in the case of Kalonda today.
3. Settlement should be planned around lakes/ponds with well-defined public spaces around it.
4. The urban place must celebrate local history and agriculture.
5. Efforts must be made to make people aware of the importance of ponds in the urban area model.

Proposed LULM breakup for Village Kalonda for the next 25 years -

Years	0	5	10	15	20	25
Abadi Area	Existing	Expansion	Densification	Densification	Densification	Densification
Population projection	9910 12326	14360	16394	19099	21804	25401
Residential densities	219.1	255.2	291.4	339.5	387.5	451.5
Agriculture policy	Protection	Prevention from conversion	Increase yield	Increase yield	Increase yield	Increase yield
Agriculture/Greens	853 Ha	853 Ha	853 Ha	853 Ha	853 Ha	853 Ha

WATER BODIES						
	Lake Details	5 years	10 years	15 years	20 years	25 years
Lake 1 (Kunkuna Talab)	Perimeter (m) -278 Area (sq.m)- 4073	Desilting	Aquaculture	Aquaculture	Aquaculture	SLWM
Lake 2 (Mata Talab)	Perimeter (m) -323 Area (sq.m)- 6950	Desilting SLWM	Commercial	Aquaculture	Kalonda craft	Institutional
Lake 3 (Pokhar Valmiki)	Perimeter (m) - 296 Area (sq.m)- 4630	Desilting	SLWM	Aquaculture	Institutional	Commercial
Lake 4 (bagha Pokhar)	Perimeter (m) - 359 Area (sq.m)- 6506	Desilting	Aquaculture	SLWM	Commercial	Kalond craft+Institutional
Lake 5 (Chhayansa mod Talab)	Perimeter (m) - 384 Area (sq.m)- 7752	Desilting	Maintenance	Maintenance	Maintenance	Aquaculture
Lake 6 (Peer Talab)	Perimeter (m) - 451 Area (sq.m)- 5334	Desilting + Commercial	Aquaculture	Kalonda craft	Institutional	Kalonda Fare
Lake 7 (Naya Talab)	Perimeter (m) - 233 Area (sq.m)- 2909	Desilting	Aquaculture	Commercial	SLWM	Kalonda craft

Table 6 Proposed LULM breakup for village Kalonda for next 25 years¹

Urbanization, backed by the economy, backed by the government will and social aspirations is not easy to control. The general tool adopted by planners was to construct a ring road, to circumscribe the growth and to limit it. This has been time and again tried and tested in different situations. The result always has been unauthorized growth on the other side-allowed as development and later recognized as legal. The village thus must be limited by peripheral land uses which do not allow further growth. The development of institutions with a back to the green fields and with controlled access to

¹ The area and perimeter shown in the above chart is considering that there is no further encroachment. If we are able to clear out lake side encroachment then lakes areas might increase by 20% in the case of Jatav Valmiki, Mata Vala Talab and Peer vala Talab .

the fields is the only method to do this. The diagram illustrates the development of such institutions along the periphery of the village and especially towards the side where the village is racing to merge with Gesupur.

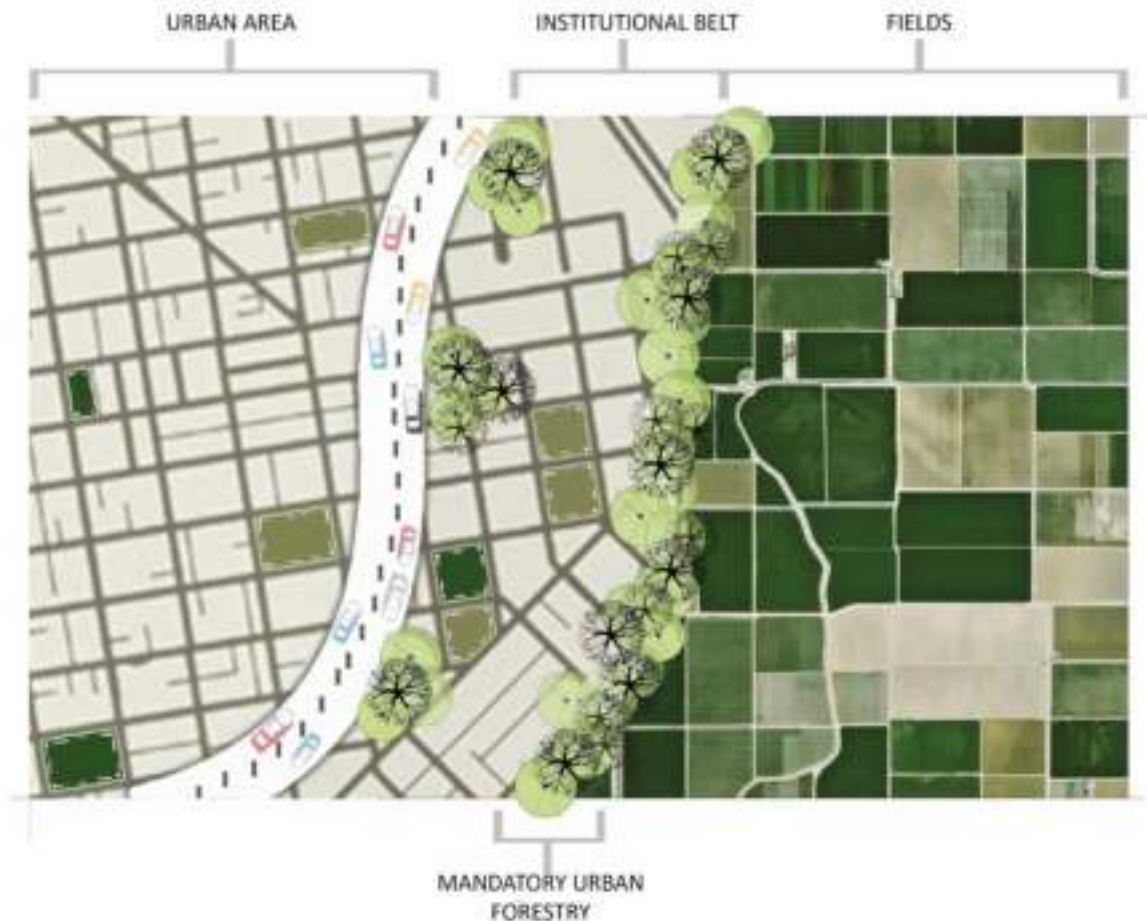


Figure 41 Village at the junction of urban growth and agricultural area

3. Village Hydrology

It is essential to understand the village Hydrology both for irrigation of the agricultural fields as well as to maintain the regular supply of water for domestic and other everyday purposes. The presence of water-bodies within the settlement provides space for water retention. The village is covered with open drains for sanitation as well as for holding rainwater runoff. It was identified that Encroachment of water-bodies from landfill village expansion is crucial in order to maintain the balance. The waste dump in and around water bodies and environmentally sensitive areas is identified as another crucial concern. The calculation below explains the amount of rainwater runoff in the village and the crucial role played by water bodies to retain this for a year-round supply of water.

The Soil type of the region of GB Nagar aids in the development of Lakes and Ponds. Ponds and small lakes are spread throughout Surajpur Aviflora and in Noida and all the villages in the Block Dadri. Their

formation and their connection to the aquifer that recharges groundwater is a system that is there since time immemorial, built into the predicament the "given" of the land on which we live. Efforts of landfills and encroachment into these low lying areas by land mafias or by authorities and overlooking their need in our terrain, of not cleaning them and making them dumping grounds leads to not just a loss of visual or aesthetic but also a possible imbalance in the habitat.

The Aqua Connect of human settlements has been since time immemorial a bond that gives an assurance to life. Ponds, Lakes, and Rivers all have stories to tell. They have a festival that connects and aids the growth of cattle and supports us in our functions of life. With groundwater becoming a potential supply of potable water and for our daily needs, there is still a psychological connection that is there. A village interspersed with ponds is a dynamic landscape and offers high imageability to the settlement. If left unattended the village lakes will get encroached and they will be landfill sites, used at best by villagers to make houses. This should be avoided. At no cost should this element be lost.

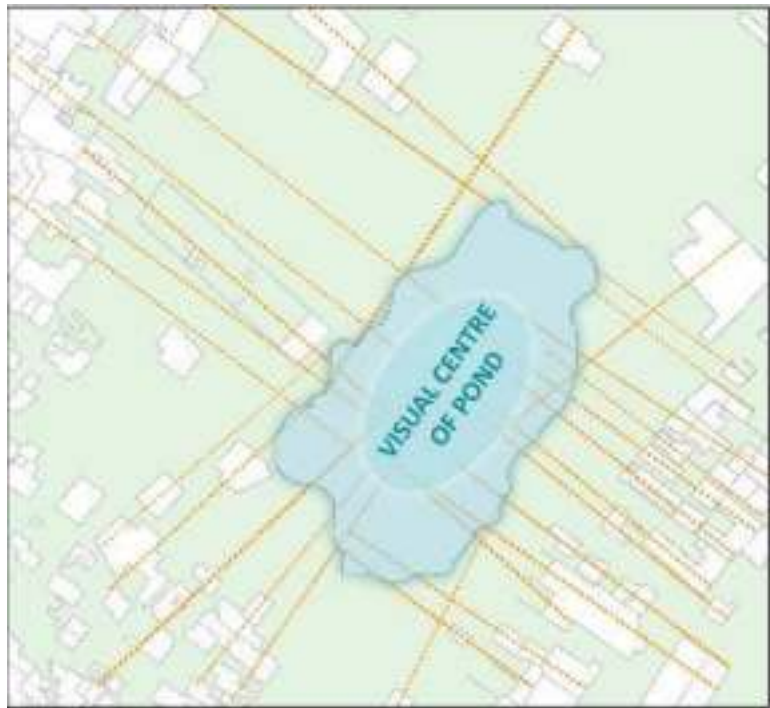


Figure 42 Connect between Lake and human settlement

I. Calculating Rainwater runoff

The Soil type in the agro-climatic region from Meerut to Bulandshahar region is alluvial and sandy with rainfall of 600 – 965 mm. The **annual normal rainfall** (1901-1970) of the district comes to 700.6 mm as observed in the nearest **rain** gauge station at Sikandrabad. The maximum **rainfall** occurs during the monsoon period i.e., June to September having the normal value of 600 mm which is 85.7% of **annual rainfall**. The Institutional team working on GPDP has calculated the rainwater runoff in the Village in order to explore the irrigation potential.

- Area of Kalonda: 489.61 hectares
- Total surface runoff = 489.61 hectare X 700 mm
- Since we are assuming that some water is going to be absorbed and some will evaporate. Therefore we are getting the surface runoff from the area of settlement.

- Coefficient of water absorption = 0.35
- Area of settlement = 56.26 hectares (pukka) X 0.65(coefficient of runoff) X 700 mm X 10 = 2,55,983 cubic m
- Total area of ponds = 4.48 hectares = 44893X3 = 1,34,679 cubic meter

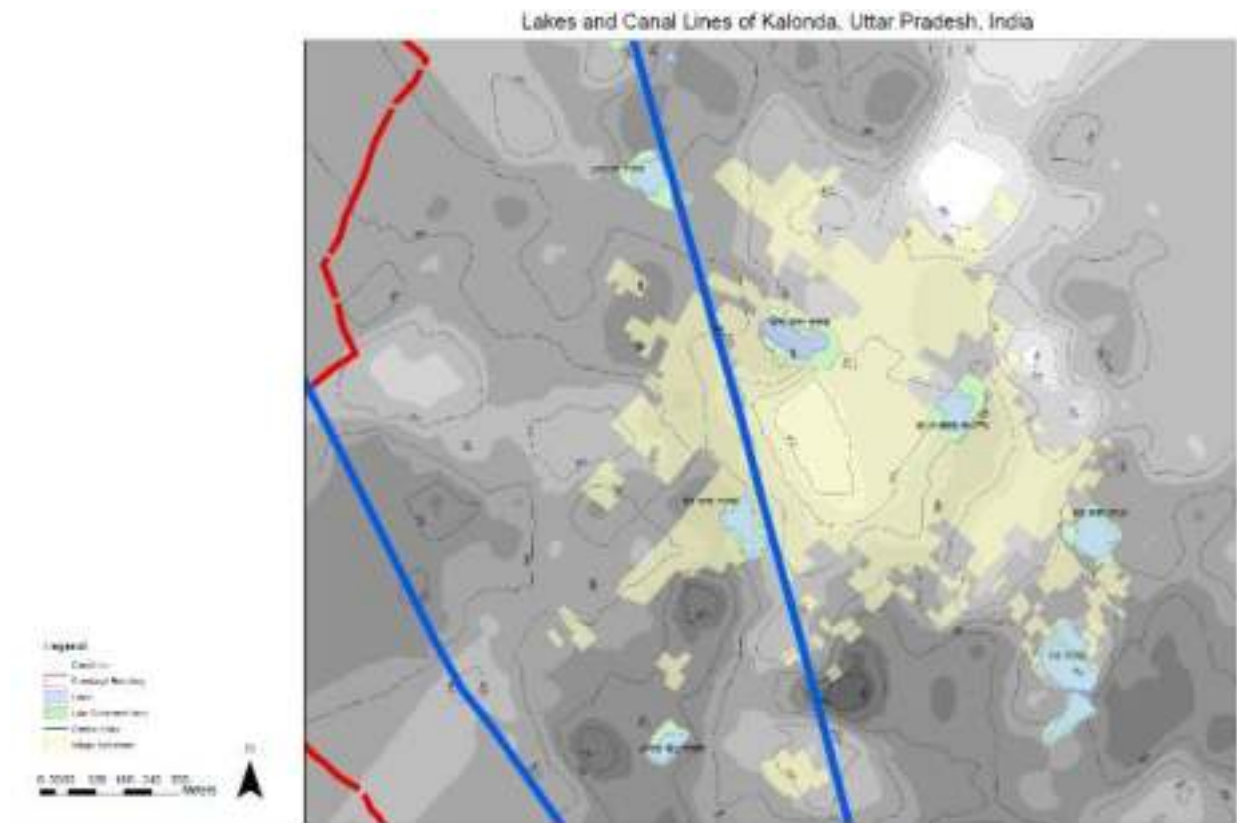


Figure 43 Lakes and Canal lines of Kalonda

The map above (figure 44) shows the village slope and contour analysis along with the position of water bodies, the settlement pattern, and how it is so closely linked and dependent upon the water bodies for its survival. The Presence of the Ganga canal passing through the village land provide a possible alternate source of irrigation. The Map below (figure 45) shows the extent of the catchment area of the water bodies in Blue lines. The map further below shows the network of stream order in the village where the thickness of streamlines show the amount of water it can hold during the rainy season. This shows that due to natural terrain the system of lakes in Kalonda is extremely sustainable. These lakes are not seasonal and with suitable conservation measures and de-silting, they can bring resilience to water systems.

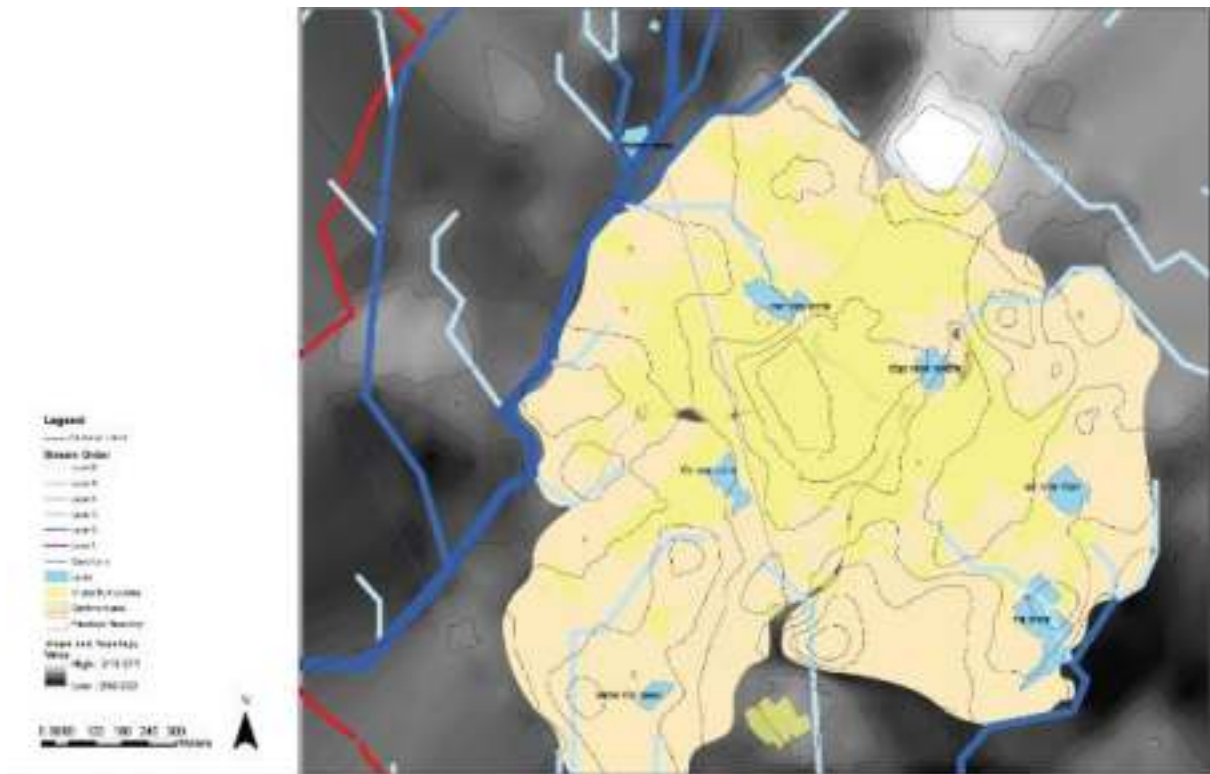


Figure 45 Hydrological study of Kalonda- catchment areas

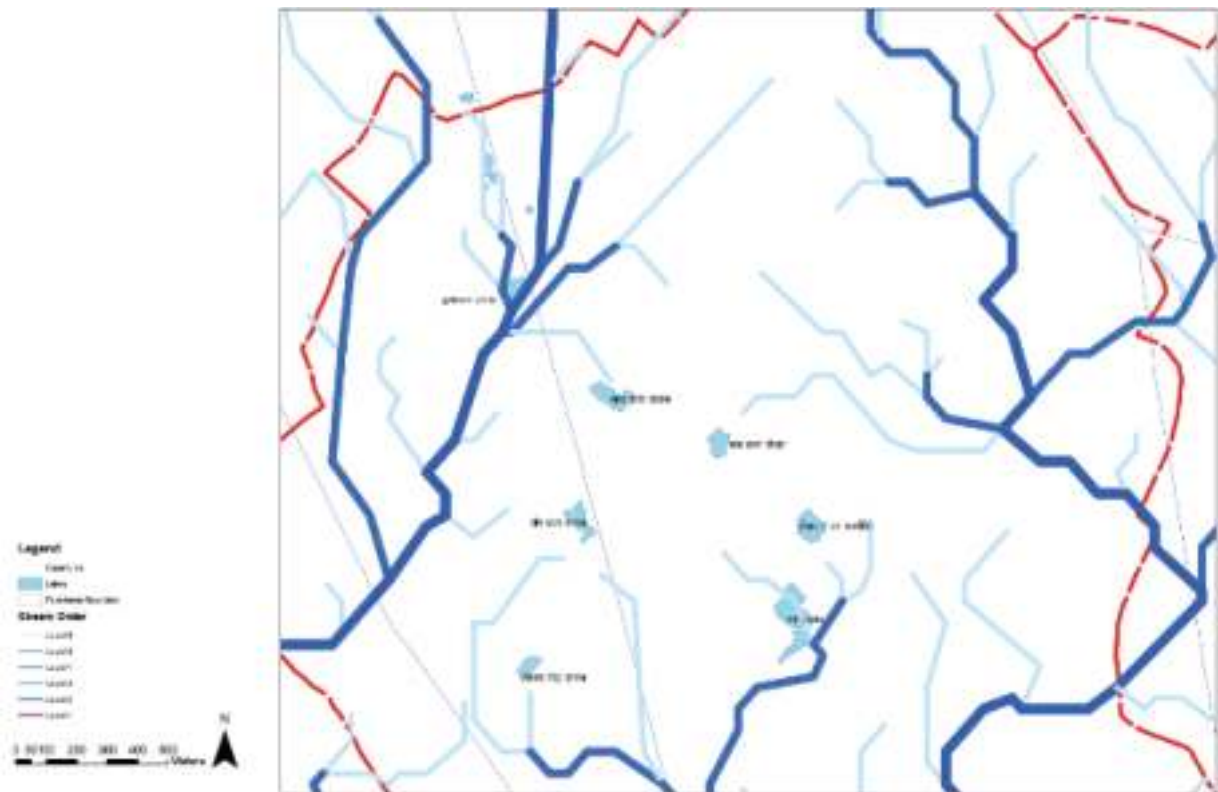


Figure 44 Hydrological study of Kalonda- stream order

4. Conservation of lakes



Image 16 Lakes of Kalonda

There are 5 water-bodies within the village settlement, additionally, 2 more lakes have been identified during the primary survey for GDPD. Most of the water-bodies are shallow in depth and hence comes under the category of ponds. The difference between the ponds and lakes according to dictionary definition can be identified as - **Ponds**, according to limnology (the study of water bodies) are shallow enough where plants could conceivably grow across the entire surface. This area, where plants could grow is known as the “**photic zone**,” meaning where the sun’s rays can reach the bottom. **Lakes:** A **lake** (from Latin lacus) is a large body of water (larger and deeper than a pond) within a body of land. Since the size of water bodies is small and has a shallow depth, these water bodies are in a neglected condition.

The Soil type of the region of G B Nagar aids in the development of Lakes and Ponds. Ponds and small lakes are spread throughout Surajpur Aviflora and in Noida and all the villages in the Block Dadri. Their formation and their connection to the aquifer that recharges groundwater is a system that is the response time immemorial, built into the predicament the "given" of the land on which we live. Efforts of landfill and encroachment into these low lying areas by land mafias or by authorities and overlooking their need in our terrain, of not cleaning them and making them dumping grounds leads to not just a loss of visual or aesthetic but also a possible imbalance in the habitat.

The Aqua Connect of human settlements has been since time immemorial a bond that gives an assurance to life. Ponds, Lakes, and Rivers all have stories to tell. They have a festival that connects and aids the growth of cattle and supports us in our functions of life. With groundwater becoming a potential supply of potable water and for our daily needs, there is still a psychological connection that is there. A village interspersed with ponds is a dynamic landscape and offers high imageability to the settlement. If left unattended the village lakes will get encroached and they will be landfill sites, used at best by villagers to make houses. This should be avoided. At no cost should this element be lost.

5. NIC data on water bodies in Kalonda

NIC is the National Informatics Centre which is a government body. It has calculations only for four *Talab* s. This may be due to the reduction of their sizes and thus it is assumed that later the other *Talab* s will not be part of the village. Also, the data available with GIS might be from the satellite image and a smaller *Talab* with plant cover on the top layer is not readable. Here also, Mata Wala *Talab* located on the northern part of the village settlement is the largest *Talab* covering an area of 10824 sq M. According to GIS data calculation there is a total of seven ponds in the villages. Here, we have calculated the perimeter, area, depth, and volume of all the seven *Talab* s of the village. Five lakes fall within the settlement of the village whereas other falls around the perimeter of the village. The Chhayansa mod *Talab* is identified largest in terms of area 7752 Sq M followed by Mata wala *Talab* with about 6950 sq M Area. The Smaller *Talab* s such as Naya *Talab* and Kunkana *Talab* are not identified in Census or NIC data but verified during the physical survey and GIS mapping of the village.

Calculations of the ponds in the village according to NIC data

S.NO	WATER BODY	PERIMETER(M)	AREA(SQM)	DEPTH	VOLUME(M3)	Source
1	A	496.19	10823.9	6'-10'	1164978 cubic feet	NIC data
2	B	323.45	6928.64	6'-10'	745792 cubic feet	NIC data
3	C	369.19	9584.24	6'-10'	1031639 cubic feet	NIC data
4	D	390.38	9661.65	6'-10'	1039971 cubic feet	NIC data

Table 7 Calculations of the ponds in the village according to NIC data

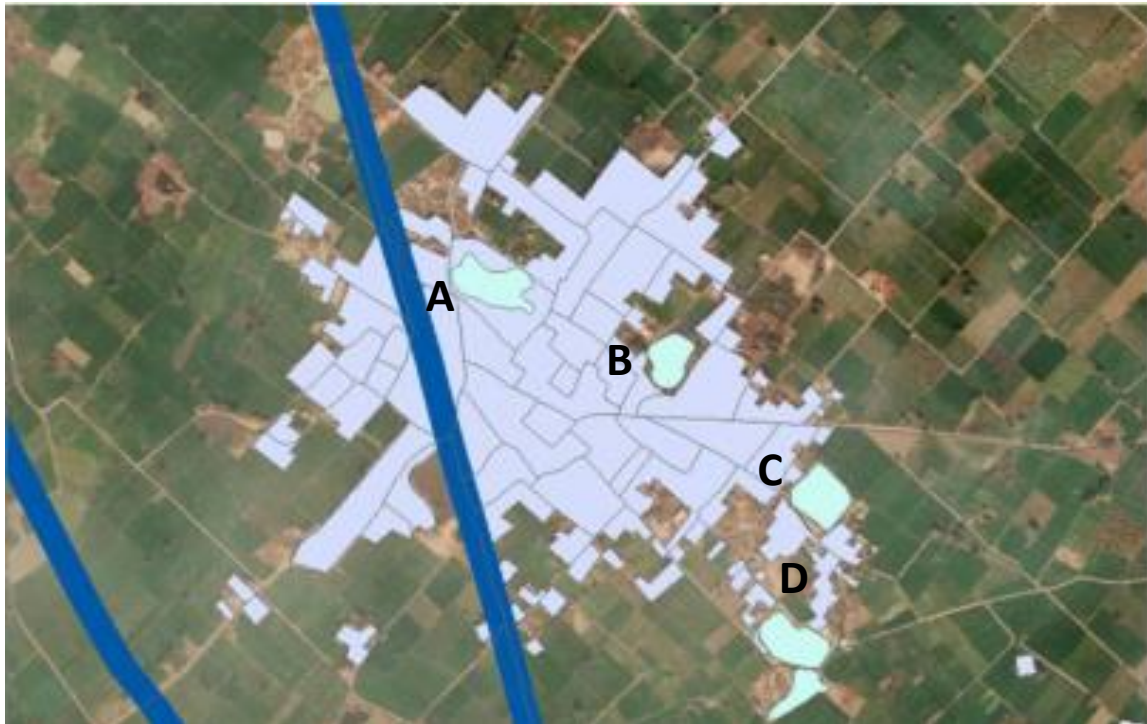


Figure 46 Map showing the position of NIC documented lakes in Kalonda

Calculations of the ponds in the village according to GIS

S.NO	WATER BODY	PERIMETER (M)	AREA (SQ M)	DEPTH	VOLUME(M3) Cubic feet	Source
1	Kunkana Talab	278	4073	6'-10'	435811	GIS
2	Mata wala Talab	323	6950	6'-10'	743650	GIS
3	Pokhar jatav valmiki	296	4630	6'-10'	495410	GIS
4	Bagha wala Pokhar	359	6506	6'-10'	696142	GIS
5	Chhayansa mod Talab	384	7752	6'-10'	829464	GIS
6	Peer wala Talab	451	5334	6'-10'	570738	GIS
7	Naya Talab	233	2909	6'-10'	311263	GIS

The Water bodies have to change peripheral areas due to seasonal rainfall patterns, evaporation, extraction for domestic use and irrigation, and also, filling up of lake area for acquisition for development purposes. To analyze this changing pattern of area and perimeter, we have calculated and analyzed the data for the selected lakes over the past 12 years. The data for three important lakes are shown in the tables below.

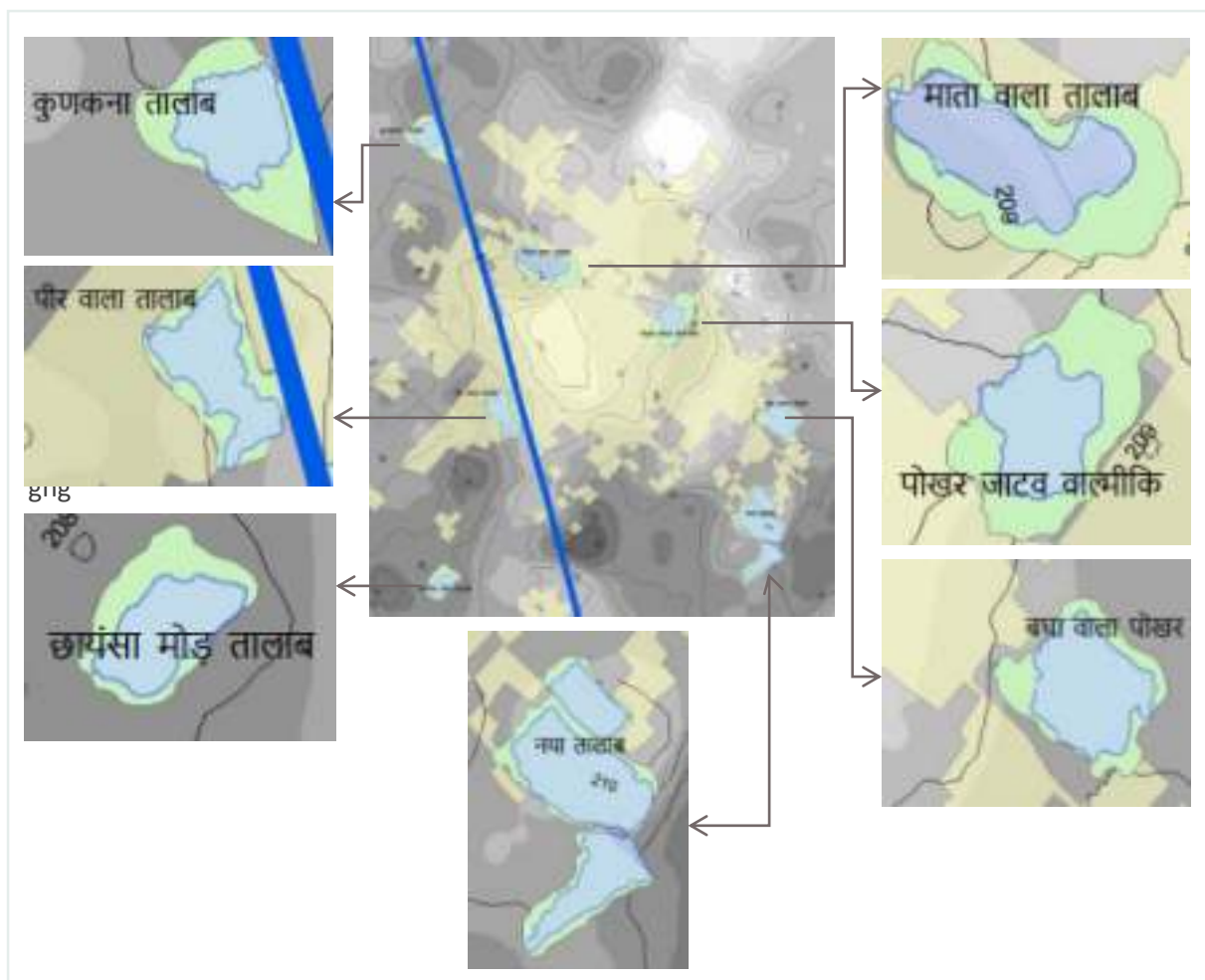


Figure 47 Position and names of water bodies in Kalonda

I. Change in Lake Area over past 12 years as per GIS mapping:

a) Peer Wala Talab :

Peer wala *Talab* is located on the western edge of the village across the Ganga canal. The perimeter over the period has remained the same while the area has decreased. The capacity of the *Talab* has decreased every year. This means the encroachment by the settlement has been continuous and the zone of water body needs to re-defined and marked physically. Also, there is a need for strict legal regulation and enforcement against the encroachment of water bodies.

S. No.	Category	2007	2009	2015	2020
1	Perimeter (m)	543	485	474	451
2	Area (Sq. m)	10284	7507	5893	5334
3	Capacity (cu. m)	30852	22521	17679	16002

Table 8 Change in the boundary of Peer Wala Talab

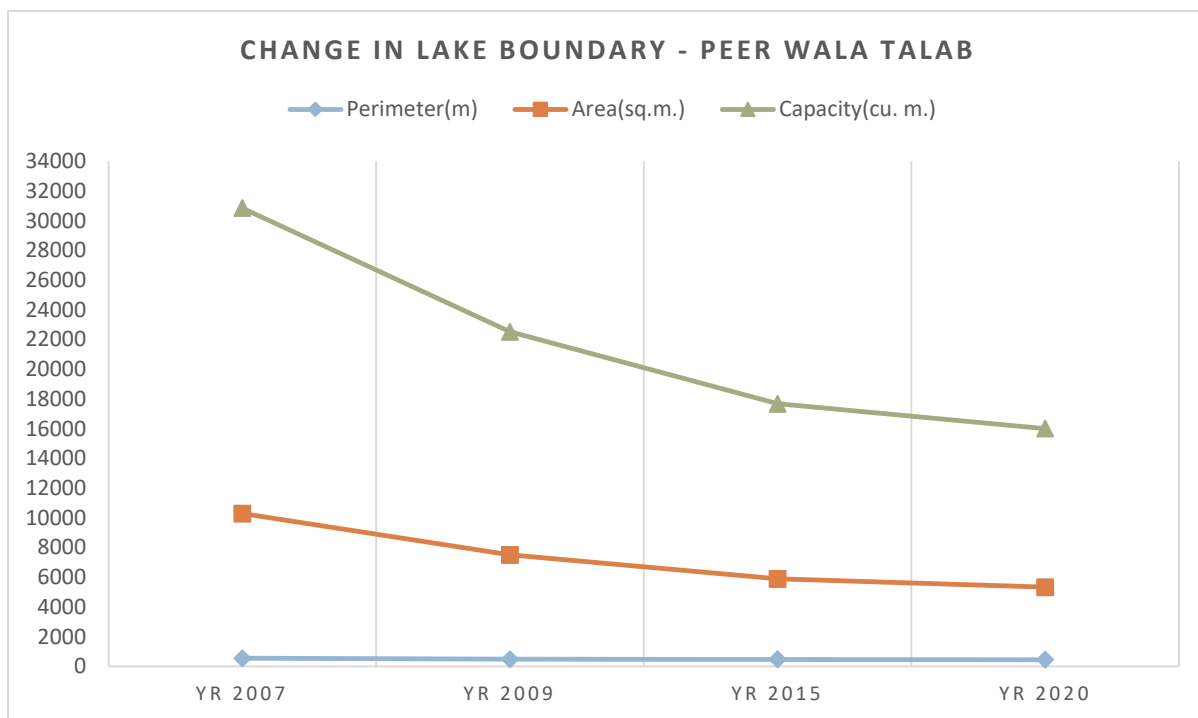


Figure 48 Change in the boundary of Peer Wala Talab

b) Mata Wala Talab :

Mata wala *Talab* is one of the largest *Talab* in the village, located in the northern part of the village. Its perimeter over the period has seen a reduction of about 100 meters. There has been a drastic reduction in the Lake Area and depth specified in the last 5 years. This has further resulted in the capacity being reduced to almost half the original capacity since 2007. This evident change in the *Talab* area and capacity is understood to be caused by an uncontrolled sprawl towards the *Talab* area.

S.no.	Category	2007	2009	2015	2020
1	Perimeter (m)	524	504	489	425
2	Area (sq. m)	12789	11621	9614	6950
3	Capacity (cu. m)	38367	34863	28842	20850

Table 9 Change in the boundary of Mata Wala Talab

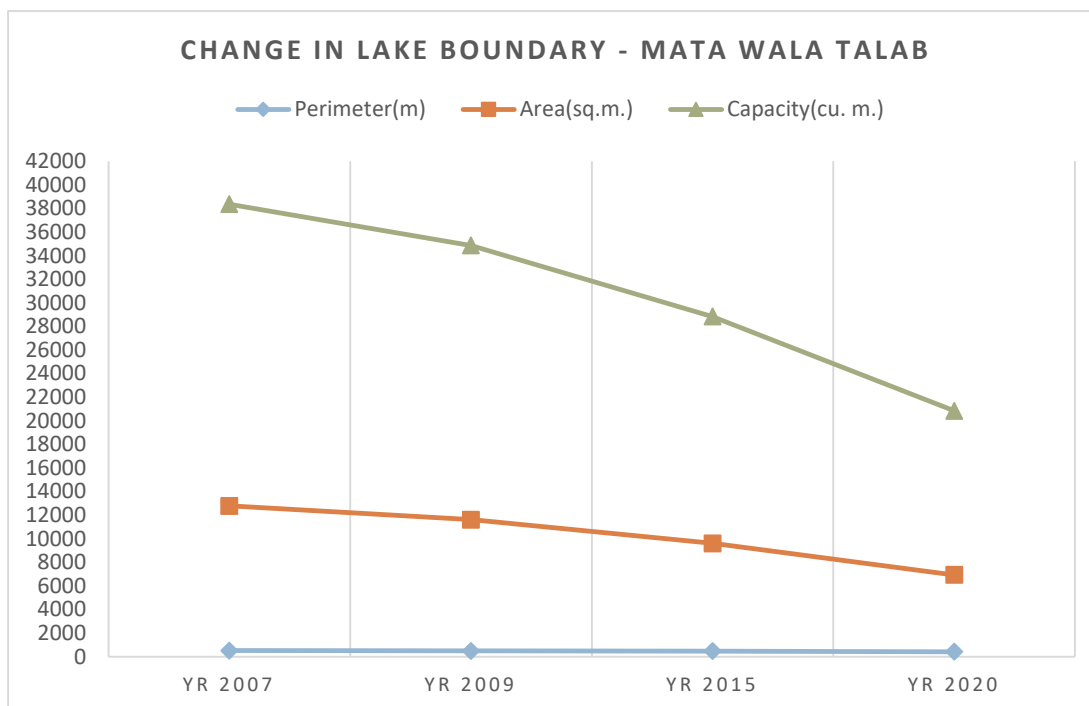


Figure 49 Change in the boundary of Mata Wala Talab

c) Pokhar Jatav Valmiki Talab :

Pokhar Jatav Valmiki is located on the north-west of the settlement and is surrounded by the settlement from all sides. This is causing a reduction in the Lake Boundary perimeter. There is also some reduction in lake area and capacity. This suggests a gradual process of encroachment in this Pokhar Jatav Valmiki as well.

S.no.	Category	2007	2009	2015	2020
1	Perimeter (m)	397	321	306	296
2	Area (sq. m)	4985	4916	4843	4630
3	Capacity (cu. m)	14955	14748	14529	13890

Table 10 Change in the boundary of Pokhar Jatav Valmiki Talab

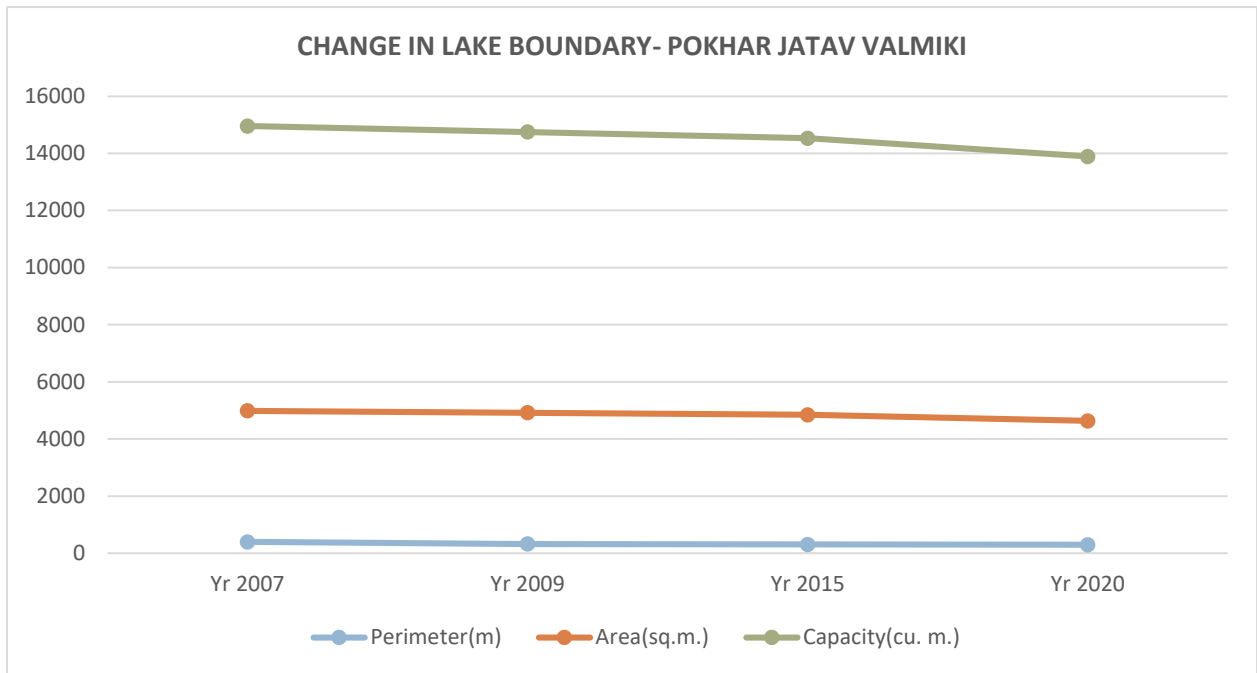


Figure 50 Change in the boundary of Pokhar Jatav Valmiki Talab

6. Proposal for Lake Conservation and development under 25 year Plan

The lakes at the base of the geomorphological layers and being used for the surface runoff, have been accumulating silt and toxic deposits for a while.

It is important to de-silt them immediately to prevent flooding of the inner areas. The lake ecological system that develops on its fringes, thereby allowing a live ecosystem into play must be allowed to develop segregating the level of walking around the lake and the lake edge. Since the studies show that the villagers have been orienting their growth around the water bodies, they must be encouraged by planning towards a deeper association of these with the essential ingredients of development. It is thus proposed that along with leisure areas associated with the green and open structure of these lakes, tourism-centric commercial areas needed by the village ad institutions like schools and small crafts also be developed along the. The under given illustrations how a five-yearly achievement plan for the same.



Figure 51 Lakes in Kalonda – Today



Figure 52 Lakes after 5 years- 25 years GDP



Figure 53 Lakes after 10 years- 25 years GDP

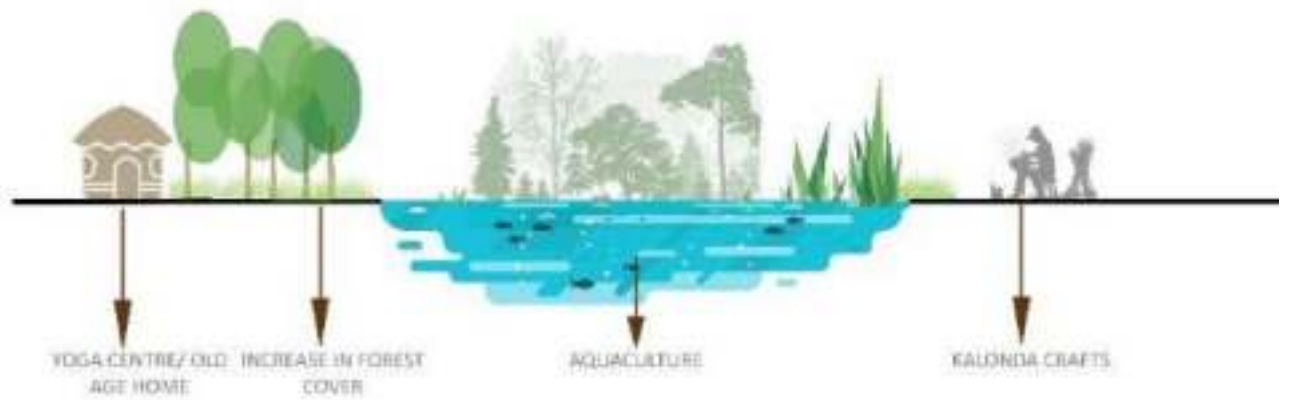


Figure 54 Lakes after 15 years- 25 years GDP



Figure 55 Lakes after 20 years- 25 years GDP



Figure 56 Lakes after 25 years- 25 years GDP

7. Interlinking of Lakes

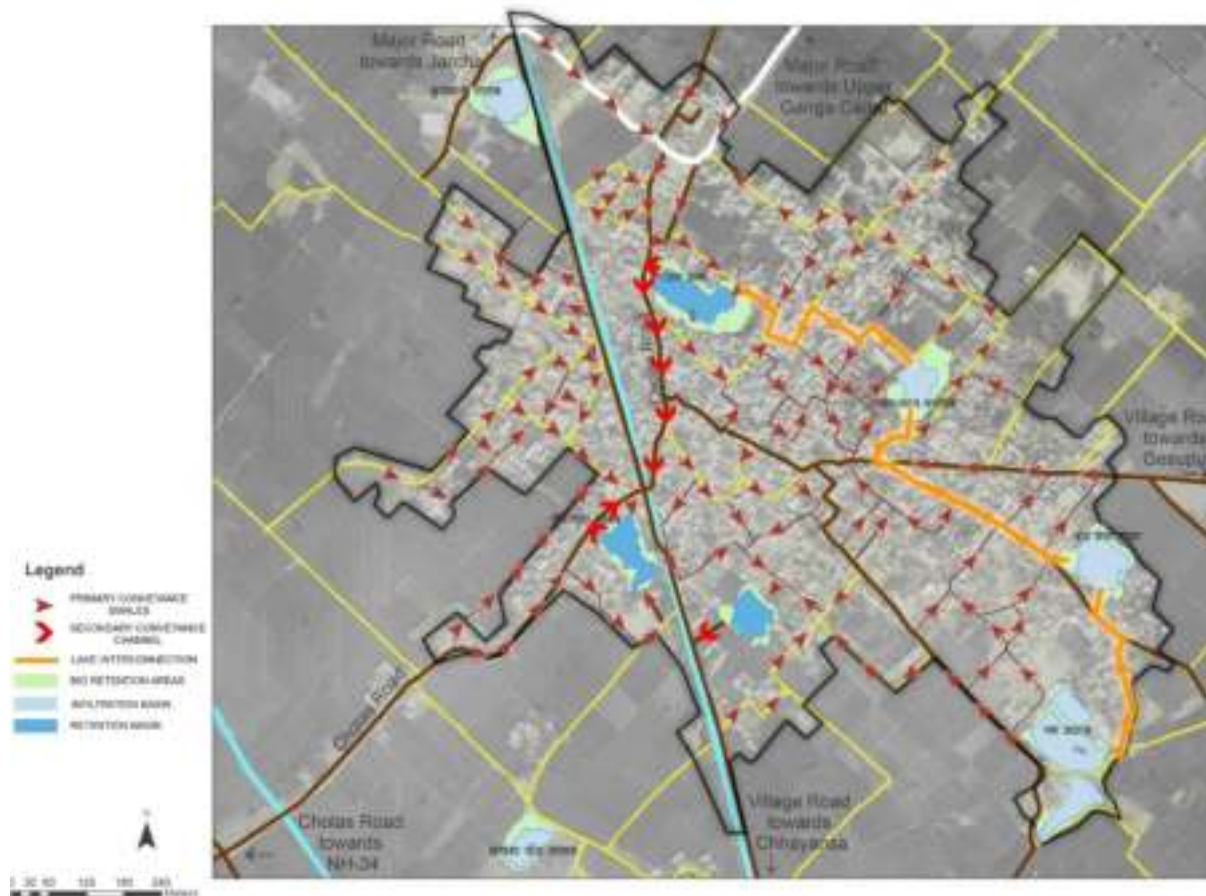


Figure 57 Proposed interlinking of lakes

Interlinking of lakes is a necessity that is evident in the geomorphology of the area in which this settlement has come up and thus follows a natural phenomenon. Naturally, the lakes are either connected via confined or unconfined aquifers. In urban areas due to rapid urbanization and an increase in impervious areas, the natural groundwater recharge is hindered and thus affects the natural linkage, forcing the lakes to function independently and thus causing flooding. A clean SLWM in place before every pond can also aid in the improvement of the condition of groundwater, thus improving the health of people. Therefore interlinking the lakes using alternate techniques will transform the lake system into one functional system, giving purpose identity and imageability to Kalonda.

The interlinking is proposed to be done via connecting swales and channels. The swales and channels will also help in the purification process of water before the water enters the lakes (which further act as infiltration and retention basins).

8. Conservation of Agricultural Area

As urban development approaches towards agricultural land, people with no attachment to or understanding of farming come into close contact with its operations. When urban envelope expands onto farmland without adequate buffers or when non-agricultural uses are permitted in rural areas or not stopped from entering the villages, a conflict is born. This conflict between the farmers and new arrivals in the countryside, with persistent challenges to normal farm practices that undermine the long-term viability of farming in affected areas. The consequence is often that the farm practices are forever destroyed.

Where on one hand, Kaloda can benefit from the regional changes around it shortly, it is also possible that the land is poached from the villages, ahead of time and they are left to serve as mere laborers or menial workers in the benefitting economies of the promising future. True development is in retaining agriculture, protecting the lands from being poached, and reaching the benefits of the promising future to the needy settlers.

9. SLWM: Solid Liquid Waste Management

The village Kalonda lacks any structure measures and systems for waste management. In the absence of any viable treatment process, Grey water generated from Rural Households is disposed of into Open drains, Streets, Vacant land, or Water Bodies resulting in surface water contamination, land contamination, and aggravated water-borne diseases. Lack of suitable technological options, especially for rural areas was the greatest challenge in providing a universal solution for managing the grey water.

Since there are no industries in the village there is no hazardous waste to be managed. Neither there is any industrial chemical being disposed of in the village. However, the agricultural runoff carrying fertilizers is one of the concern areas. The paper, plastic waste generated from the households and their disposal in open areas, drains and near water, bodies are slowly degenerating the village environment and causing the pollution of soil and water bodies. The photographs below show the variety of waste being disposed of in and around the village settlement.

I. Types of waste in the village



Image 18 Cattle washing in the water body



Image 17 Domestic Garbage dump at the backyard



Image 24 Waste dumped st the open drains



Image 22 Waste dump at a vacant plot



Image 21 Polythene and plastic waste on green field



Image 20 Cattle shed and organic waste



Image 23 Polluted water from tube well



Image 19 Dilapidated buildings

II. Decentralized Sewage Treatment (DST):

This method of waste treatment is quite useful in a rural context due to its small and handleable size.

The process has several advantages including -

- It would save on the enormous cost of underground drainage,
- It makes treated water available close to where it is needed and easily usable,
- It reduces a load of sewage that the city's existing UGD has to carry and that the existing facilities have to treat.

But Decentralized Sewage Treatment requires inner-city space, which is always very expensive and coveted. So space for decentralized sewage treatment is always rare, has not been planned for, and is rarely even considered as an option. It should be because in all Indian cities, waste-water today flows unplanned or illegally into storm-water drains which were formerly natural water-courses.

All of these empty by gravity into their original low-lying areas or rivers or lakes which were once a city's water supply source, polluting them today and causing eutrophication. At the same time, being designed for rain-water, no provision was ever made, or is today possible, for sewage treatment plants at the tail end of "storm-water" drains to handle these polluted urban flows. To solve the space problem, **DST can be done either at the neighbourhood level or within the storm-drains themselves.**

III. Natural waste-water treatment in drains:

- Use the area of the storm-drain itself for improving waste-water quality and if possible providing recreational use of the space as well.
- DSTs should be zero-energy natural systems or low-energy-consuming solutions, requiring very low capital cost and minimal maintenance.

The 4 types of plants: note that each requires a different habitat as you can see from the diagram below

a) Deep Marginal

The leaves float on the surface, but the roots are anchored in the soil beneath the water, plants such as Water -lily Nymphaea.



Image 25 Deep Marginal

b) Floaters

The plants float on the surface and the roots are suspended free in the water, plants such as Duckweeds *Lemna minor*

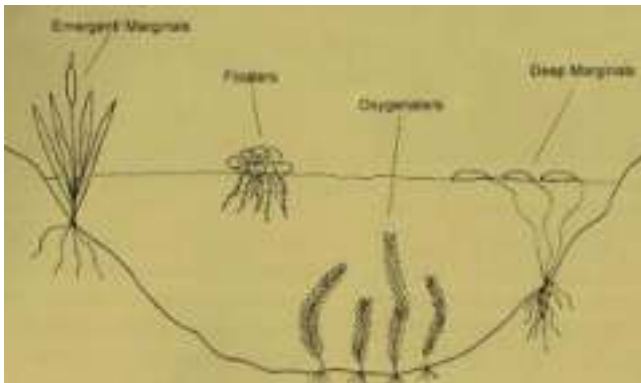


Image 26 Floaters

c) Fully Submerged/ Oxygenators

Water weeds like water milfoil *Myriophyllum* sp.



Image 27 Fully submerged oxygenators

d) Emergent /Marginal

Or only partially submerged, such as Cattails/ bullrushes Latin name *Typha*



Image 28 Emergent/Marginal

e) Algae

Algae will be the most successful plant in your pond. It is a green sludgy stringy like substance. The alga thrives in warm sunlit conditions and is a very fast consumer of nutrients. If you have high levels of organic matter (leaf shed, excrement) then the algae will consume it at an incredible rate.

- Algae can cause a considerable disturbance in the pond ecosystem by decreasing light filtration
- consumption of oxygen levels
- reducing surface intake of oxygen

It's worth mentioning that algae get bad press due to the destruction that they cause in natural lakes and ponds but please remember that they can only cause this destruction because they are overfed with chemical fertilizers that have leached into these water bodies from a farm or nearby housing estate.



Image 29 Algae

IV. Comparison of our purification system with STP

The lake and water purification system adopted by us is very much similar to a standard Sewage Treatment Plant just that, ours is done through the natural process. We have adopted all the age-old processes and practices and combined them to create a wholesome purification system that in no way is less than the modern water treatment systems. The step by step comparison with the modern STP is shown in the table below.










WORKING OF A STP	OUR PROPOSAL
PRIMARY TREATMENT Screening - Remove large objects	
	 <p>Jails can be provided at on a regular interval in the Open drains (Nallah). These will screen the large objects from the flowing grey water.</p>
Grit Chamber- grit removal	 <p>The stored jails can be provided near the water inlet points. These will serve the purpose of a grit chamber by slowing down the water and thus removing the Grit.</p>
Primary settling tanks- sludge removal	
   <p>From Treatment - primary stage</p>	<p>Similar kind of sedimentation tanks can be provided near the inlet points of the lake at a level drop of 20 to 30 cms. This can remove 60% of the solid and also coagulate the water. Further the sedimentation tank will help to remove the sludge and scum from the water.</p>
SECONDARY TREATMENT Aerobic treatment	
	
Anaerobic treatment	 <p>As an alternate to aerobic and anaerobic treatment plants, we can introduce the useful bacteria, Micro-organisms in the water itself. Further acclimatization can help reduce the pollutants in the water.</p>
TERTIARY TREATMENT Filtration ion exchange activated carbon adsorption, electrodialysis nitrification demineralization.	
	<p>Tertiary treatment is the third stage of the wastewater treatment and is also known as an advanced treatment. Tertiary treatment removes the load of nitrogen and phosphorus present in the water. It includes processes like filtration, ion exchange, activated carbon adsorption, electrodialysis, nitrification, and demineralization. Treatment options in tertiary treatment depend upon the characteristics of effluent after secondary treatment and what kind of water is needed at the end of the treatment. For example, if we need potable water then filtration and disinfection are implemented to produce wastewater. Although for frequently reused water, this treatment can be avoided.</p>

Table 11 Comparison of our purification system with STP

V. Sanitation Programmes

The government of India is paying huge emphasis on the issue of sanitation both in urban and rural areas under the Scheme of 'Swachh Bharat Mission - Gramin' to create Open Defecation Free (ODF) Villages. The mission has been a great success and further issues related to SLWM are being addressed by taking advantage of government schemes.

Table 4: Liquid waste management: Wastewater Treatment Technologies

Technology	Whether Natural or Built	Aerobic/ Anaerobic/ Mixed	Expected effluent quality (low, medium, high)	Area Requirement (m ² /person)	Power requirement kWh/ person/ year	Prevalence in India
Waste Stabilisation Pond System	Natural	Mixed	Medium to High	2.0–3.0	Nil	All over India
Duckweed Pond System	Natural	Aerobic	Medium to High	2.5–6.0	Nil	Greater number in the state of Punjab
Constructed Wetland	Natural	Aerobic	Medium	1.5–2.5	Nil	Less implementation experience in India
Upflow Anaerobic Sludge Blanket	Built	Anaerobic	Low	0.1–0.2	Only for pumping	All over India in urban areas, but very less experience in rural areas
Anaerobic Baffled Filter	Built	Anaerobic	Low	0.2–0.4	Nil	All over India
Package Aeration System	Built	Mixed	High	0.1–0.15	20–30	All over India
Extended Aeration System	Built	Aerobic	High	0.1–0.2	15–25	All over India
Sequencing Batch Reactor System	Built	Aerobic	Very High	0.05–0.1	10–20	All over India
Soil Bio Technology	Natural	Aerobic	Very High	0.021	40–50 kWh/MLD to pump wastewater for distribution across the reactor bed	All over India

Note: For details on the above methods, refer

3. Ministry of Drinking Water and Sanitation, Swachh Bharat Mission (Gramin). (2015) Technological options for solid and liquid waste management in rural areas⁵. Government of India.
4. Ministry of Drinking Water and Sanitation, Swachh Bharat Mission (Gramin) (2015). Source book on solid and liquid waste management in rural areas⁵. Government of India

Table 12 Liquid waste management: Wastewater treatment Technologies,

Different bodies taking care of sanitation

- CRI - Centre for Rural Infrastructure
- DRDA - District Rural Development Agency
- GoI - Government of India
- GP - Gram *Panchayat* (Village *Panchayat*)
- HH - Household
- MDWS - Ministry of Drinking Water and Sanitation
- MoPR - Ministry of *Panchayati Raj*
- MoRD - Ministry of Rural Development
- MGNREGS - Mahatma Gandhi National Rural Employment Guarantee Scheme
- NIRD&PR - National Institute of Rural Development and *Panchayati Raj*
- ODF - Open Defecation Free
- SLWM - Solid and Liquid Waste Management
- SLRM - Solid and Liquid Resource Management
- SWM - Solid Waste Management



Image 30 Liquid waste management: Wastewater treatment technologies,

The key Proposals to be explored for SLWM in Village Kalonda Shall be –

- Segregation of waste at source (Bin it Right)
- Construction of soak pits at household and community level
- Capacity building with the help of education and research organization for waste management and water conservation.

This is to be applied in a phase-wise manner to ensure constructive and sequential implementation of the SLWM system. The Phasing of our proposal has been laid out in the table below.

Waste Category (Bin it Right)

Wet waste (green)	Dry Waste (Blue)	Hazardous Waste (Red)
<ul style="list-style-type: none"> Vegetable peels Rotten fruits and vegetables Leftover food Used tea/tea bags Used coffee ground Floor sweeping dust cosmetics containers Expired cosmetics Meat & non-veg remains Hair Garden shrubs Floor sweeps Road sweeps 	<ul style="list-style-type: none"> Soap covers / pockets / sachets Milk covers Broken stationery like used pens, pencil sharpener Used toothpaste tubes etc. Metal tins, and cans (e.g. Pepsi Coke cans) – Aerosol cans Package / polythene covers / Plastic covers Broken household plastic items 	<ul style="list-style-type: none"> Mosquito repellent refill bottles/ Mosquito repellent mats Broken glasses/ceramics Old Electronic items/part Pieces of wires, old chargers, old pen drives Insecticide sprays / leftovers Empty cans of lubricants used for car/bike.

Table 13 Waste Category (bin it right)

Stages of Waste-management

Stages	Technology / Technique	Tools
Stage – 1 PRIMARY SEGREGATION	Segregation of waste at source or community level. The three kinds of bins to be placed at each community cluster and then taken for processing	Color-coded waste bins at each ward.
Stage – 2 SECONDARY SEGREGATION	Wet Waste Management: This is especially to ensure that wet waste that will go for vermicomposting or into the gasification plants does not have anything harmful / mix up of plastics etc.	Pick anything that is not supposed to go into vermicomposting and put them in an aluminium vessel given (for sending to landfill).
Stage – 3 TREATMENT OF WET WASTE	Wet Waste Management: After ensuring that wet waste does not have any mix-up, they are shredded/crushed as it may require, and fed into the gasification plant / vermin-composting bed.	

<p>Stage – 4 TERTIARY SEGREGATION</p>	<p>Dry Waste Management: This is to sift /sort materials that are recyclables and that which must go to landfill</p>	<p>Pick items (such as bottles, pet bottles, plastics, milk/oil covers, bottle caps, etc.) that are saleable/ recyclable.</p>
<p>Stage – 5 TREATMENT OF DRY WASTE</p>	<p>Dry waste recyclable/saleable are kept in stores for sale to scrap dealers periodically, as decided</p>	
<p>Stage – 6 TREATMENT OF HAZARDOUS WASTE</p>	<p>Hazardous wastes such as children’s diapers, sanitary napkins, medical bandages, band-aid, and such items go into the incinerator. Other items such as old batteries, blades, fused bulbs/ tubes, broken ceramic items, rusted tins, etc. go to landfills.</p>	

Table 14 Stages of waste management

Economic opportunities and Livelihood

Summary

- *Low literacy and employment rate demands for skill development and employment generation focusing on women population – Kalonda Crafts with the help of NIRDPR.*
- *Community base rural tourism to provide livelihood to large population with varied skillset and promote education.*
- *Recreational services for surrounding urban area – Old age home, SPA and Yoga center, to be adopted as Rural Development policy by NIRDPR.*
- *Establishment of Small scale cooperative industries for feeding into nearby industrial zone.*
- *Need to explore the potential for non-conventional farming*
- *To look out for upcoming government schemes for financial support and capacity building of farmers.*
- *Encourage non-pesticide and organic farming options.*

1. Introduction



Figure 58 Proposed economic opportunities and livelihood for Kalonda

We propose a holistic economic development of Kalonda in the first phase that is within 10 years for Kalonda Gram Panchayat Development Plan. The present level of education and the working population poses a serious concern and needs immediate attention to be paid in order to prevent the indigenous character of the village. The second issue addressed is the prevention of agricultural land from real estate speculation due to the pressure of the surrounding urban area. Hence, the economic

growth is proposed under two major heads of Agriculture reforms and Business and Entrepreneurship. Each proposal is elaborated further in the detail (Figure 57).

2. Working population distribution in Kalonda

The literacy rate in Kalonda is very low with about 58% illiterate population (figure 2). About 62 percent male population is educated but only 34% of the women in Kalonda are literate. Such high rate of illiteracy and low availability of agricultural land in Kalonda there is large number i.e. 78.4% of the non-working population and 2.2 percent of working women out of which a considerable population is a marginal worker meaning that they are employed for less than 6 months only. (figure 3 & 4). Presently, 50% of the working population is involved in agriculture either as cultivators or as agricultural laborers.

The low level of education and employment is posing a grave threat to village homogeneity too as while looking at the case of villages in neighboring towns such as Greater Noida when the population has low literacy and employment rate the economic pressure causes the villagers to fall for the trap of real estate. With urbanizing context there is a sudden increase in land value, causing villagers to sell off their land and leaving their only skill of agriculture too. Then, these villagers seek employment in nearby urban areas as domestic servants and laborers. In order to prevent this phenomenon to occur in the Village of Kalonda, we are proposing our greatest focus on employment generation. We have also noticed that also women are involved in domestic works and are skilled in crafts too but household industry employment is considerably low. The household industry demand short-duration training, people do not require formal training to establish a household industry. Also, strategies to improve the yield of agriculture are to be looked at.

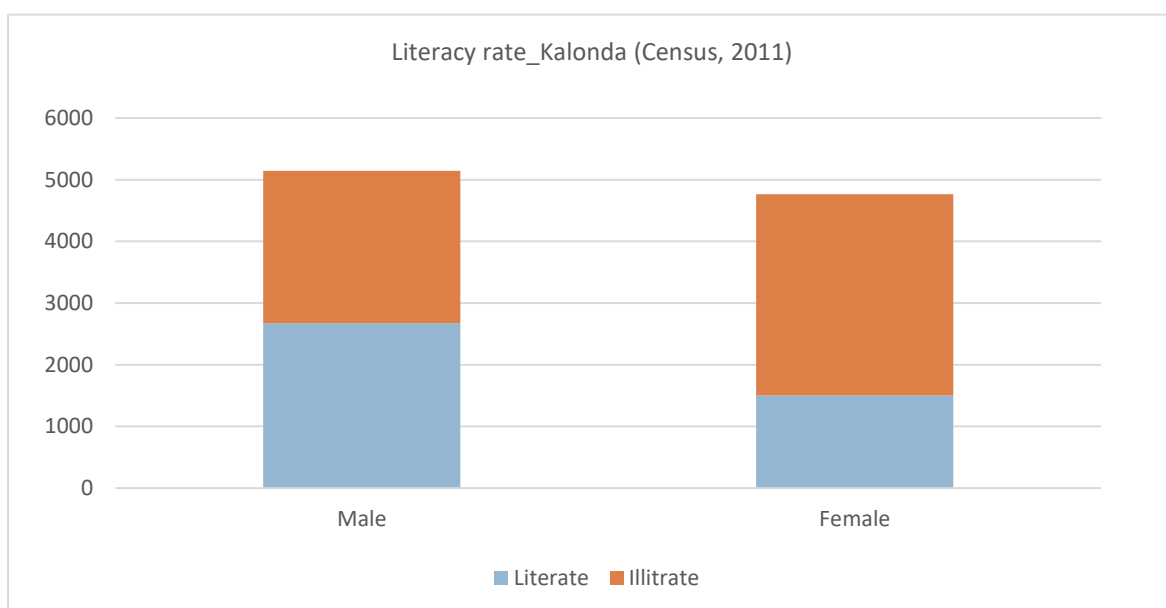


Figure 59 Literacy rate in Kalonda as per Census 2011 data

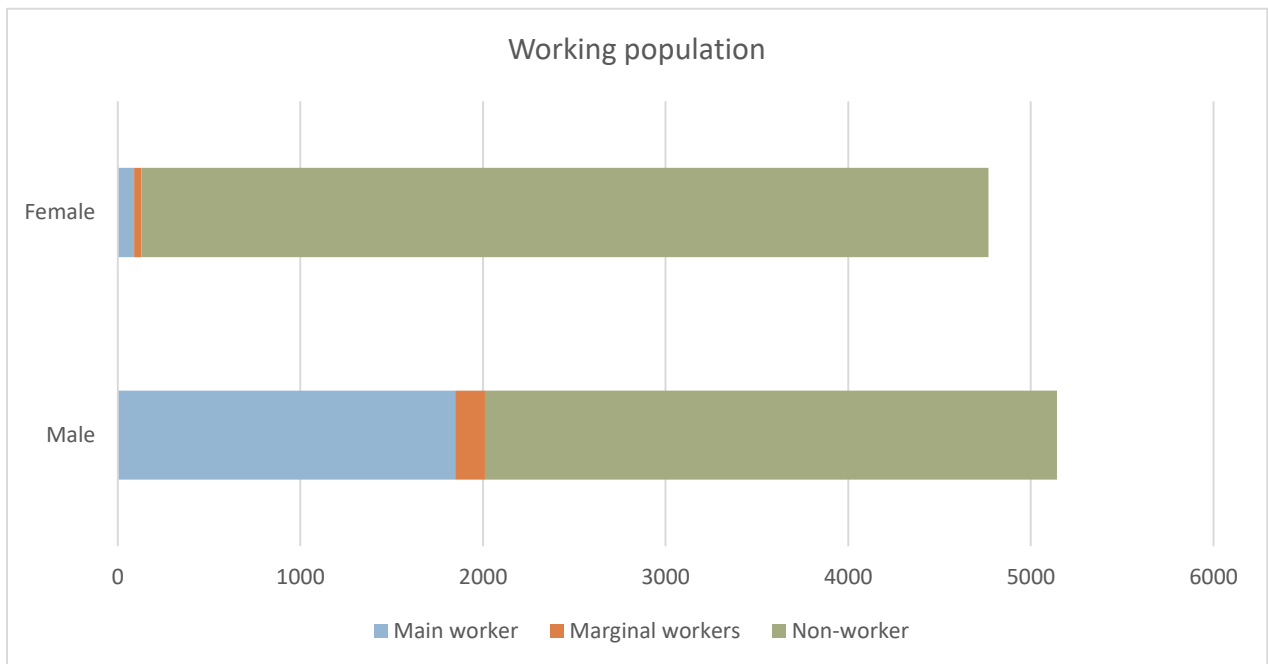


Figure 60 Working population in Kalonda

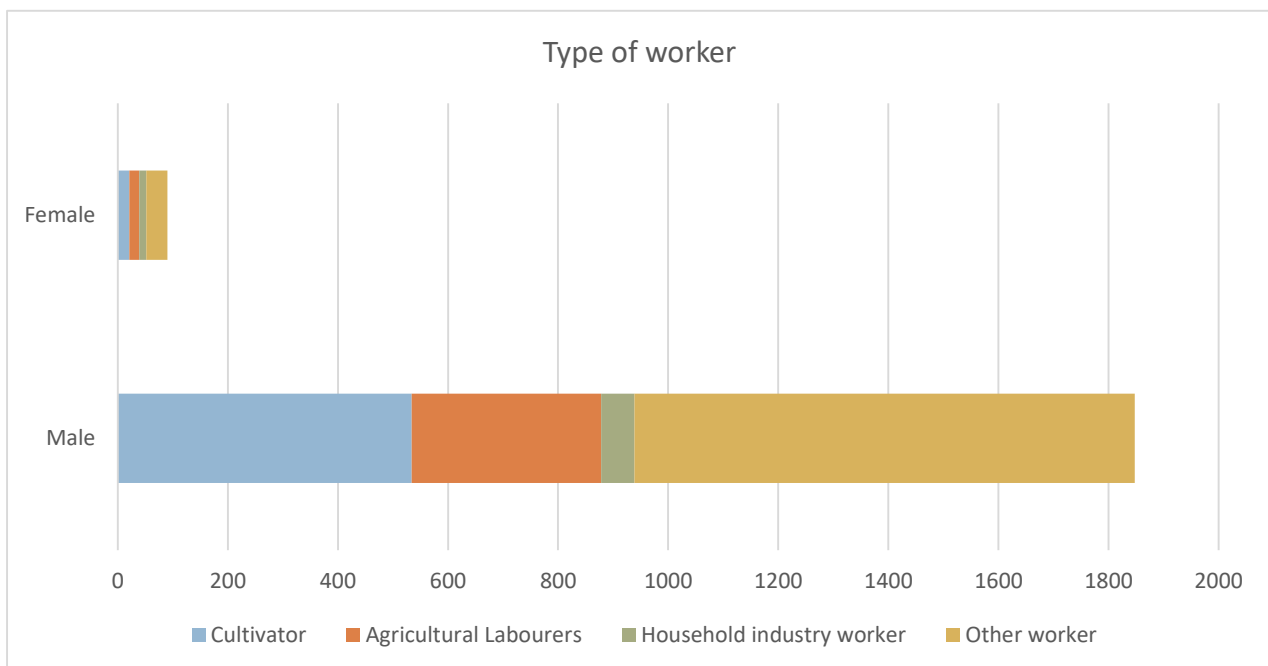


Figure 61 Type of workforce in Kalonda as per Census 2011 data

3. Regional Forces and Economic opportunities

The context plays a crucial role in determining the economic future of any Village or town. Here, this is been looked at as an opportunity due to the proximity to the city of Delhi and the Eastern part of

the National Capital Region. This region has a characteristic Industrial belt and ongoing development in the residential sector. The huge availability of urbanizable land, Vicinity to Delhi- Mumbai industrial corridor, and Delhi Kolkata Grand trunk brings in greater connectivity to the whole country. This brings in several industrial townships, and business parks in the nearby region (Chapter 2). Now, for Kalonda all this provides numerous aspects that can be explored for their economic potential.



Figure 62 Regional forces and their future economic potential for 25 years

4. Agro-dependent livelihood opportunities

We are proposing 6 key concepts for sustainable agriculture reforms (figure 6) based on the existing issues and future opportunities. The first goal is to use pesticide-free organic farming options to increase the per-unit sale price of the crop and hence attain organic certification through PGS. Soil health is crucial for crop health and hence, preventing soil from pollutants and using bio-manures from the cattle industry shall be looked at as the second goal. The third goal shall be to increase the bio-diversity of the village and exploring the potential for tree-based farming. As most of the landholders have a small piece of land or they rely on renting the lands the fourth goal looks at the intensive cultivation on small plot sizes. The fifth goal shall be to integrate traditional agriculture with Cattle farming, fisheries, and other agro-dependent livelihood options. The final sixth goal shall be to create its seed banking and lending systems and take support from National level agriculture research institutions such as ICAR. The reach to markets can be increased by using 'mobile Bazar' to get

everyday mandi price through free SMS and hence using digital media for better information sharing and market intelligence.

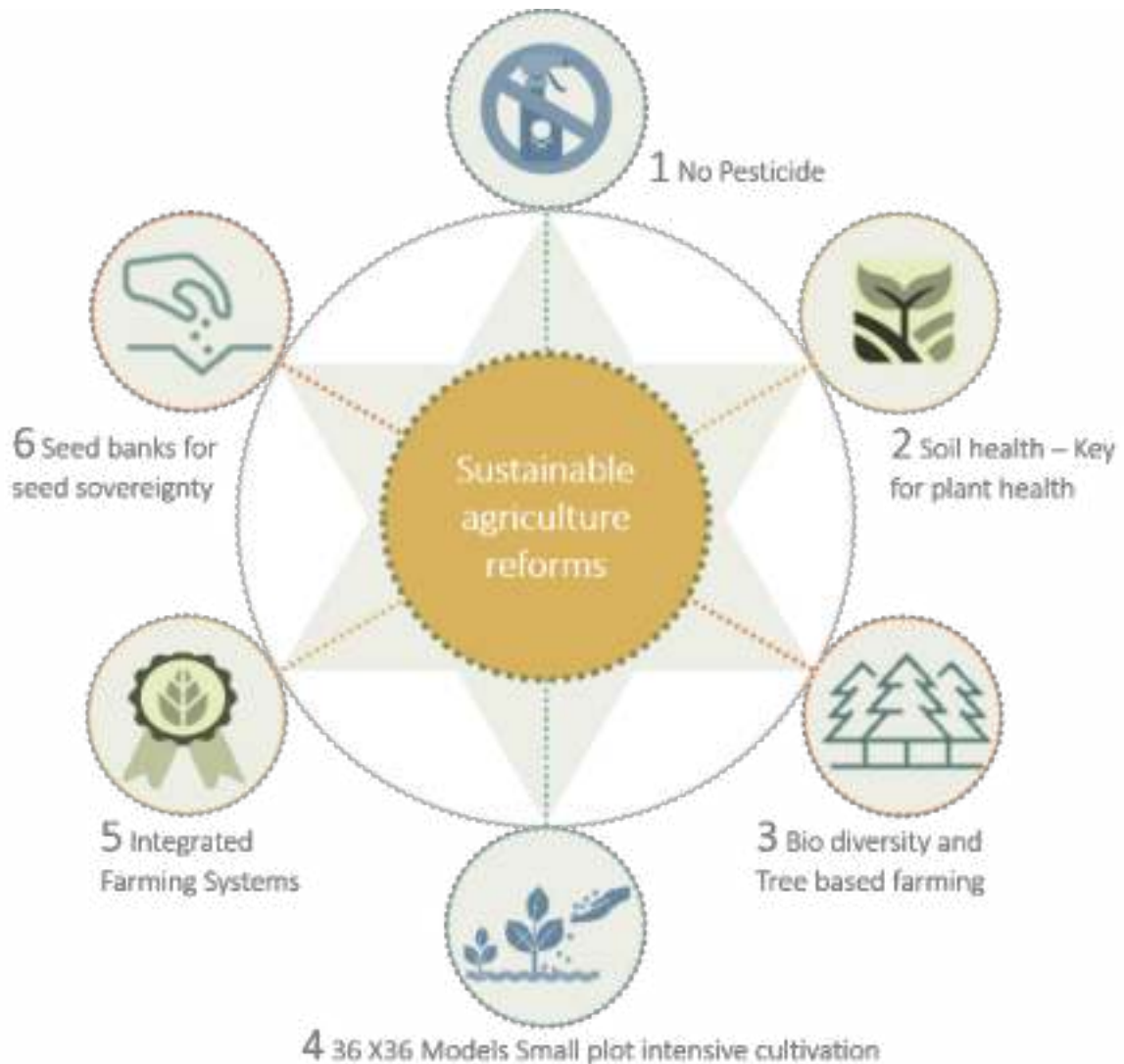


Figure 63 Sustainable agriculture reforms

A. Traditional Crops

Land area used for agriculture in a village and the population of the village have a relationship. The amount of crop cultivated in the fields should be able to feed the people living in the *Abadi* area of the village.

Kalonda today is at the critical edge where the fields produce only as much as the people need. Beyond this point where the relationship is in complete balance, efforts to make agriculture worthwhile and to identify new farming techniques or to identify related economic measures. The image of a village is incomplete without agriculture. Where a village cannot be thought of without agriculture, the latter

cannot be practiced as an economic activity in the heart of cities. Green fields have to be connected to green fields and the complete conglomerate of green fields to forests, hills, rivers, water channels, and mountains. A village gets destroyed when the *Abadi* area eats into the agricultural area and land is looked at no as a resource to be protected, but as a commodity to be sold for profit. Our agriculture has to be protected from the commodification of land, it must be looked at as a National Resource, the heritage of not just the present, but also of future citizens of the country.

Based on interviews and visual surveys it is observed that the agricultural areas at the southwestern side of the village are low lying were observed the loss of the crops like Maize, Jwar, Bajra. In the low-lying agriculture belt along the Cholas road- Paddy Cum Fish Culture (PFC) - profitable and sustainable, as two crops i.e. paddy and fish can be harvested from a unit cultivable area.

A large number of cultivators are small & marginal. There are three types of farmers in the village one as the cultivators owning small landholding with additional land on rent to practice agriculture the second one with not having own land and practicing completely on rented land and the third one is with own enough land but with the complaint of no profit in practicing agriculture.

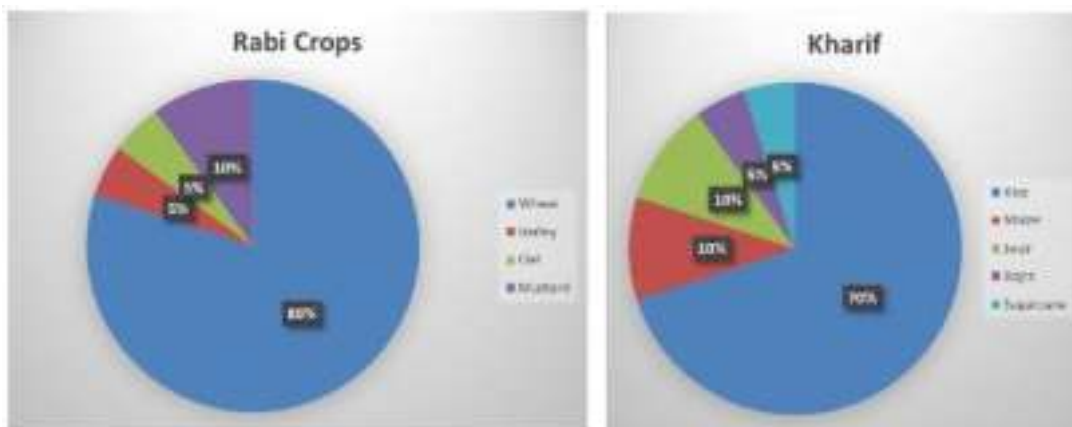


Figure 64 Distribution of crop types



Image 31 Loss of crops observed along Cholas road in August flooding of excess rainwater

B. Livestock farming

Livestock farming, when combined with traditional agriculture, can provide threefold benefit from traditional crops – Easy availability of food, fertilizer, and grazing land. Livestock Farming got a huge boost with subsidy allotment in budget 2020. Citing the profits from animal husbandry, the government has taken a series of actions to improve its status.

i. Government Allocation to Animal Husbandry

Animal husbandry has become a luring business in livestock farming because of its profit-generating capacity. Most suitable business after farming which the farmers can take up to increase their income. The government has allocated Rs. 3289 crores to the Animal husbandry and Dairy sector this year (18% more than 2019- 20's allocation). Out of this, Rs. 825 crores have been allocated to the fishery sector. Further, the government decided to develop fodder farms under MGNREGS's program. This will not only help to boost milk production but will also protect natural grasslands, protecting the environment.

ii. Dairy Farming

The livestock and agriculture are said to be complementary to each other, but in a village survey, it was noticed that **people of Kalonda consider livestock farming as a work of no profit.**

The sale price of milk is Rs.50-70 per litre, which requires feed available at Rs.30 per Kg, additionally, the cow dung cannot be utilized for composting without cleaning as it is mixed with plastic waste. There is a need to explore this as a potential livelihood source. Livestock Farming got a huge boost with subsidy allotment in budget 2020. Citing the profits from animal husbandry, the government has taken a series of actions to improve its status.

iii. Livestock Farming: Fishery (with the aid of Ministry of Fisheries)

The government of India is intending to boost fish production by 200 lakh tonnes by 2022, the government has encouraged rural youth to work for this sector. The government will help developing fish farmer organizations to take this sector to the next level. The village Kalonda can explore the potential for fish farming due to the presence of 5 lakes with rich biodiversity and suitable soil type. The existing lakes are proposed to be a visual, recreational asset to the village. These lakes can also provide economic benefits by providing a resource for fish farming. This will be easily supplied to mandi's in Delhi NCR.

iv. Livestock Farming: Rural Backyard Sheep, Goat and Piggery Scheme

The government decided to provide a 90% subsidy on goat/sheep and pig rearing. While the Centre government will pay 60% of the cost, the state government will cover 30% of the cost. This means that

the farmer will just have to bear 10% of the cost. To avail of the benefits of the scheme, the potential beneficiary needs to deposit 10% of the total cost in their respective accounts opened under the scheme. The rest of the amount will be deposited by the government through the RTGS scheme. The scheme has already been initiated in Uttar Pradesh, can apply to the block-level veterinary officer.

C. Cattle and Agriculture connect

There is a silent equation between the wild, the wildlife the forest the cultivatable lands, domesticated animals, the villages the larger settlements, and then the cities. Cattle exists in between the wild, the wildlife, and the village, where they are needed for heavy work and milk and other products related to them. Cattle in Indian villages exist socially. It is never just the cattle, they exist in a setup where the women of the family share responsibilities with men in milking, bathing, food gathering, and managing their medical emergencies. The bulls become a part of the cultivation plan and the cows give milk and produce children. The older ones are set off into the forest nearby or in some cases, even consumed for meat.

There is no training possible to help people who have not grown into a social setup, where the cattle is a part of the life, festivity, economy and also can be a source of milk production. The animal is too big to be handled without adequate experience but when this training is woven into the life of the growth of individuals, then it is different. Living with their size, responsibilities, in Indian villages is done primarily with the aid of not just customs that involve the calf, the bull, and the cow, but also by an interweaving of mythology, starting from Nandi the bull of Lord Shiva to the cows of Lord Krishna the association of the cattle with all Gods and goddesses possible makes the process very profound. The cattle especially the cow is connected to Ayurveda too. It is woven into food, medication, blessings, milk, and is thus an animal that is serving the existence of humanity at large.

It is worthwhile to mention here that organic architecture also needs the cattle much beyond just as a beast of burden. Cow urine and buffalo urine is used as a pesticide and cow dung as a fertilizer, It has partnered agriculture since the inception of the settlement of human civilization into egalitarian agrarian communities. The decrease in the number of cattle in the villages, as in Kalonda is primarily due to three reasons:

1. Culling of the big animal for meat
2. The disinterest in the new generation to engage in the arduous task
3. The low cost of milk purchase as paid by the Doodhiya

4. The use of inorganic manures, urea, and chemicals for the growth of crops and thus the reduced need for organic manure.

Every house in Kalonda is designed to have a cattle shed and cattle sufficient for the family, but, with the disturbance in the equation of the cattle concerning the agriculture and human settlement, the cattle are reared either only for milk or for meat. In Kalonda the use of the cattle for its meat is marked. Milk cultivation is generally done in Indian villages like Kalonda by a person who is called Doodhiya. Doodhiya is responsible for the payments against the cultivation of milk. The price at which the Doodhiya buys milk is Rs 30 per liter of milk. The disconnect of cattle with agriculture is such that the cattle are fed on manures produced by industries, rather than the farm products. This manure is available at Rs 30 per kg. As per their calculation, a liter of milk needs a kilogram of food. The fresh milk collected from the village is sold for as much as Rs.75 per liter of milk in the developed urban areas of Greater Noida and Noida.

With the new talk of organic food and milk and fresh vegetables, Kalonda has great potential and can be utilized for organic crops and milk managed through village co-operatives. The glaring example of Amul through social initiatives is an outstanding example. Some other benefits of the presence of social co-operatives are:

1. Social integration with economy
2. Social cohesion
3. Village get as a village character
4. A balanced approach to development through sustainability

D. Sale and Purchase of Agricultural produce

The market value of agricultural produce: Based on the primary survey, it is noted that the farmers are not getting the MSP rates, and the nearest market for their produce is Dadri mandi.

Farmer Producer Organizations (FPOs) will contribute to enhancing cost-effective productivity and higher net incomes to the member farmer producers group through better liquidity and market linkages for their products and will help to become FPOs sustainable through collective action.

Tools and machinery: Small landholder is unable to keep tractor, expensive mechanized tools and hence depended on hiring for various farming activities which in turn increases input cost. Multilayer farming model using small locally customized tools is a good solution it needs regular work engagement along with ensuring regular income. It will also help to reduce dependency on expensive mechanized tools.

Human Resource, Education and Capacity Building

Summary

- *Kalonda has an immense potential for Human resource which needs to be capitalized for regional benefits. This would give employment to the people of Kalonda.*
- *Short term courses with the help of NIR DPR should be organized for outcome based development.*
- *Villagers have to be educated to sustain agriculture with development.*
- *Education into better ways of agriculture and secondary and tertiary economy while engaging with agriculture must be promoted.*
- *The existing infrastructure of the school in Kalonda should be utilized.*



Figure 65 Regional forces and the vocational training required for the same

1. Introduction

Kalonda has a large population which is under 18 age and in the next 5 years, most of them will be in the employable age where their physical energy and mind can be cultivated to be of use to the Regional opportunities. As understood in the regional context of the village of Kalonda, there are mega projects that are being expected to boost the economy of this region. With its high population and the constraint in the opportunities, the village of Kalonda can become a great human resource. It can cater to the manpower needs of the district.

The VRSB Inter College in Kalonda has a huge campus (approx. area 6 acres) and can offer vocational training in -Carpentry, Agriculture, Hospitality, Naturopathy, Medical Assistantship, Tooling and Machinery, Electronics, Civil and Draftsmanship. While we are keeping the land area for agriculture protected, there may be a lot of employment for the villagers in the field of agriculture and related activities. The rest of the population can keep living in Kalonda and work in areas of the economic catchment of the GB Nagar.

The limiting possibility that is an impediment today can be elevated to be an opportunity.

2. Education and Human Resource

The village of Kalonda has a very poor literacy rate as of now, even though a 70-year-old school VRSB Inter college exists in the city. This inter-college is also used by the people from nearby villages. The infrastructure and facilities of the inter-college are not up to the mark. The college does not even have a proper office for the principal and thus the principal sits under a tin shed. The student-teacher ratio is 41 while the student-classroom ratio is 79. These are quite high ratios as compared to the standards by UDISE where the student-teacher ratio in a senior secondary school must be 27 and in a primary school must be 23. These bad ratios simply suggest that the village school has bad facilities and it has not been updated and renovated for years because the priority there is not quality education.

Currently, in the age bracket of 0-19 years for both males and females, the population is more than 50% of the total which in the coming years would become the working population, but the resources and job opportunities will remain the same as of today. The least being 4-5% in the age bracket of 60-80 years. In the age bracket of 20-60 years, both male and female population is about 44-46%. This implies that the working population is less than the dependent population to the accord of more than 10%. These are the current statistics. With the population increase in the coming times, these will go worse and unemployment will increase.

From the household surveys that we had performed, we could see that about a quarter of the population of the village had not received formal education. Amongst the population who had attended school, only 11.5% qualify up to inter, and 40% drop out before that and only 6.5% of people pursue graduation and post-graduation. Women's education rate is even lower as compared to males. Only 34% of the women have received formal education in their whole lives while 62% of the male population have attended school. As a result, most of the population do not qualify for good jobs and thus they take up jobs where they are paid less and thus are exploited. It was found that in the working-age of 18-60 years, about 65% of the population is either unemployed or have only marginal employment throughout the year. Only about a quarter of the working population is directly engaged with the Primary sector. There is almost no secondary sector available in the village, implying no kind

of manufacturing or cottage industry. About 10% of the working population is involved in the tertiary sector. Currently, there are 78.4% of the non-working population and only 2.2% of working women.

Even if we retain all the agricultural land, then also it will only cater to only 25% of the population. Currently, 65% of the population is unemployed. We first have to take care of them and then move on to future prospects. In the coming ten years, the maximum population would be in the working-age group that is, the current 50% population which is in the age group of 0 to 19 years will be in the age 10 to 29 which the working-age group is. If we won't take care of the increase in the demand for jobs, then there is a chance of mass migration to other nearby districts and cities. In order to solve that, we must generate employment within Kalonda to hold the young generation within the village. For the same, we also must have better education facilities in the village. More institutions with vocational training in the field where employment is generated the most must be established in the village. On a priority basis, a few technical courses must be introduced in the existing VRSB inter-college, like carpentry, agriculture, hospitality, naturopathy, medical assistantship, tooling and machinery, electronics, civil, and draftsmanship, etc. These are the fields where most of the people of the village are either already employed, or there is a scope for their employment. Therefore training in these fields will provide them with better opportunities, not only today but in the coming times as well.

Age group	2021	2026	2031	2036	2041	2046
0-19	6163	8135	10738	14174	18709	24696
20-60	5546	7320	9633	12715	16783	22153
60-80	613	809	1067	1408	1858	2452

Table 15 the projected population of different age groups for next 25 years

	Population (2011): 9910	Male	Female
Cultivator	5.6%	534	21
Agricultural Labourers	3.65%	344	18
Household industry worker	0.75%	61	13
Other workers	9.5%	909	38
Total	20%	1848	90

Table 16 Occupation of people of Kalonda as per census 2011

If we will not create further employment, the total employment rate will go down to 11.85% by 2031 as the resources will remain the same, but the population will increase.

	Population (2031): 16394	Male	Female
Cultivator	3.4%	534	21
Agricultural Laborers	2.2%	344	18
Household industry worker	0.45%	61	13
Other workers	5.8%	909	38
Total	11.85%	1848	90

Table 17 Projected Occupation by 2031

For the women of the village, the existing art forms must be promoted. They already are making arts and crafts and selling them but through a secondary and tertiary resource. Due to this they are paid less and exploited. We can make arts and crafts their primary source of income by selling their crafts directly without involving numerous people in between. Also, they can be trained better so that their crafts sell better. In addition, we can also pick up a few activities from their daily chores and promote them and convert them into businesses. Like the making of pickles, papad, halwas, etc can be done on a commercial level. These activities will not require any additional training, yet will add on to their income.

After 25 years, we intend to set up a fare which will exclusively be for selling and showcasing the works of the villagers of Kalonda. This will increase tourism, promote art and crafts, and will further improve the economy of the village. If this turns out to be a yearly affair, many more opportunities for the villagers will be created.

3. Capacity building

The key point is that the villagers in Kalonda lack education and Capacity building on exploring the potential of agriculture and other related primary sources of employment. An awareness regarding the same must be created within the villagers. Improvement and augmentation of Educational Infrastructure are also needed. Also taking Kalonda towards sustainability and promoting agriculture is our main motive. For the same, we can have vocational training in the institutes, which will guide them and help in improving the agriculture of the village. The kinds of pests which can be used, the organic fertilizers that can replace the chemical ones, the effective utilization of seeds, the cross-

breeding of the plants, the life cycle of the pests and lands, moving towards renewable sources of energy, etc can be taken into account. A program can be developed to manage these.

For this following points are recommended -

- Life cycles of pests and enabling climatic condition for disease prevalence and spreading farming systems
- Sustainable use of resources
- Maximizing output from a unit land
- Effective utilization of inputs like Seed, organic fertilizers, sunlight, water, land, etc,
- Conservation of Renewable Natural Resources & Genetic biodiversity both flora and fauna – SRI in Paddy
- Program management



Image 32 Cattle waste mixed with plastic dumped along the road instead of composting

Convergence with MGNREGS

Farming systems under small farm holders can only be made profitable if farmers adopt a conservative approach at all stages of farming. For it, there is a need to utilize each and every inch of land for raising suitable field and plantation crops, select low-cost viable enterprises for diversification, recycle all farm wastes and crop residues within the system itself, and make productive use of farm boundaries and wastelands if any. Further, farmers are also advised to make use of renewable sources of energy such as solar and biogas, etc. Cattle waste Dumped along the road instead of composting Cattle waste mixed with plastic waste enables a need for waste segregation and proper disposal of waste for hygiene as well as recycling and reuse of bio-waste for agriculture and related activities.

Infrastructure and Housing Policy

Summary

- *To match up with the needs for habitation of the villagers a well formed housing policy which can accommodate modern amenities and technology must be in place.*
- *Recognizing vernacular typologies of houses is important to preserve the connection of houses to culture, climate, cultivation, small scale house based industries.*
- *Densification of vernacular typologies as based on their open space structure and architectural character must be used for building of houses. For this a housing approval process must be in place.*
- *Recognizing open space structures and clusters with varying definitions for understanding appreciating and reorganizing the self-selection of sites by villagers must be done.*
- *Identifying potential of clusters for better functioning organized open spaces. This is determined by the inter positioning of houses and the vacant geometries can be used to develop typologies like chowks, baithaks, dallans, meeting areas, aanganwadis, and convenient shopping.*
- *Recognizing nodes and proposing densification strategies. This is to be done to accommodate the growth of commerce, institutional needs of the village. A good three dimensional footprint of the node will help in the conversion of design into policy/ two dimensional development plan. (as an example of design based planning code)*
- *House plan documentation and approvals must be undertaken for village houses through an agency dedicated for the village and aware of its vernacular typologies.*
- *Village house bye laws recognizing the vernacular typologies must be approved by a component agency and implemented through the structure of MoPR in the villages.*
- *One-way traffic movement plan will be helpful in maintaining a flow of automobiles through the village. A plan for Kalonda has been suggested.*
- *Entry/Exits plazas and gates to earmark the starting of the village and provide for a parking space for vehicles of the village. This will encourage pedestrianization and will avoid unnecessary movement of automobiles.*

1. Introduction

A plan itself is toothless to bring about a change in the area. It must be supported by public policy and development practices akin to the local population, history, and geomorphology:

1. Neighbourhoods should be diverse in use and population. Interdependence between areas must be there.
2. Communities should be designed for the pedestrian and transit as well as cars, as in the case of Kalonda today.
3. Settlement should be defined by physically defined and accessible public spaces around lakes.
4. The urban place must celebrate local history and agriculture.
5. Efforts must be made to make people aware of the importance of ponds in the urban area model.

2. Design based Planning: an approach to Rural Development in India

Indian villages have a very large variety of house types. The difference in the geography and climatic challenges make housing types very diverse and a lot of changes in between districts and states and through agricultural practices. There are changes in building materials and also in social associations, making the pattern of development very unpredictable.

The urbanization trend in the world is very inviting, as it is synonymous with comfort and economic progress. The village in its heart wants to be the city, with and without a car. The automobile invasion into the human settlements has invaded and eroded all character from the human areas to the extent that all guidelines see this association of the human race with the automobiles as a partnership and hence feel it imperative to aid their presence in the planning processes. A city as per development guidelines is thus not possible without adequate car space, yet all examples of our ancient civilization and cores of all modern cities are areas where ingress of cars is almost always not possible or prohibited to conserve their character.

With self-run and self-designed typologies of houses, there has to be a design-centric approach through an architecture who understands the village and at the same time has the ability to after the design-based development work on guidelines of the area for a minimum period of 25 years for all the villages in a region, village wise. This when done keeping in mind the development of the existing rural character will have a positive bearing on the intensity and character of the area.

All urban spaces and all design examples illustrated in the books of the world, all monuments of significance are ones which have a human connection to the city. their scale almost always is akin to pedestrians. So are our villages, still struggling to keep up the connection of the scale of life, of the living with the space in the urban. Their roads and sections are a mix of the motorized and the pedestrian urban pattern. These must be kept intact through a design-based planning approach, where first the design is done and then the same could be codified into a plan.

3. Housing Policy

i. A discussion on what is at the root of Indian culture

At the root of Indian culture and society is a multi-capability family unit, which practices agriculture, makes its own houses, designs spaces, practices carpentry, shares village development responsibilities, dig their drains, and are the vote bank of our country. They are the socio-cultural units of our country on which bigger cities are built.

The housing typology of these people is very different. They devise self-selection of the site and their house spread “*gher*” is synonymous to family size, economic capacity, industrial/ cattle or agricultural needs, interaction spaces, etc. They build in ways that they have been traditionally doing to protect themselves from floods, climate, rain, and with knowledge systems and construction processes known to the “locals”. Their housing typologies are a repository of what we should have recognized as house plans permitted by development authorities or as “Indian” houses. No such inventory exists. While there is a need to build such an inventory, there is also a need to devise a housing policy sensitive to the villages. Indian open spaces have to be recognized. The reduced road widths, titrated for pedestrian-inclusive paths and to the force-reduce speed of vehicles within the village has to be respected. The village adaptation of lakes and ponds within their settlement framework as a refuge from the rain and for better hydrology must be used as tools to initiate planning.

Given under is a listing of local vernacular house types and an attempt to devise a policy to accommodate technology, economic growth, and sustainable models in rural Kalonda.

ii. The organization through administration and planning

Local Area Plans specific to villages are the way ahead. A summary of steps as adopted in the development of this housing policy are as under:

- i) Identify all house types indigenous to the village *Abadi* areas and thereby respecting areas like forecourt, courtyard, and dalans needed in the house for agriculture and cattle.
- ii) Identify clusters of houses to organize them into better social, shared, and public spaces.
- iii) Develop densification models on house types identified, as based on the projections of the present day to accommodate the rising needs of the population in the years to come.
- iv) The Node densification and growth models as growth guidelines in 3D and convert them into policy following the international Design to the Policy process.

v) Work on documentation and accurate models of growth of *Abadi* areas keeping housing separate from fields and declaring agricultural lands and practices as of national Importance for nutritional security of the future citizens of the country.

iii. Study of Existing conditions

A. Types of Houses

a) Front forecourt open house

The front open forecourt houses are a majority in the village of Kalonda. These houses have a smaller built-up area compared to a large open area. The open forecourt is used by people to sit and lay on their *charpai's* and thus forms a semi-private meeting space. The forecourt usually holds the toilet towards the boundary. A few houses in this category (usually the larger ones) have a kitchen, stairway, and a tree as well in the open forecourt. The tree provides shade on harsh sunny days and thus maintains the microclimate of the house. These houses do not have a separate cattle area.

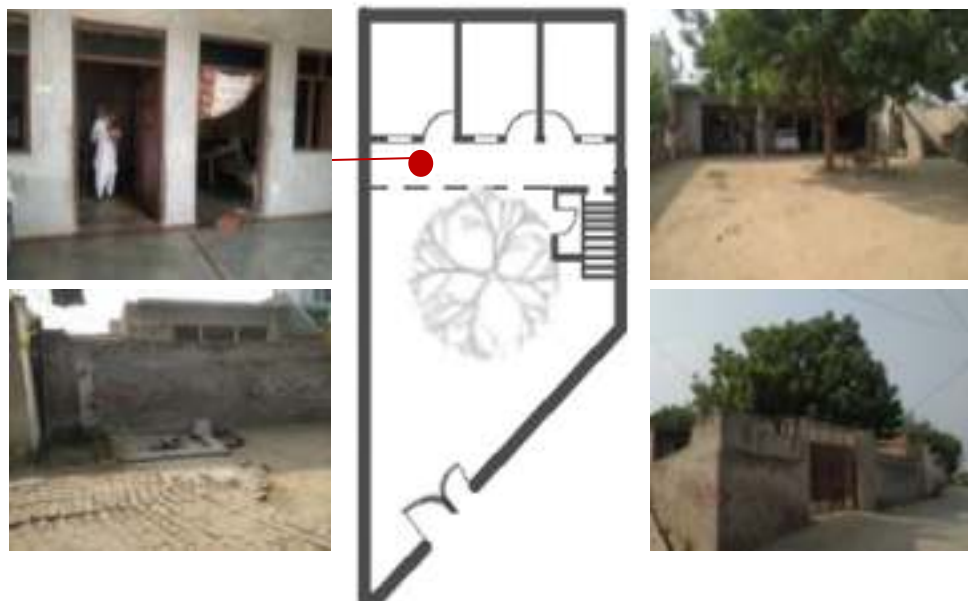


Figure 66 Front forecourt open house

b) Multi Storeyed Linear house along a lane

These houses have a series of linear rooms along with an open space forming a cul-de-sac. These houses are generally found near the lakes and are a result of encroachment. They do not have a designated place for keeping their cattle, thus they tie them in the lane under a shaded area. These lanes are also used by a few families to park their trucks and vehicles.



Figure 67 Multi Storeyed Linear house along a lane

c) Modern Urban houses

The modern urban houses are the most developed in the village as they belong to a *higher* income group. These have a large built-up area and small open spaces. These generally were found to be G+2 in height. Although these are modern in nature, the division and position of spaces are very much similar to the rest of the houses of the village, as the positioning of toilets is near the boundary wall. These have a series of small open spaces where one open space leads to another. Cattles sheds are absent from this typology.



Figure 68 Modern Urban houses

d) Mixed-use houses on commercial node

These houses are found near the most important nodes and junctions. These are mixed-use houses with commercial and residential use. The side exposed to the road have shops, and the inner side is used for living. Many of these are multistoried with major residential portions on top floors. These houses have a smaller open area in the form of Verandahs usually found near the entrance. The prime

income of the families living in these houses is from the commercial shops, thus crop storage area, cattle shed, etc is absent.



Figure 69 Mixed-use houses on commercial node

e) Cattle pro houses

These houses have a designated huge space for the cattle as their main source of income is from them. The cattle sheds are usually semi covered temporary areas with a storage space nearby. These houses have a smaller built-up area and huge open spaces.

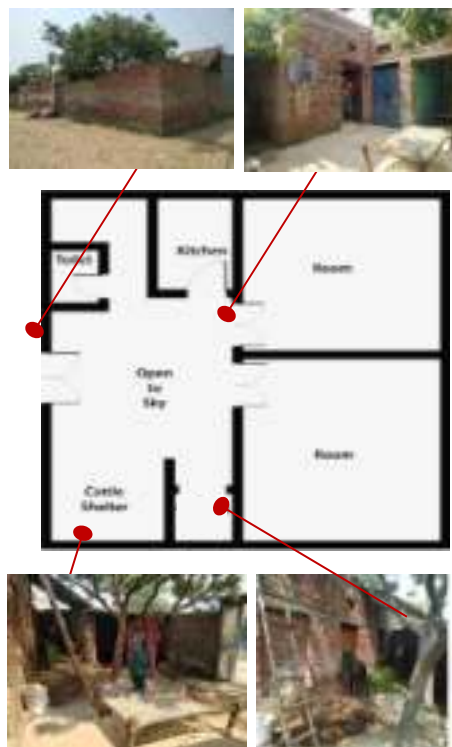


Figure 70 Cattle pro houses

f) Multi Court houses

These houses have multiple open courts. The outer court serves as a public space while the inner ones as a semi-public /private space. These houses are huge in the area with a small designated space for

the cattle. These houses along with multiple open courtyards, have one or multiple verandahs as well. Chabutras are also found in a few houses



Figure 71 Multi Court houses

g) Central courtyard house

These houses are designed around a central open courtyard. All the functions of the house take place around this courtyard. The presence of verandahs and cattle sheds is found in a few houses. These houses also have their toilets and bathing areas near the boundary, totally segregated from the main living areas.

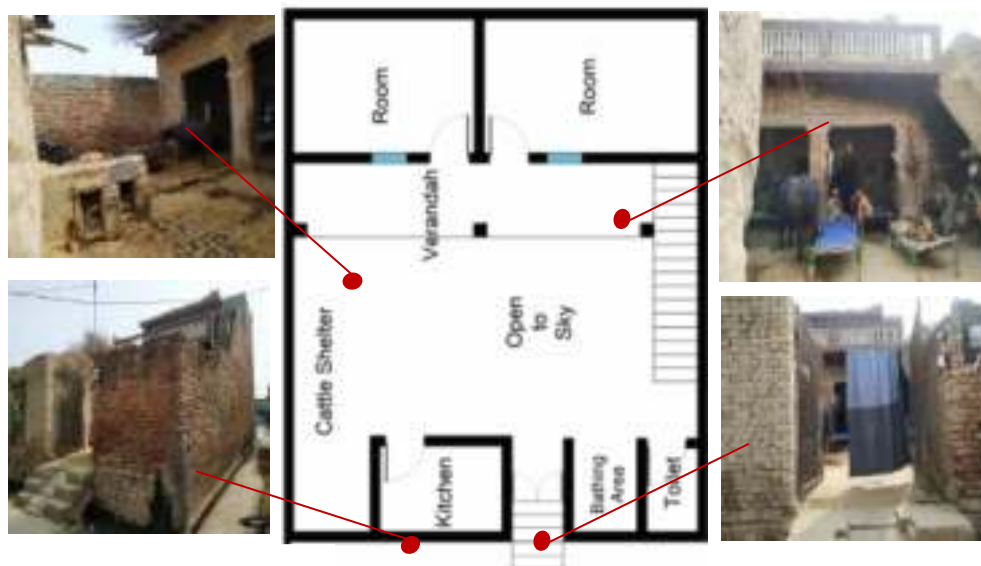


Figure 72 Central courtyard house

B. Group of houses-

a) Identification of wards on the basis of similarity

In the existing mapping of the LULM, a disconnect between the water bodies and settlements is observed. Commercial land use is limited to a few *chowks* and squares and is not evenly distributed. Almost all houses are mixed land use and are in indigenous typologies (discussed separately in the housing policy chapter). The Proposed Land area of the village is divided into agriculture and the *Abadi* area. It is felt by us that the scope of the LULM for villages must be restricted to the *Abadi* area. In the present LULM, the density of the population is close to 220 ppHa (as projected through census data and understood through household inventories), which would rise to 450 ppHa in the next 25 years.

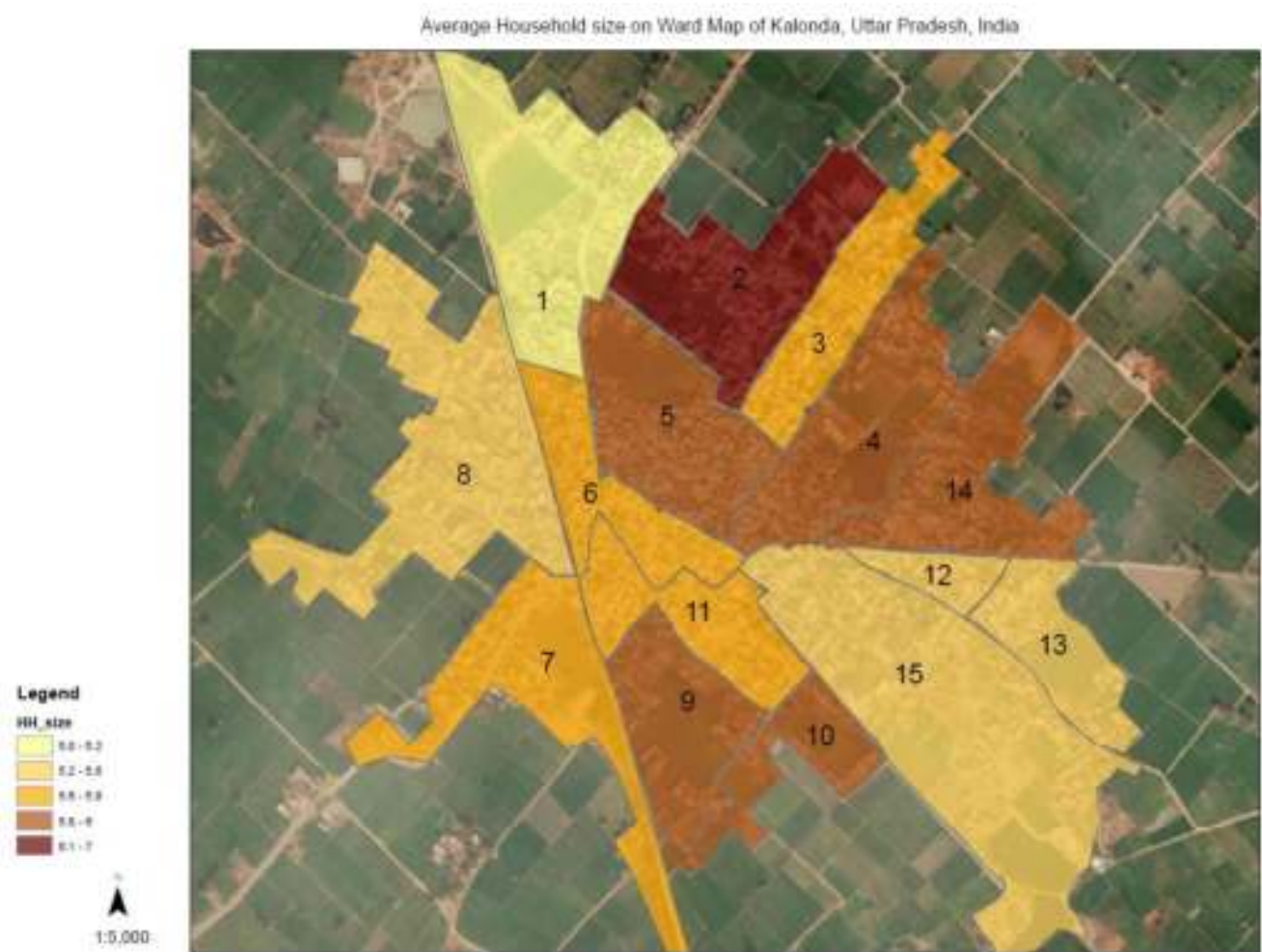


Figure 73 Average household size on ward map of Kalonda



Figure 74 Plan of Ward 1 with house numbers

Name of the ward	1
Ward population as calculated on basis of households/ current population of Kalonda	512/12000 = 4.30% of the total population
Area of the ward (Ha)	8.5594
The number of households (approx.)	64
Density	44.65
Possible increment in additional houses by 2046	416 housing units distributed across multiple floors for a densified Kalonda
Increased density by 2046	450
Remark	This is a very sparsely built area and has immense potential for “organized development” through rural housing and commercial areas in vernacular vocabulary.



Figure 75 Plan of Ward 2 with house numbers

Name of the ward	2
Ward population as calculated on basis of households/ current population of Kalonda	808/12000 = 6.73% of the total population
Area of the ward (Ha)	6.7128
The number of households (approx.)	101
Density	90.45
Possible increment in additional houses by 2046	276 housing units distributed across multiple floors for a densified Kalonda
Increased density by 2046	450
Remark	This is a partially developed area and thus has lower potential for “organized development” except the increment in housing and small commercial areas using vernacular vocabulary.



Figure 76 Plan of Ward 3 with house numbers

Name of the ward	3
Ward population as calculated on basis of households/ current population of Kalonda	632/12000 = 5.27% of the total population
Area of the ward (Ha)	4.1439
The number of households (approx.)	79
Density	114.49
Possible increment in additional houses by 2046	153 housing units distributed across multiple floors for a densified Kalonda
Increased density by 2046	450
Remark	This is a developed area and thus does not have a potential for “organized development” except incremental housing using vernacular vocabulary.



Figure 77 Plan of Ward 4 with house numbers

Name of the ward	4
Ward population as calculated on basis of households/ current population of Kalonda	720/12000 = 6.00% of the total population
Area of the ward (Ha)	6.4767
The number of households (approx.)	90
Density	83.38
Possible increment in additional houses by 2046	273 housing units distributed across multiple floors for a densified Kalonda
Increased density by 2046	450
Remark	This is a partially developed area and thus has a lower potential for “organized development” except the increment in housing and small commercial areas using vernacular vocabulary.

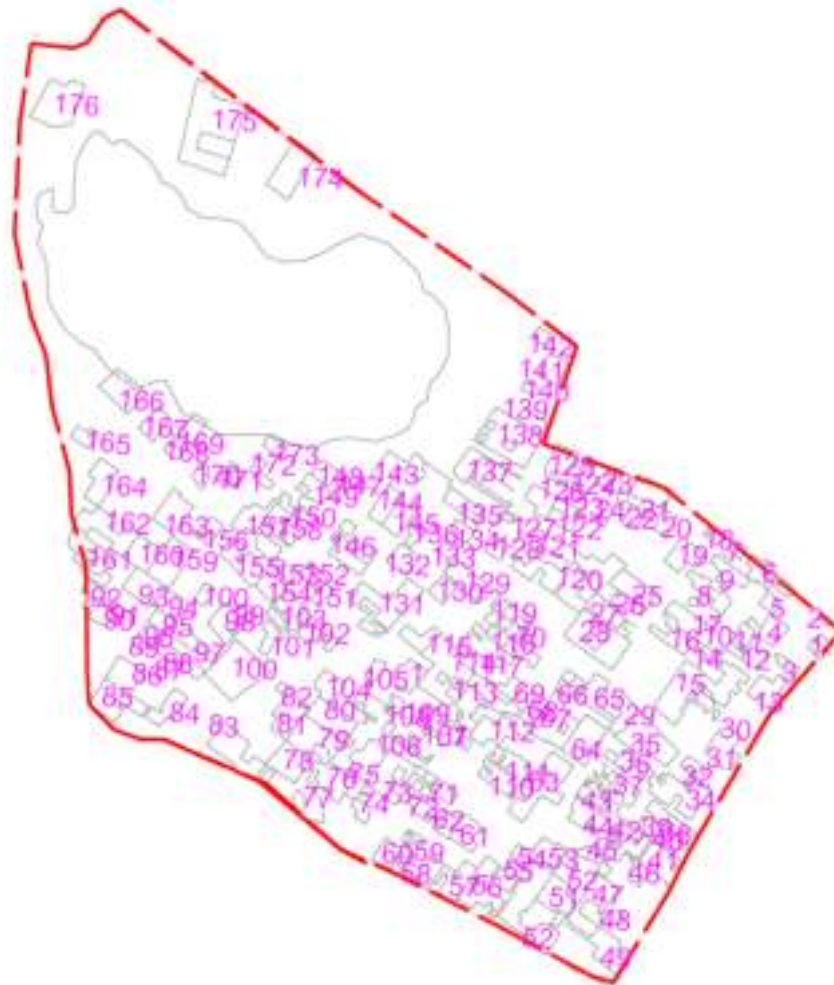


Figure 78 Plan of Ward 5 with house numbers

Name of the ward	5
Ward population as calculated on basis of households/ current population of Kalonda	1408/12000 = 11.73% of the total population
Area of the ward (Ha)	5.7736
The number of households (approx.)	176
Density	183.02
Possible increment in additional houses by 2046	148 housing units distributed across multiple floors for a densified Kalonda
Increased density by 2046	450
Remark	This is a fully developed area and thus has no potential for “organized development” except the increment in housing using vernacular vocabulary.

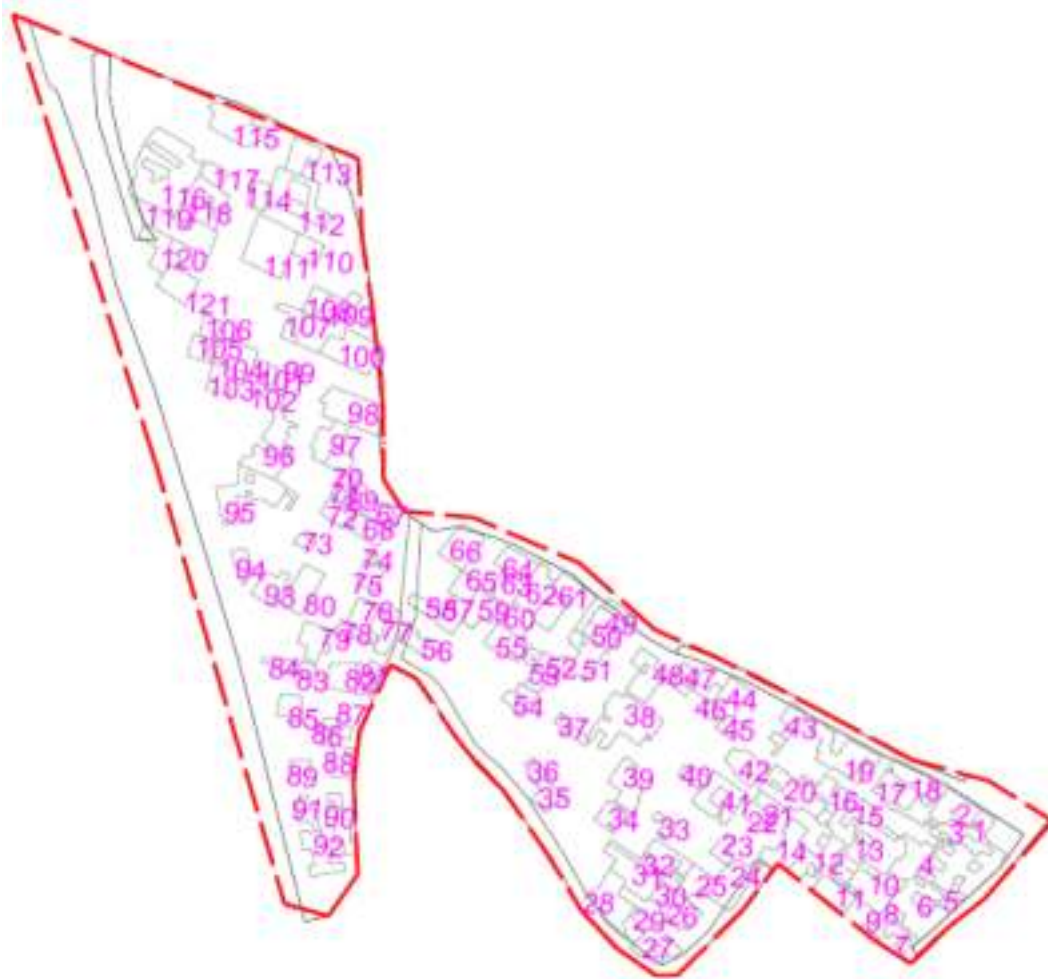


Figure 79 Plan of Ward 6 with house numbers

Name of the ward	6
Ward population as calculated on basis of households/ current population of Kalonda	968/12000 = 8.07% of the total population
Area of the ward (Ha)	3.6647
The number of households (approx.)	121
Density	198.36
Possible increment in additional houses by 2046	85 housing units distributed across multiple floors for a densified Kalonda
Increased density by 2046	450
Remark	This is a fully developed area and thus has no potential for “organized development” except the increment in housing using vernacular vocabulary.



Figure 80 Plan of Ward 7 with house numbers

Name of the ward	7
Ward population as calculated on basis of households/ current population of Kalonda	848/12000 = 7.07% of the total population
Area of the ward (Ha)	8.5398
The number of households (approx.)	106
Density	74.56
Possible increment in additional houses by 2046	373 housing units distributed across multiple floors for a densified Kalonda
Increased density by 2046	450
Remark	This is a partially developed area and thus has a lower potential for “organized development” except the increment in housing and small commercial areas using vernacular vocabulary.

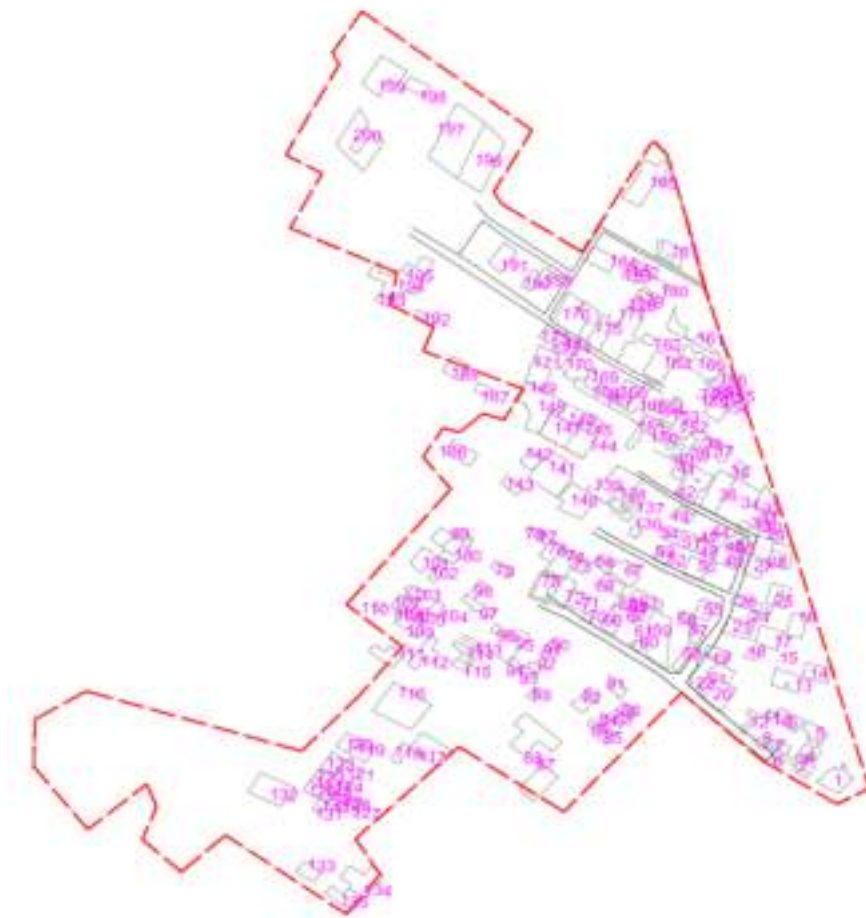


Figure 81 Plan of Ward 8 with house numbers

Name of the ward	8
Ward population as calculated on basis of households/ current population of Kalonda	1600/12000 = 13.33% of the total population
Area of the ward (Ha)	10.1839
The number of households (approx.)	200
Density	117.87
Possible increment in additional houses by 2046	372 housing units distributed across multiple floors for a densified Kalonda
Increased density by 2046	450
Remark	This is a developed area and thus does not have a potential for “organized development” except incremental housing using vernacular vocabulary.

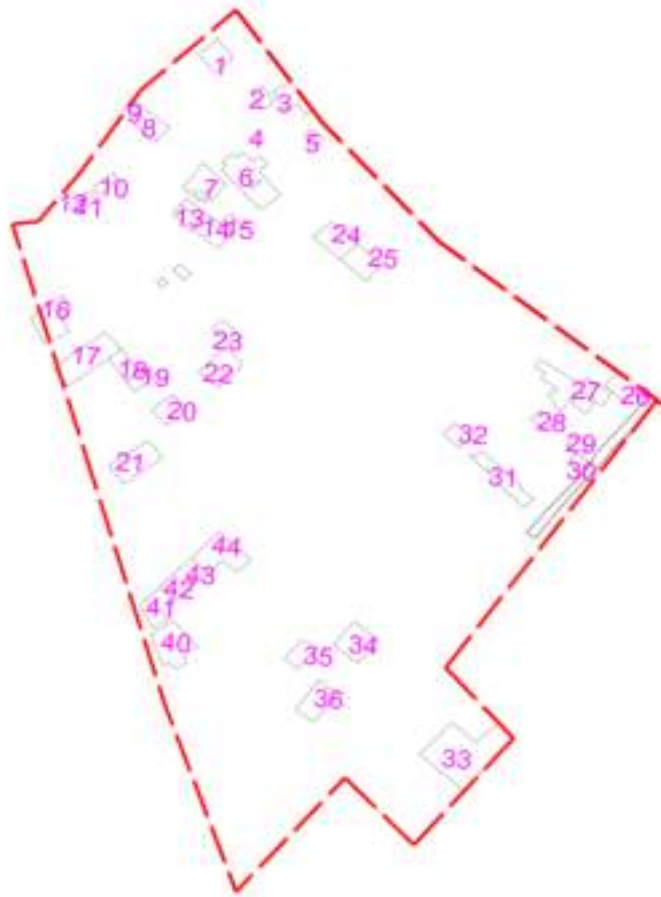


Figure 82 Plan of Ward 9 with house numbers

Name of the ward	9
Ward population as calculated on basis of households/ current population of Kalonda	352/12000 = 2.93% of the total population
Area of the ward (Ha)	4.4195
The number of households (approx.)	44
Density	59.73
Possible increment in additional houses by 2046	230 housing units distributed across multiple floors for a densified Kalonda
Increased density by 2046	450
Remark	This is a very sparsely built area and has immense potential for “organized development” through rural housing and commercial areas in vernacular vocabulary.

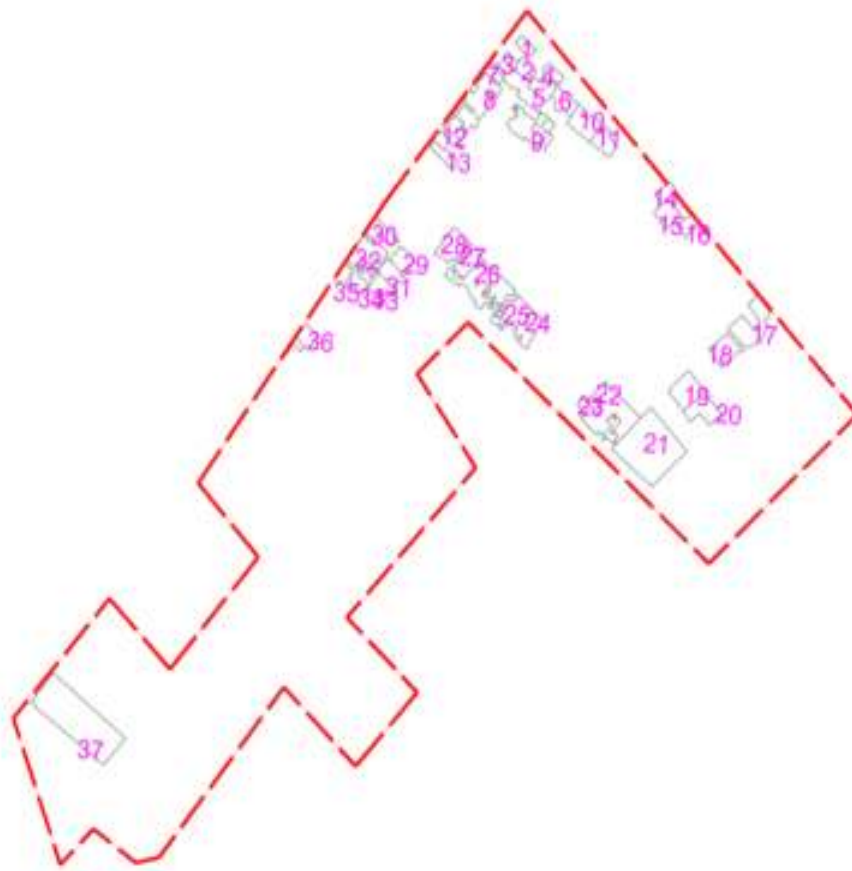


Figure 83 Plan of Ward 10 with house numbers

Name of the ward	10
Ward population as calculated on basis of households/ current population of Kalonda	296/12000 = 2.50% of the total population
Area of the ward (Ha)	2.8632
The number of households (approx.)	37
Density	77.6
Possible increment in additional houses by 2046	123 housing units distributed across multiple floors for a densified Kalonda
Increased density by 2046	450
Remark	This is a very sparsely built area and has immense potential for “organized development” through rural housing and commercial areas in vernacular vocabulary.



Figure 84 Plan of Ward 11 with house numbers

Name of the ward	11
Ward population as calculated on basis of households/ current population of Kalonda	$936/12000 = 7.80\%$ of the total population
Area of the ward (Ha)	3.8602
The number of households (approx.)	117
Density	184.7
Possible increment in additional houses by 2046	100 housing units distributed across multiple floors for a densified Kalonda
Increased density by 2046	450
Remark	This is a developed area and thus does not have a potential for “organized development” except incremental housing using vernacular vocabulary.

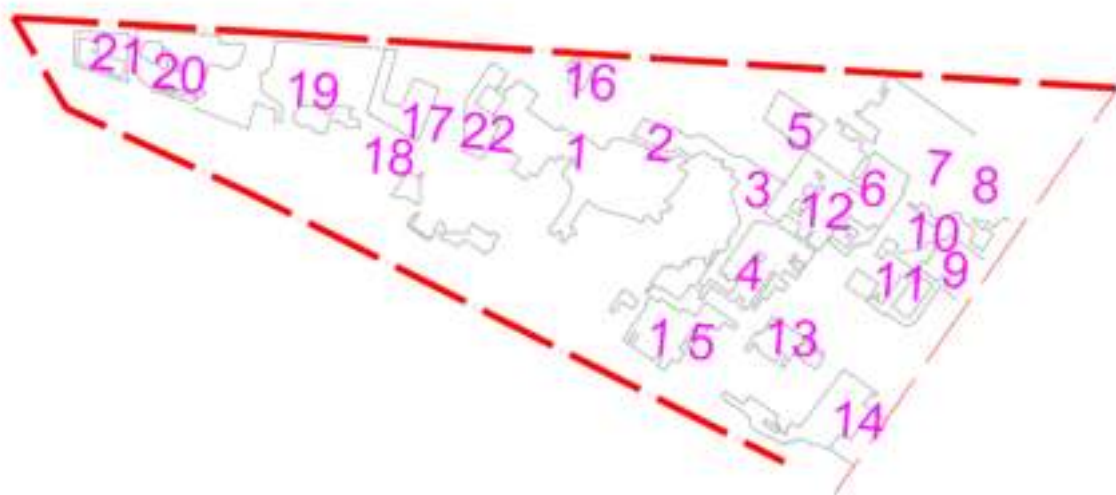


Figure 85 Plan of Ward 12 with house numbers

Name of the ward	12
Ward population as calculated on basis of households/ current population of Kalonda	$176/12000 = 1.47\%$ of the total population
Area of the ward (Ha)	1.2403
The number of households (approx.)	22
Density	106.45
Possible increment in additional houses by 2046	48 housing units distributed across multiple floors for a densified Kalonda
Increased density by 2046	450
Remark	This is a developed area and thus does not have a potential for “organized development” except incremental housing using vernacular vocabulary.

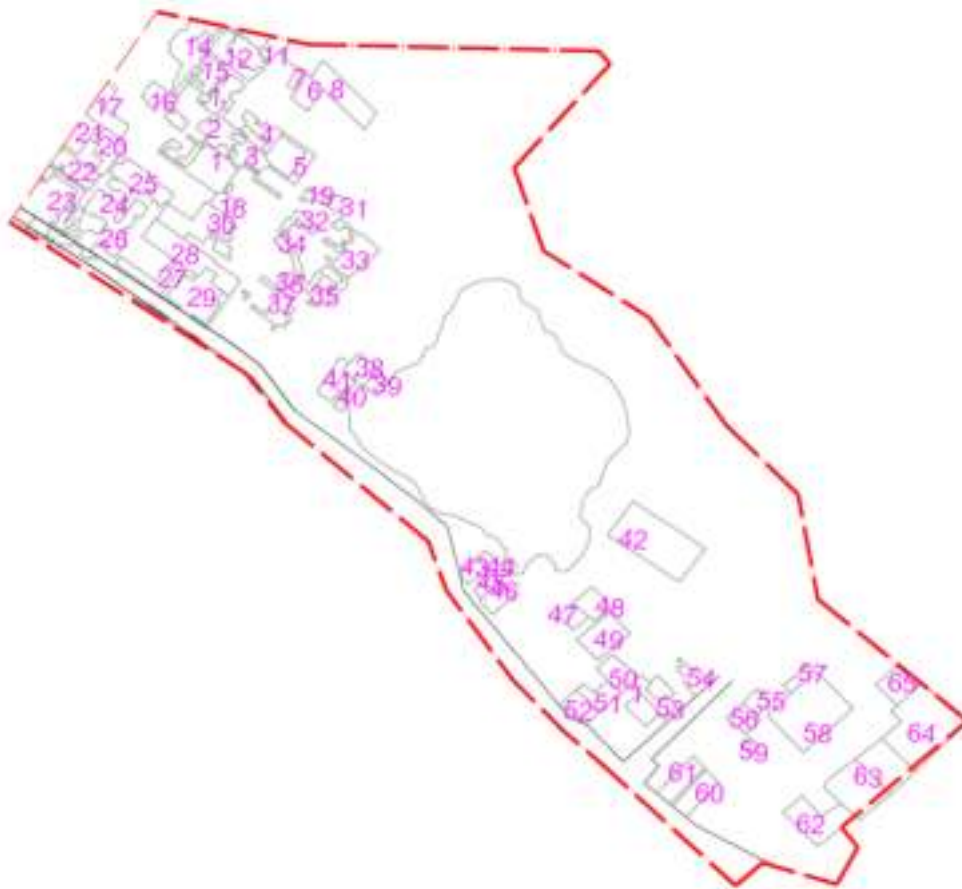


Figure 86 Plan of Ward 13 with house numbers

Name of the ward	13
Ward population as calculated on basis of households/ current population of Kalonda	520/12000 = 4.33% of the total population
Area of the ward (Ha)	3.2375
The number of households (approx.)	65
Density	120.74
Possible increment in additional houses by 2046	116 housing units distributed across multiple floors for a densified Kalonda
Increased density by 2046	450
Remark	This is a developed area and thus does not have a potential for “organized development” except incremental housing and small commercial area using vernacular vocabulary.

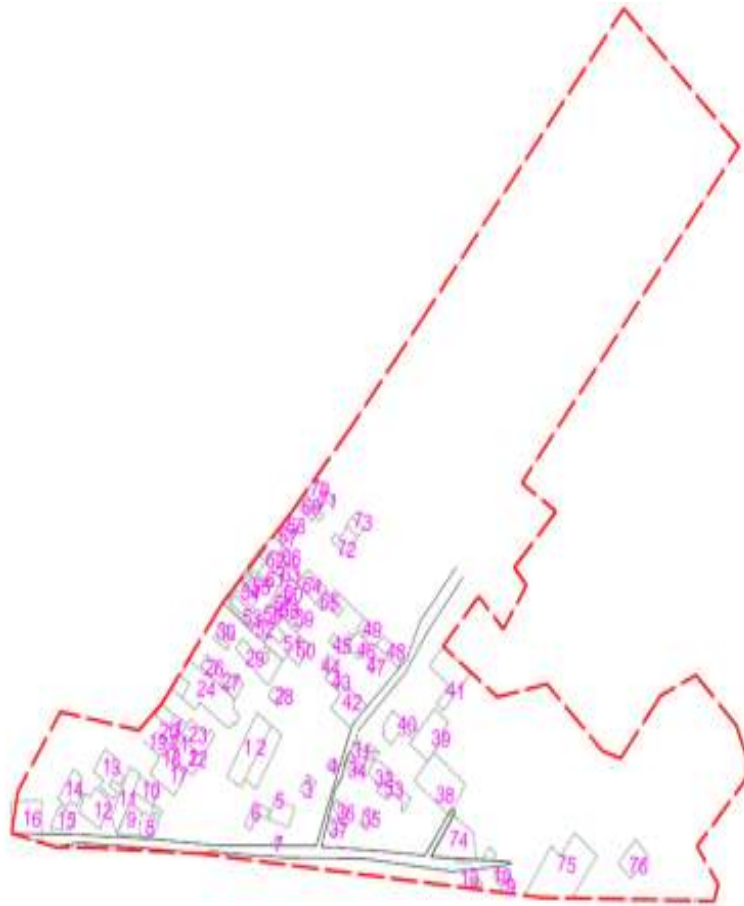


Figure 87 Plan of Ward 14 with house numbers

Name of the ward	14
Ward population as calculated on basis of households/ current population of Kalonda	608/12000 = 5.07% of the total population
Area of the ward (Ha)	6.1554
The number of households (approx.)	76
Density	74.14
Possible increment in additional houses by 2046	269 housing units distributed across multiple floors for a densified Kalonda
Increased density by 2046	450
Remark	This is a partially developed area and thus has a lower potential for “organized development” except the increment in housing and small commercial areas using vernacular vocabulary.

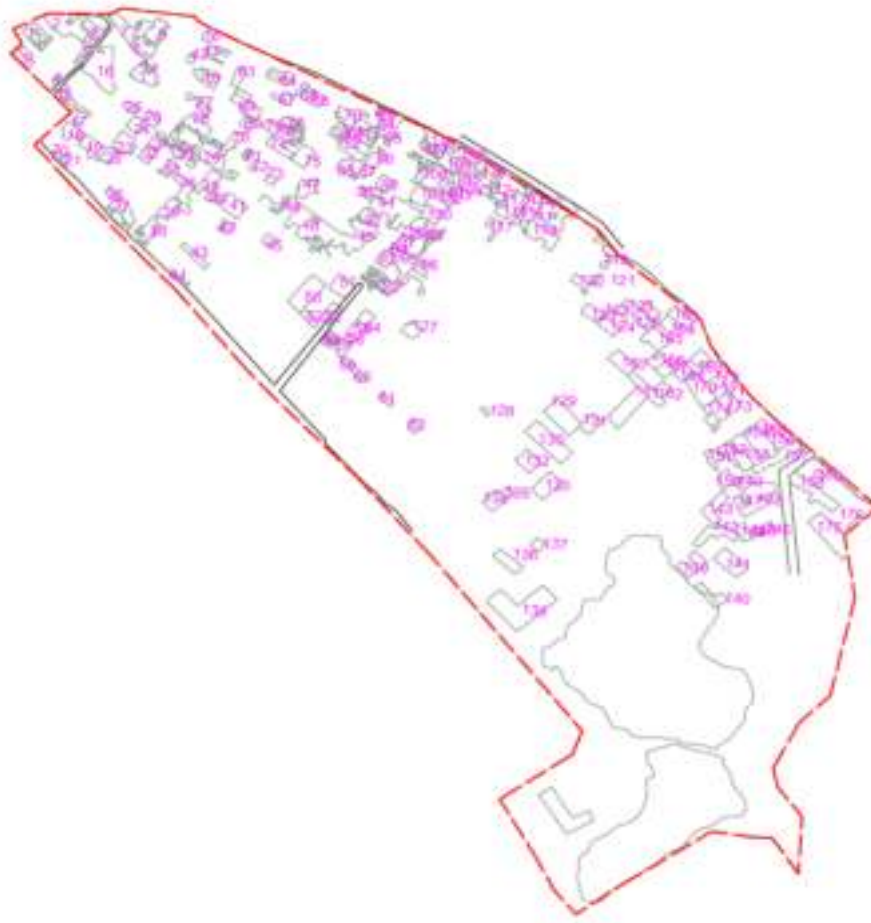


Figure 88 Plan of Ward 15 with house numbers

Name of the ward	15
Ward population as calculated on basis of households/ current population of Kalonda	1056/12326 = 8.57% of the total population
Area of the ward (Ha)	14.0813
The number of households (approx.)	176
Density	75
Possible increment in additional houses by 2046	1050 housing units distributed across multiple floors for a densified Kalonda
Increased density by 2046	450
Remark	This is a partially developed area and thus has a lower potential for “organized development” except the increment in housing and small commercial areas using vernacular vocabulary

C. Clusters

OBSERVATIONS CLUSTER -A (Characteristics)

This has *Nala*-facing houses having problems with waste dumping in and along the *Nala* by the residents. A small patch from masjid at *Nala*- to main *puliya* at Chholas road is *kaccha* and the condition of *Nala* is deplorable. The *Nala* needs to beautification, as it has become an important route connecting Chholas road with Jarcha road. Tree plantation, cleaning of *Nala*, widening of roads etc needs to be done.

There are *kaccha* houses in this cluster built in mud and local wood. The people have a notion that RCC construction is better and modern and thus they ask for funds for *pucca* construction in RCC. We propose to promote vernacular houses, but alternatively, a technical support to construct the houses with better mud construction techniques like stabilized and rammed earth construction may be provided to them. It will help to retain the vernacular housing techniques and also will make the village sustainable as the materials are locally available and are climatically responsive.

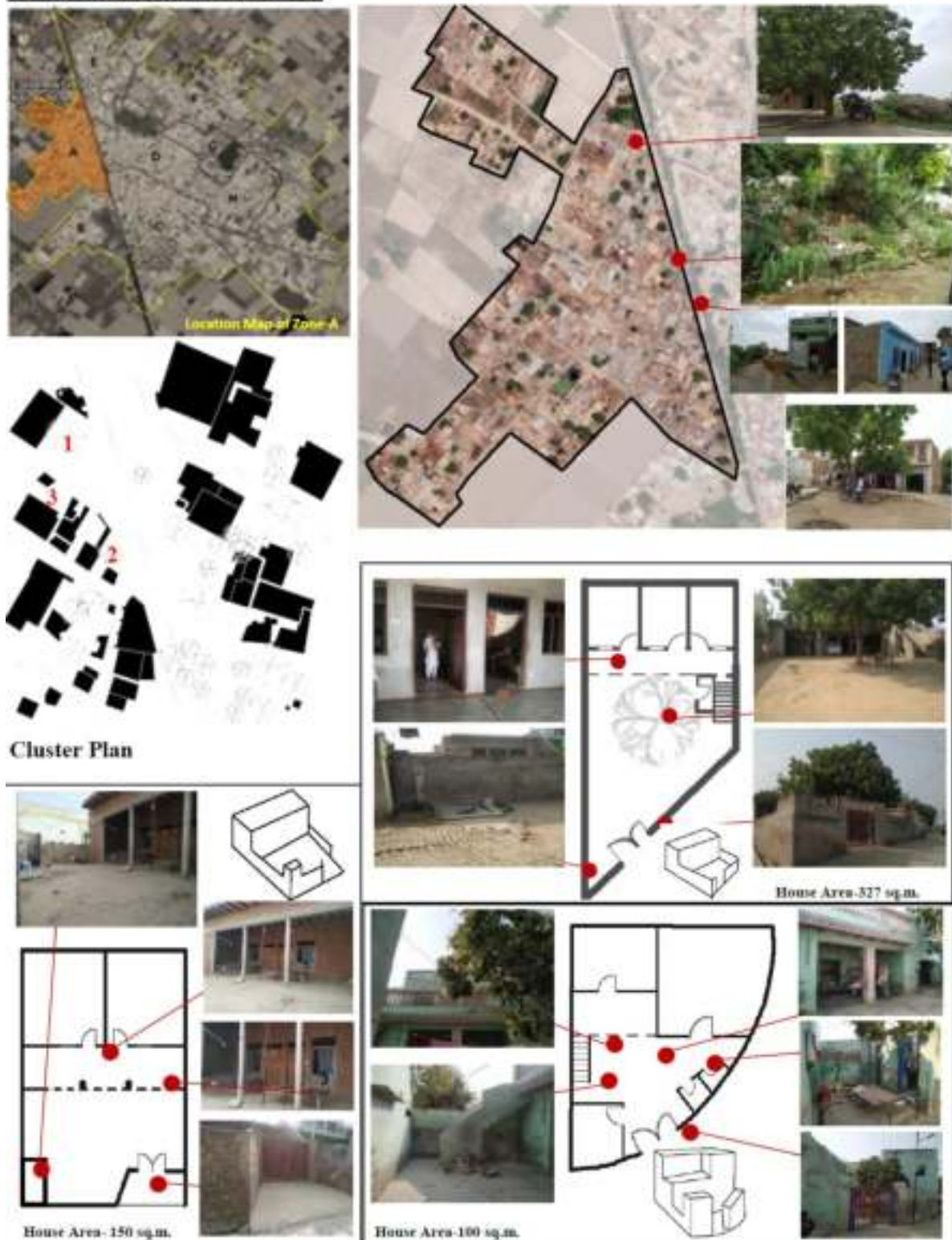
Many houses in this cluster are now made up of RCC and thus their material, planning and architecture is similar and modern in nature. Most of the houses have lost the essence of village house, and so have lost *aangan*, *chowk*, Mitti-Chulha Kitchen with outtas with wall decorations in mud and natural colours. They are moving towards RCC as it's easy and quicker to construct. They also believe that it is stronger as well. Therefore, if a technical support is provided to the vernacular setup – they may save cost and response climatically reviving and preserving the Vernacular Housing of Kalonda.

OBSERVATIONS CLUSTER -B

This cluster has one of the important water bodies locally known as Peer Baba ka Talao. In the household surveys we got to know that this water body has cultural and historic significance which is lost and needs to be revived. The restoration and beautification of Peer baba ka Talao may act as a magnet for visitors to the village and a place of pride for the villagers. It may lead to good transformation, employment generation, beautification, and enhancing the cultural and historic significance of the place.

This cluster covers a very important connection of village with Chholas, (one of the important settlement support) that connects Kalonda with the National Highway. This also is one of the major entries to the Village therefore it needs interventions more sensibly. There may be a theme-based designed gateway to the village representing the communal harmony and long history of the settlement. Shaded pathways and roads and green cover can also be added to beautify the area.

Household study of Zone-A

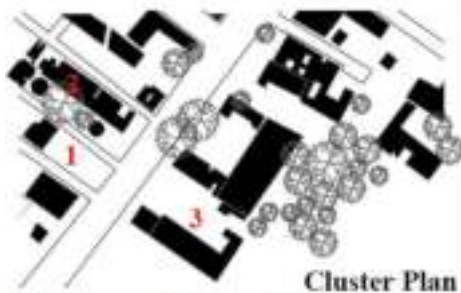


Zone- A is located on the left side of the settlement along with the canal and main road which connects kalonda village from other surrounding villages like Cholas, Jharcha, and Gesupur.

Household study of Zone-B



Zone-B is located nearby the peer wala talab of the settlement along with the main road of the village.



A floor plan for a house with a total area of 182.5 sq.m. The plan shows multiple rooms, a central courtyard, and a staircase. Red dots on the plan are connected by lines to several photographs showing the interior and exterior of the house, including a courtyard, a tree, and a building facade.

House Area- 182.5 sq.m

A floor plan for a house with a total area of 36 sq.m. The plan shows a simple layout with a few rooms and a courtyard. Red dots on the plan are connected by lines to several photographs showing the interior and exterior of the house, including a courtyard and a building facade.

House Area- 36 sq.m

A floor plan for a house with a total area of 323.8 sq.m. The plan shows a more complex layout with multiple rooms, a large central courtyard, and a staircase. Red dots on the plan are connected by lines to several photographs showing the interior and exterior of the house, including a courtyard, a tree, and a building facade.

House Area-323.8 sq.m

OBSERVATIONS CLUSTER – C

This cluster covers the houses along the *Nala* but the condition is very different from that of Cluster A and therefore needs a different approach for the development. Near the settlement area, there was made a road with interlocking tiles with trees planted all around, but the trees are now either lost or taken in for personal use by the people, making the pathway informal. The opposite side hold the agricultural fields with trees all around the edge of the *Nala*.

This is a very scattered settlement on the outer fringe with houses integrated agriculture fields in between the houses at great distances. Due to this, agricultural land also ends up to be used as residential, which is creating a loss in agricultural fields. Also it gets difficult to provide with infrastructure, facilities and amenities in scattered settlements. So there is a need to propose policies for settlement densification that may protect the reducing agricultural land further as well as providing better infrastructural facilities for the residential area.

This cluster has a lot of scope for increment and thus must be utilized fully.

OBSERVATIONS CLUSTER – D

This cluster is very important as it covers the core historic part and lies at the heart of the village. It includes the important node locally, *Baba Chowk*. Most of the houses constructed near this node are new and transformed with commercial front usages. The place is historically important, as it is associated with *Baba's* house and helps to connect the storyline of the evolution of the village and expansion in the present context.

Another very important node is the *Paith Wala Chowk* as it is a major junction where all major streets meet, that are the skeleton of the core village. If seen poetically as a growing tree, *Baba chowk* seems to be the root of the village and the *Paith wala chowk* becomes the node from where the branches of the tree disperse out in different directions making the tree grow. The cluster still is found with traditional houses with wooden doorways having intricate carving, beautiful screens used as ventilators, *roshandans*, and a variety of patterns of brickjallis at parapets. This cluster needs a sensible intervention for the development with a heritage perspective.

Household study of Zone-C



House Area-126.7 sq.m



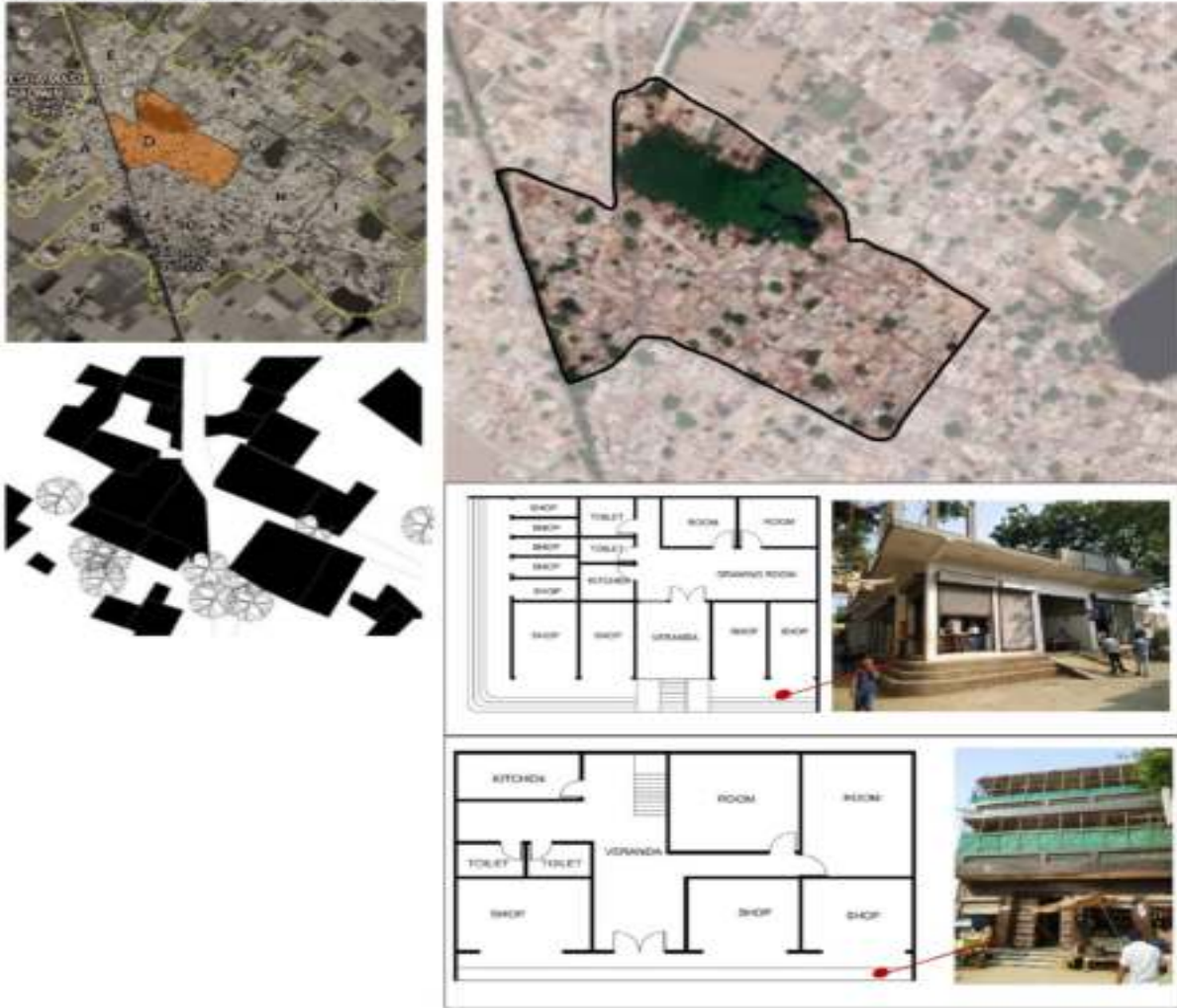
House Area-547.8 sq.m



House Area-165.5 sq.m

Zone-C is located nearby Masjid Ehle Hades. The majority of residents living in this area are from a Muslim background.

Household study of Zone-D

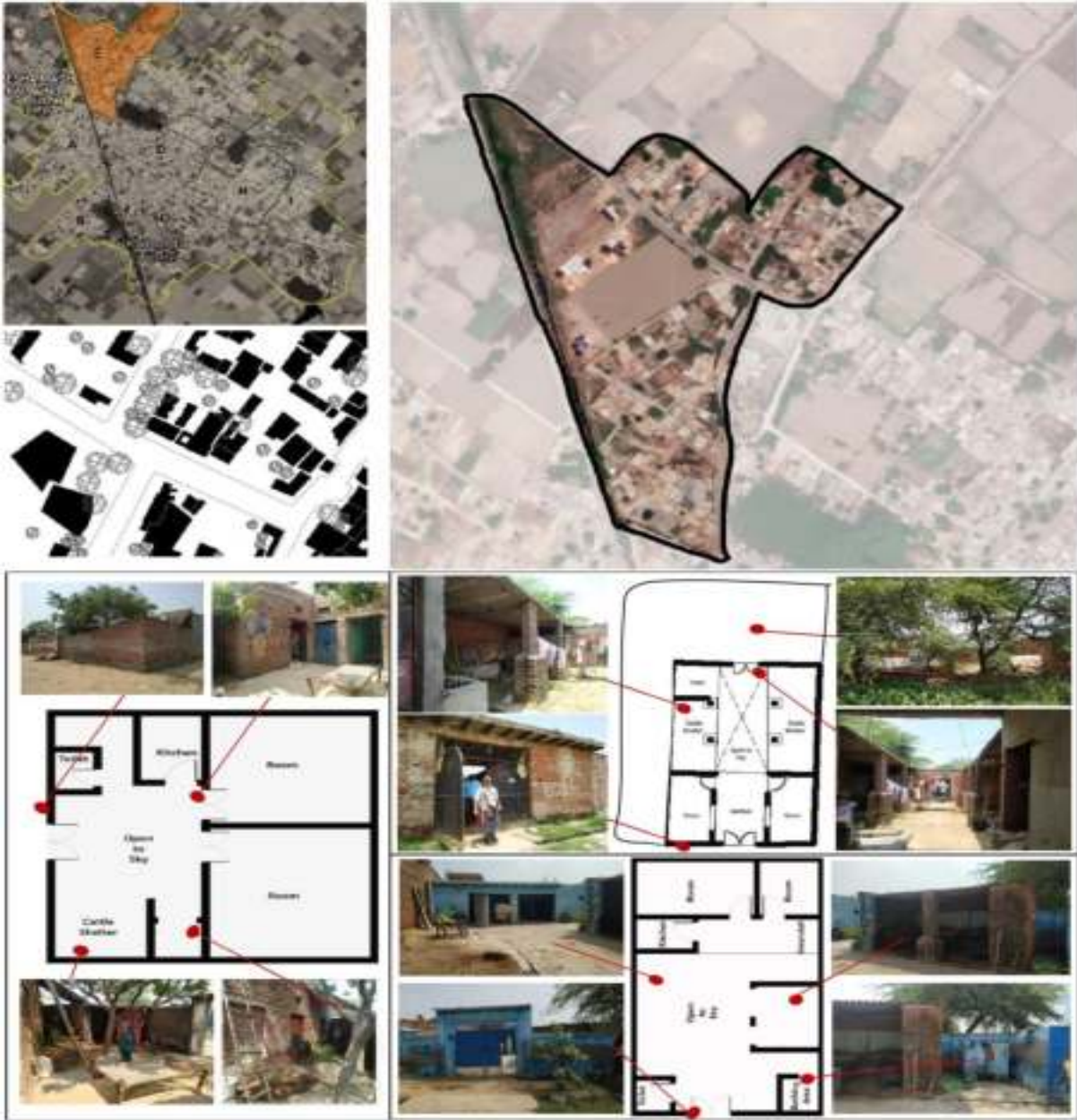


OBSERVATIONS CLUSTER – E

This cluster covers the village expansion towards Jarcha road and comprises the triangulation formed between central spine leading from Chholas road *puliya* to Jarcha road and the *Nala* on the other side. The cluster is has scattered houses with vacant plots filled with garbage and waste water from houses so the area is lacking infra structural facilities like drains and many of the streets are *kaccha* though there is an ongoing work of CC roads but it should be with planned drainage. There should be some policies for the newly plotted development at the Jarcha road as it is another important entry to the village and its further evolution should be an integral part and a connect to the village identity.

On the opposite side of the junction of the Jarcha and the Mata *Talab* road there is blocked drain. Its revival may serve for waste water drainage for the area and also will transform the appearance if its beautification is taken in into account as per the site context.

Household study of Zone-E



E. Open spaces and congregation spaces

It is impossible to conceive the image of a village without agricultural fields. The open space structure connects the fields to the ponds to the *chowks* to the *dallans*, to the courtyards. It structures the perception of life through a gradation. The scale from a field to a courtyard is very vast and can be cherished as a pattern intrinsic to an inseparable from village life

a) Agriculture Fields



Figure 89 Agriculture fields with Abadi areas

Area of Panchayat Boundary = 913.7693 Ha

Area of Waterbodies = 4.4893 Ha

Area of Village Built up = 56.2646 Ha

Total Agriculture area = {913.7693- (56.264+4.4893)}

= 853.0154 Ha

b) Festival Spaces- Eidgahs, Mosques, and Temples

The presence of religious institutions and festival areas earmark the village periphery. These are largely constructed on highlands and within the dense population pockets. They are safe from flooding which occurs often on lakesides. The placement of religious and festival grounds show that there are newer areas which are recent encroachments and are yet to mature, as compared to older and more mature part of the village. While outlining the densification plan an effort has been made to incorporate all the existing religious institutions within the boundary. Administrative enforcement and control are needed to prevent the mushrooming of religious structures in fields as an aide to the expansion of *Abadi* boundaries. These space will develop in the Eastern parts of Kalonda *Abadi* area. Provisions for grouping them with lake side open areas must be made.



Figure 90 Festival spaces of village Kalonda

c) Lakes

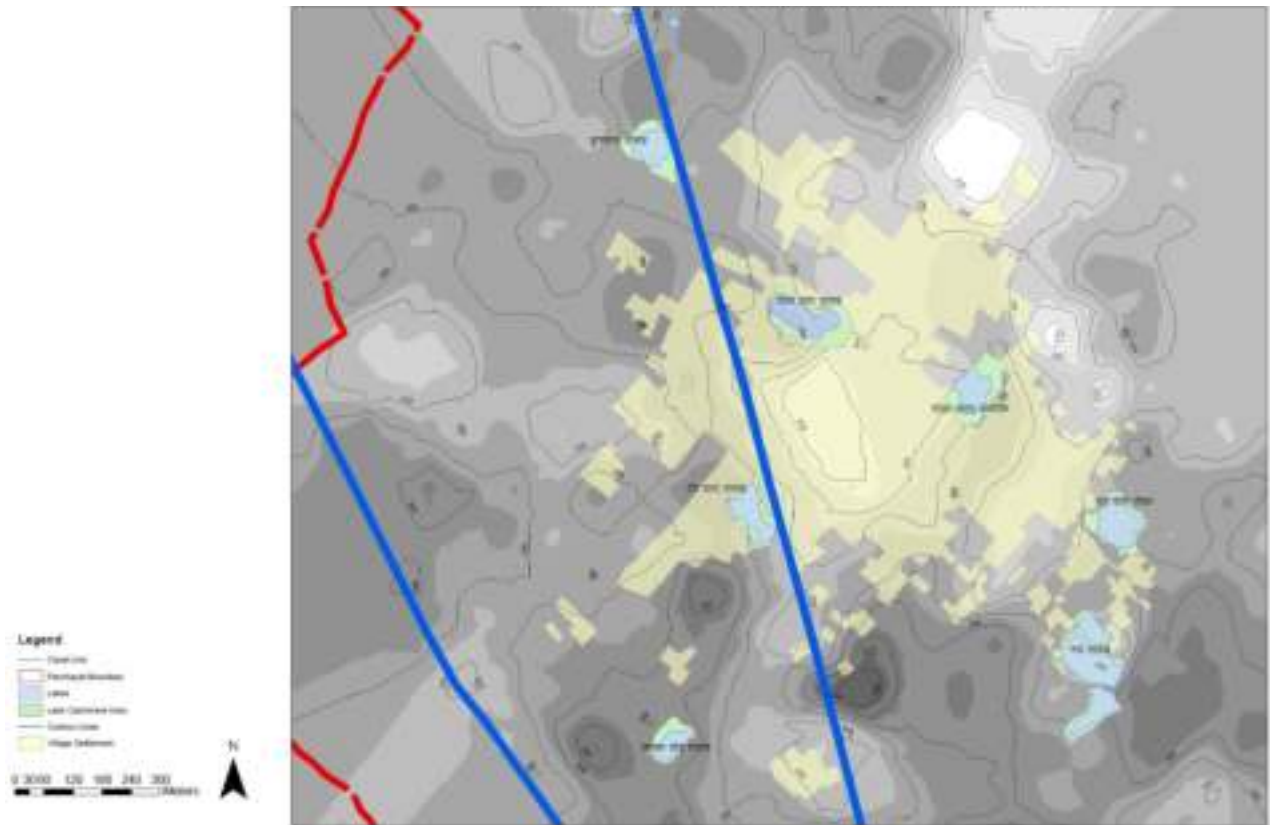


Figure 91 Existing lakes of village Kalonda

Initially, the lakes were on the periphery of the villages and never were enclosed. This gave them an open end and maintained the green connect. This also gave room to the lakes to expand. But with time and development, people started encroaching the lakes and thus the lakes shifted inside the village boundaries.

In the case of Kalonda, major three lakes are inside the densely populated areas while a few still lie on the periphery. Also, initially, these lakes were interlinked, and thus water from one lake traveled from one lake to another via natural aquifers. This prevented flooding. With the new construction of roads and buildings, this has ended, and thus must be revived for the better drainage and avoiding flooding.

d) Nodes

The potential open structure of nodes, likely to get encroached by unplanned development must be anticipated and designed for the future.



Figure 92 Peer vala Talab



Figure 93 Peer vala Talab



Figure 94 Painth vala chowk

iv) Growth Illustrations (to aid approvals for typology expansion)

These are studies of possible expansion of vernacular houses, keeping intact the spaces that define them in a typology. During vertical expansion the first thing to be encroached is the open spaces on ground. Growth illustrations show how each could grow while retaining open use spaces intrinsic to their innate uses.

1. Types of Houses - Typology growth

HOUSE 1

LOCATION:

28°32'56.0"N 77°40'21.1"E

GMXF+H2 Kalonda, Uttar Pradesh

<https://goo.gl/maps/LzRa9jmLWbwdjEv67>

HOUSE TYPOLOGY: Courtyard

NO. OF PEOPLE: 5

NO. OF FLOORS: Ground

EXPANSION:

PLOT AREA = 300 SQM

GROUND COVERAGE = 36 SQM

BUILT UP = 36 SQM

FAR achieved is 0.12, so the scope of expansion is 0.98.

- There's a scope for an additional floor
- Space for more rooms is available
- The number of toilets (one) is less for 5 people.

Graphical depiction of the increase of FAR from 0.12 to 1 in vernacular house types.

Existing condition

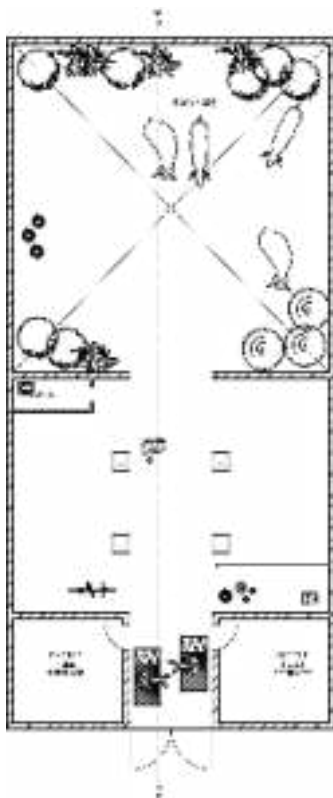


Figure 95 Existing plan



Figure 96 Existing Section

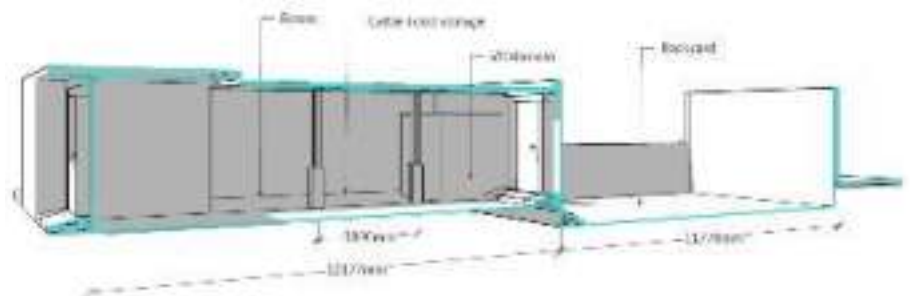


Figure 97 Existing Section

Proposed development

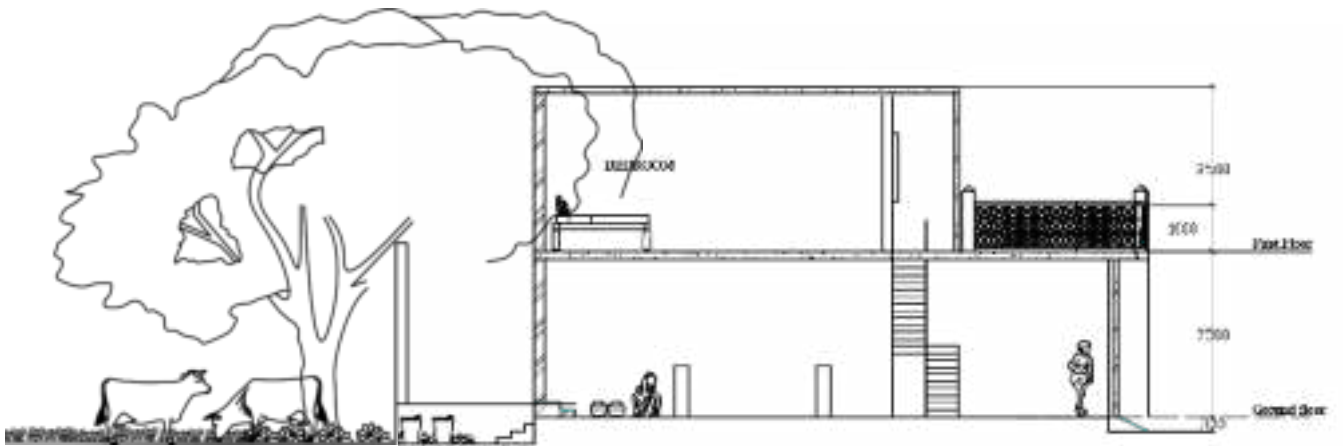


Figure 101 Updated section



Figure 100 Updated elevation

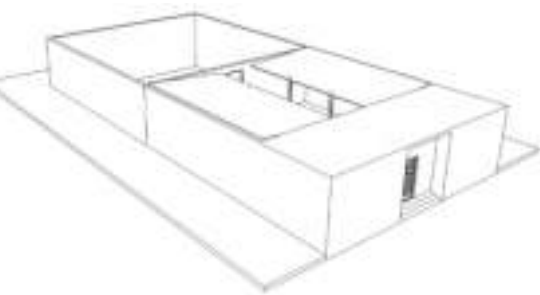


Figure 98 House with FAR 0.12

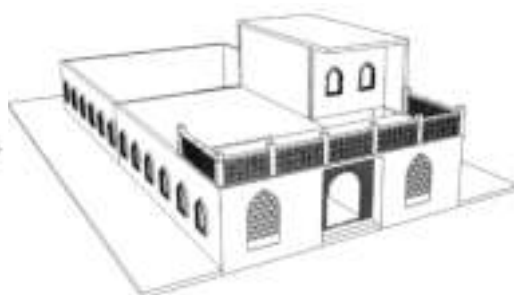


Figure 99 House with FAR 0.4

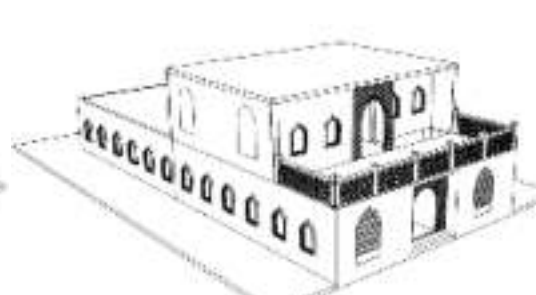


Figure 102 House with FAR 1

HOUSE 2. (BLUE)

LOCATION:

28°32'58.3"N 77°40'22.3"E

GMXF+R4 Kalonda, Uttar Pradesh

<https://goo.gl/maps/1KG4fNUQbwGEigTx6>

HOUSE TYPOLOGY: Courtyard

NO. OF PEOPLE: 7

NO. OF FLOORS: Ground

EXPANSION:

PLOT AREA = 160 SQM

GROUND COVERAGE = 60.15 SQM

BUILT UP = 60.15 SQM

FAR achieved is 0.4, so the scope of expansion is 0.6.

There's a scope for an additional floor

Graphical depiction of the increase of FAR from 0.4 to 1 in vernacular house types

Existing condition

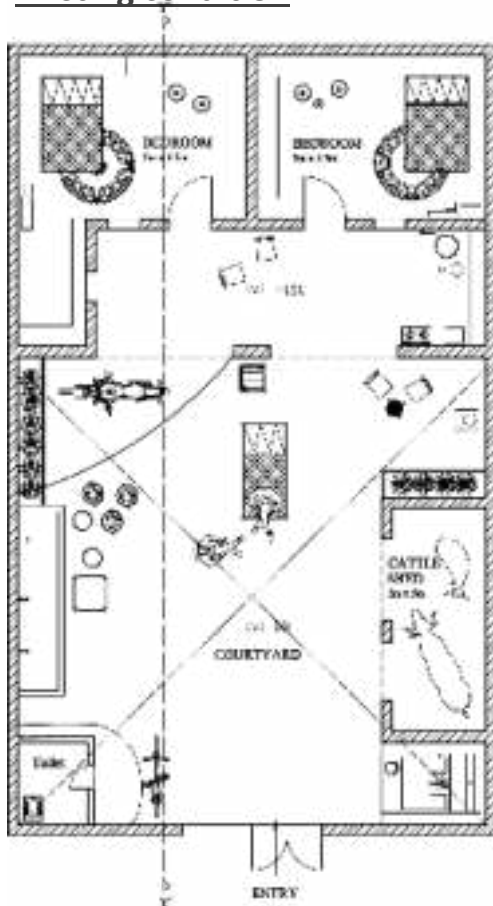


Figure 105 Existing House plan

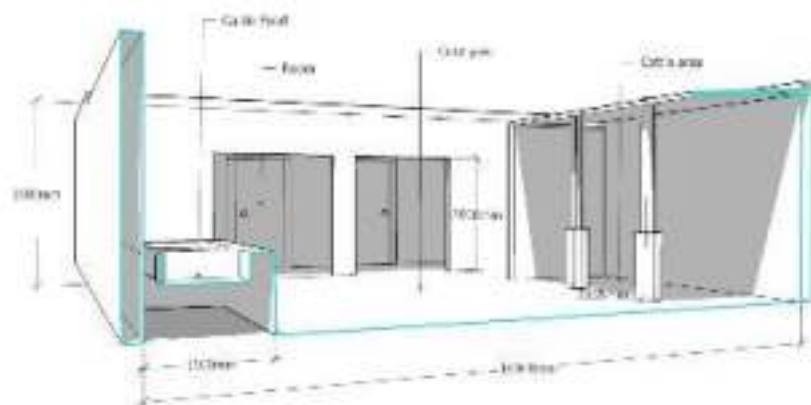


Figure 104 Existing section

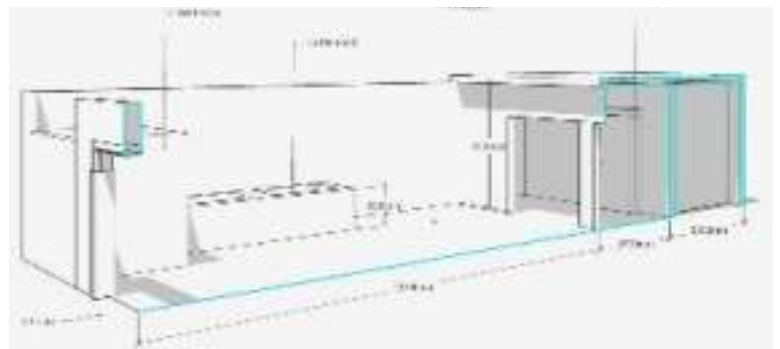


Figure 103 Existing section

Proposed development

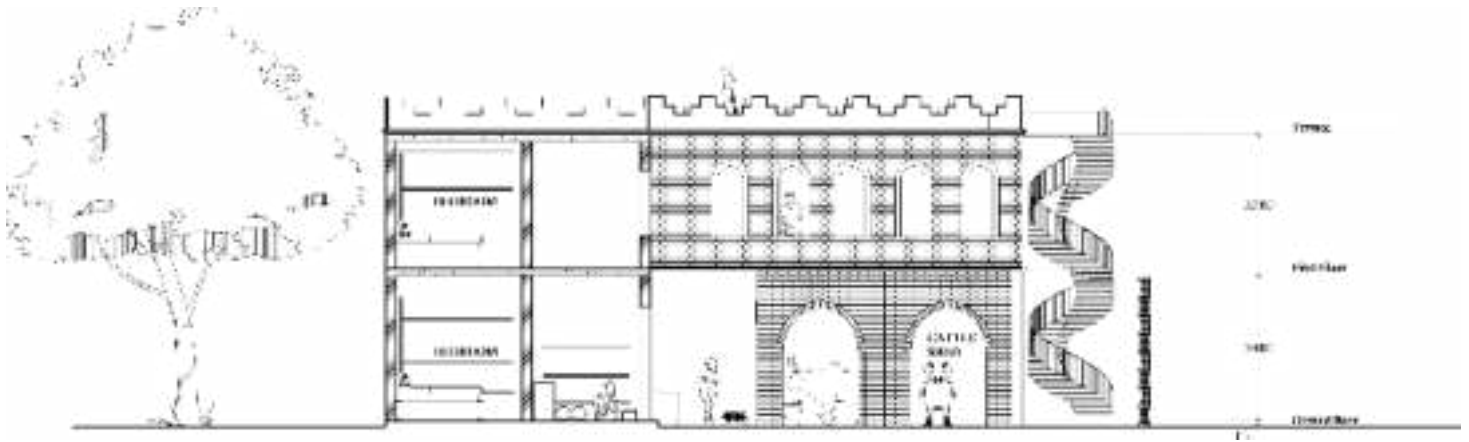


Figure 109 Updated section of the house



Figure 108 Updated elevation

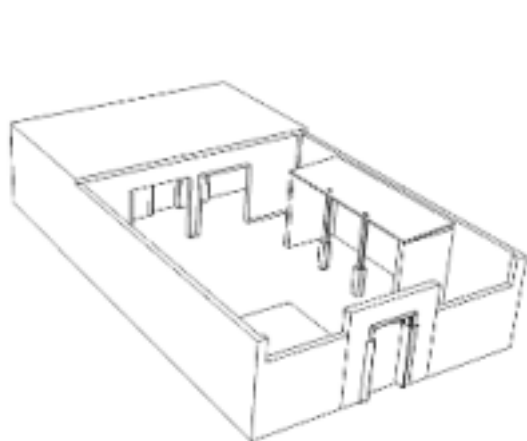


Figure 106 House with FAR 0.4

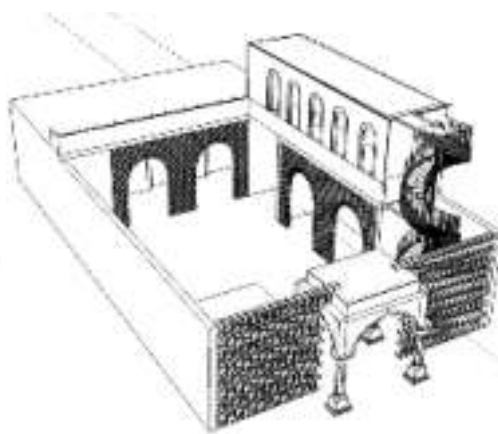


Figure 107 House with FAR 0.5

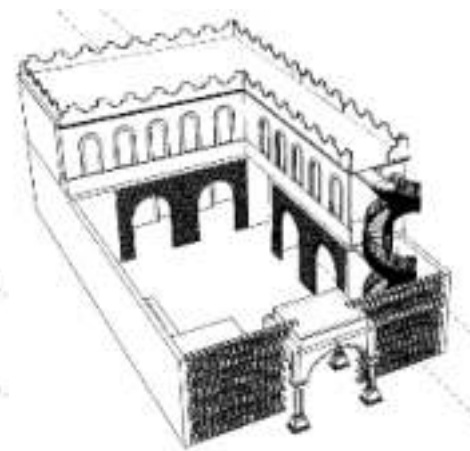


Figure 110 House with FAR 1

House 3

LOCATION:

28°32'58.8"N 77°40'22.0"E

GMXF+V4 Kalonda, Uttar Pradesh

<https://goo.gl/maps/gZINGz8ZUitZwhNt5>

HOUSE TYPOLOGY: Single room

NO. OF PEOPLE: 2

NO. OF FLOORS: Ground

EXPANSION:

PLOT AREA= 28 SQM

GROUND COVERAGE= 10.5 SQM

BUILT UP = 10.5 SQM

FAR achieved is 0.3, so the scope of expansion is 0.7.

There's a scope for an additional floor

No electric point, no toilet, no kitchen was given

Graphical depiction of the increase of FAR from 0.3 to 1 in vernacular house types

Existing Condition

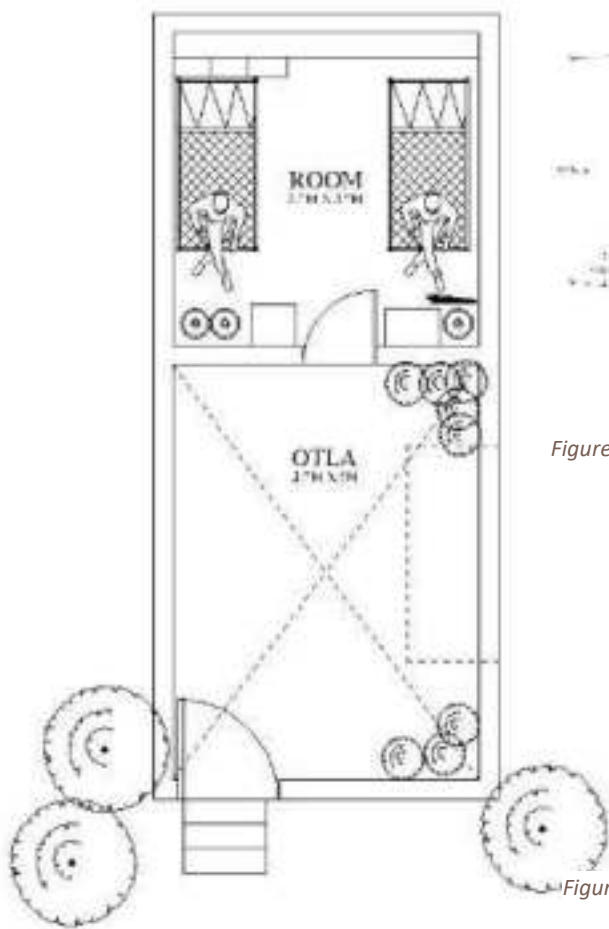


Figure 113 Existing plan

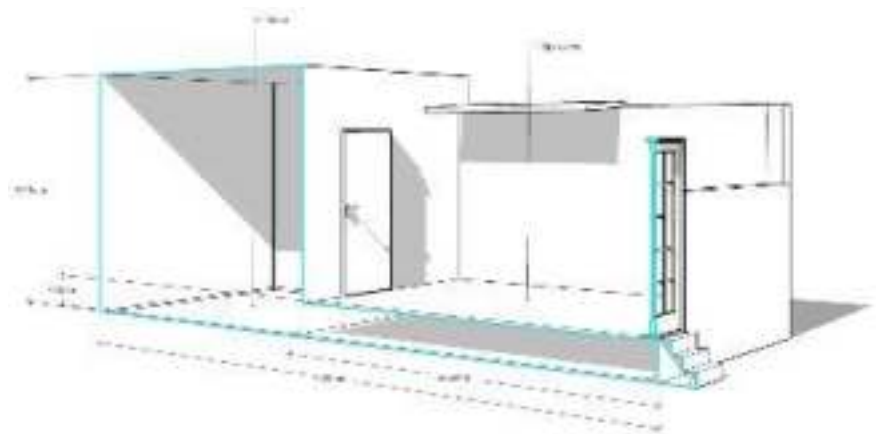


Figure 112 Existing section

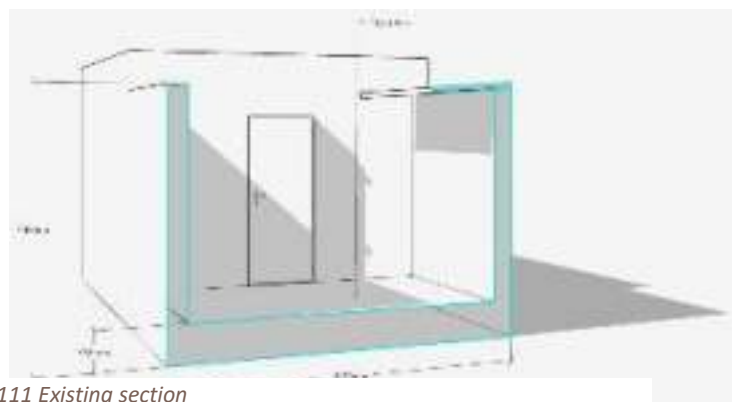


Figure 111 Existing section

Proposed development



Figure 119 Updated section YY'

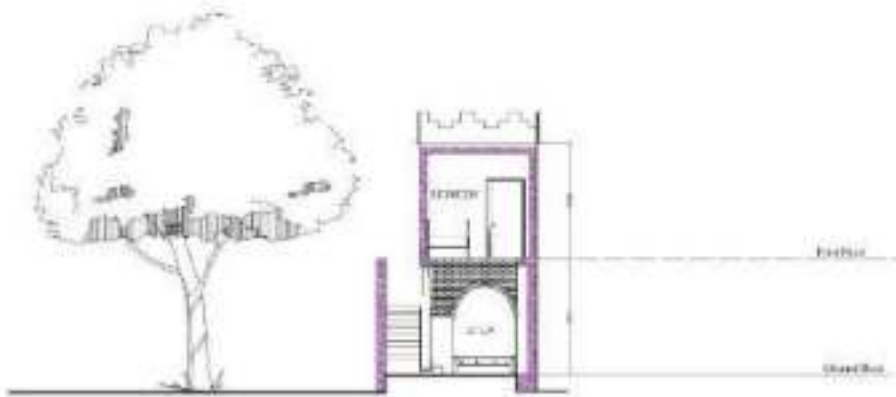


Figure 118 Updated section XX'

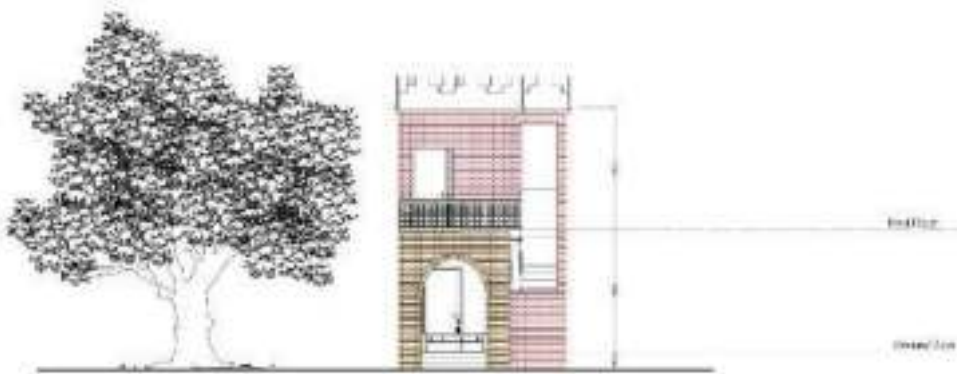


Figure 117 Updated elevation

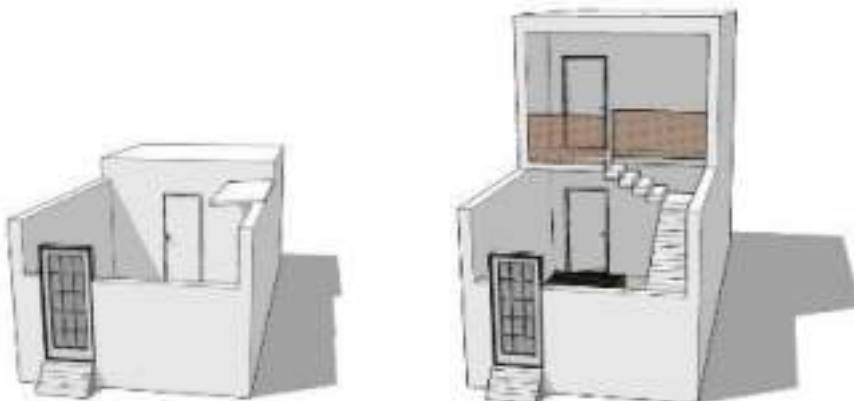


Figure 115 House with FAR 0.3



Figure 114 House with FAR 0.5



Figure 116 House with FAR 1

HOUSE 4.

LOCATION:

28°32'42.5"N 77°40'13.0"E

GMWC+34 Kalonda, Uttar Pradesh

<https://goo.gl/maps/D7BT8UfgoTVphNp98>

HOUSE TYPOLOGY:

NO. OF PEOPLE: 5

NO. OF FLOORS: Ground

EXPANSION:

- There's a scope for an additional floor
- Lack of teachers at Madarsa
- House got demolished due to heavy rains, due to which people were living at the Madarsa
- Better mud construction techniques could be adopted

Graphical depiction of the increase of FAR in vernacular house types

Existing Condition

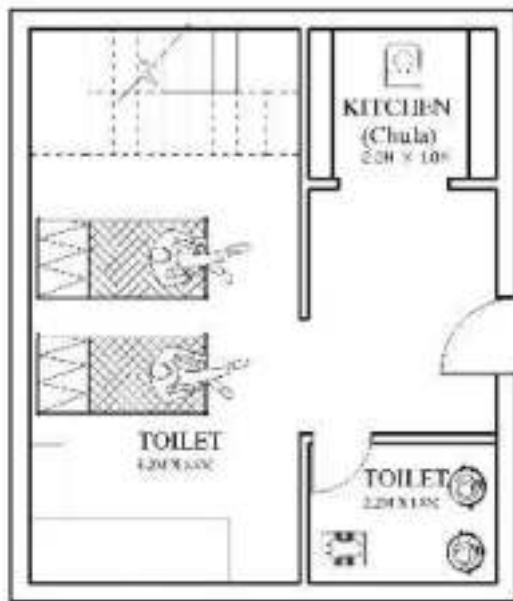


Figure 122 Existing Plan

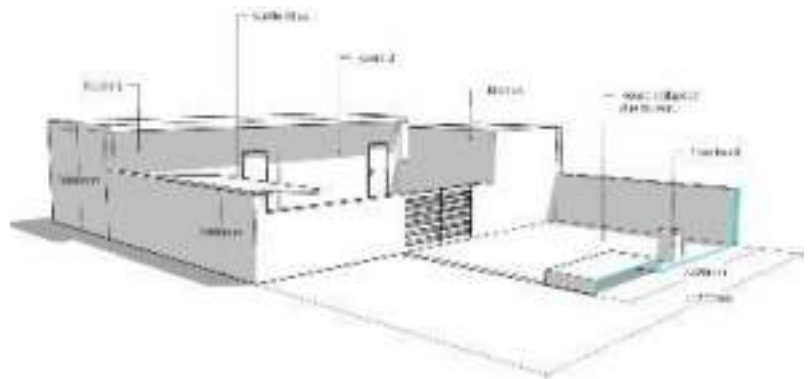


Figure 120 Existing section

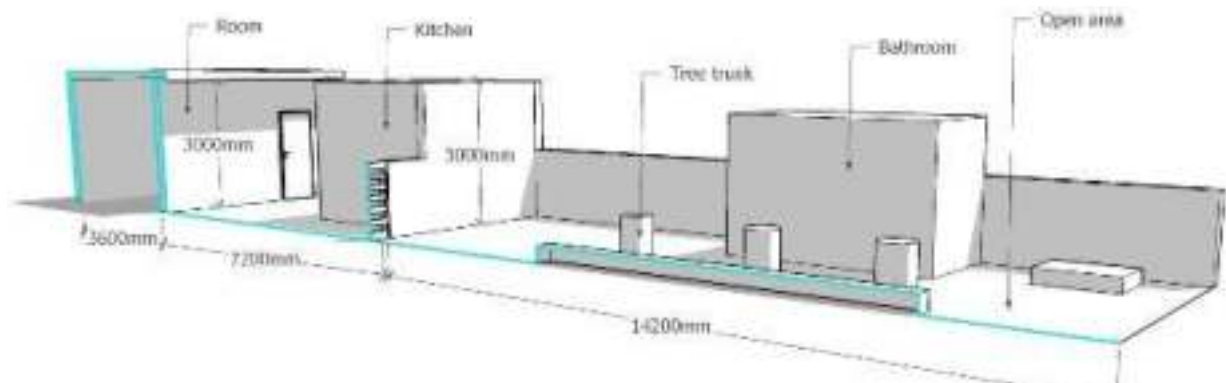


Figure 121 Existing section

Proposed development

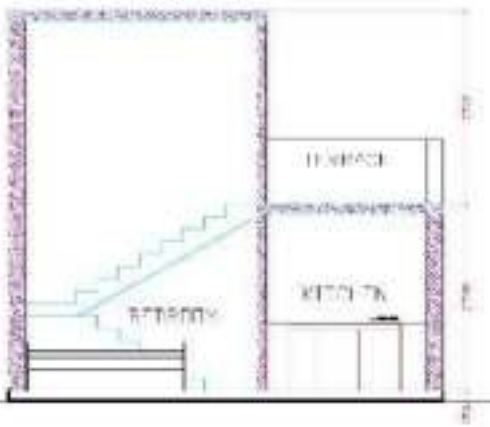


Figure 124 Updated section

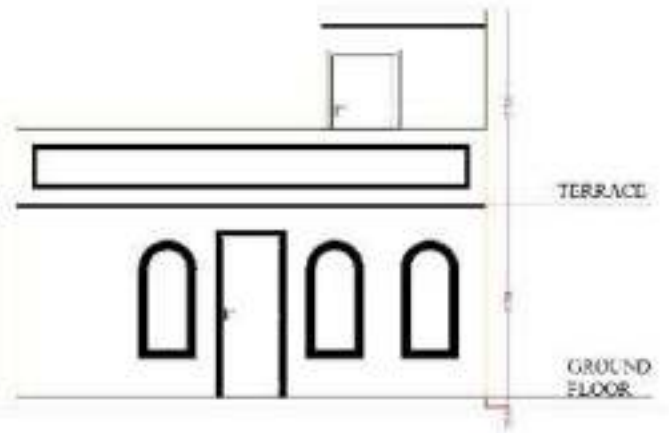


Figure 123 Updated Elevation

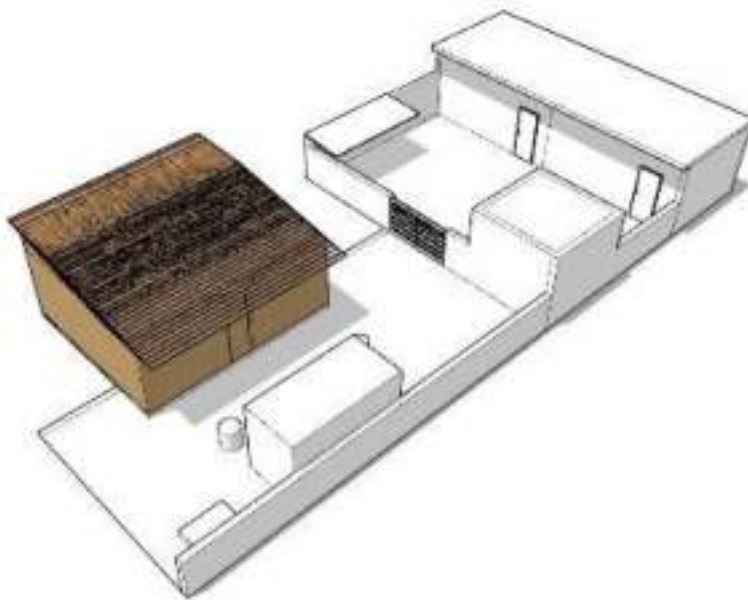


Figure 125 House with FAR 0.8

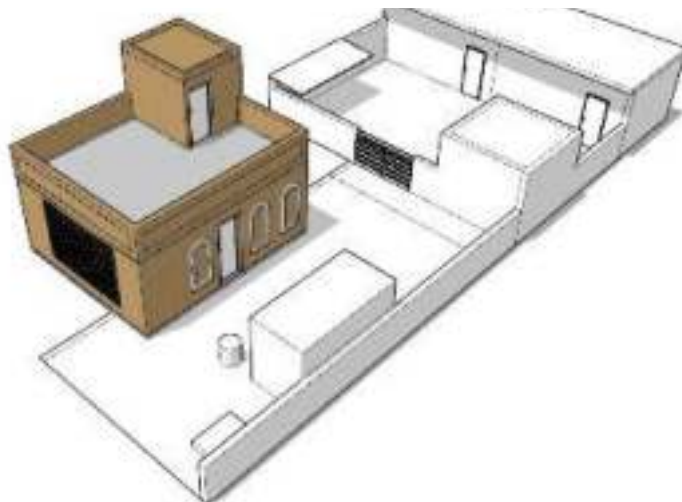


Figure 126 house with FAR 1

HOUSE 5.

LOCATION:

28°32'43.4"N 77°40'11.0"E

GMW9+5V Kalonda, Uttar Pradesh

<https://goo.gl/maps/8tbCJSNsqd28WnXr9>

HOUSE TYPOLOGY: Mud House

NO. OF PEOPLE: 10

NO. OF FLOORS: Ground

Graphical depiction of the increase of FAR in vernacular house types

Existing Condition

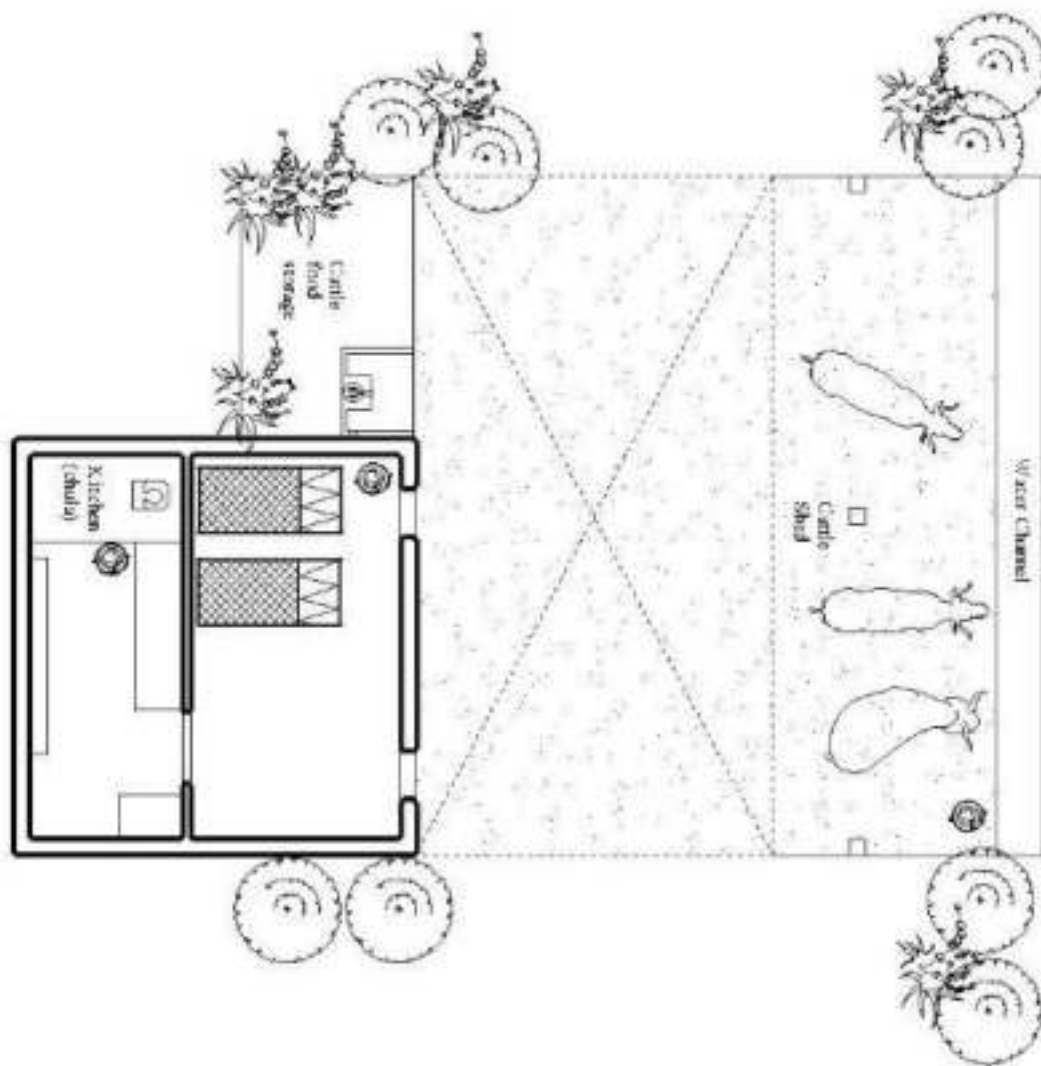


Figure 127 Existing Plan

Proposed development

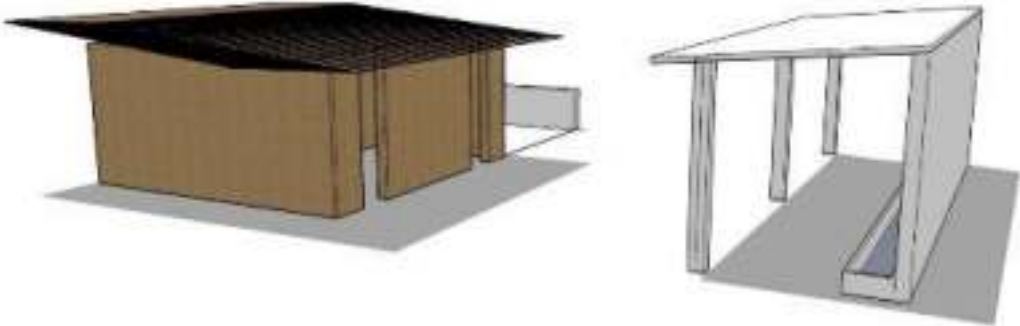


Figure 129 House with existing FAR

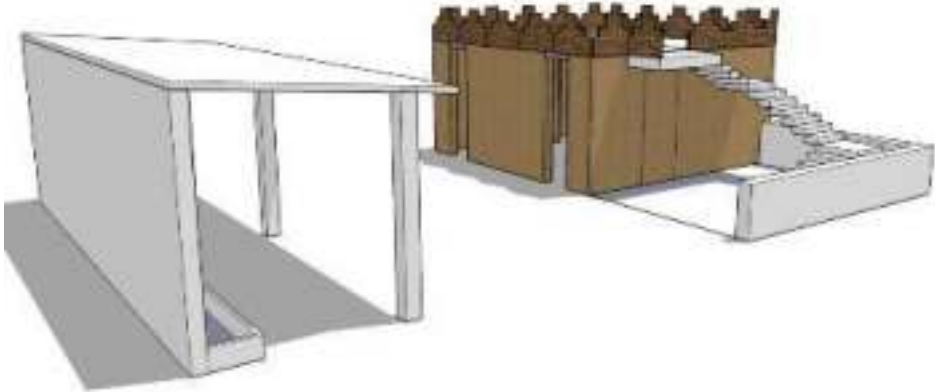


Figure 130 House with FAR 0.5

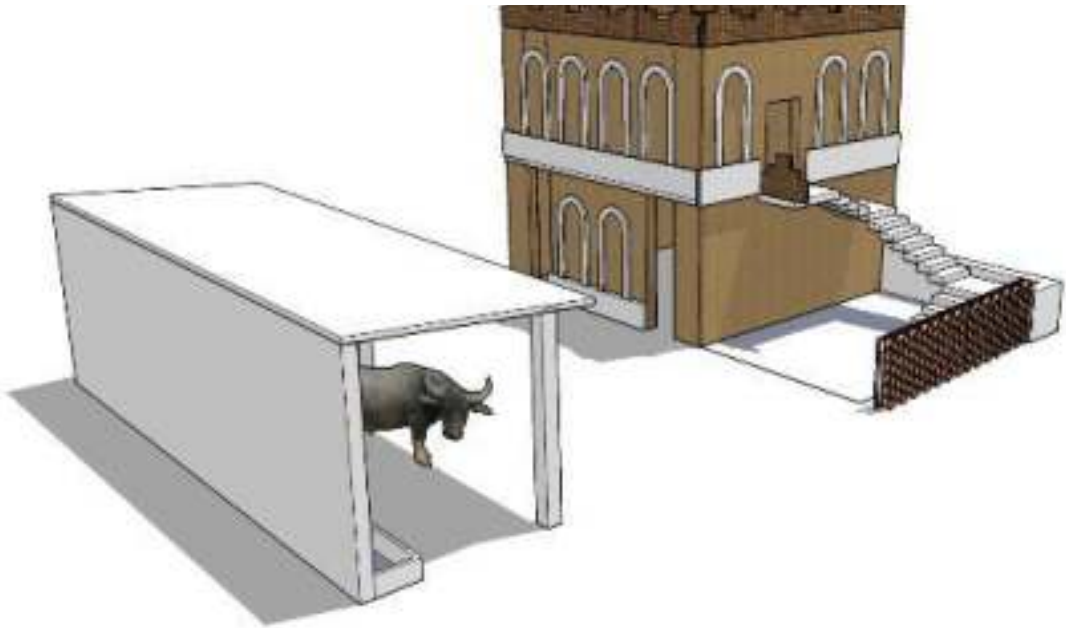


Figure 128 House with FAR 1

HOUSE 6.

LOCATION :

28°32'45.2"N 77°40'20.5"E

GMWC+9W Kalonda, Uttar Pradesh

<https://goo.gl/maps/3GpZpd364GBwDbEV9>

HOUSE TYPOLOGY: Courtyard

NO. OF PEOPLE: 12

NO. OF FLOORS: G+1

EXPANSION :

PLOT AREA = 164.29 SQM

GROUND COVERAGE = 90.8 SQM

BUILT UP = 116.12

FAR achieved is 0.7, so the scope of expansion is 0.3

Graphical depiction of the increase of FAR from 0.7 to 1 in vernacular house types

Existing Condition

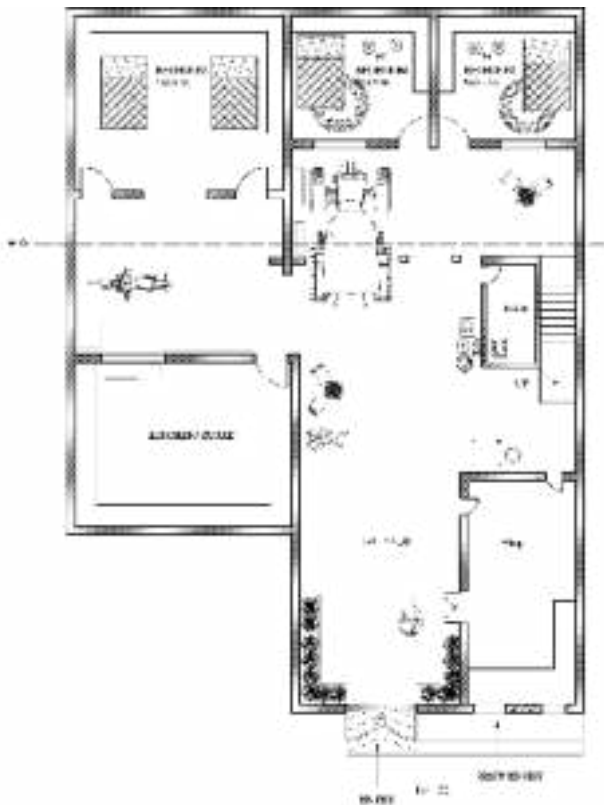


Figure 131 Existing plan

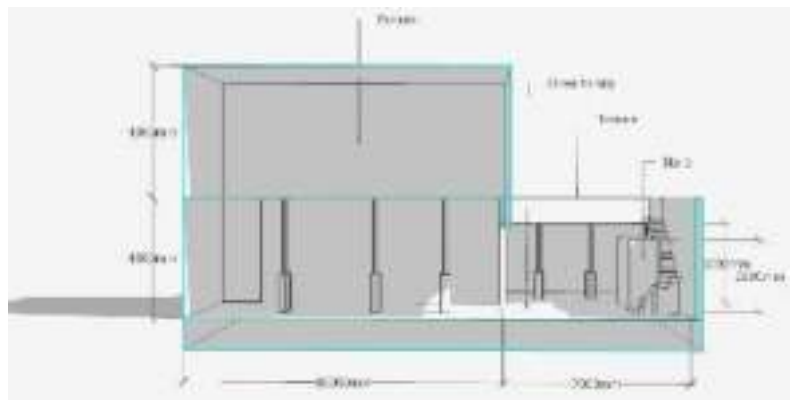


Figure 133 Existing section



Figure 132 Existing section

Proposed development



Figure 135 Updated section

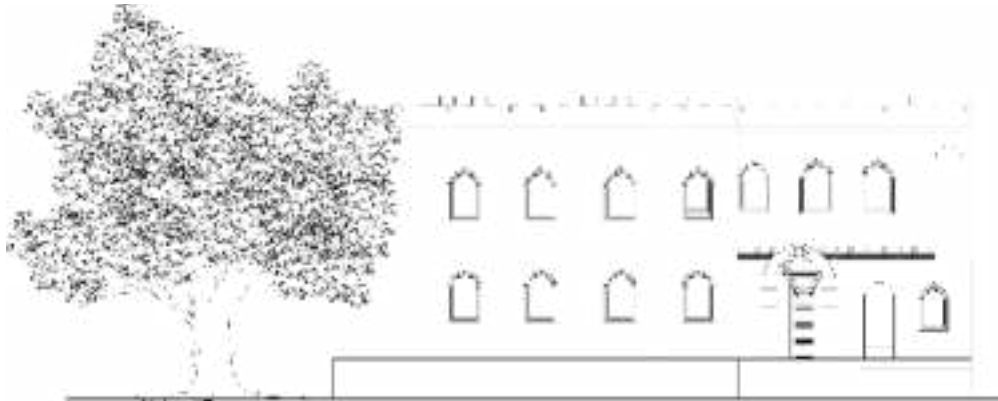


Figure 136 Updated elevation

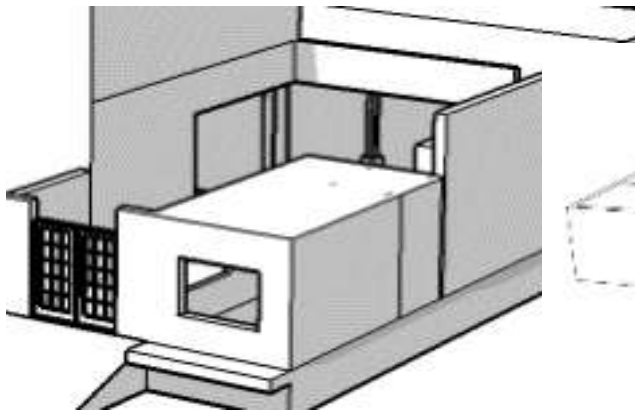


Figure 134 House with FAR 0.7

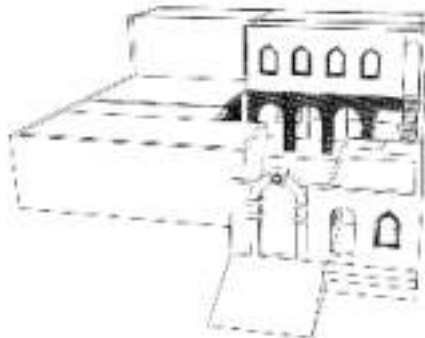


Figure 137 House with FAR 0.8

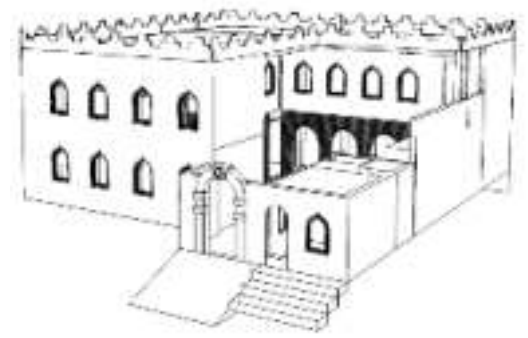


Figure 138 House with FAR 1

HOUSE 7.

LOCATION:

28°32'35.7"N 77°40'44.5"E

GMVH+7J Kalonda, Uttar Pradesh

<https://goo.gl/maps/MvbTnr38VXA8vkwo7>

HOUSE TYPOLOGY: Courtyard

NO. OF PEOPLE:

NO. OF FLOORS: G+1

EXPANSION:

PLOT AREA = 195.3 SQM

GROUND COVERAGE = 155.3 SQM

BUILT UP = 153.3 SQM

FAR achieved is 0.7, so the scope of expansion is 0.3.

Graphical depiction of the increase of FAR from 0.7 to 1 in vernacular house types

Existing Condition

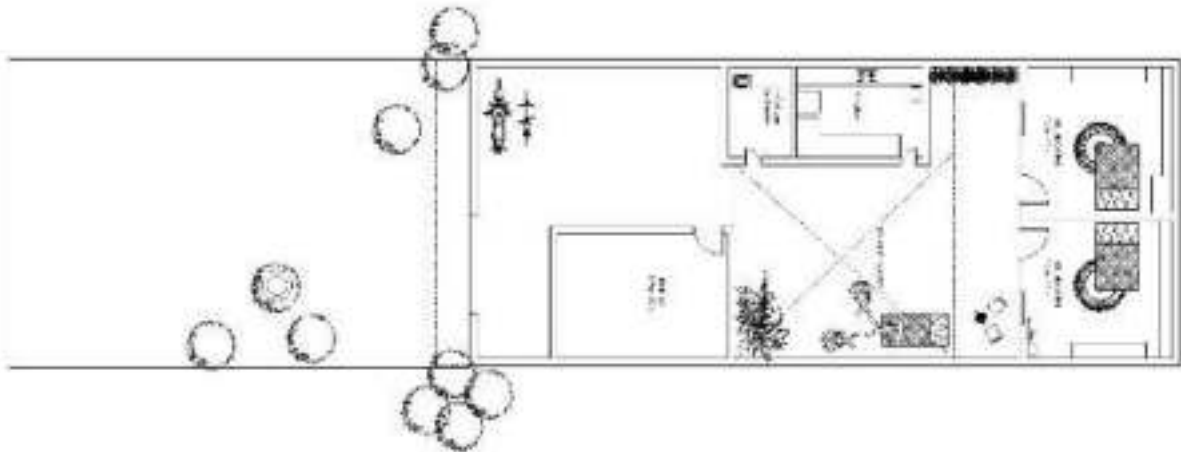


Figure 139 Existing Plan

Proposed development

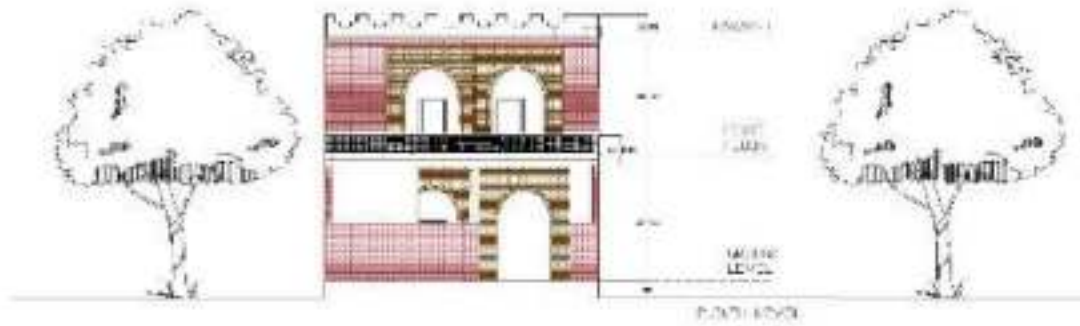


Figure 144 Updated elevation

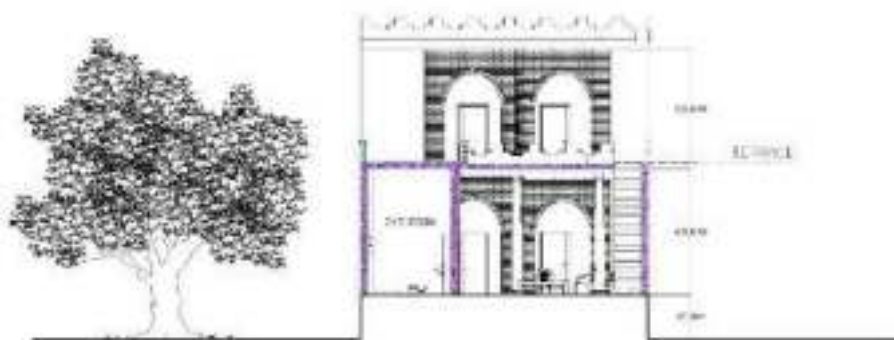


Figure 143 Updated Section

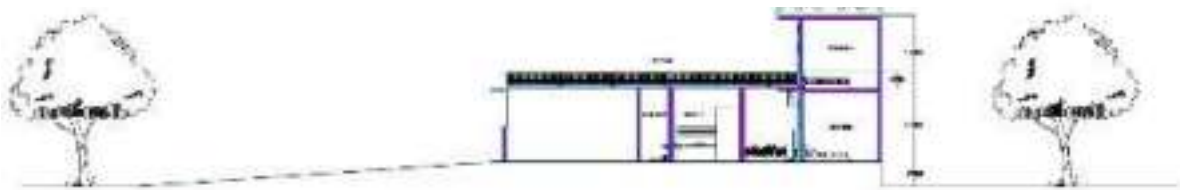


Figure 142 Updated section

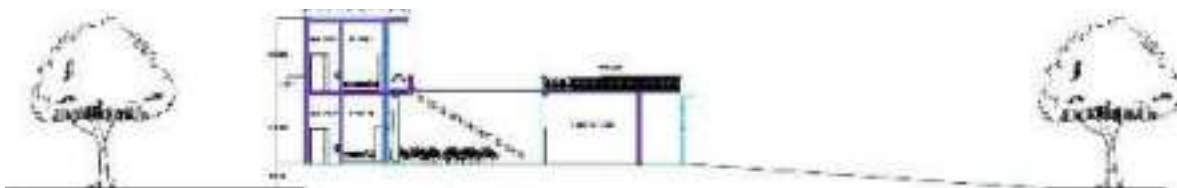


Figure 141 Updated section

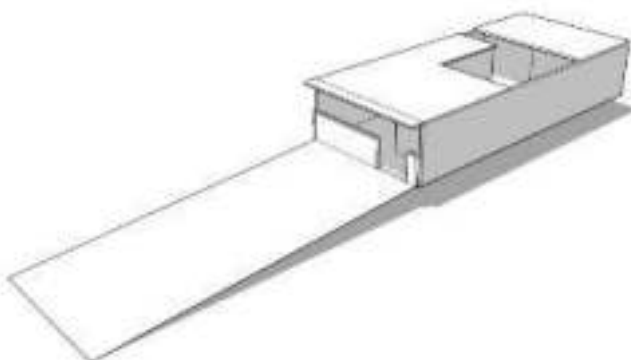


Figure 145 House with FAR 0.7



Figure 140 House with FAR 1

HOUSE 8.

LOCATION:

28°32'32.5"N 77°40'38.2"E

GMRG+WW Kalonda, Uttar Pradesh

<https://goo.gl/maps/it7oJ99RVAoDMZ676>

HOUSE TYPOLOGY: Mud House

NO. OF PEOPLE:

NO. OF FLOORS: Ground

PLOT AREA = 108QM

GROUND COVERAGE = 33 SQM

BUILT UP = 33 SQM

FAR achieved is 0.3, so the scope of expansion is 0.7.

Graphical depiction of the increase of FAR from 0.3 to 1 in vernacular house types

Existing Condition

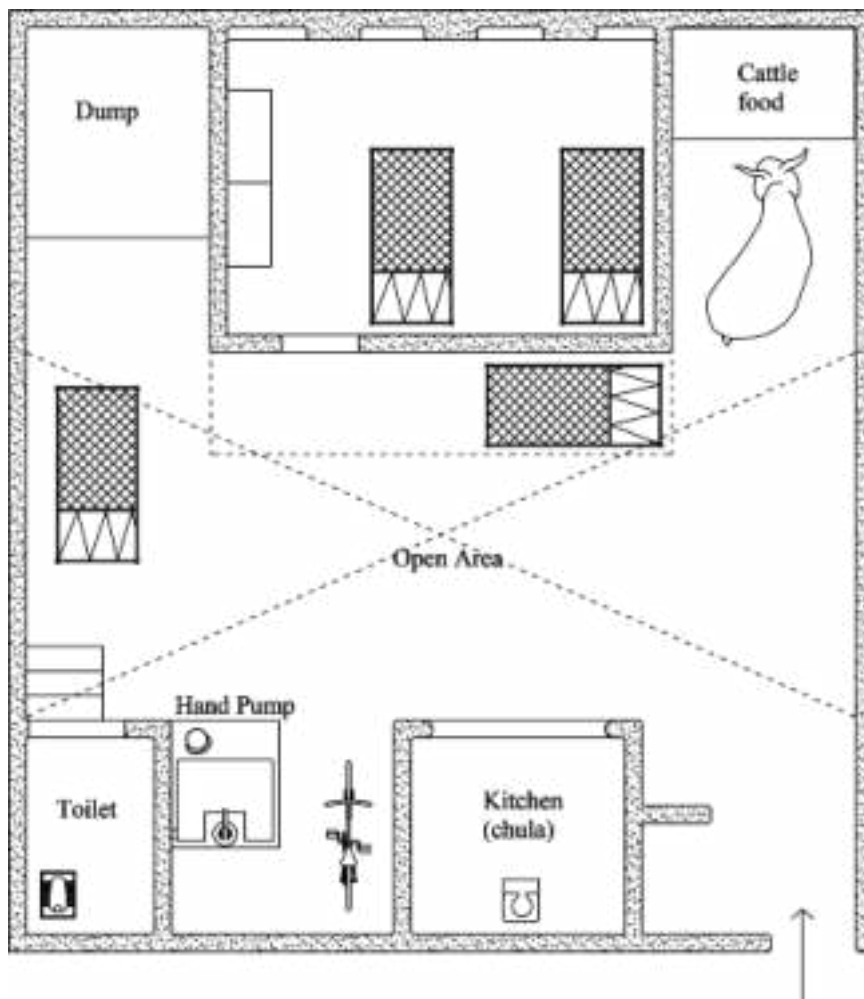


Figure 146 Existing Plan

Proposed development



Figure 150 Updated Section

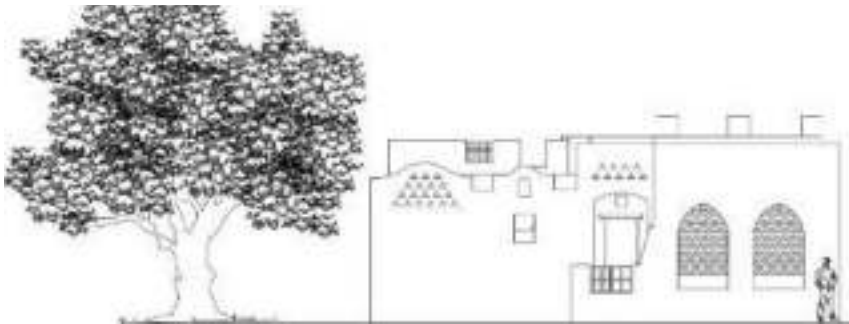


Figure 148 Updated Elevation

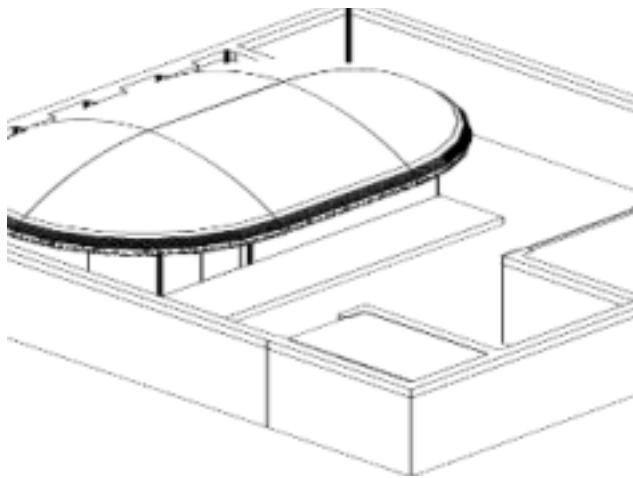


Figure 149 House with FAR 0.3

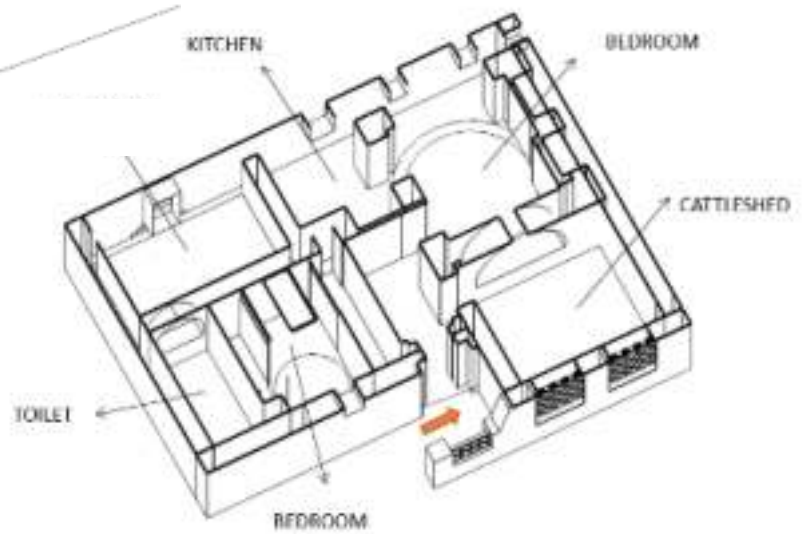


Figure 147 Updated House

2. Group of houses (clusters - in growth and change)

The plan developed out of a mix of **physical surveys and dronography**, shows the typologies of houses found in the village. We have plotted houses as those of courtyard type, the forecourt type, urban mixed use type and the unidentified type. The diagram is successful at exhibiting the following -

1. The largest number of house types are the forecourt house types, as these are the most suitable for agriculture.
2. The maximum number of forecourt houses are there in the outskirts and it is evident that as we reach the densified core of the village, these get converted to courtyard types.
3. The induction of the modern house typology of the village is a sign of disconnect between agriculture and rural living.

The mapping of house types will aid in the development of area wise densification strategy.



Figure 151 Housing typologies in Kalonda

3. Open spaces and congregation spaces - nodes densification

NODE DENSIFICATION

Designing of nodes is an attempt at working as foresight for developing villages rather than leaving it to a two-dimensional diagram. As the plot sizes aren't regular, three-dimensional development of space gives a better developed urban and negates compromises possible in 2D.

To attain this, plans were densified and spaces were made more usable. The open space structure remains the same but the built-up is designed to meet the future needs of Kalonda users.

Architecture compatible with Kalonda style of vernacular vocabulary was adopted wherein low height buildings were envisaged and open space structure was restricted in the design process.

PEER WALA TALAB NODE

For the "**Peer Wala Talab** " node, an amalgamation of leisure and commercial activities is proposed in five stages to congregate the utilization of the node.

Existing stage:

The existing scenario of the peer *Talab* node is not very hygienic. Debris and garbage is in abundance. The area around the pond and water inside is infected with plastics and unmaintained growth of weed plants. There is heavy Encroachment over the pond area by the residents of the village. Garbage is dumped in the water under the existing *puliya*. The cattle roam freely everywhere on the road and on the canal.



Figure 152 Existing Peer vala Talab node



Figure 153 Existing Peer vala Talab

Stage 1 – After five years

The development in the first stage starts by cleaning the surrounding areas of the pond, removing the growth of weeds, and cleaning the debris lying around the node. Making the water of the *Talab* free of plastics and grey water contamination, since the people are using the same water for their daily needs. Addition of footpaths on either side of the road, for easy segregated movement of pedestrians and vehicles. Taking existing ground floor buildings to the first floor without altering their plan forms as they have the potential of increasing their FAR.



Figure 154 Peer vala Talab node after 5 years



Figure 155 Peer vala Talab after 5 years

Stage 2 - After ten years

In the second stage, street lights are accentuated on the roads for creating a safe environment for the visitors and the residents, also, allowing visitors to enjoy the lakeside view even at night. Bushes and planters are added along the footpath for beautifying the streets and creating a pleasant experience. Night lighting of ponds is also a possibility.



Figure 156 Peer vala Talab node after 10 years



Figure 157 Peer vala Talab after 5 years

Stage 3 - After fifteen years

Commercializing some of the buildings to create revenue by adding Oyo rooms, restaurants and cafes, etc. to attract more tourists to enjoy and stay in the village for a vacation showcasing the beauty and culture of the Kalonda village and serenity of its ponds. Parking becomes a necessary facility that has been added here to prevent their ingress into the village.



Figure 158 Peer vala Talab node after 15 years



Figure 159 Peer vala Talab after 15 years

Stage 4 - After twenty years

Adding to the beauty of the pond, some commercial activities such as boating, fishing, and eating kiosks are added. Fish cultivation in ponds may further help in keeping the water clean. Installing food kiosks, sit out spaces, and leisure activities around the pond helps to exploit its every potential view. People can sit here and enjoy the calm and tranquility of the water, a proposal worthy of urban attention from the surrounding areas.



Figure 160 Peer vala Talab node after 20 years



Figure 161 Peer vala Talab after 20 years

Stage 5 - After twenty-five years

Through design we have envisaged low height buildings to up to four floors. The buildings can further be used in the future by the users. Adding green terraces and rooftop sitting on some buildings to give a top view of the activities going on near the *Talab* . These spaces can be put to commercial use by the owners in the future by renting them out as air BnB etc.



Figure 162 Peer vala Talab node after 25 years



Figure 163 Peer vala Talab after 25 years

PRADHAN KI BAIETHAK NODE

For the "Purani Pradhan Ki Baithak" node, a thoughtful meaning to the commercial spaces has to be inculcated and make the street more appropriate for a "baithak".

Existing stage:

The existing node is not a great place. The debris is lying around haphazardly. The vendors are all over the street creating a blockage for vehicular/pedestrian movement. The cattle are roaming freely everywhere on the road. The drains were uncovered.



Figure 164 Existing scenario of Purani Pradhan Ki Baithak

Stage 1 - After five years

The development in the first stage starts by cleaning the surrounding areas, removing the growth of weeds, and cleaning the debris lying around the node. Addition of footpaths on either side of the road, for easy and segregated movement of pedestrians and vehicles. Providing dustbins at regular intervals

to promote hygiene. Street lights are installed on the roads for creating a safe environment for the visitors and the residents



Figure 165 Purani Pradhan Ki Baithak after 5 years

Stage 2 - After ten years

In the second stage, taking existing ground floor buildings to the first floor without altering their plan forms and keeping the forms values intact as a potential of increase in FAR. Planters are added along the footpath for beautifying the streets and creating a pleasant experience. A designated space along the footpath is allocated for the street vendors to put their kiosks/stall.



Figure 166 Pradhan Ki Baithak after 10 years

Stage 3 - After fifteen years

Commercializing some of the buildings to create revenue by adding Oyo rooms, restaurants and cafes, etc. is proposed. Benches for seating alongside the footpath are added to create a zone within the node.



Figure 167 Purani Pradhan Ki Baithak after 15 years

Stage 4 - After twenty years

A separate cycle track can be added. The footpath can be extended and seating could be increased to better serve the purpose of *baithak*.



Figure 168 Purani Pradhan Ki Baithak after 20 years

Stage 5 - After twenty-five years

Low height buildings are envisaged to up to three floors while keeping the plan footprint as it is. The buildings can further be used in the future by the users as necessary. Adding green roof terraces and rooftop sitting on some buildings to give a top view of the activities happening along the street. These spaces can be used commercially by the owners in the future by renting them out as air BnB or any other purposes. Connecting bridges were added on the top floor of the buildings to serve as common communal and leisure spaces.



Figure 169 Pradhan Ki Baithak after 25 years

Kalonda today has a density of 200. With its population increase, and bottling of *Abadi* area, densification is the only outcome. These design illustrations can be used to envision the future and plan Kalondas nodes for a predictable outcome.

ENTRY/EXISTS

There are three main roads from which the village is approached which are separated by a dense core area and must thus be developed as termination points of the village. The village by its structure is pedestrian in nature. One way movement of vehicular traffic is practiced by villagers on these roads to keep the village automobile friendly. These must be recognized as future patterns for densification. Practices should take shape as a policy to aid the densification of *Abadi* area in the future.

It is proposed that a gate and a large parking space adjoining a water body, limiting the village and announcing its beginning should be developed on these three junctions.

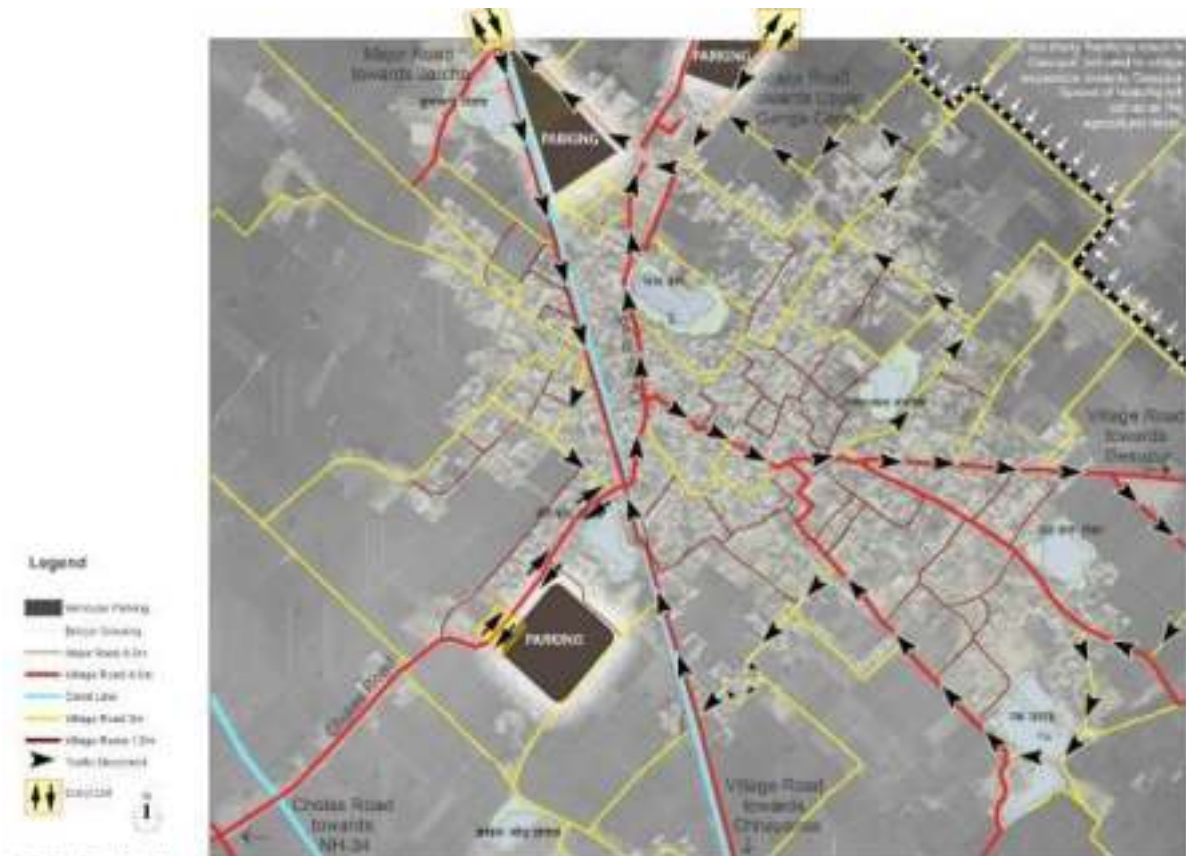


Figure 170 Proposed One way traffic movement, entry/exists and parking



Figure 171 Proposed development at entry/exit

v) Titrated bye laws for Growth of houses in Villages

(This is a draft, and stakeholder sanctions must be undertaken before it is finally implemented.)

- Subdivision of individual residential plots or buildings constructed shall not be allowed.
- For a plotted development, the minimum plot size shall be 15 sq meters.
- Maximum ground coverage shall be according to the table below:

Plot Size	Maximum permissible ground coverage	Maximum FAR for the Areas with densification
Up to 25 sq meters	100%	1.50
26- 200 sq mtrs	80%	1.40
201-500 sq meters	75%	1.35
501-1000 sq meters	70%	1.30
1001-2000 sq meters	65%	1.25
2001-4000 sq meters	60%	1.20
Above 4000 sq meters	55%	1.00

With exemption for parking of cars in the vernacular house types.

- The maximum permissible Floor Area ratio shall be 1.00.
- The FAR shall not include-
 - Balconies projecting 0.9 mtrs.
 - Open Courtyards, Verandas, and *Baithaks*.
 - The inner courtyard can be covered by a temporary coverage, at a height of 1.5 meters above roof level. If covered at roof level, it shall not be permissible.
 - Temporary cattle sheds and open dalans
- Building height shall maximum go up to 15 meters.
- A projection of maximum width of 0.75 m at lintel or roof level. No construction of any type shall be permitted over such projections.

- The main vehicular road shall not be less than 4.5 meters and access to plots shall be provided through roads/passages not less than 2.5 meters (as can be seen in the present nature of village)
- Open spaces may be provided in a group and should work as shared cluster spaces.
- The proposed plantation on the roadside has to be evergreen trees planted 10 meters from Centre to Centre.
- Provisions for community facilities like Creche, Balwadi, Health care center, etc to be made as per population requirement, in areas as close to the lake.
- The number of dwelling units permissible will be equivalent to the number of members in the Aadhar list or as decided by the *Panchayat* Authority with the maximum variation of ± 10 percent.
- Parking spaces provided for motor vehicles shall not be less than 20 sq meters in the open area (under stilts; 30 sq meters) and for scooters and cycles, the parking spaces provided shall not be less than 3 sq meters and 1.40 sq meters respectively. (houses under expansion must plan for parking in shared spaces near gates through signatures)
- On plots situated along 30 meters and above roads, commercial activities shall be allowed in addition to the land use activity.
- Plantation-
 - One tree in every plot for plot size up to 120 sq meters.
 - Two trees in every plot for plot size above 120 and up to 300 sq meters.
 - One tree additional in every 100sqm for a plot above 300 sq meters.
- Fee for land conversion
 - Land conversion of agricultural land to any other use shall be prohibited.
 - Land conversion of any other land (apart from agricultural land) to mixed-use and commercial shall be allowed after paying the land conversion price, only within *Abadi* area.
 - A formula for the conversion rate has to be worked out where the rate of conversion will be inversely proportional to the promising open area on the ground floor and preference to vernacular typology, detail and materials given.

- A land with a maximum open area and least ground coverage to be given maximum priority and lowest conversion rate with a mandatory condition to retain the open space as in present form. To mixed and commercial
- Lands with trees older than 10 years also to be prioritized. Houses with trees older than 10 years in their area to be given a FAR relaxations of 10% provided they retain their typology.
- Standards for spaces-
 - Interior courtyard- in case the whole of one side of every room excepting bath, WC and storeroom are not abutting on either the front, rear or side open spaces, it shall abut on an inner courtyard, whose minimum width shall be 3 meters for the plot size up to 200 sq meters, and for plot sizes above 200 onwards shall be minimum 5 meters.

Further, the inner courtyard shall have an area, throughout its height, of not less than the square of one-fifth the height of the highest wall abutting the courtyard.

Every interior courtyard shall be raised 150mm above the determining ground level and shall be satisfactorily drained.

- Outer Courtyard- The minimum width of the outer courtyard shall not be less than 2.4m. If the width is less than 2.4m, it shall be treated as a notch.
- The maximum height of a building shall not exceed 3.5 times the width of the road abutting it, plus the front open space.
- The water body should be protected by ensuring that no permanent/ temporary construction development takes place around it up to a distance of 50m from the edge of the water body and the same shall be suitably landscaped. Further, the public shall have easy access to the water body.
- The height of the plinth shall not be less than 450mm from the surrounding ground level ensuring adequate drainage of the site.
- The height of all room for human habitation shall not be less than 2.4 meters (2.75 meters according to NBC but the prevalent height in vernacular houses is 2.4 meters) measured from the surface of the floor to the lowest point of the ceiling.
- The area of the habitable room shall not be less than 9.0 sq meters, where there is only one room with a minimum width of 2.5 meters. Where there are two rooms, one of these shall

not be less than 9.0 sq meters and the other less than 6.5 sq meters, with a minimum width of 2.1 meters.

- The size of the independent water-closet shall be 0.9 sq meters; with a minimum width of 90 cm.
- The size of the independent bathroom shall be 1.2 sq meters with a minimum width of 0.9 meters.
- The size of the combined bath and water closet shall be 1.8 sq mts with a minimum width of 1 m.
- The height of the bathroom measured from the surface of the floor to the lowest point of the ceiling shall not be less than 2.1m.
- The size of a cooking alcove serving as cooking space shall not be less than 2.4 m² with a minimum width of 1.2 m. The size of an individual kitchen shall not be less than 3.3 m² with a minimum width of 1.5 m. Semi-open spaces with low walls and roof may also be provided for cooking in areas where such provision is suitable with respect to climatic comfort. Provision for smokeless *CHULLHA* shall be made in all kitchens considering fuel efficiency and health hazard due to smoke inhalation.
- The minimum width of an individual balcony, where provided, shall be 0.9 meters and shall not be more than front face of the house. It shall not project beyond the plotline and on roads or pathways.
- Boundary wall restricted to a maximum of 2.1 meters.
- The minimum tread without nosing shall be 250mm for residential buildings.
- The maximum height of the riser shall be 200mm for residential buildings. (as per the prevalent vernacular practice in the village riser of 250 mm and tread of 250 mm should also be acceptable)
- The minimum width of the enclosed staircase shall be 0.60 m, while open staircases in the courtyards can also be within 0.45 meters as is a trend in vernacular.
- The house site shall provide space for storage of food grains and keeping cattle. A manure pit having a minimum area of 1.0 m² shall also be catered for. This will take care of the composting of biodegradable waste.
- Cluster

- Shared open spaces define a cluster.
- In-ground and one-storied structures, not more than 20 houses should be grouped in a cluster. Clusters with more dwelling units may create problems relating to identity, encroachment, and maintenance.
- Minimum dimensions of open spaces shall be not less than 6 m or 3/4th of the height of buildings along with the cluster open space, whichever is *higher*. The area of such cluster court shall not be less than 36 square meters. (In case of irregular open spaces, the two diagonals shall be considered for minimum dimension)
- Water from drains shall be connected to village ponds and appropriate eco-friendly methods like growing of duckweed plants shall be adopted to treat wastewater. This treated water may be used for irrigation and agriculture. Appropriate methods (namely conservation, groundwater recharging, rainwater harvesting, etc.) should be employed to ensure effective water management.
- Every house shall have adequate light, sufficient water supply, and a walkable passage from the main road with proper drainage.
- Community Facilities
 - A community hall/*BARAAT GHAR* shall be established.
 - Rural Development Centre shall include *PANCHAYAT GHAR*, a *MAHILA KENDRA* that may also serve as a vocational training centre under NIRDPR.
 - School, health centre, post office, police post, shopping, work sheds for the artisans, telephone facilities, etc. should also be established.
 - The use (to the extent possible) of locally available building materials and cost-effective substitutes for scarce building materials. Appropriate technology inputs shall be introduced for improving the local materials or conventional or traditional practices for improved efficiency.
 - The concept of 'aided self-help' shall ensure the active participation of the prospective users and association in the construction and development of dwelling units and other community buildings.
 - The special needs of women-headed households/ single and working women/women in difficult circumstances should be addressed. The specific requirements of women in terms of

providing necessary facilities in homes to lessen their drudgery would be given sufficient attention. Protecting and promoting our cultural heritage, architecture and traditional skills should be given due importance.

APPROVAL DOCUMENT

For the approval of the construction of the building on the land, the plan submitted shall have -

- The boundaries of the plot and the name/number of the properties and road abutting plot along with the names of the owners of the neighboring plots.
- Plot number and ward number of the property on which the building is intended to be erected.
- The distance of the property from the nearest water body and *chowk*.
- Mention the source of the electricity connection.
- Details and list of other properties owned by the person in the village (if any).
- All existing buildings and physical features standing on, over, or under the site.
- The total plot area and the break-up of covered areas on each floor with their percentages with reference to the total area of the plot.
- Total floor area ratio, ground coverage, and height of the proposed building.
- Details of projections.
- Sewerage and drainage lines up to discharge point, rainwater harvesting, and water supply lines.
- Car parking (if applicable)
- Location of temporary structures like cattle shed stores, toilets, etc.
- Building envelope at each floor level in relation to the site.
- Floor plans at each level including mezzanine (if any) and plinth level plans.

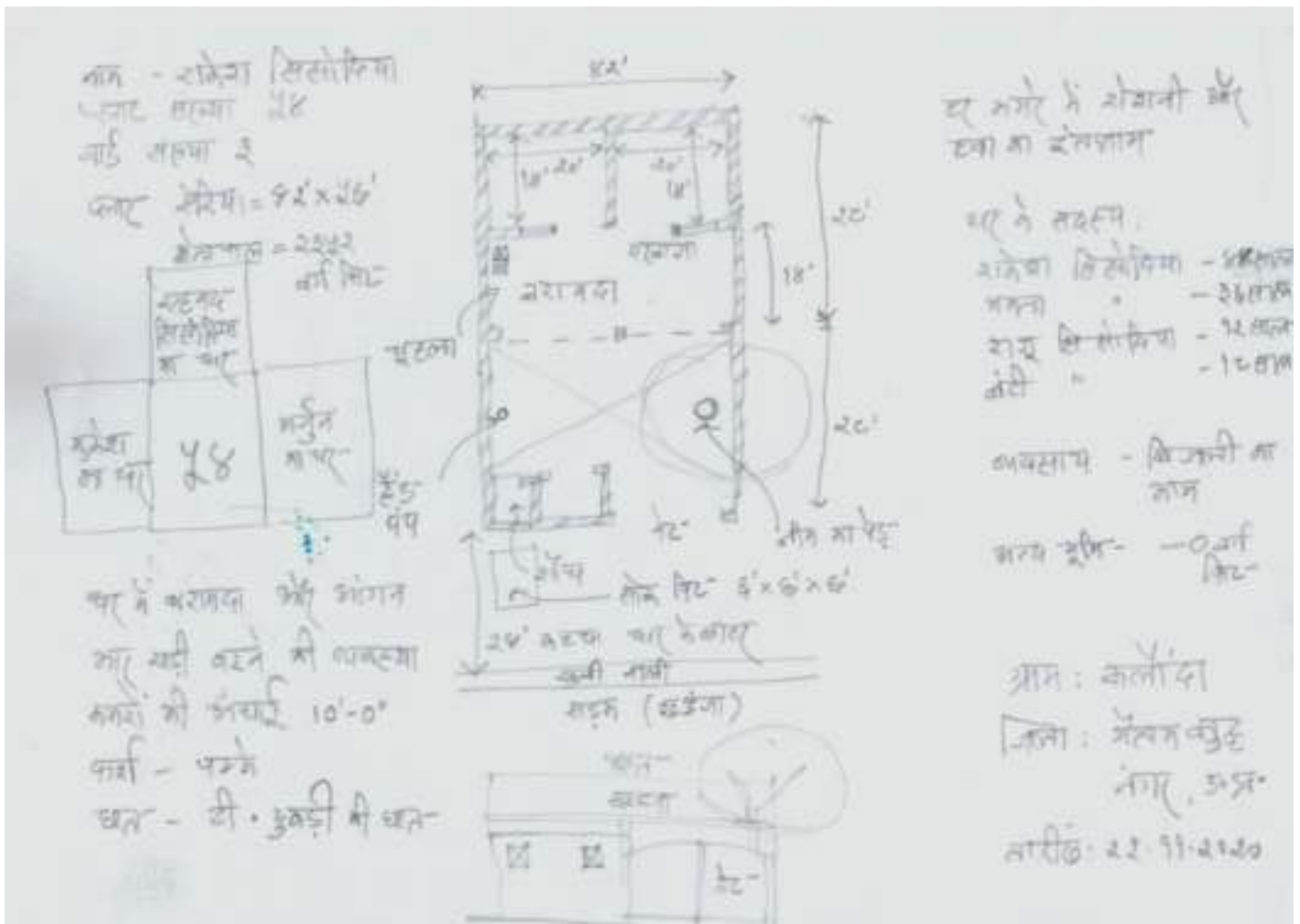


Figure 172 Sample approval document

Vision for Kalonda: GPDP

Summary

- *With the vision of retaining a village as a village for appropriate open spaces and conservation of green/forest /agriculture in the district, steps must be taken to enforce a truer character of villages of the new ,millennia with technology and facilities so that villages become a new destination for development.*
- *Planning must be an active process and not a static document. The GPDP of 25 years to be updated annually on the basis of the results of annual plans and new needs/ challenges identified.*
- *Design based planning approach to be adopted for villages. The footprint of buildings must be preserved while conditioning the village for automobiles, public facilities, infrastructure and commerce.*
- *Projects on PPP basis and corporate intervention to be undertaken for connecting village interest tl the interest of the leading economic institutions.*
- *NIRDPR to be actively involved in skill development and founding Kalonda crafts.*
- *Use typologies as old age home, therapy centres, home for special needs, de-addiction centres, must be identified and annexed in the village development for better economics.*
- *Village must benefit from pond side leisure areas for rural tourism.*
- *Each block of village must have COA recognized architect appointed for documentation, submission, sanction and planning updates of rural planning.*

The proposal for Kalonda has been made keeping in mind the following -

- 1. A village using its hydrology to benefit, purifying lakes, storing potable water, treating grey water.**
- 2. A Solar Powered village with self-sufficiency for energy needs**
- 3. Identification of exiting housing typologies as standard typologies**
- 4. Cluster Analysis**
- 5. Open space Studies _ festival and congregation spaces**
- 6. Lakes and Nodes relationship addressed through densification**
- 7. Densification and growth of typologies**
- 8. Circulation and movement**
- 9. Entry and Exits in villages**
- 10. Bye-Laws for villages and the approval document for village house extensions.**

It is necessary that trained architects be hired in every block to guide the development of Rurban and village areas so that we save the connection between social knowledge, culture, festivals, spaces, economy, and housing. The problem of housing and villages cannot be treated through development models practiced to date.

1. Statement of Vision

To uphold the village of **Kalonda** as an example for all other Indian villages as a repository of **Social, Cultural, and Aesthetic values**.

Maintaining the village as a resource for the agendas of **Economy, Capacity Building, Education & health, Environmental Sustainability**.

By way of agriculture, horticulture, forests, orchards, animal husbandry, aquaculture and promoting self-reliant rural economy and the reverse flow of urban economy to villages by uses compatible to the pace of rural life through **modification in Policy & Participatory Decentralized Development as an aid** to entrust India's growth to its villages and uplifting the Indians living an impoverished life in villages.

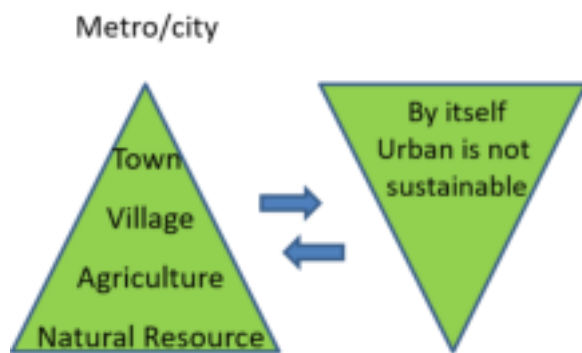


Figure 173 A diagram illustrating the imbalance, if all become urban and if natural resource, agriculture and villages are lost

To discontinue the overlooking and subjugation of the common Indian as seen in the face of policy (much of which is an extract, a continuum and an addendum to British policies in India).

Independence, Development, and the growth of our country in the new age has overlooked the villages. Our primary sector of the economy, our cultural roots, and the large percentage of our countrymen living in villages are at a threat and so is our wildlife and natural resource. The agnostic focus on the metropolitan centres and towns and the mistaken association of success to luxury to economics has led to the rise of a new social ambition that now is driving every able-bodied and educated individual from the village to the anonymity of city life and from the city to the metro and soon. There is a mass migration to nowhere and to no end.

It is impossible to keep up with the city without the village. The pyramid of growth where the metros of our country sit at the top, only because the village or the rural lies at the base, could get inverted, making the metro a centre of discontentment, crime, and hunger, if not supported by a balance in the rural. Urban which is the most developed form of human existence is now seen as blight and this is primarily because of an uncared rural. Also, the movement from rural to urban is seen as an ascension.

With a richer, more content, and happier rural the urban experience will also be more fulfilling. The development driven by the governance of India must also take care of the villages and the rural.

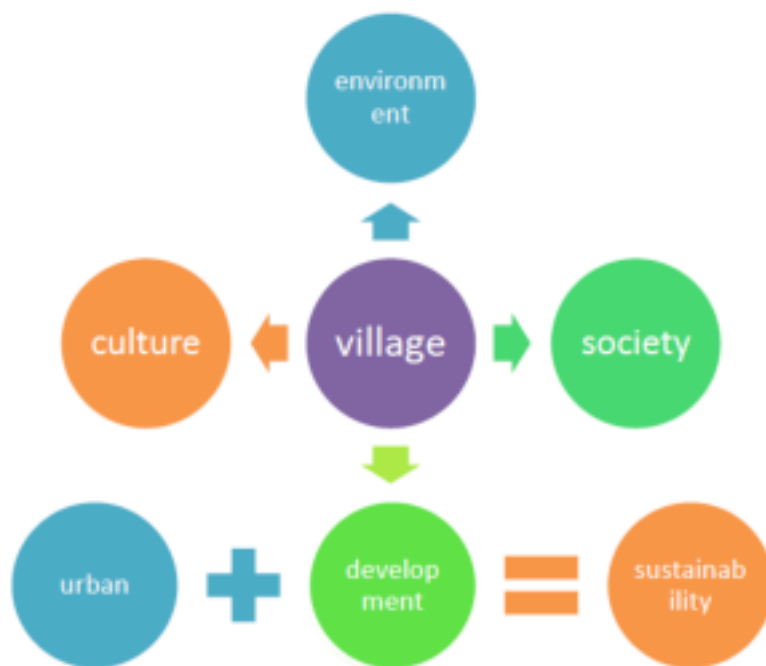


Figure 174 this figure explains a shift needed. Development focus on village will give sustainability

The new vision of development must be driven through the agenda of villages for a better and more sustainable urban. With the boundaries of the world shrinking through connectivity and technology, it is now possible to reposition the villages to become the new centres of sustainability, peace and growth. The ever-interconnected world uses the metaphor of a global-village and not a global-city to address the new-age cohesiveness in life. The economic model of accumulation of resource towards the centre, i.e. driving economics to towns and metros was a very colonial model where the metros had become centres of sapping the resource. This model was never followed in the first world nations. With the emergence of a country with a better vision, India must also focus on preserving its environment, culture, dialects, languages and the diversity of life while protecting its villages. **Villages have been a sapient resource for the social values which are a better outlay towards a fitter administration and a safer society.** These are better than the economic values persistent in the cities and hence must be adopted and nurtured.

2. Vision 2021

Step 1-Densification of agricultural fields. Removal of sprawl and wide roads from fields to restore their density.

Firm steps should be undertaken to reduce the development of roads within the agricultural fields. The state earns revenue from the conversion of agricultural fields to residential, through stamp duty. This conversion of land at the level of the office of the SDM Dadri should be curbed as a practice. Active land conversion from agriculture to residential is seen. Almost 10,000 sq mt of land near the canal on the Jarcha road has recently been plotted into small houses and many such plotted chunks of land are lying vacant in Kalonda.

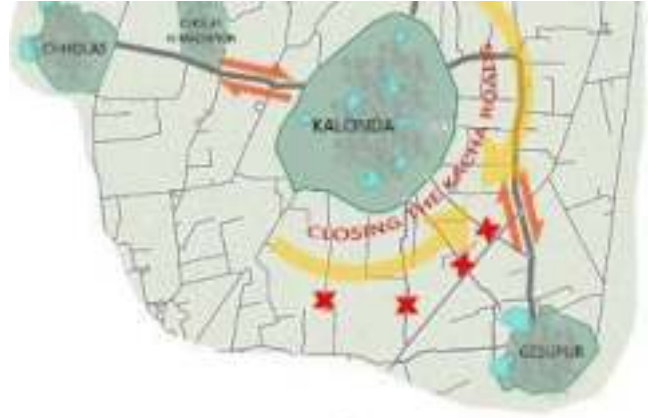


Figure 175 The increasing interdependency of Kalonda and Gesupur

Step 2- Street lighting, in the central areas of the village through a phase wide manner and clearing of drainage issues from all main roads.

A programme with the help of NIRDPR on the street lighting with the aid of solar cells can be done to the village. This should be taken up with the help of a co-operative formed with the village with young village boys from the school, participating in the activity. It will develop into skill development , education and village upliftment programme.



Figure 176 Before and after of Kalonda streets after installing street lights

Step 3- Geomorphology & Hydrology – Lakes

- Clearing the encroached land near the lakes.

- De silting the lakes

- Planting of orchards

- Beginning of Kalonda crafts



Figure 177 Present condition of lakes



Figure 178 Lake after clearing the encroached area

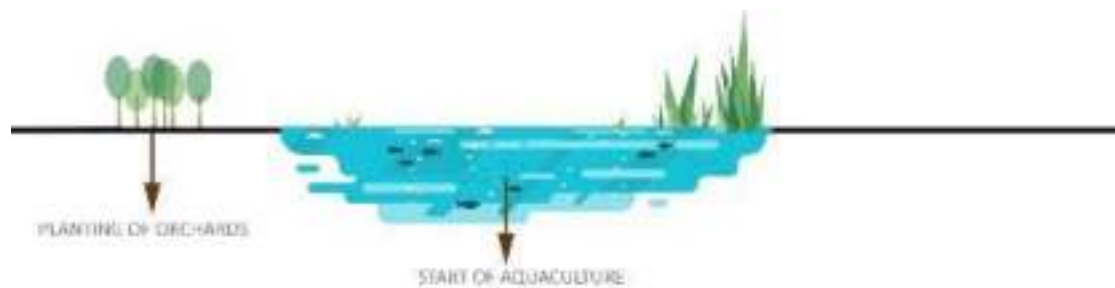


Figure 180 After desilting



Figure 179 Planting of orchards, introduction of Aquaculture and Kalonda crafts

Desilting of lakes is of utmost importance. Ages of continuous disposal of household waste and at times even large volumes of sand and mud into them, to encroach their land for construction of houses, is reducing their capacity to take up rainwater and is affecting the aquifer connection. A vital

Step 4 -Identification of all housing typologies and all documentation of existing - PLUS initiation of a proto call for future "pre-expansion of house approval" processes.

A junior architect must be appointed under the district office of Panchayati raj to work on the housing development and construction within the village. Documentation of vernacular house plans and on-site aid to the development of houses, rectifications and their betterment must remain in focus so that they do not fall prey to malpractices and lose their vernacular connection forever. The involvement of MoHUA in the rural vernacular housing typology identification and the Smart City Mission in the up-gradation of the associated facilities would be of use to the village at large.



Figure 181 A sample of approval plan as expected from the villagers

Step 5- Introduce technical courses in the VRSB college like-

- Carpentry
- Agriculture
- Hospitality
- Naturopathy
- Medical Assistantship
- Tooling and Machinery
- Electronics
- Civil and Draftsmanship.



Figure 182 Carpentry



Figure 187 Agriculture



Figure 183 Naturopathy



Figure 185 Electronics



Figure 184 Civil and Draftsmanship



Figure 186 Tooling and Machinery

Step 6- Initiation of garbage collection in Kalonda



Figure 188 Garbage collection in the Village

Step 7- Milk cooperatives

Milk cooperative in the village to supply fresh organic milk for residents of Greater Noida and Noida. This may be done with the involvement of NDDDB – National Dairy Development Board.



Figure 189 Milk co operatives that can be introduced in the village

Step 8- Treatment of Greywater



Figure 190 Grey water treatment

A systematic process of treating grey water by building a series of oxidation tanks with weirs, floating fountains, fishes and aquatic plants to treat water before it becomes suitable to be used for aquaculture.

Step 9- Addition of basic facilities

Addition of an ATM, Local bank, Police check post and dispensary to be made functional.



Figure 193 Addition of ATM



Figure 191 Addition of a bank



Figure 192 Police check post

3. The vision of the Gram *Panchayat* Kalonda

25 years GPDP & Landuse and Land Management (Stage wise intervention for achieving the Spatial Plan)

a) First Five year Plan for Kalonda

The year 2021-2026

Population by 2026 (as projected from the census):

14360

The rise in Population Density: **255 ppHa**

Thrust areas –Villages should look forward to holistic development. Everything is interconnected and cannot be treated through a singular focus, development too must add environment and agriculture to its agenda. Ponds and groundwater recharge can be saved only with an efficient Solid-Liquid Waste Management (SLWM), as it is of utmost importance in the view of the cleanliness and sustainability of the village. The village lacks any structured measure and intention or awareness for waste management. People have left everything on the government for solutions. While the government works, awareness must be built in the masses. In the absence of any viable treatment process, Grey water generated from Rural Households is disposed into open drains, Streets, Vacant land, or Water Bodies resulting in surface water contamination, land contamination, and aggravated water-borne diseases. Lack of exploration of suitable technological options is a great challenge. In the absence of industries in the village, there is no hazardous waste to be managed and household grey water can be treated. However, the agricultural runoff carrying fertilizers is one of the concern areas.

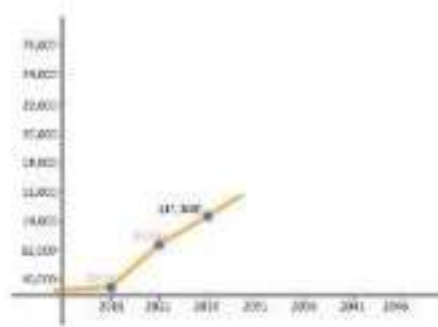


Figure 194 Population growth

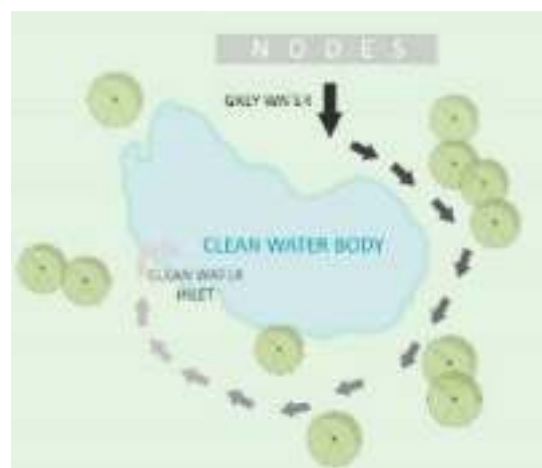


Figure 196 integrated development



Figure 195 SLWM

The paper, plastic waste generated from the households and their disposal in open areas, drains and near water, bodies are slowly degenerating the village environment and causing the pollution of soil and water bodies.

Therefore a systematic SLWM system is needed in the village. We propose to develop the system lake wise, starting with lakes situated in the central part due to two main reasons. The first being that SLWM needs additional space to be worked upon, so if we delay the SLWM of the central lakes, there is a possibility that we might have to leave them due to the increased densification in the future years. Secondly, these lakes due to their positioning in the heart of the densified area take up most of the grey water and thus are important for the hydrology and geomorphology of the village. In the first five years (2021-2026) we target two main lakes, Peer Wala Talab and Mata Wala Talab . These two lakes fall into the major urbanized areas, thus these were most contaminated and needed immediate action. They take up most of the grey water from the nearby houses. Cleaning and creating an SLWM system near them, at the beginning of the GPDP will set a precedence and hence will help develop an attitude for solving problems in the village.

The development of the village needs to be an integrated system. The Land Use and Land Management (LULM) moves hand in hand with the development of the SLWM. Lakes and ponds at the heart of the agenda of development must be made the focus of commercial areas, recreational areas, leisure, and new bodies which can be woven with villages and may become catalyst promoters of rural tourism.



Figure 197 LULM

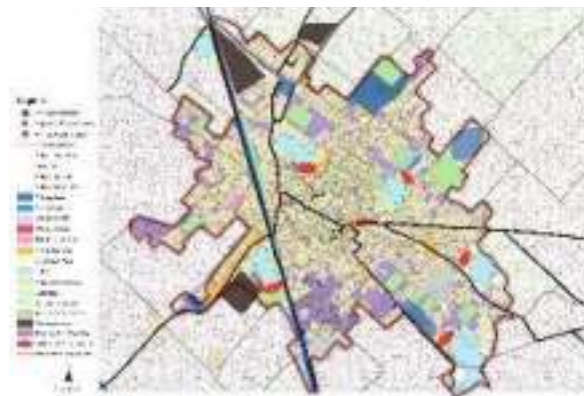


Figure 198 Influence of development on nearby areas

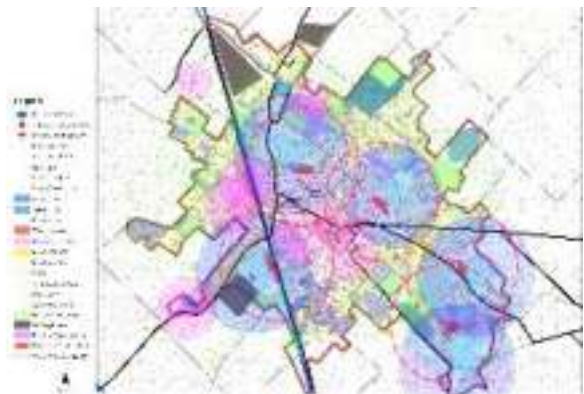


Figure 199 Housing densification

As the SLWM is developed near the lakes, the development of the land near it also begins. Starting with the Peer Wala *Talab*, as in the first five years a SLWM would be developing, parallelly the encroachment near the *Talab* can be cleared and a new commercial area is developed. This lake needs immediate attention as it has the maximum encroachment and also because an attempt documented by satellite imagery can be seen where a huge chunk of mud or sand was dumped in 2005 dividing the lake into two, drying a part of it for encroachment by village *Abadi* area.

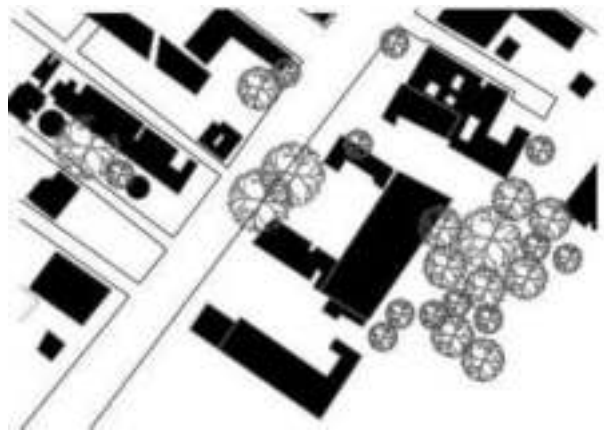


Figure 200 Housing cluster

A major part of the LULM is the residential increment. As the population will increase in the coming years, so will the need for housing and shelter. If the densification doesn't happen in a controlled manner, then all the vacant green lands, agricultural lands, lands near the lakes will be taken up by built and eventually, all the nearby villages will merge into one and form a giant urban sprawl. To avoid this, we must go vertical to reach up to the demand for residential accommodations. The cluster and housing densification must be done carefully. The courtyards and forecourts of the houses can be reduced and multiple stories can be added to the houses. Currently, the FAR of the existing houses is found to be much less than one. So in the first five years the FAR can be increases as per need, and can maximum go up to 0.5

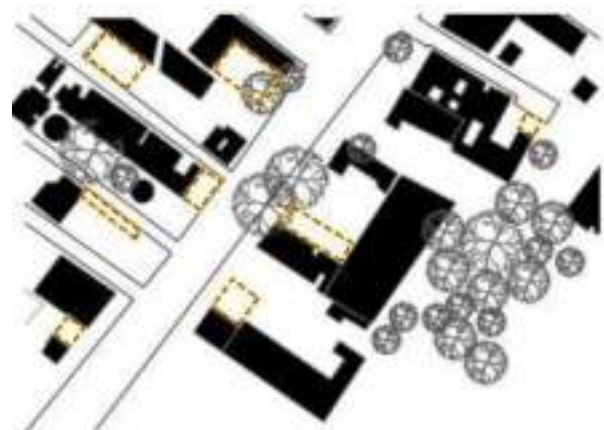


Figure 203 Densification of housing clusters



Figure 202 Existing node



Figure 201 Densified node

The important nodes can be made an exception and can have a *higher* FAR. These nodes will be developed as commercial centers of the village, with wide roads, green medians, and cleaned

lanes with mixed-use development. The mixed-use development can have commercial, institutional and residential uses. For prospects, the provision of small accommodations like OYO must be there. Along with that, a police check post, an ATM, medical shops, etc. must also be constructed.



Figure 204 Existing lake

Also, we intend to create a vocabulary of Kalonda Village architecture, by identifying the existing elements of the houses and facilitating the new constructions to use it. This eventually will help us to retain the character of the village and thus can be developed as a visual sight for the tourist and also help in the economy of the village. For the same, defined entry and exit points are very important. Currently, the village lacks a proper gate or entrance to the village. Therefore, 3 major entries and exits to and from the village have been identified. Within the planning of the five years, we can develop proper entry gates at all of these and thus define Kalonda.



Figure 206 Developed lake

The next very important aspect that we aim to achieve is lakeside development. It takes time to develop the Lacustrine, still water, or lentic ecosystem. The still water ecosystem promotes birdlife, aquatic plant life, and aquaculture. Keeping all of these things in mind, in the first year, de-silting of all the lakes, clearing the encroached areas near the lakes, and spotting the trees needs to be done. To maintain the cleaned water, floating fountains must be introduced. These floating fountains help in



Figure 205 Entry/exit development



Figure 208 Existing condition of the lakes



Figure 207 Proposed development in the lake

maintaining the bio oxygen demand of the lakes which keeps the water oxidized and therefore clean and also adds to the aesthetical value of the lakes.

With the increase in population comes an increase in the demand. The demand for housing, workplaces, schools, hospitals, etc. Keeping them in mind, we propose to densify the housing clusters. On analyzing the current population distribution, we can say that more than 50% of the village population is currently in the age bracket of 0 to 19 years which in the future will be the working population. Considering the huge number of the working population in the village, we need to generate a lot of economic opportunities for them so that they stay in the village and do not have to move out to big cities for work. Kalonda crafts, nearby industries, the start of tourism, existing agricultural lands, animal husbandry, etc. will help to build a stronger economy.

The regional forces also play a very important role in the development of the village. The upcoming Jewar airport will help in increasing the value of Kalonda. The development of new airports in any area is likely to boost the area's real estate development and will enhance its image as a business destination thus increasing demand for commercial real estate as well. Moreover, greater commercial activity in a locality will mean *higher* employment opportunities, which directly augments the scope for rental housing. Also, various types of warehouses could develop and these could further increase the employment of nearby places. With such pressure channelizing of construction to appropriate use is necessary.



Figure 209 Economic dependence

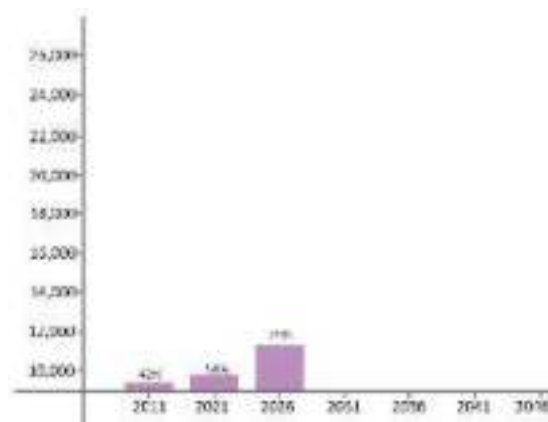


Figure 210 Literacy rate projection



MMLH & MMTH
Metro Connectivity
Airport at Jewar

5 Years

- Multi Modal Transport Hub (MMTH) & Multi-modal Logistics Hub at Borail in Greater Noida
- Extension of Metro-rapid line from Gaur city to Greater Noida Extension with 9 new station
- Asia's Largest Airport at Jewar on a land of 10000 Hectare by 2024

b) The year 2026-2031

Population by 2031 (as projected from the census): **16394**

The rise in Population Density: **291 ppHa**

Thrust areas –

In the next five years as the village densifies further, we deal with the third lake that falls into the urbanized area, which is the *Pokhar Jatav Valimiki Talab* for developing SLWM. This lake will satisfy the increased needs because of the rise in the population. This lake lies in the center of the village and thus if not touched immediately, might get encroached.

Next, we develop the commercial area at the Mata Vala *Talab*. This lake lies towards the village Gesupur. Gesupur and Kalonda already have developed many interconnected roads with each other and if this lake will not be developed now, there is a chance that the encroachment near the lake increases as Gesupur will also grow and so will Kalonda. Therefore the peripheral lake development is very necessary. In this five year GPDP plans, we propose to develop another entry and exit gate. These entries and exits will also serve as spots for parking the vehicles. Currently, not much of the parking is needed, but with time as the village will develop, more and more vehicles will increase and thus will create chaos inside the village. To solve this problem we have proposed one-way traffic routes within the village, with huge parking spots only at the entries and exits of the village. In the lakeside development, Kalonda crafts must be introduced. These Kalonda crafts will grow with time and will

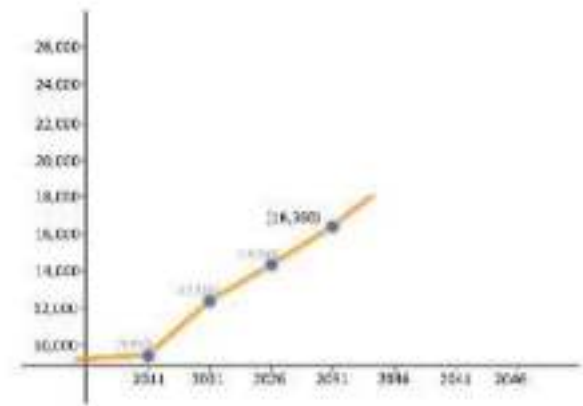


Figure 211 Projected population



Figure 212 Integrated development

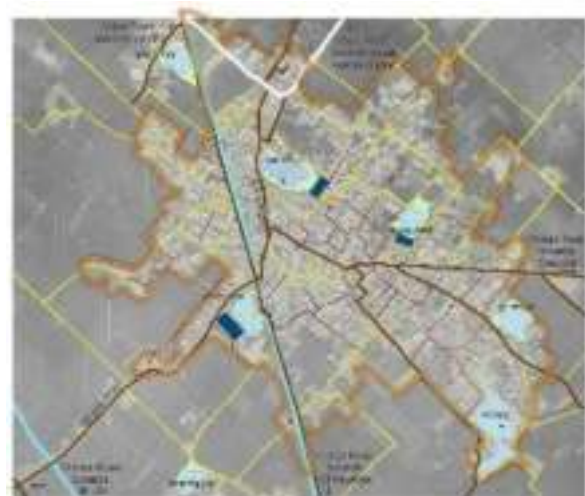


Figure 213 SLWM

help in developing the economy of the village. Kalonda crafts will include all the existing art forms of the village and in addition the simplistic forms of art which can be learned easily by the mass, especially women of the village. The crafts could include weaving, beading, cane work, the making of sun-dried herbs and pickles, handicrafts, etc. These will further add to the economy of the village. Increased industries and increases animal husbandry will also help in building a stronger economy.

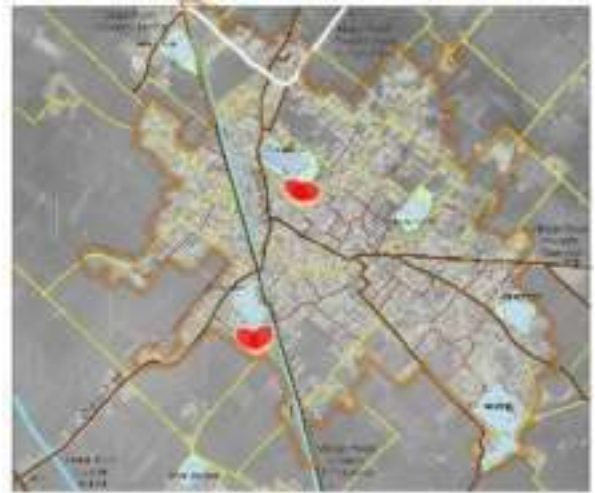


Figure 214 LULM

In the regional context, the Multimodal transport hub and the extension of the aqua blue line of Greater Noida, will directly or indirectly have a major impact on the village. The metro connectivity till Gaur city will reduce the travel time to Kalonda which can allow the workers to go and work in Delhi NCR.

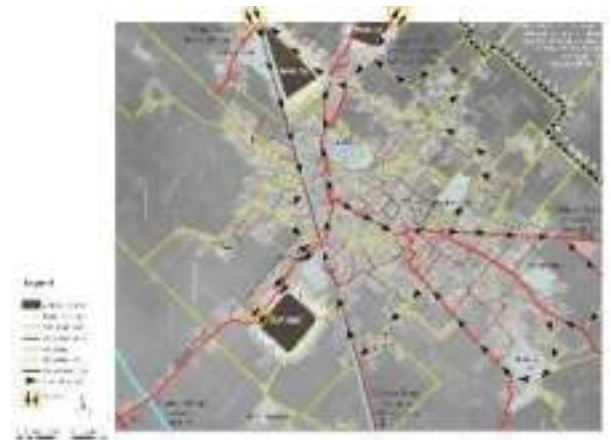


Figure 216 Entry/Exit, One way traffic movement and parking

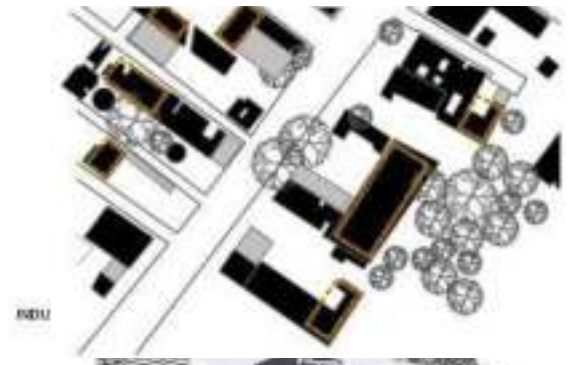


Figure 215 Cluster densification

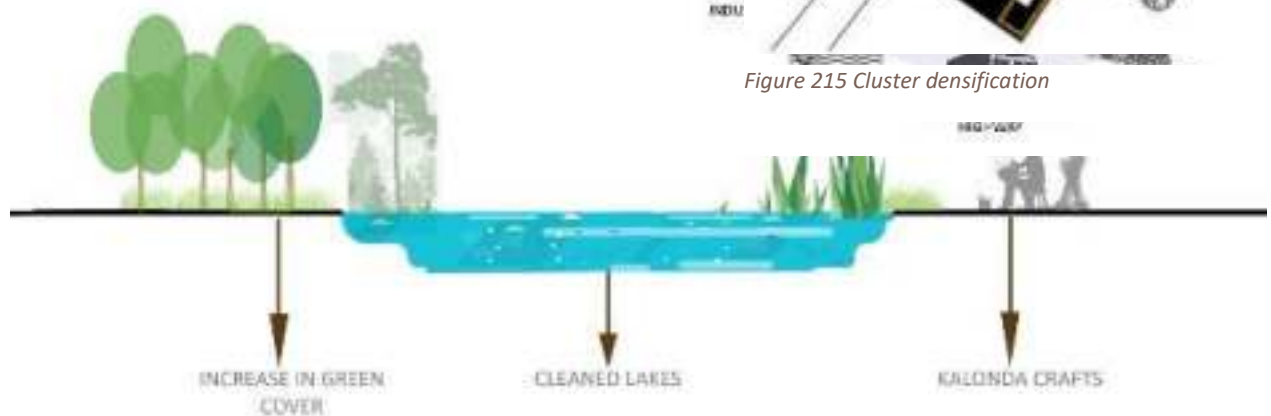


Figure 217 Lake development

c) The year 2031-2036

Population by 2036 (as projected from the census): **19099**

The rise in Population Density: **340 ppHa**

Thrust areas –

In the SLWM establishment system, the next lake Bagha Vala Pokhar which lies on the periphery will be developed. Currently, there is not a need for its development but as the population increases, the greywater will also increase. Thus this SLWM will cater to those needs.

In the GDPs of this lot of 5 years, we propose to develop a commercial area near Naya Talab . The major reason for this development being that it lies on the periphery of the village, and near the parking slots. Therefore the end-users can come and use the space without disturbing the entire village and creating unnecessary chaos. Till this time the last entry and exit gate will also be made and defined.

In the lake vicinity, special institutions congruent to the village environment should be established. These institutions can be old age home, yoga centre, spa, special need home, de-addiction or correction centre, wellness centre, meditation centre, or alternate therapy centre like - magnet therapy, naturopathy, Yunani medicine, flower remedies, etc. These can be in the form of separate centres or can be integrated with the Kalonda crafts and thus become an attraction for the people of nearby cities and districts. It is estimated that new economies will flow towards Kalonda with the establishment of these.

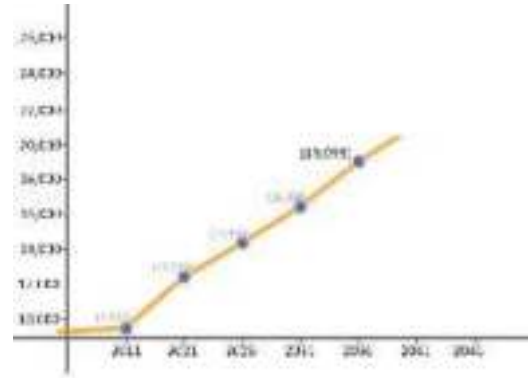


Figure 218 Projected population



Figure 219 Integrated development

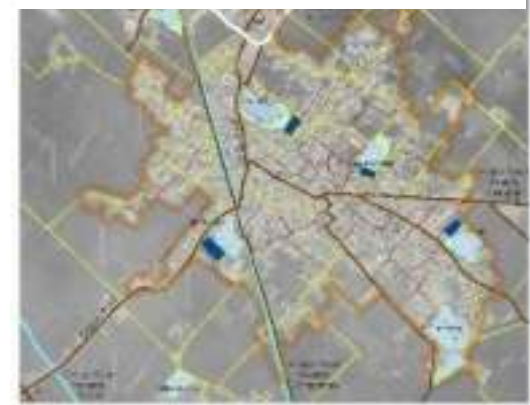


Figure 220 SLWM



Figure 222 LULM



Figure 221 Node densification

Further, we also can connect the village by mass rapid transit system with the nearby cities, districts, and villages, so that the people can work there and return on the same day. In these years we expect, that the Patanjali food park would be fully developed and thus would generate economic opportunities for the village people.

Therefore in 15 years, we plan to achieve optimal densification, utility-oriented development, mixed-use development, sustainable and green village.



Figure 223 Entry/Exit development



DMIC (1500 km long)
Film City (1000 acre)
Data Center (200 acre)

15 Years

- Completion of Delhi – Mumbai Industrial Corridor by 2032
- Improved connectivity and access to states of Haryana, Rajasthan, Gujarat and Maharashtra

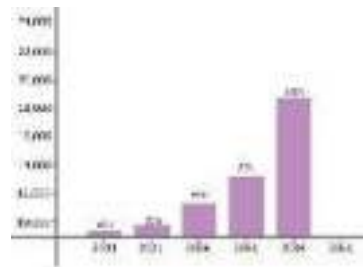


Figure 226 Education rate Projection



Figure 225 Economic interdependency

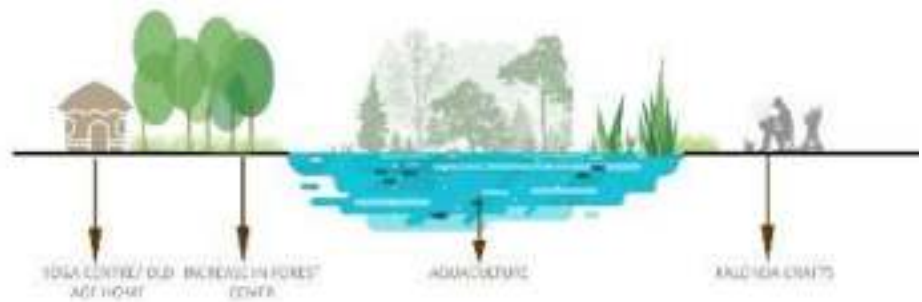


Figure 224 Lake development

d) The year 2036-2041

Population by 2041 (as projected from the census):

21804

The rise in Population Density: **388 ppHa**

Thrust areas –

The lake, Naya Talab lying on the fringe of the village must have a developed SLWM till now, to cater to the needs of the increased population. Alongside the densification of housing, clusters can continue and a commercial area in the Bagha Vala Pokhar can be developed. This commercial area can be an individual area or collaboration or increase of the commercial area of the Naya Talab. The densification of housing clusters continues to happen based on the need.

Meanwhile, the development of aquaculture in the ponds can take place. Also, fishing can be made a chargeable licensed practice as a part of rural tourism. All of these will help to bring back the birds and bring the place closer to nature. In the last five years, the Kalonda crafts must have increased, a small village fare can now be introduced at this point. A fare where people from the village and nearby villages, urban areas can come and buy the crafts.

Alongside we also believe that the literacy rate of the village would have been increased to 100% with new institutions and more awareness.

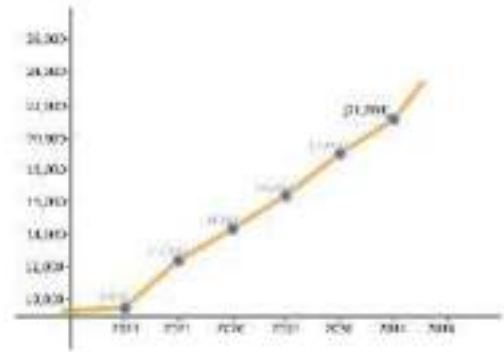


Figure 227 Projected population



Figure 228 Integrated development



Figure 230 SLWM



Figure 229 LULM

Till this point, the Delhi Mumbai industrial corridor would also be running and thus this will provide better connectivity to the village and Delhi NCR for more trade-related economic gains.



Figure 232 Entry/exit



Figure 231 Node densification

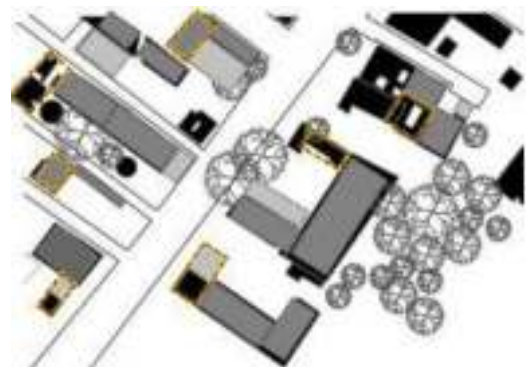


Figure 233 Cluster densification

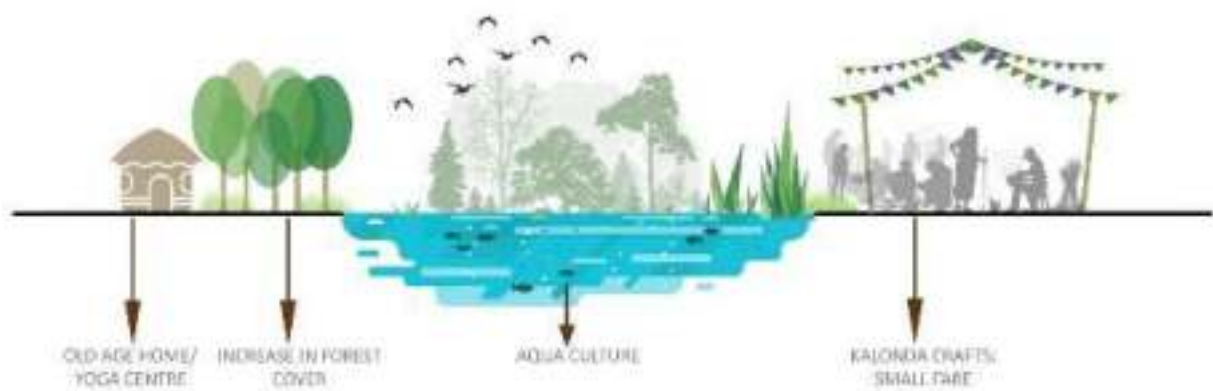


Figure 234 Lake development

e) The year 2041-2046

Population by 2046 (as projected from the census): **25401**

The rise in Population Density: **451 ppHa**

Thrust areas –

It is expected that by this time SLWM at all the lakes of the village would have been developed and thus if further needed we can extend the SLWM system to the Kudkana *Talab* which falls outside the village boundary but is in close proximity of the village. The development of a successful SLWM system will take Kalonda towards sustainability and green.

The commercial area at the last left lake, which is *Pokhar Jatav Valmiki* would be constructed now. This lake lies in the center of the village and thus it will take time to identify the nature of commercial space needed in the area.

Till this time, all the things would have started shaping up. The housing densification will be on full fledge and near to achieving FAR of 1. The nodes would be commercially developed with interconnecting bridges and mixed-use development with a Kalonda Architectural vocabulary.

All the lakes would be fully developed with Kalonda fare at its peak. Thus we can take it to a larger level so that people from nearby cities, districts, and villages can also enjoy and the Kalonda fare becomes and yearly affair.

The institutions also would be running full swing and people from all over would be coming to get closer to nature and the natural treatments. We also believe that with increased awareness and resources by the end of 2046, we would continue with the 100% literacy rate achieved in the previous years, and people will start getting *higher* education as well. Therefore at the end of 25 years, we

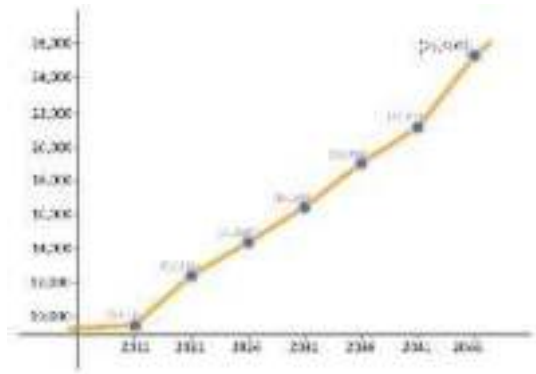


Figure 235 Projected population



Figure 236 Integrated development



Figure 237 SLWM



Figure 238 LULM

visualize Kalonda as a green, sustainable, and self-sufficient village with ample amount of green spaces and retained agriculture fields.

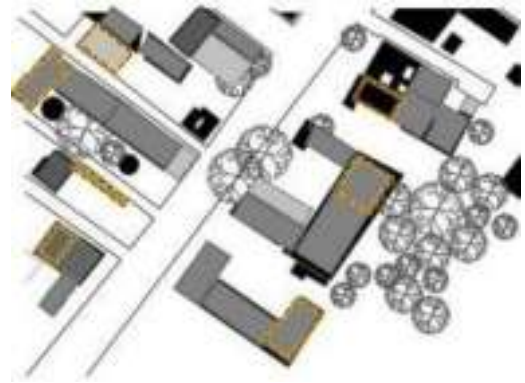


Figure 239 Cluster Densification

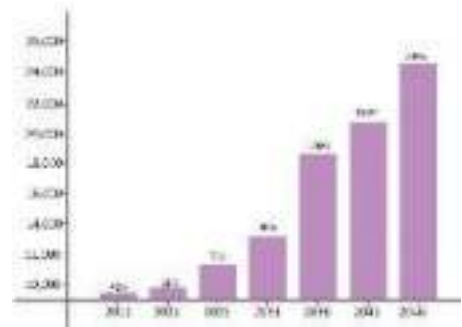


Figure 240 Projected Literacy rate



Figure 242 Densified node



Figure 241 Densified node



Figure 243 Developed lake

	0 Years	0-5 Years	5-10 Years	10-15 Years	15-20 Years	20-25 Years
SLWM						
LULM						
LAKE						
POPULATION						
HOUSING DENSIFICATION						
NODE DENSIFICATION						
NODE DENSIFICATION						
ENTRY/EXITS						
ECONOMY						
INTEGRATED DEVELOPMENT						
REGIONAL FORCES AND FUTURE OPPORTUNITIES						
EDUCATION						

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Annexures

A. An approach to design based planning – through the eyes of charter for new urbanism

In the late 1980s and early 1990s, it was realized that the prevailing development patterns focused more on building dispersed housing far from traditional downtown and main streets. On the other hand the urban renewal in the cities were destroying the fabric and historic neighbourhoods and isolating once stable communities.

As cities continued to decline, a coalition of urban designers, architects, planners, developers, and engineers coalesced to create New Urbanism—a movement for reinvestment in design, community, and place. Their values, and the core principles of their work, are articulated in the [Charter of the New Urbanism \(CNU\)](#).

The Charter is a manifesto for physical and social change in American towns and cities.

New Urbanism is a planning and development approach based on the principles of how cities and towns had been built for the last several centuries: walkable blocks and streets, housing and shopping in close proximity, and accessible public spaces. In other words: New Urbanism focuses on human-scaled urban design.

It is a movement united around the belief that the physical environment we live in has a direct impact on our chances for happy, prosperous lives. New Urbanists believe that well-designed cities, towns, neighbourhoods, and public places help create community: healthy places for people and businesses to thrive and prosper.

Over the past 25 years, the New Urbanist movement has changed the conversation from debating the alternative forms of development to discussing how best to preserve, design, develop, and restore our regions, cities, and neighbourhoods. New Urbanists have been responsible for creating and popularizing many now-common development patterns and strategies, like mixed-use development, transit-oriented development, and traditional neighbourhood design, integrating design standards into affordable housing, and designing complete and beautiful streets.

As momentum for mixed-use, walk able neighbourhoods has grown, New Urbanists have risen to the challenge of building on past successes, establishing new design and development standards, and accelerating the pace of change.

The idea is to work towards achieving three key goals: to diversify neighbourhoods, to design for climate change, and to legalize walkable places. They aim to identify and address the range of issues impeding the development and redevelopment of well-designed neighbourhoods, public places, commercial corridors and rural environments.

The Congress for the New Urbanism(CNU) views disinvestment in central cities, the spread of placeless sprawl, increasing separation by race and income, environmental deterioration, loss of agricultural lands and wilderness, and the erosion of society's built heritage as one interrelated community-building challenge.

The CNU stands for the restoration of existing urban centres and towns within coherent metropolitan regions, the reconfiguration of sprawling suburbs into communities of real neighbourhoods and diverse districts, the conservation of natural environments, and the preservation of our built legacy.

They also are responsible for the restructuring of public policy and development practices to support the principles like neighbourhoods should be diverse in use and population; communities should be designed for the pedestrian and transit as well as the car; cities and towns should be shaped by physically defined and universally accessible public spaces and community institutions; urban places should be framed by architecture and landscape design that celebrate local history, climate, ecology, and building practice. Also they believe that the relationship between the art of building and the making of community, through citizen-based participatory planning and design should be re-established and homes, blocks, streets, parks, neighbourhoods, districts, towns, cities, regions, and environment must be reclaimed.

The CNU asserts the following principles to guide public policy, development practice, urban planning, and design:

The Region: Metropolis, City, and Town

1. Metropolitan regions are finite places with geographic boundaries derived from topography, watersheds, coastlines, farmlands, regional parks, and river basins. The metropolis is made of multiple centres that are cities, towns, and villages, each with its own identifiable centre and edges.
2. The metropolitan region is a fundamental economic unit of the contemporary world. Governmental cooperation, public policy, physical planning, and economic strategies must reflect this new reality.

3. The metropolis has a necessary and fragile relationship to its agrarian hinterland and natural landscapes. The relationship is environmental, economic, and cultural. Farmland and nature are as important to the metropolis as the garden is to the house.
4. Development patterns should not blur or eradicate the edges of the metropolis. Infill development within existing urban areas conserves environmental resources, economic investment, and social fabric, while reclaiming marginal and abandoned areas. Metropolitan regions should develop strategies to encourage such infill development over peripheral expansion.
5. Where appropriate, new development contiguous to urban boundaries should be organized as neighbourhoods and districts, and be integrated with the existing urban pattern. Non-contiguous development should be organized as towns and villages with their own urban edges, and planned for a jobs/housing balance, not as bedroom suburbs.
6. The development and redevelopment of towns and cities should respect historical patterns, precedents, and boundaries.
7. Cities and towns should bring into proximity a broad spectrum of public and private uses to support a regional economy that benefits people of all incomes. Affordable housing should be distributed throughout the region to match job opportunities and to avoid concentrations of poverty.
8. The physical organization of the region should be supported by a framework of transportation alternatives. Transit, pedestrian, and bicycle systems should maximize access and mobility throughout the region while reducing dependence upon the automobile.
9. Revenues and resources can be shared more cooperatively among the municipalities and centers within regions to avoid destructive competition for tax base and to promote rational coordination of transportation, recreation, public services, housing, and community institutions.

The Neighbourhood, the District, and the Corridor

10. The neighbourhood, the district, and the corridor are the essential elements of development and redevelopment in the metropolis. They form identifiable areas that encourage citizens to take responsibility for their maintenance and evolution.
11. Neighbourhoods should be compact, pedestrian friendly, and mixed-use. Districts generally emphasize a special single use, and should follow the principles of neighbourhood design when possible. Corridors are regional connectors of neighbourhoods and districts; they range from boulevards and rail lines to rivers and parkways.

12. Many activities of daily living should occur within walking distance, allowing independence to those who do not drive, especially the elderly and the young. Interconnected networks of streets should be designed to encourage walking, reduce the number and length of automobile trips, and conserve energy.
13. Within neighbourhoods, a broad range of housing types and price levels can bring people of diverse ages, races, and incomes into daily interaction, strengthening the personal and civic bonds essential to an authentic community.
14. Transit corridors, when properly planned and coordinated, can help organize metropolitan structure and revitalize urban centres. In contrast, highway corridors should not displace investment from existing centres.
15. Appropriate building densities and land uses should be within walking distance of transit stops, permitting public transit to become a viable alternative to the automobile.
16. Concentrations of civic, institutional, and commercial activity should be embedded in neighbourhoods and districts, not isolated in remote, single-use complexes. Schools should be sized and located to enable children to walk or bicycle to them.
17. The economic health and harmonious evolution of neighborhoods, districts, and corridors can be improved through graphic urban design codes that serve as predictable guides for change.
18. A range of parks, from tot-lots and village greens to ballfields and community gardens, should be distributed within neighbourhoods. Conservation areas and open lands should be used to define and connect different neighbourhoods and districts.

The Block, the Street, and the Building

19. A primary task of all urban architecture and landscape design is the physical definition of streets and public spaces as places of shared use.
20. Individual architectural projects should be seamlessly linked to their surroundings. This issue transcends style.
21. The revitalization of urban places depends on safety and security. The design of streets and buildings should reinforce safe environments, but not at the expense of accessibility and openness.
22. In the contemporary metropolis, development must adequately accommodate automobiles. It should do so in ways that respect the pedestrian and the form of public space.

23. Streets and squares should be safe, comfortable, and interesting to the pedestrian. Properly configured, they encourage walking and enable neighbours to know each other and protect their communities.
24. Architecture and landscape design should grow from local climate, topography, history, and building practice.
25. Civic buildings and public gathering places require important sites to reinforce community identity and the culture of democracy. They deserve distinctive form, because their role is different from that of other buildings and places that constitute the fabric of the city.
26. All buildings should provide their inhabitants with a clear sense of location, weather and time. Natural methods of heating and cooling can be more resource-efficient than mechanical systems.
27. Preservation and renewal of historic buildings, districts, and landscapes affirm the continuity and evolution of urban society.

Since its ratification in 1996, The Charter for the New Urbanism has had enormous influence on the planning, design, and development of towns and cities worldwide, and has been translated into 12 languages. In 2009, leading CNU members, including two framers of the Charter, created the Canons of Sustainable Architecture and Urbanism to outline operating principles for human settlement that re-establish the relationship between the art of building, the making of community, and the conservation of our natural world.

The CNU has had a great impact on the architects and planners worldwide. A great many examples can be found where the principles for New Urbanism have successfully developed a neighbourhood. One of the major examples can be Architect Peter Calthorpe's successful reconstruction of an 18 acre derelict mall in Mountain View, California into a mixed-use neighbourhood where all residents live within a five minute walk to a train station. This is more integrated vision of energy efficient, and less car-dependent lifestyle.

During 1990's Randall Arendt developed similar principles for rural development and exemplified them in his book *"Rural by Design: Maintaining Small Town Character"*. Randall Arendt's contribution to New Urbanism and Smart Growth has been to approach the design of small town environments from the position of preserving the rural character of the surrounding countryside threatened by suburban expansion. His design approach first establishes the important rural features and landscape components of the property to be developed, safeguards these areas from building activity, and only then inserts new development carefully into natural setting. By clustering development, more land

can be set aside as permanently protected open space, and in many instances this ethos of landscape preservation has added considerable value to new housing.

With careful planning at the community scale, these areas of open space can be connected together to create a long-lasting green infrastructure for the environmental benefit of the community. One downside of this otherwise admirable approach is that the extra economic value conferred on properties developed in the manner raises the cost of housing above the level many people can afford. To overcome this objection, the town of Davidson, North California, has enacted a zoning ordinance that both requires the preservation of 50% open space in new greenfield developments, and the provision of 12.5% of the new housing to be at price ranges refined as affordable, that is accessible to people earning 80% of the national median income. Taken together, these visions of urban and rural sustainability provide the strongest argument for New Urbanism in its alliance with the Smart Growth movement and indeed for the New Urbanism to be synonymous with Smart Growth.

The Design based Planning if done according to the principles of CNU can prove to be an asset for the end users and the environment. The New Urbanists theory to promote human-scale neighbourhood designed around a five minutes' walk from centre to edge can provide a stronger end to end connectivity to the users and will help the region function better. Also it can help to decongest the vehicular traffic on roads by promoting walking, bicycling, transit use, driving, etc., resulting in conversion of the streets to pedestrian friendly from car friendly. Their belief in redeveloping underutilized building types helps in contributing to diverse neighbourhood and promotes mixed use self-sustained development. Provision of plazas, squares, sidewalks, cafes, and porches can promote daily interaction and furnish a stronger public life by giving a sense of community. Above all, the principles take us towards an eco-friendly design and planning approach. A design with decreased carbon footprint, and thus a Sustainable design.

B. Meetings with the Stakeholders

MEETING 1

MEETING HELD WITH GRAM *PRADHAN*-RAJU NAMBARDAR ON 13 JULY 2020

- The first meeting of the village was held at the house of Raju *pradhan's*, on 13 July, 2020 for the purpose of starting the study of the village.
- The meeting proved to be very important as it connected us to the local people from whom we could take key leads and know more about the village. This gave directions to our further study.
- The religious demography which doesn't allow uniformity of the village structure, 75% of the population is Muslim and 25% is Hindu. The Muslim population has grown immensely and the situation is different from initial years when Hindu population was more.
- The increase in inhabitants is adding to the problems. The resources available are for limited number of people. Lack of occupation opportunities are there. Since the majority are not skilled or educated, they follow the primitive methods of farming and majorly do agriculture on their own lands.
- There is insufficient crops for selling in the market and it's not enough for feeding villagers.
- A strong need of vocational training and education is there. Policy should be made and this is important so that people develop skills which can open new employment opportunities.
- Names of all the mohallas were shared and this helped us plan our strategy. We divided the mohallas into different zones so that it is easier to get information through the surveys.
- He told us about all the ponds and water bodies and the problem of surface runoff in the village. So there is a need of surface run off and grey water management policy for the better lifestyle of the villagers.
- He indicated a need of SLWM (Solid Liquid Waste Management) policies. People should have awareness and habit of secluding the organic waste and the other waste before disposing it. While the organic waste can go into the soil but we need to plan for grey water.
- We could plan the next few assemblies over here as he connected us to the Anganwadi women who had some details of the villagers as well as to Akbar Khan who was the primary teacher and another former navy captain.
- Despite efforts by the *Pradhan*, a reluctance was felt from villagers.



Image 33 A picture showing the meeting held with Raju Nambardar at his house

MEETING 2

MEETING HELD IN HINDU QUARTER (Meeting behind Babita's House)

- There was a meeting held behind Babita's house: she invited us to come inside her place. The people of the village were very hospitable. While coming to this place, we perceived that the entrances of the residents were unlocked and doors were open and since it was mid afternoon, most of the people had gone for work and in some only the males had gone to work while children and women were inside the house.



Image 34 Picture of the village showing us walking in the Hindu quarter

- While sitting in Babita's house, we noted down the problems that the villagers have been facing since long times.
- As we stepped outdoor, there were lot of other people coming from the contrary directions and they were very curious to know as to what is our purpose of visit. Meeting in which we asked about what problems they face in their daily routine is summarized under:
 - **Water blockage:** due to which there were more chances of diseases like dengue.
 - **No proper roads (internal):** roads were broken and not maintained properly.
 - **Hindu/Muslim discrimination:** the Hindu lot feels that there has been some discrimination on the basis of caste and because the vote bank from the Muslim is more, they feel that the development in more in terms of infrastructure, streets, sanitation , drainage, roads etc.
 - **No proper drainage:** There was a lot of hygiene issue. There is no waste segregation. There was open dumping of waste by all the households of the villages.
 - **No doctors in the hospital:** As there were no doctors, they had to go to Naveen hospital in Dadri which is 15 km away from their village.
 - Generally they used to do the home made medication but it may not be very effective for any serious disease.
 - **Ladies go to Dadri for delivery:** since there are no doctors around, the deliveries were either done at home or they had to be rushed to Dadri
 - **No employment in the village:** People have to go out of the village for the jobs as there are no inside the village.

- People are **interested in mushroom farming**: They were asking for the advices and methods for the same.
- **Toilet scheme by the government have come and worked up**: Majority of houses had toilets and they are under working conditions. Villages got 12 thousands for making the toilet.
- **No leisure activities**: Most of their energies does not go into anything productive.
- There are **no playgrounds and parks** where they could practice any sport. This is actually inhibiting the hidden abilities of the village.
- **No higher education**: Lot of girls were deprived of *higher* education since people didn't send them outside the village and there is no option inside or nearby to the village. Therefore after twelfth the women are made to learn a household chore which keeps their confidence shallow.



Image 35 Picture of the meeting with village locals

MEETING 3

MEETING HELD IN INTER COLLEGE OF THE VILLAGE

We explained the MoPR plan and intentions to the villagers.

- This is a very old inter college. Our educational minister is from this place as well as many students have gone to navy and other repetitive jobs. The faculty is well educated and well trained for their respective fields.
- The crop pattern has changed from the past from green peas to dhan and gehu as there was no commercial market before and because of wild cows which used to destroy the crops earlier.
- They told us about lot of government land which has been Encroached. This will give us a direction to what is the village's actual boundary and the part that has been encroached.
- There are 3 Eidgah in the village. The Muslims in the village were the converted Muslims and some of them had a Hindu surname with Muslim first name.
- The faculty in the college is trained for agriculture so an agriculture department can be opened.
- There are 5 canals in the village but still there is irrigation problem in the village.
- The implementation of the policy is week.
- The college is quite old but still there has not grown likewise.
- The affluent and educated class of the village is migrating.
- They said that they will help us through their teachers and students for enhancing community participation to ensure house hold surveys.
- They were the people living in the village since very long so they told us about the evolution of the village in detail



Image 36 A picture with the college officials

MEETING 4

A meeting at Dinesh Sisodia's residence

We explained the MoPR plan and intentions to the villagers.

- A meeting was held at Dinesh Sisodia, a resident of the village on 16 July 2020
- He Explained us about agriculture, college and Anganadi..
- He also connected with the Hindu borders along with his sons and wife.
- He explained about the
 - a. **institutional development:** he told us about the number of schools and institutions inside the village
 - b. **limitations of agriculture:** how the primitive methods are being used in agriculture and people are less aware of techniques
 - c. **Medical facilities:** are not great in the village. There has been no corona testing. Generally they treat themselves. Though there is no major disease prevailing in the village but a small number of children have died due to lack of medical facilities.
 - d. **Transport:** public transportation is not very smooth. People have to go to Jarcha by walk and from there they get an auto which leads to the bus from the highway.
- Besides that he told us why the **production of milk is less** as 30 rupees is the cost of milk at which milkman buys which 30 rupees is the cost of the fodder. This doesn't give them any profitable margin.
- **Women employment is very poor:** since women still have to follow the purdah system and are not allowed to go outside frequently.
- For **job opportunities**, people goes out of the village as there is not much generation of economy in the village.
- There is a **very limited educated class** and **no provision for higher education** so people have to go outside the village for *higher* education. So there is lot of people depriving this particularly the females.
- **Water has been stopped** going from one lake to another.
- **Village aspires to be a city.** Though they don't have an answer to what they would want to make their life better and therefore they don't have an understanding of a better village.
- Besides that he told us why the **production of milk is less** as 30 rupees is the cost of milk at which milkman buys which 30 rupees is the cost of the fodder. This doesn't give them any profitable margin.
- **Women employment is very poor:** since women still have to follow the purdah system and are not allowed to go outside frequently.

MEETING 5

MEETING AT OLD PRADHAN KI BAITHAK 1:23 JULY

We explained the MoPR plan and intentions to the villagers.

- **Poverty:** the per capita income of the village is very low. There is a lot of difference in the economic conditions of people. Some have bigger houses while there are some people who have *kaccha* houses where water seeps into due to heavy rainfall. Poverty is also due to more population and no employment opportunities
- No schemes reach the people. People are not aware of lot of schemes. This may be due to the intermediary bodies who have failed to make people aware of them.
- Lack of drinking water: since the water is not
- Water from the bore well has to be filtered.
- Water is hard, has high TDS and is contaminated with salt.
- 400 families work for contractors to get beading work from NSEZ.
- No bank: there are no banks. People are not aware of the loan schemes which can actually change their lives and make it more efficient.
- Work has stopped (due to corona): though this condition globally but since people had resources hand to mouth, the problems here are way bigger.
- No guidance for young men and women: as to what carrier they should go for and how can they achieve some good opportunities in life. They are basically without any guidance and direction. They need to be molded and this is why they waste lot of their time and energies doing nothing fruitfully and we all know once the time is gone, it never comes back.



Image 37 Meeting with the villagers

MEETING 6

MEETING AN OLD *PRADHAN* KI *BAITHAK* 2

We explained the MoPR plan and intentions to the villagers.

- Drinking water: the water is not filtered and people drink the water that comes from boring.
- Low level of primary education: children don't get efficient education on the primary level because of which their base is weak. This may be due to less interest of the students in studying, less guidance of parents (since they may also be less aware)
- Polluted water near the *Pokhar*: since it is much polluted affecting the health of the people living around this place. People dump all the waste inside it openly.
- Lack of furniture in the inter college: since the numbers of students are more than the resources available in the college.
- There is no place for the celebration of any occasion. (FESTIVAL GROUND): these types of spaces unite the people of the village. It gives them convenience in celebrating at one

Place.

- No charagah (meadows-fields for raising cattle): they have space at their home to feed their animals but no open meadow fields.
- There is no provision of an individual's personality development: there is no place where they could get some guidance on how they can work on themselves and how they can improve their overall personality and communication.
- A severe problem of hygiene and cleanliness in the streets despite of employees' .since there are only 2 karamchari for the cleanliness of the complete village.
- No burial ground facility: no ground has been allotted to people where there is burial facility for the Muslim people, though there is shamshan ghat.
- There is no approachable road for shamshan ghat. There is no boundary to the land allotted for this. *Kacchar* roads: a number of *kacchar* roads in the village.

MEETING 7

MEETING AN OLD PRADHAN KI BAITHAK 3:25 JULY

We explained the MoPR plan and intentions to the villagers.

- There are no veterinary hospitals. Though there are no prevailing diseases but there is no place where animals can be cured.
- Drains are blocked: due to which there is no cleanliness on the roadsides and the gutters are also not maintained.
- People of the village stated that, 15 years ago, we were agriculturally independent. The current situation is sufficient for the population that was there 15 years ago.
- 5 irrigation canals running next to the village, yet there is no water for irrigation.
- Electricity breakdown is frequent. No electrical substation is present currently in the village.
- No seed supply and no point for sale of crops. Therefore villages have to go to the market to get the seeds as well as for selling of their crops. But the market is not inside the village rather it is in Dadri
- Distant from highway: since there is no direct conveyance, going to the highway becomes a task for the villagers.
- Water pollution near the *Pokhar*.: in the 3rd meeting also, villagers complaint about the water pollution and dumping issues of the *Pokhar* restricting the cleanliness

MEETING 8

MEETING ON THE CAR: 23 JULY

We explained the MoPR plan and intentions to the villagers.

- Need for organized effort towards require for young men: since they are deprived of the guidance, they feel the need of proper cell helping the youth to get engaged in fruitful activities.
- Roads broken at certain areas: especially secondary roads towards the internal parts of the village.
- Rain water collection up to 6 feet in residential mohallas around the ponds: since there is no level of the plinth, the water collects inside the houses during the heavy rainfall.
- Lack of women education: as stated earlier, women are not sent outside the village and it gets impossible for them to take any further education after 12th standards.
- Absence of alternate profession to peruse in the village other than farming. As they don't have any other skill mostly they have grown up watching their ancestors farming and fulfilling their basic need.
- People have to dig earth for their living
- They travel up to 50 -60 km daily to work as a labor: since there is no in-house opportunities for employment , villagers have to travel far off for opportunities and the daily wage is very less as compared to their efforts in travelling
- Demand for vocational training for youth: so that they develop other skills and also become creative and know their area of interest.
- Proper medical checkups to be done: medical checkups should be done on regular basis within the village so that villagers don't have to travel so much and also the medications can be done on the right time.
- No medicines available in the village: there should be medical stores so that medicines should be available on the emergency basis.



Image 38 A picture of the meeting held with the locals

MEETING 9

MEETING ON THE PAITH CHOWK: 20 JULY

We explained the MoPR plan and intentions to the villagers.

- There was a meeting held at Paith *chowk* on 20 July with the local residents of the village.. They listed few problems and some of them are mentioned below. Polluted drinking water: since it is affecting the health of the people and producing the diseases like typhoid and jaundice.
- Area around water body is encroached: due to increase in population resulting in the scarcity of the resources that the village has for its people.
- Lack of medical facilities: people have complaint that there are no doctors. On finding out we also noticed that there are no delivery cells in the hospital. No one goes for the medical checkups. People generally take home remedies instead of consulting the doctor's advice. Also there are no chemist shops where medicines are available readily. They have to go to Dadri for any medical facility. Though we haven't seen any disease prevailing but we have noticed some children have died due to lack of medical facility.
- Position of ponds: we also discussed the position of ponds in the village so that we could plan our spaces accordingly as in we can use this feature (of pond) efficiently.
- Diseases (stones gall bladder) prevailing around mata ka *Talab* : since this *Talab* has become dump yard for the people living around.
- Migration of the affluent business community from Kalonda: as discussed in the previous meeting, here also we talked about lack of resources and employment opportunities because of which the affluent class has migrated. Mostly the people who live here are the laborers who do up down on the daily basis.
- Houses lying vacant in central Kalonda since people have migrated: especially the Hindu lot has gone outside the village instead of improving their conditions inside the village.

MEETING 10

MEETING AT PAITH CHOWK: 20 JULY

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- Position of ponds: we also discussed the position of ponds in the village so that we could plan our spaces accordingly as in we can use this feature (of pond) efficiently.
- Diseases (stones gall bladder) prevailing around mata ka *Talab* : since this *Talab* has become dump yard for the people living around. This was substantiated in water analysis
- Migration of the affluent business community from Kalonda: as discussed in the previous meeting, here also we talked about lack of resources and employment opportunities because of which the affluent class has migrated. Mostly the people who live here are the laborers who do up down on the daily basis.
- Houses are lying vacant in central Kalonda since people have migrated. Especially the Hindus have gone out of the village instead of improving the conditions inside the village.
- Lack of banks: for providing loans, pensions and the saving accounts. To the people.
- Lack of commercial institutions: there is no infrastructure for the institutions and the ones existing have less number of resources.
- Lack of good primary education: due to which students are unable to get a strong base.
- Lack of option of *higher* education in the village: as discussed several times, in this also we heard people complaining the limitation of *higher* education options as well as vocational training centres in the village which makes them deprive of the further education. The time and energy of the youth cannot be used fruitfully specially the women who are supposed to do the household chores only.



Image 39 A meeting at the paith chowk

MEETING 11

MEETING WITHIN MOHALLAS

We explained the MoPR plan and intentions to the villagers.

- The following are the inferences of all the live meeting we have had with the people.
- Inferences:
- Lack of aspirations within the problems due to lack of exposure.
- People don't have aspirations for making their lifestyle better. They either want to leave the village and go towards the town or live the same way. This may be due to their lack of exposure or the intermediary bodies unable give them a vision of a better village.
- They do not have proper addresses: they do not have the papers of their houses so they do not have the proper address. The bonding inside a village allows them to know each other's house only by name. This is a great thing in today's time but not having address will limit the online as well as courier services if used on the bigger scale.
- Lot of schemes has come up in the village but some people are not aware of them: this may be because of the intermediary bodies unable to work properly.
- Nobody wants to learn new things: people have been living the same way since very long. They are so much equipped with their comfort zone that they do not want to do something new, take chances and achieve something bigger than what they have. This may be due to their hesitation of the society or they think they will not be able to fit in or maybe they think probably this is the only way, one is supposed to live.
- There is no financial support for improving houses: There are no schemes for the government in which they can improve their houses built several years ago. The level of the ground has also changed with respect to the road level. Some of the *kaccha* houses has the problem of rain water coming inside and therefore there is a severe need for better infrastructure as a basic necessity
- Lack of unity between the two communities: this is very important for the benefit of the village as a whole. We need some community spaces, festival celebrating spaces as well as playgrounds to build a bonding between the two communities.
- No recreational activities for the youth: this is due to the lack of playgrounds and parks
- There is no waste management for disposal: this is the reason why people dump all their waste at the streets, on the roads and in the water openly.
- No *higher* education for villages and particularly women who are not sent out by their families.
- The houses are old but the ground level has changed. Therefore in older areas these make conditions better for the health benefits of the people.
- There has been the expansion of the village in terms of population but not in terms of area. So there will be a collision soon. There is no management of waste for disposal.

- No *higher* education for villages and particularly women who are not sent out by their families. The nearest options of *higher* education are at Dadri which is 15 kms away and there is no direct route or transport available. So most of the people don't go for *higher* education and most of such people include women.
- There has been the expansion of the village in terms of population but not in terms of area. So are chances of collision anytime soon especially for the Hindu lot.



Image 40 Houses of village



Image 41 Dumping of garbage in the village

MEETING 12

Meeting with block development officer, Ankit Tomar

A meeting was held and the inception report with the outline of proposals as explained. The stake holder agreed to the outline. Some observations are noted as under:

- A zoom meeting was held on 19th august with the block development officer who manages 4 villages of Dadri for Shri Kumar Singh Yadav. There were different discussions with him on various fields.
- He told us about the “krishi vibhag” which provides people with machineries and fertilizers for the purpose of agriculture.
- There is a great need to improve it as people having bigger acres of land are shifting to the towns and very less number of people use agriculture commercially.
- Therefore pashudhan and organic farming are not growing at any pace.
- The five year plan of the officer includes working on all the *kacchar* roads and the drainage systems. Besides that, he also advised for an amendment of some act to be made in order to control the population growth.
- He also told us that for encroachment issues, we should connect to the lekhpal and patwari of the region.



Image 42 Virtual Meeting with block development officer, Ankit Tomar

- As of now, few projects are going on such as *pradhan's* office, w50 roads, 25 inter locking paving roads, the finishing of floor from primary school 1 and 2.
- He said for maintaining the unity of two communities, we should not give much attention to the community based fights.
- They are still working for improvement of garbage dumping practices in the houses of the village

- For the upcoming project , which includes women 's empowerment programmed in which there will be 4 cells of
- Help group having few women who will be staying in the village for 15 days and opens up 30 systems.
- This scheme is called NRLM and offers the loan of 15 thousands to 25 lakhs so that they can help the women of the village to open up their own source of income. The interest is kept nil so that women are not afraid from taking the loan. These can be used to form co operations.
- The officer suggested mechanical training in carpentry as some of the vocational training programmed as it is related to the background of the villagers.
- The officer has said that tourism will support the economy of the village if planned properly.

MEETING 13

A MEETING DEPUTY DIRECTOR, PRAVEENA CHOUDHARY

A meeting was held and the inception report with the outline of proposals as explained. The stake holder agreed to the outline. Some observations are noted as under:

- A meeting was held on 21 august with the deputy director, Praveena Choudhary.
- We discussed with her various issues of the village and she has been very supportive throughout.
- Her department, *Panchayati raj* played role for sanitation and water supply systems for this she said, that finance commission fund receives 30 to 40 lakhs from which at least 50% should be spent on sanitation and improved water quality.
- They conduct annual meeting for making plans and she advised us to go through these plans to see how they are working on the improvement.
- She told us that this plan can be available from the *Pradhan* and the secretary of the village.
- We were advised to prepare a GDPD for the coming year which we have attached in this report.



Image 43 Virtual meeting with deputy director

MEETING 14

MEETING WITH KUNWAR JI

A zoom meeting was held on 22.8.2020 with Kunwar ji and he gave us a number of information related to the current road scenario of the people. A meeting was held and the inception report with the outline of proposals as explained. The stake holder agreed to the outline. Some observations are noted as under:

- A meeting was held with Kunwar ji on zoom and we talked to him about the transportation system of the village. People have to go to Jarcha to take an auto, till then they have to walk and then they get a bus for their destination.
- There is no such problem of transport in the village.
- The work of road is under construction in some of the areas while in some areas it is made.
- The drainage and sanitation requires lot of efforts and work for that is still in progress.
- He updated us with an in depth insight into villages.
- The process of *Panchayati Raj* limitations and the honest intent was expressed.



Image 44 Virtual meeting with Kunwar ji

MEETING 15

A MEETING WITH DR. AMIT (health department)

A meeting was held and the inception report with the outline of proposals as explained. The stake holder agreed to the outline. Some observations are noted as under:

- A zoom meeting was held on 25.8.2020 with the health department official and he gave us a number of information related to the current health scenario of the people.
- He told us about the Jarcha, which is an additional district having a hospital for the people of Kalonda. The district is 3 kms from the village and Kalonda people go there.
- The Jarcha hospital works on the normal OPD schedule which is 8-2 in March to October and 10-4 October to march.
- The recruitment of doctor is done by the central government.
- There are various programs to make women aware of their health and take care of themselves. Some of such programs would include ANM: Auxillary nurse mid wise as well as central govt. programme like R.I. (for women and child care) and CHO (breast cancer).
- The other vaccinations like polio are scheduled time to time in the village according to the load.
- The common diseases are related to stomach, skin, cold etc.
- The problems that have been faced by them are the community beliefs and rigidness.
- He also feels Kalonda should be facilitated by a hospital.



Image 45 Virtual meeting with Dr. Amit

C. Data analysis and GIS mapping in the progress report

GIS Vector layers shared by NIC in shapefile format

S.No.	Name of layer	Major Attributes
1.	<u>UP PanchayatBoundary</u>	<u>Gp_code</u> , <u>subdistrictname</u> , <u>districtname</u> , <u>statename</u> , <u>gname</u> , <u>state_2011</u> , <u>district_2011</u> , <u>subdistrict_2011</u> , <u>remark-single GP</u>
2.	<u>UP_Road</u>	<u>Class</u> , <u>classcode</u> , <u>type</u> , <u>type_code</u> , <u>name</u> , <u>road_code</u>
3.	<u>UP_RailwayLine</u>	<u>objectID</u> , <u>Shapelength</u> , <u>trackname</u> , <u>status</u>
4.	<u>UP_River</u>	<u>Class</u> , <u>shapelength</u> , <u>shape area</u>
5.	<u>UP_Canalline</u>	<u>Class</u> , <u>type</u> , <u>shapelength</u>
6.	<u>UP_Canalpoly</u>	<u>Class</u> , <u>type</u> , <u>shapelength</u> , <u>shape area</u>
7.	<u>UP_WaterBody</u>	<u>Class</u> , <u>type</u> , <u>shapelength</u> , <u>shape area</u>
8.	<u>UP_Settlement</u>	<u>Class</u> , <u>type</u> , <u>shapelength</u> , <u>shape area</u>

Metadata

S.No.	Name of layer	Data Type	Date of generation	Scale	Remarks
1.	<u>Landuse/Landcover</u>	Polygon	2010-11, 2015-16	1:10000, 1:50000	<u>Landuse planning at 1:2000 or 1:5000 needs to be done</u> , with further sub categorisation, for analysis at village level. Presently Map is made with the 3 visible Land use types- Water Body, Agriculture Land and Built-up Area(Rural).
2.	Settlement	Polygon	2010-11	1:10000	Layer shows the outer boundary line for all settlements in the <u>Panchayat</u> area and the surrounding area. No Land Parcels demarcated. Cadastral Map is required
3.	Road	Line	2010-11	1:10000	Layer shows the Road Network for the <u>Panchayat</u> and surrounding areas. Further Road Networking and hierarchy developed through on site reconnaissance survey.
4.	Rail	Line	2010-11	1:10000	NA, Rail Network <u>doestnot</u> exist in <u>Kelonda Village</u> .
5.	Drainage	Line	2010-11	1:10000	Drainage pattern at 1:2000 or 1:5000 is required. Drainage pattern developed through Google Earth and DEM Modelling.
6.	Slope map	Polygon	2010-11	1:10000	NA, Earth DEM used to develop Lake drainage and sloping pattern

GIS Vector layers shared by NRSC in shapefile format

Phase 1

S.No.	Name of layer	Major Attributes
1.	<u>Clip Drainage UP</u>	<u>Category,grid.stcode,drcode,pi code,</u>
2.	<u>Clip LULC UP</u>	<u>Grid,Lccode,description1,2,3, shapelength,shape area, pi code, st code</u>
3.	<u>Clip Rail up</u>	<u>Grid.type,pi code.status,category,shapelengt h,stcode</u>
4.	<u>Clip Road UP</u>	<u>Grid,layer,type,status,tr rdcode,shapelength, category,stcode</u>
5.	<u>Clip Settlement UP</u>	<u>Grid,shapelength,shapearea, description1,2,3, set code,stcode, pi code</u>
6.	<u>Clip Slope UP</u>	<u>Grid.shapelegth,class.fcode, range.grid code, shape area, stcode, SLcode</u>

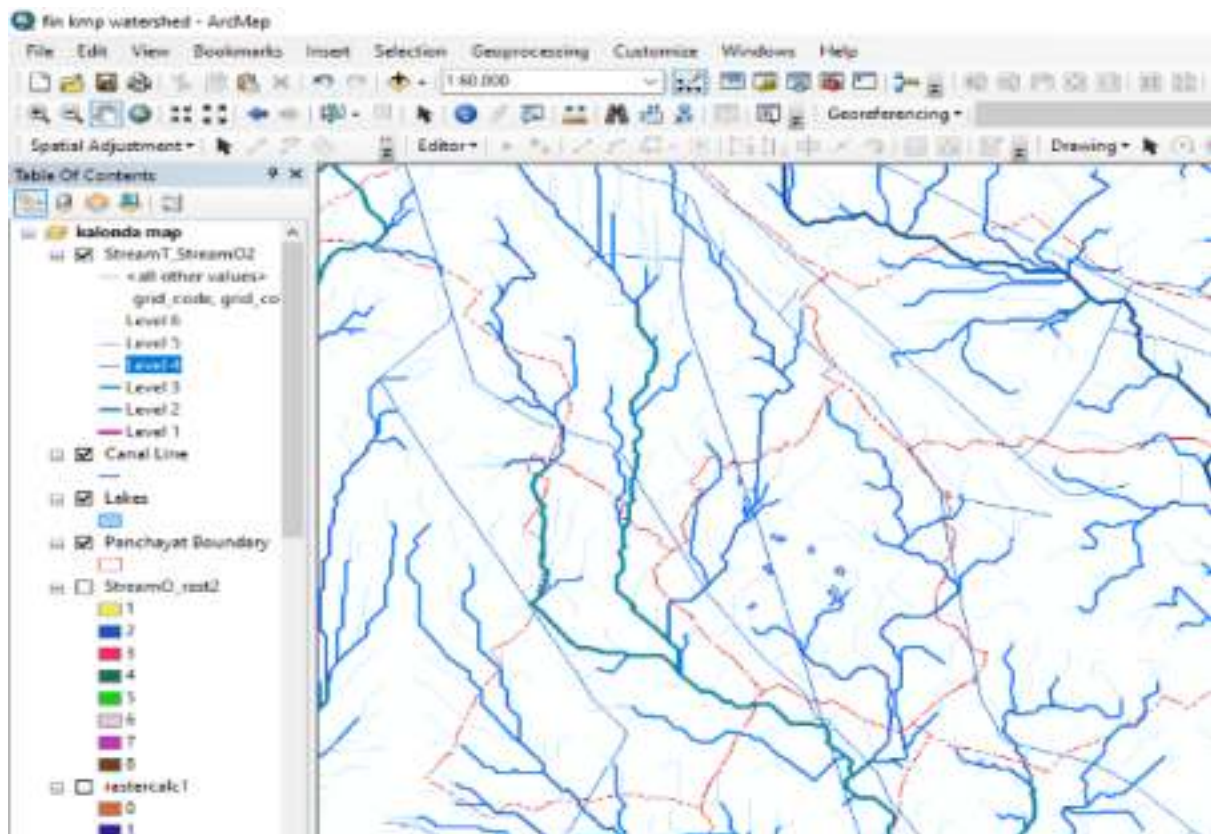
GIS Vector layers shared by NRSC in shapefile format (relevant District-GB Nagar only mentioned)

Phase 2

S.No.	Category	Name of layer	Major Attributes
1.	CONTOUR	<u>contour_clip_GBNagar</u>	Contour levels
2.	GEOMORPHOLOGY	<u>GBNagar_clip_Geomorphology</u>	One entry- Alluvial Plain-Older/Upper, Under Canal Command
3.	LITHOLOGY	<u>GBNagar_clip_Lithology</u>	One entry-unconsolidated sediments,Alluvium clay dominant, stratigraphy, rocktype, GW Mapcode
4.	LULC	<u>final_UP_LULC_new</u>	<u>grid, Lccode, description1,2,3, shape length, shape area, pi code,stcode</u>
5.	SOILS	<u>GBNagar_clip_soil</u>	<u>soilID, soil code, order,so order,group, family,series</u>

Raster Data sets

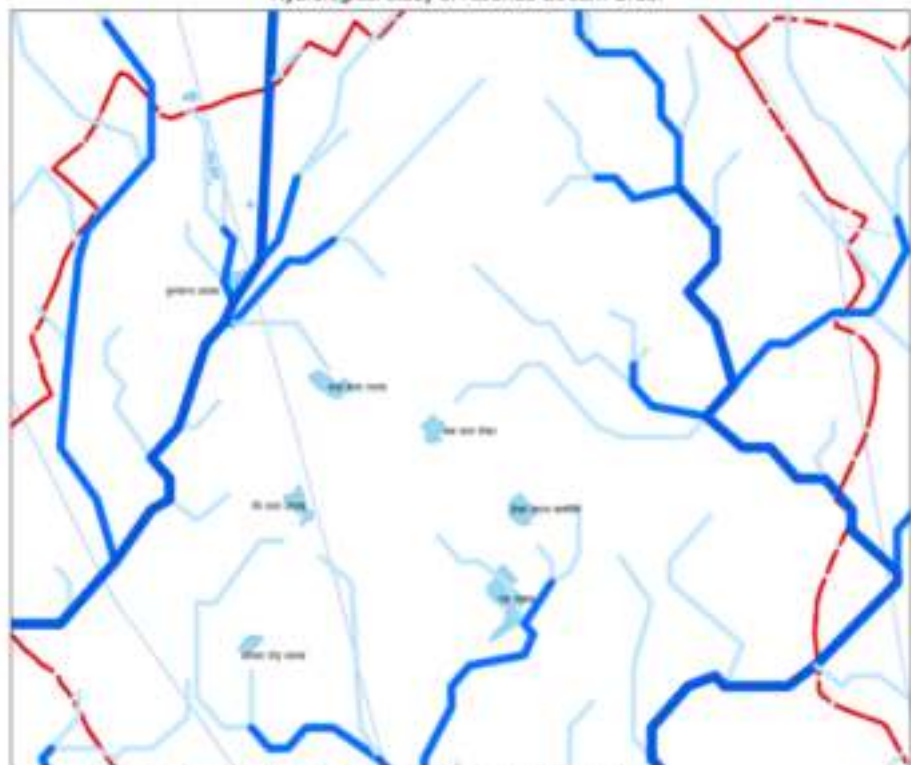
S.No.	Category	Name of layer	Major Attributes
1.	Satellite imagery	<u>Clip-UP_Satellite</u>	Natural colour composite
2.	DEM	<u>Clip_DEM_GBNagar</u>	count

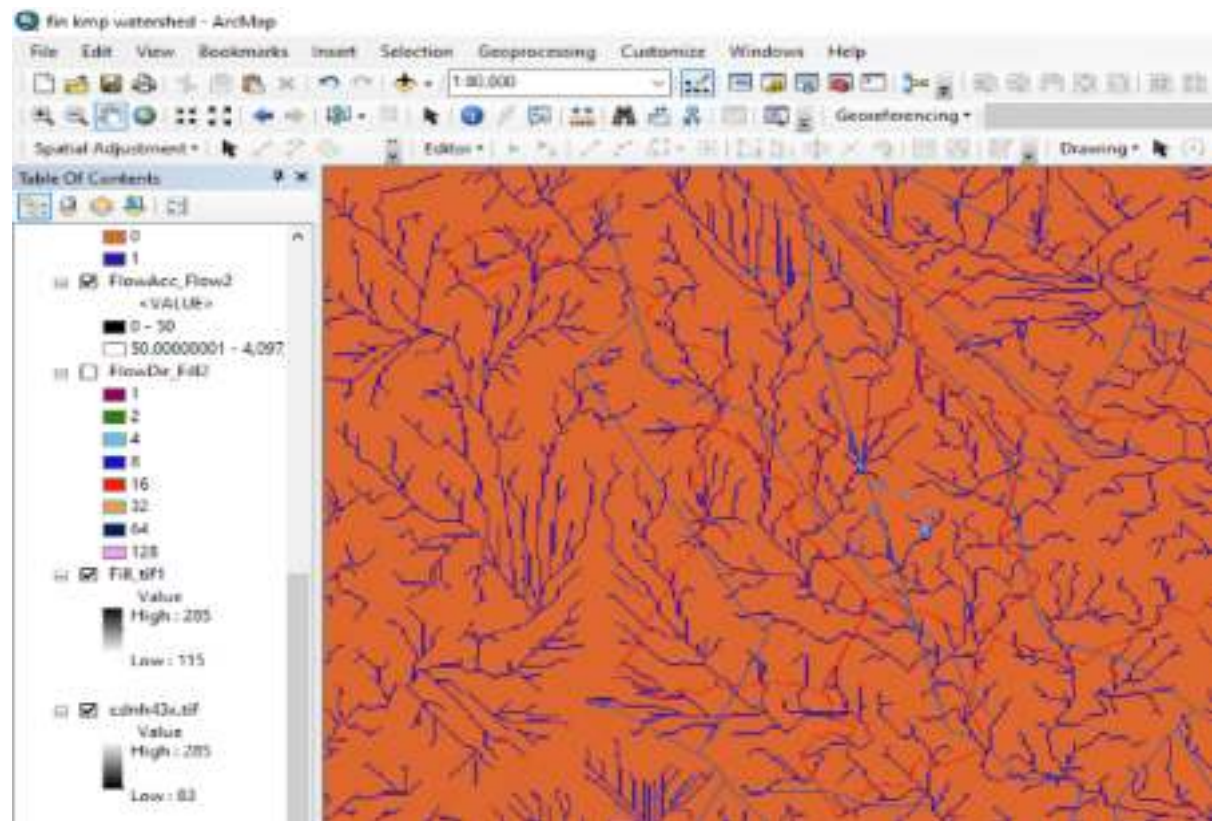
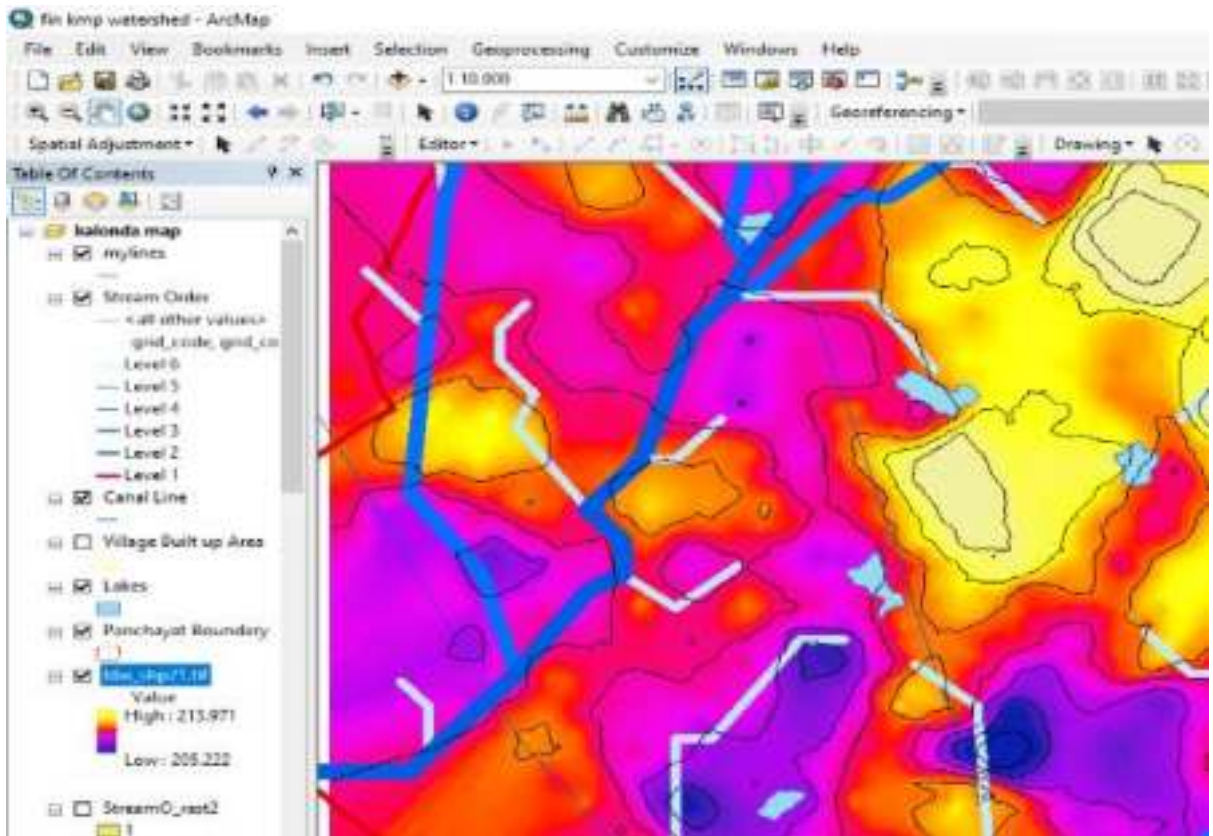


Run-off Estimation for Settlement

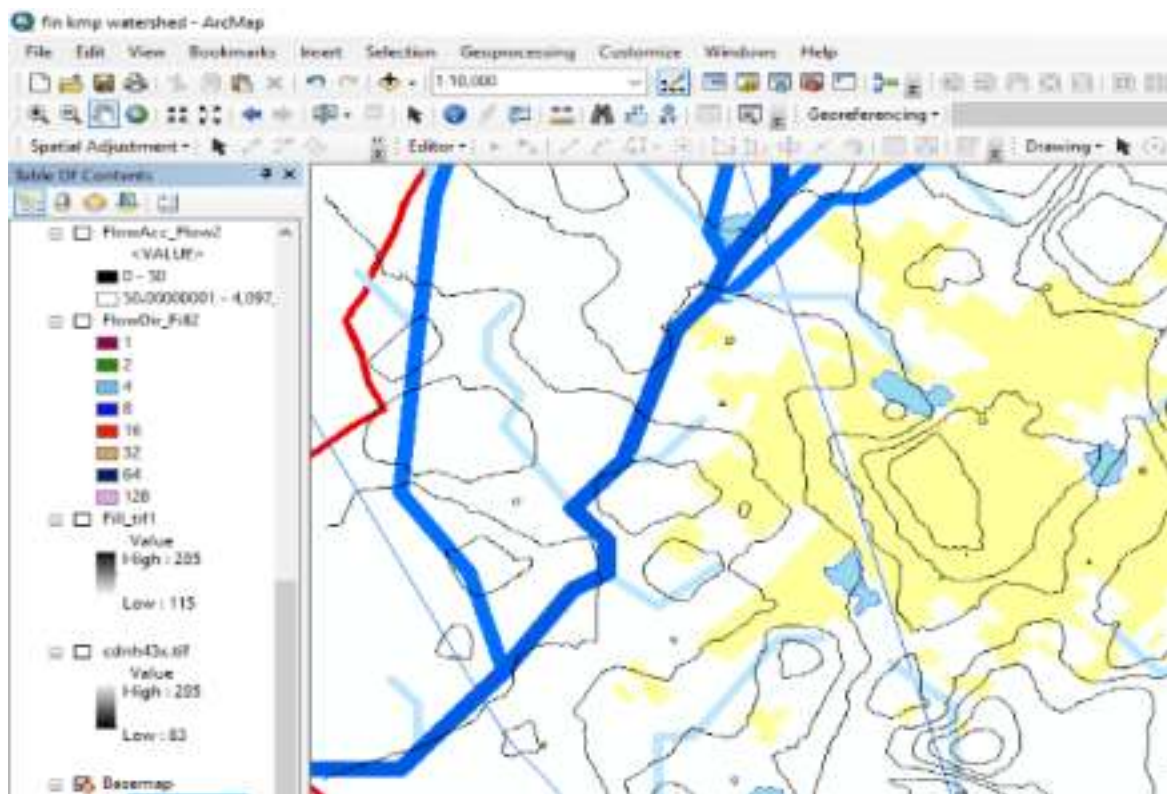
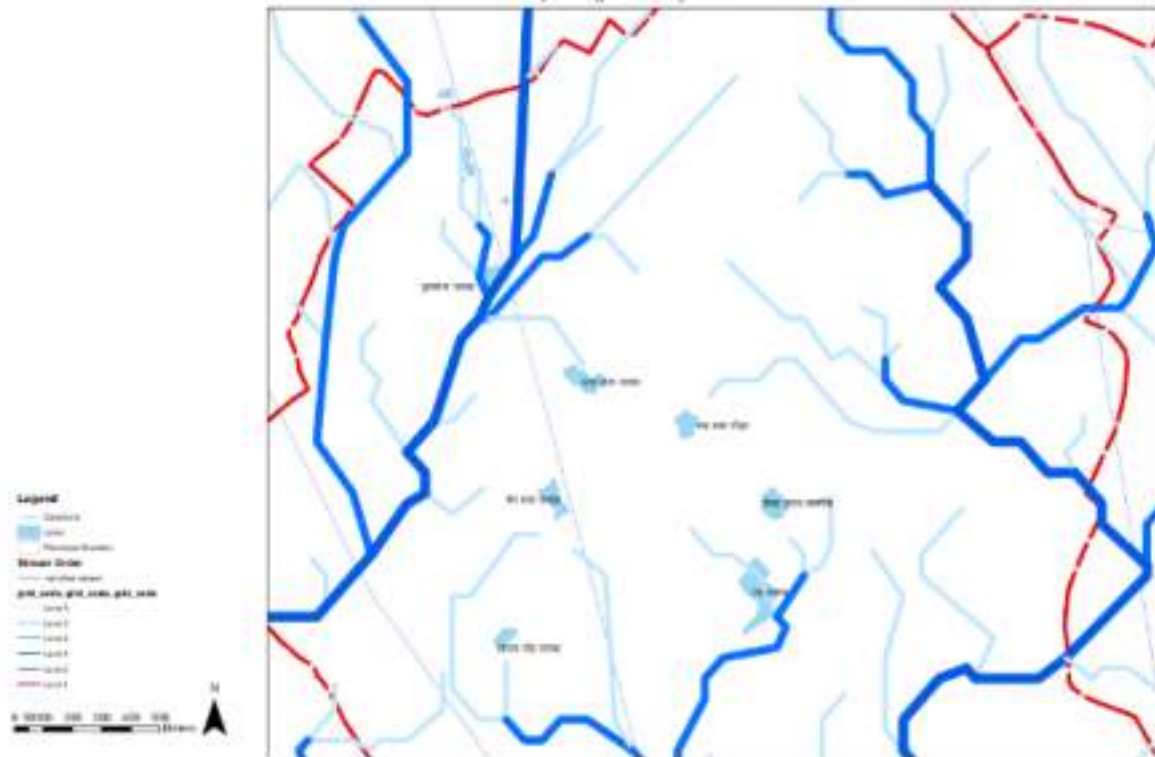
Hydrological study of Kalonda-Stream Order

- Catchment total area=
- Assuming average annual rainfall as 600mm as per meteorological data of Sikandrabad
- Estimated surface runoff within settlement area= $0.65 \times 600 \times 10$

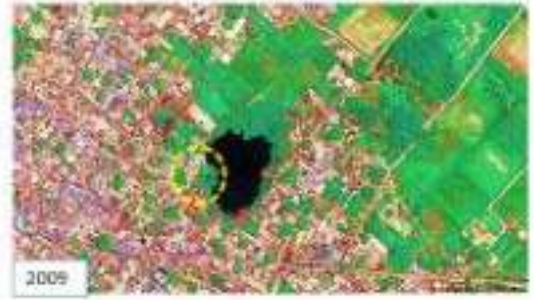
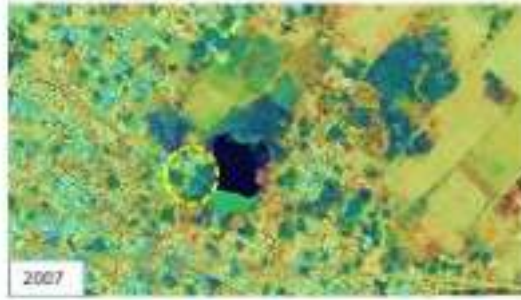




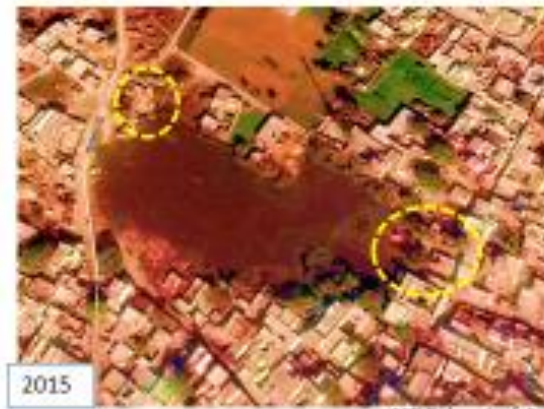
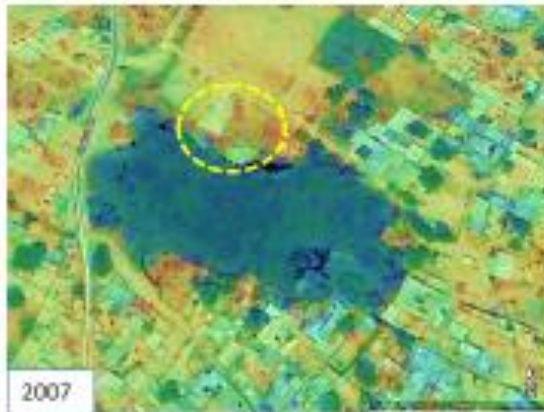
Hydrological study of Kalonda-Stream Order



Change in Lake boundary- Pokhar Jatav Valmiki



Change in Lake boundary- Mata wala talab



Change in Lake boundary- Pokhar Jatav Valmiki



These are images from satellite clearly showing huge disposition of mud and sand on lakes followed by encroachments. Many lakes have suffered due to heavy silt deposits.

D. Water Test Results

Water Test Results : Kalonda Village, Dadri,

G.B. Nagar, UP.

The water testing samples were collected on site on 16th September 2020. The testing agency was , Shri Om Testing and Research Laboratory, Noida, UP.

The test was conducted as per IS-10500-2012, under 17 parameters including, Color, Odour, Taste, Turbidity, pH, Total dissolved solids, total hardness, Iron, Chlorides, fluorides, calcium, Magnesium, Copper, Nitrates, Arsenic, Manganese and Sulphates

S. No.	Parameters	Test Method	Units	Limits as per IS:10500-2012)		WHO Standards	Testing Results									
				Desirable Limit	Permissible Limit		Location No.1	Location No.2	Location No.3	Location No.4	Location No.5	Location No.6	Location No.7	Location No.8	Location No.9	Location No.10
1	Color	IS:3025(Pt-4) 1983, Reaff. 2017	Hazen	5	15		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2	Odour	IS:3025(Pt-5) 1983, Reaff. 2018		Agreeable	Agreeable		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Taste	IS:3025(Pt-8) 1984, Reaff. 2017		Agreeable	Agreeable		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	IS:3025(Pt-10) 1984, Reaff. 2017	NTU	1	5		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

5	pH	IS:3025(Pt-11) 1983, Reaff. 2017	6.5-8.5	No Relaxation	6.5 to 8.5	6.84	7.08	7.13	7.31	7.23	7.61	7.02	6.83	7.04	7.43
6	TDS	IS:3025(Pt-16) 1984, Reaff. 2017	Mg/l 500	2000	300	853	603	536	730	622	507	744	1034	730	575
7	Total Hardness (as CaCO ₃)	IS:3025(Pt-21) 2002, Reaff. 2019	Mg/l 200	600	0-75 #	804	360	356	368	364	320	484	648	508	312
8	Iron (as Fe)	IS:3025(Pt-53) 2003, Reaff. 2019	Mg/l 0.3	No Relaxation	0.2 *	0.18	<0.01	<0.01	0.18	0.09	0.09	0.08	0.18	<0.01	0.1
9	Chlorides (as Cl)	IS:3025(Pt-32) 1988, Reaff. 2019	Mg/l 250	1000	250 *	152.3	269.8	10.2	173.7	110	85.2	173.9	347.9	205.9	106.5
10	Fluoride (as F)	APHA 22 nd Ed., 4500F (D)	Mg/l 1	1.5	1.5	0.11	0.13	0.12	0.11	0.07	0.11	0.11	0.1	0.11	0.13
11	Calcium (as Ca ²⁺)	IS:3025(Pt-40) 1991,	Mg/l 75	200	200 #	70.4	72	32.8	78.4	31.2	32.2	43.2	56.7	47.9	26.7

		Reaff. 2019														
12	Magnesium (as Mg ²⁺)	APHA 22 nd Ed., 3500-Mg(B)	Mg/l	30	100	50.0 #	104	43.7	66.9	42	69.8	58.6	90	103	94.7	59.8
13	Nitrate (as NO ₃)	IS:3025(Pt-34) 1988, Reaff. 2014	Mg/l	45	No Relaxation	50	18.6	16.8	14.9	13.4	15.1	11.2	16.5	18.7	16.3	14.6
14	Copper (as Cu)	APHA 22 nd Ed., 3120 B/3111 B (AAS)	Mg/l	0.05	1.5	2.0 *	<0.01	<0.01	<0.01	<0.01	<0.01	0.18	0.12	0.11	0.17	<0.01
15	Arsenic (as As)	APHA 22 nd Ed., 3120 B/3114, AAS-VGA	Mg/l	0.01	0.05	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
16	Manganese (as Mn)	APHA 22 nd Ed., 3120 B/3111 B (AAS)	Mg/l	0.1	0.3	0.05 *	0.02	0.02	0.02	0.02	0.02	≤0.01	0.02	0.02	0.01	0.02
17	Sulphate (as SO ₄)	IS:3025(Pt-24) 1986,	Mg/l	200	400		53.7	56.8	51.1	48.5	54.9	56	54.8	56.3	49.2	54.8

		Reaff. 2019												
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Parameter

1. Color

- Within Safe Limit
- Beyond Safe Limit
- Beyond Dangerous Limit

If the water has any coloration whatsoever, it attracts a disgusted reaction from the consumer.



Parameter

2. Odour

- Within Safe Limit
- Beyond Safe Limit
- Beyond Dangerous Limit

If the water has any odour, it renders the consumer abhorrent.

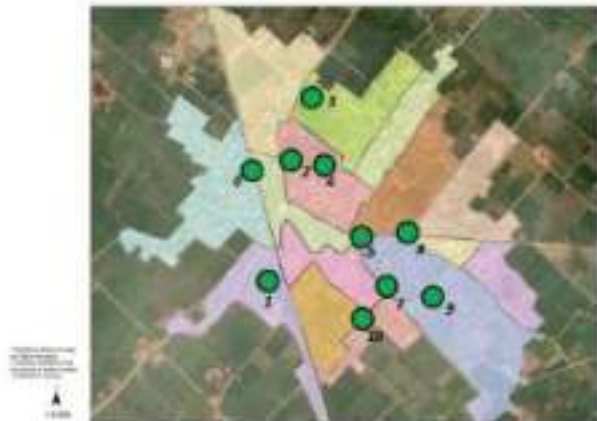


Parameter

3. Taste


- Within Safe Limit
- Beyond Safe Limit
- Beyond Dangerous Limit

If the water has any taste beyond the permissible limit, it makes it non-potable, as well as repulsive.



Parameter

4. Turbidity

-  Within Safe Limit
-  Beyond Safe Limit
-  Beyond Dangerous Limit

High turbidity in drinking water can shield bacteria or other organisms so that chlorine cannot disinfect the water as effectively. Some organisms found in water with high turbidity can cause symptoms such as nausea, cramps, and headaches.



Parameter

5. pH Value

-  Within Safe Limit
-  Beyond Safe Limit
-  Beyond Dangerous Limit

When the PH of water becomes greater than 8.5, water taste can become more bitter. This elevated pH can also lead to calcium and magnesium carbonate building up in your pipes. While this higher pH doesn't pose any health risks, it can cause skin to become dry, itchy and irritated.



Parameter

6. TDS




-  Within Safe Limit
-  Beyond Safe Limit
-  Beyond Dangerous Limit

While these solids may not affect human health, they can cause technical damage to plumbing and surfaces. Elevated TDS levels can indicate corrosive water. If drinking water has high corrosivity, it will often contain high amounts of chloride, iron, copper, manganese, or zinc.

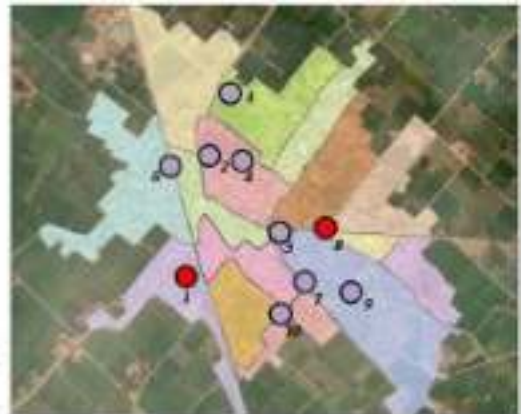


Parameter

7. Total Hardness (as CaCO₃)




-  Within Safe Limit
-  Beyond Safe Limit
-  Beyond Dangerous Limit

Among them a good percentage consumes hard water, which is considered to be a significant etiological factor around the globe causing many diseases such as cardiovascular problems, diabetes, reproductive failure, neural diseases, and renal dysfunction and so on.



Parameter

8. Iron (as Fe)

-  Within Safe Limit
-  Beyond Safe Limit
-  Beyond Dangerous Limit

A dose of 1500 mg/l has poisoning effect on a child as it can damage blood tissue.

Digestive disorders, skin diseases and dental problems.



Parameter

9. Chlorides




-  Within Safe Limit
-  Beyond Safe Limit
-  Beyond Dangerous Limit

Although excessive intake of drinking-water containing sodium chloride at concentrations above 2.5 g/litre has been reported to produce hypertension (12), this effect is believed to be related to the sodium ion concentration. A normal adult human body contains approximately 81.7 g chloride.



Parameter

10. Fluoride

-  Within Safe Limit
-  Beyond Safe Limit
-  Beyond Dangerous Limit

Immediate symptoms include digestive disorders skin diseases, dental fluorosis



Parameter

11. Calcium (as Ca²⁺)

-  Within Safe Limit
-  Beyond Safe Limit
-  Beyond Dangerous Limit



The Health Effects of Hard Water

Studies have generally found hard water to have positive effects on the health of its drinkers. Several studies have reported that calcium and magnesium in drinking water have a dose-dependent protective effect when it comes to cardiovascular disease.

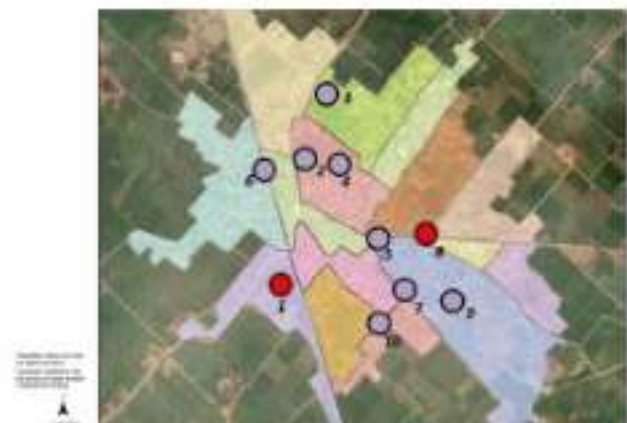


Parameter

12. Magnesium (as Mg²⁺)

-  Within Safe Limit
-  Beyond Safe Limit
-  Beyond Dangerous Limit

Increased intake of magnesium salts may cause a change in bowel habits (diarrhea). Drinking-water in which both magnesium and sulfate are present in high concentrations (~250 mg/l each) can have a laxative effect.



Parameter

13. Nitrates (as NO₃)

-  Within Safe Limit
-  Beyond Safe Limit
-  Beyond Dangerous Limit

Causes methemoglobinemia (Blue baby diseases) where the skin of infant becomes blue due to decreased efficiency of hemoglobin to combine with oxygen. It may also increase risk of cancer.



Parameter

14. Copper (as Cu)




-  Within Safe Limit
-  Beyond Safe Limit
-  Beyond Dangerous Limit

Eating or drinking too much copper can cause vomiting, diarrhea, stomach cramps, nausea, liver damage, and kidney disease.



Parameter

15. Arsenic (as As)

-  Within Safe Limit
-  Beyond Safe Limit
-  Beyond Dangerous Limit




Immediate symptoms of acute poisoning typically include vomiting, esophageal and abdominal pain and bloody 'rice water' diarrhea.

Long term exposure to arsenic causes cancer of the skin, lungs urinary bladder and kidney.



Parameter

16. Manganese (as Mn)


-  Within Safe Limit
-  Beyond Safe Limit
-  Beyond Dangerous Limit

While a small amount of manganese is essential for human health, new Health Canada research has shown drinking water with too much manganese can be a risk to health. Manganese can also cause discoloration and an unpleasant taste in drinking water. It can also stain laundry.



Parameter

17. Sulphate (as SO₄)

-  Within Safe Limit
-  Beyond Safe Limit
-  Beyond Dangerous Limit

Sulphate minerals can cause scale buildup in water pipes similar to other minerals and may be associated with a bitter taste in water that can have a laxative effect on humans and young livestock. Elevated sulphate levels in combination with chlorine bleach can make cleaning clothes difficult.



E. Household surveys

A Random Sample Survey of permissible limit was conducted to collect Household data. The questionnaire thus framed touches upon the following aspects:

- 1) **Family Details** (Name, Age, Sex, Qualification etc)
- 2) **Socio-Economic** (Religion/Caste/Occupation/Wages)
- 3) **Animal Husbandry** (Animal/Nos/ Usage)
- 4) **Infrastructure** (Water Supply, Irrigation, Electricity, Road Network, Communications)
- 5) **Health** (Facilities, Diseases)
- 6) **Education** (Facilities, Results)
- 7) **Land Management** (Holding, Disposal, Circle Rate, Land Use)



Aayati Raj

DEMOGRAPHIC PROFILE

- A2- caste
- A3- Religion
- B10-Household size(no of members)workers
- B2-Avg age of family members-
- B2 and B3-Age-sex ratio
- A6(A & B)- Rental Housing(Potential for labour/service/business of renting/(Avg Rental Cost)
- A5- Residential Ownership
- B5- Educational Qualification(Dropouts /Graduates- male vs female)
- B8-Digital Literacy(Not aware/Personal Use/Commercial use- male vs female)

(I(A)) Occupation:

- 1. B7-Place of work(inside village/out)
- 2. B6-Occupation Type- (Primary/Secondary/Tertians)
- 3. B2B: B6-Age and Occupation(with B2-Male vs female)

4. C1-Land Ownership(for

- agriculture purpose)
- C1(C)-Land Holding size for agriculture
- C1(E)(I),(J)-Cropping Pattern(Type/season/crop cycle number)
- C1(H)-Seed Availability(Agriculture market & distance/alternative crops)
- C1(G)-Agriculture Produce(n Rs- or kg)

- 5. C2-Labour in which sector
- C2(B)-Place of work
- C2(C)-Mode of transportation for workers
- 6. C2(e) + C3(D)+C4(D)-income avg
- 7. C4(B)-Detail of where outside they work
- C4(C)-No of persons involved in SMEs and MSMEs

(B) Household Expenditure:

- F1-Ranking for expenditure in Food/Edu/Transp/Health sectors)
- 2. F2-Household expenditure (in Rs)
- 3. F3, F4, F5-Role of Financial institutions (FS Lending Agency - govt/privt)
- 4. K-Type of assets owned

(I) LAND AND HOUSING:

- 1. D1(C)(D), D1(E)- Land Distribution [-Agriculture/Fallow, II- Residential]
- 2. D2(B)-Period of ownership

(II(A)) Details of Housing:

- 3. D1(A), D1(B)- Open vs covered area
- 4. D1(C) to D1(H)-Housing typology, Habitat morphology
- 5. D1(I)+ B10)-Housing Goa
- 6. D2(A) to D2(F)- Construction Typology
- 7. D2(E1) & D2(E2)-scheme/policy related to housing

III. PHYSICAL
INFRASTRUCTURE:
1. E1-Water

supply(+EA=Availability, +EB=Frequency, +EC=source)

2. E2-Solid

waste(+EA=Availability, +EB=Frequency, +EC=Collection mode)

3. E3-

Electricity(+EA=Availability, +EB=Metered/non metered, +E3=Use)

4. Transportation

E4-E2=Vehicle ownership type

 E5-Mode of transport (availability for residents-
pvt/public/PT)

+E2 & E5-for family members

+E5- for education

5. Sanitation

E6-Toilet availability

 E6-Alternatives-
community toilets/open
defecate

 6. Energy Source for rural
household

J1-Types of energy source

J2-Scheme of Govt if any

IV. SOCIAL
INFRASTRUCTURE:
1. B2, B5, B6, B7-

 Schooling distance/mode
of transport/share of
school going population
male vs female)

 2. G1-Vaccination(no of
children vaccinated/type
of vaccine)

 3. G2-Major diseases-
cross check with hospitals

4. G3-Nearest

hospital/PHC

5. G4-Mode of transport

6. G5-Cost of visit

V. ADMIN SCHEMES & INITIATIVES:
1. Subsidy scheme

 E7 + E8- Funding amount
or pvt construct

VI. ANIMAL
HUSBANDRY
1. H1-Cattle type

2. H2-Prob/Diseases

 3. H3-Commercial use of
animals

E. SERVICES							
Service	S.A. Availability	E.B. Frequency / Duration / Coverage	E.C. Source				
E.1. Water Supply			Well / Hand Pump / Bore Well / Water tap / Public Tap				
E.2. Solid Waste			Open Dumping / Compost / Collection Can				
E.3. Electricity			Household / Inflation				
E.4. Transport			Bus / Tempo / Tractor / Bullock Cart / SW / HW / Cycle				
E.5. Is there a toilet?	Y / N		E.5. If No, How often do you visit?	RWC / Wells / Community / Open Def.			
E.6. Amount Received Under Such Scheme?			If Yes, How	E.6. Under Scheme / Own Contribution			
F. Monthly Expenditure							
	Type	Food	Education	Transport	Health	Bank	Others
F.1. Budget							
F.2. Current Use Monthly Expenditure							
F.3. If Paying Interest Then How Much	E.3.	Use Period of interest	F.4.	Loan - Bank / Private	F.5.		
G. Health							
G.1. Vaccination?	Y / N	G.2. Preferred Disease	G.3. Nearest Hospital				
G.4. Mode of Transport	G.5. Fees paid for 1 year visit						
H. ANIMAL HUSBANDRY			I. Tools / Implements				
H.1. No.	H.2. Problem / Disease	H.3. Treatment (pvt / N)	I.1. Implements	I.2. Source (I.2. Others)			
Cow							
Buffal							
De							
Goat							
Other							
Other							
Other							
K. Other Assets			L. Vocational Training Center				
Radio			L.1.				
Telephone / Mobile							
Solar							
Refrigerator							
TV							
Computer			L.2.				
Generator							
Motorcycle			L.3.				
Car							
M. Photograph & Suggestions							

Section A,B & C

DATE: / /	HOUSEHOLD SURVEY 2021							Form No. CP/001/17		
	Gram Panchayat - Katonda, G.B. Nagar, UP.									
	A.1. Name of Head of the Family						A.2. Religion			Surveyor Code: CP
	A.2. Caste			A.5. Ownership of House		A.6. Rent		(for office use only)		
A. A.A. Time Period of Residence										
B. Family Details										
S.No.	B.1. Name	B.2. Age (Yrs)	B.3. Sex (M/F)	B.4. Married (Y/N)	B.5. Qualification	B.6. Occupation	B.7. Location	B.8. Mode of Transport	B.9. Digital Literacy	
1										
2										

C. OCCUPATION DETAILS		
C.A. Change in Occupation (Y/N)	C.B. Occupation before:	C.C. Occupation Now:
C.D. Since When and Reason:		

Breaking Section C into 3 parts

C. 1. AGRICULTURE	C.2. LABOUR	C.3. SERVICE
-------------------	-------------	--------------

C.1.A. Land Owner	[yes / No]	C.1.G. Source of Irrigation	C.2.A. Agro /Construc./Ind./Others	C.3.A.Type
C.1.B. No. of Persons Involved		C.1.H. Seeds Availability	C.2.B. Location	C.3.B. Location
C.1.C. Area		C.1.I. Cropping Patterns	C.2.C. Mode of Transport	C.3.C. Mode of Transport
C.1.D. Location		C.1.J. Produce P.A.	C.2.D. Time Period during the year	Marginal / Full Year
C.1.E. Crop?		C.1.K. Store Location	C.2.E. Wage	C.3.D. Salary
C.1.F. Soil Fertility		C.1.L. Store Distance		C.4. BUSINESS/TRADE
				C.4.A.Type
				C.4.B. Location
				C.4.C. NO. of Persons Involved
				C.4.D. Monthly Earnings

SECTION D:LAND AND HOUSING & BREAKING SECTION D INTO 2 PARTS

	D.C.Cultivable Land
D.B.Time period of Ownership of Land	D.D.Fallow Land
	D.E.Residential Land

D.2. CONSTRUCTION TYPE					D.1.C. Courtyard
D.2.A. Type	kutcha	Semi-Pucca	Pucca		D.1.D. Dalan
D.2.B. Roof	Thatch / Grass / Bamboo	Mud	Stone/Mortar	RCC	D.1.E. Street
D.2.C.Wall	Thatch / Grass / Bamboo	Mud	Stone/Mortar	Brick	D.1.F. Chabutra
D.2.D. Floors	One	Two	Three	Four	D.1.G. Chowk
D.2.E.1. Built under any Scheme/ Program/ Policy? (Y / N)		D.2.E.2. Which scheme?			D.1.H. Maidan
D.2.F. Age of House	Less than 10 Yrs	10 to 20 Yrs.	20 to 50 Yrs.	More than 50 Yrs	D.1.I. No. of Rooms

a)

SECTION E:SERVICES & SECTION F :MONTHLY EXPENDITURE

E. SERVICES			
Service	E.A. Availability	E.B. Frequency / Duration / Coverage	E.C. Source
E.1. Water Supply			Well / Hand Pump / Bore Well / Private tap / Public Tap
E.2. Solid Waste			Open Dumping / Compost / Collection Cart
E.3. Electricity			Household / Irrigation
E.4. Transport			Bus / Tempo / Tractor / Bullock Cart / 2W / 4W / Cycle
E.5. Is there a Toilet?	Y / N		E.6. If No, Then what do they use? Public/Private / Community / Open Def.
E.7. Amount received Under Such Scheme?			If Yes, Then E.8. Under Scheme / Own Construction

F. Monthly Expenditure						
Type Ranking	Food	Education	Transport	Health	Rent	Leisure
Lump-Sum Monthly Expenditure						
If Paying Interest Then How Much	E.3.	Time Period of Interest	F.4	Loan - Bank/ Private	F.5	

SECTION J:Energy Source, SECTION K:Other Assets&SECTION L:ISSUES, EXPECTATIONS AND SUGGESTIONS

	J.1.	J.2.
LPG		
Kerosene		Under any Scheme (Y / N)
Wood/ Coal		
Biogas		
Cow Dung Cake		
Others		

K. Other Assets	
Radio	
Telephone / Mobile	
Solar	
Stove	
T.V.	
Computer	
Internet	
Motorcycle	
Car	

L.	
Issues	L.1.
Expectations	L.2.
Suggestions	L.3.

SECTION G:HEALTH, SECTION H:ANIMAL HUSBANDARY & SECTION H:ANIMAL HUSBANDARY

G. Health		
G.1.Vaccination? Y / N	G.2. Prominent Disease	G.3. Nearest Hospital
G.4 Mode of Transport	G.5 Fees paid for 1 time visit:	

H. ANIMAL HUSBANDARY		
H.1. Nos.	H.2. Problem / Disease	H.3. Commercial Use (Y / N)
Cow		
Buffalo		
Ox		
Goat		
Chicken		
Horse		
Donkey		
Others		

I. Tools / Implements	
	I.1 Farming I.2 Others
I.A. Mechanical	
I.B. Motorised	

F. Derivation of Indices from Different Sections of the Household Survey Document

DATE	HOUSEHOLD SURVEY 2021						Form No. CP/001/17
	Gram Panchayat - Kalonda, G.B. Nagar, UP.						
	A.1 Name of Head of the Family						Surveyor Code: CP
	A.2. Caste		A.3. Religion				
A.	A.4 Time Period of Residence	A.5 Ownership of House		A.6. Rent		(for office use only)	

INDICES:

1. A2- caste
2. A3- Religion
3. A5 – if houses are owned then we get an idea of the possible secondary source of income when the city size increases.
4. A4 – indicates the pattern of growth – the direction in which the village is expanding.
5. A2 & A4 can give an idea of movement in housing as per social / religions conditions.

B. Family Details									
S.No.	B.1. Name	B.2. Age (Yrs)	B.3. Sex (M/F)	B.4. Married (Y/N)	B.5. Qualification	B.6. Occupation	B.7. Location	B.8. Mode of Transport	B.9. Digital Literacy
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
B.10	Household size								

DEMOGRAPHIC PROFILE

6. A1 and B2 – Age profile of decision makers and family heads
7. A2 and A3 – Ancestral linkages between the two religious communities and age of village
8. B9 & B5 – need for computer education and digital literacy in Digital India
9. A2, A3, C2(E), C3(D) and C4(D) – Population with Socio economic character

10. A3 and D2 (F) – Increase in the number of households on the basis of socio religious conditions. Hence an aid in master plans.
11. B10-Household size(no of members)
12. B2- Average age of family members
13. B1, B2 and B6 – Unemployment data
14. B1, B2 and B5 – Illiteracy
15. B3 and B5 – Gender inequality
16. B10, F2, F3 & F4 –after comparing it to per capita income establishes Low per capita income
17. B2 and B3-Age-sex ratio
18. A6(A & B)- Rental Housing(Potential of renting/Average Rental Cost)
19. A5- Residential Ownership
20. B5- Educational Qualification(Dropouts /Graduates- male vs female)
21. B9-Digital Literacy(Not aware/Personal Use/Commercial use- male vs female)
22. B2 and B3 give number of adults between 18-60
23. B2 and B3 give the number of children
24. B2 and B3 give the number of people living beyond 60
25. B2 and B5 Ready manpower to be trained for vocations
26. B5 classification can indicate the number of people who are 8th pass
27. B5 classification can indicate the number of people who are 10th pass
28. B5 classification can indicate the number of people who are 12th pass
29. B5 classification can indicate the number of people who are graduates
30. B5 classification can indicate the number of people who vocationally trained

C. OCCUPATION DETAILS						
C.A. Change in Occupation (Y/N)		C.B. Occupation before			C.C. Occupation Now:	
C.D. Since When and Reason:						
C.1. AGRICULTURE			C.2. LABOUR		C.3. SERVICE	
C.1.A. Land Owner	(yes / No)	C.1.G. Source of Irrigation	C.2.A. Agro/Construc./Ind./Others		C.3.A.Type	
C.1.B. No. of Persons Involved		C.1.H. Seeds Availability	C.2.B. Location	C.3.B. Location		
C.1.C. Area		C.1.I. Cropping Patterns	C.2.C. Mode of Transport	C.3.C. Mode of		
C.1.D. Location		C.1.J. Produce F.A.	C.2.D. Time Period during the year	Marginal/ Full Year	C.3.D. Salary	
C.1.E. Crop?		C.1.K. Store Location	C.2.E. Wage		C.4. BUSINESS/TRADE	
C.1.F. Soil Fertility		C.1.L. Store Distance			C.4.A.Type	
D. LAND AND HOUSING						C.4.B. Location
D.A. Khasra No.		D.C. Cultivable Land	D.1. DETAILS OF HOUSE		C.4.C. NO. of Persons Involved	
D.B. Time period of Ownership of Land		D.D. Fallow Land	D.1.A. Covered		C.4.D. Monthly Earnings	
		D.E. Residential Land	Open Area			
D.2. CONSTRUCTION TYPE				D.1.C. Courtyard		
D.2.A. Type	Kutchha	Semi-Pucca	Pucca	D.1.D. Dahan		
D.2.B. Roof	Tkash/Grazr/Bamboo	Mud	Stone/Mortar	RCC	D.1.E. Street	
D.2.C. Wall	Tkash/Grazr/Bamboo	Mud	Stone/Mortar	Brick	D.1.F. Chabutra	
D.2.D. Floors	One	Two	Three	Four	D.1.G. Chosk	

OCCUPATIONAL

31. B7-Place of work(inside village/out)
32. B6-Occupation Type-(Primary/Secondary/Tertiary)
33. B2& B6-Age and Occupation(with B3-Male vs female)
34. C3(B) indicate the movement of people to industrial center as part of industry
35. C2(B) indicate the movement of people to metro/ industrial center as labour

NUTRITIONAL SECURITY & HEALTH

36. B2 and B3 – are indicators of nutritional security that is essential
37. C1 – Agriculture and local produce is a strong indicator for nutritional security
38. G complete – Health
39. E2- A,B,C – Waste management includes Solid liquid Waste(SLWM)
40. G3 – need for doctors and improvised health facilities
41. G4 – medical emergency and other facilities

MIGRATION

42. Inventory of empty houses in the village. Potential migrants die to education or economic mobility.

AGRICULTURE

43. C1- Land Ownership(for agriculture purpose)
44. C1(C) – Land Holding size for agriculture
45. C1(E),(I),(J)-Cropping Pattern(Type/season/crop cycle number)
46. C1(H)- Seed Availability(Agriculture market & distance/alternative crops)
47. C1(J)- Agricultural Produce (in Rs or kg)
48. C2- Labour in which sector
49. C2(B)- Place of work
50. C2(C)- Mode of transportation for workers
51. C2(e) + C3(D)+C4(D)- Income avg. for labour/service/business
52. C4(B)- Detail of where outside they work
53. C4(C)- No of persons involved in SMEs and MSMEs
54. C1 B – Indicates the manpower needed. It shows the employment a village farmer gives to the village itself, through shared farming or labour for tilling / harvest etc.
55. C1 J – Indicates how much population, can these fields suffice.
56. C1 , C2, C3 and C4 Indicate economic similarity in pockets and clusters

D. LAND AND HOUSING						
D.A. Khasra No.		D.C.Cultivable Land			D.1. DETAILS OF HOUSE	
D.B.Time period of Ownership of Land		D.D.Fallow Land			D.1.A. Covered	
		D.E.Residential Land			Open Area	
D.2. CONSTRUCTION TYPE					D.1.C. Courtyard	
D.2.A. Type	kutcha	Semi-Pucca	Pucca		D.1.D. Dalan	
D.2.B. Roof	Thatch / Grass / Bamboo	Mud	Stone/Mortar	RCC	D.1.E. Street	
D.2.C. Wall	Thatch / Grass / Bamboo	Mud	Stone/Mortar	Brick	D.1.F. Chabutra	
D.2.D. Floors	One	Two	Three	Four	D.1.G. Chowk	
D.2.E.1. Built under any Scheme/ Program/ Policy? (Y / N)		D.2.E.2. Which scheme ?			D.1.H. Maidan	
D.2.F. Age of House	Less than 10 Yrs	10 to 20 Yrs.	20 to 50 Yrs.	More than 50 Yrs	D.1.I. No. of Rooms	

LAND AND HOUSING

- 57. D(C),D(D),D(E)- Land Distribution (i-Agriculture/fallow, ii-Residential)
- 58. D(B)-Period of ownership
- 59. DD indicates the possibility of agricultural exploration or the use of new agricultural techniques.
- 60. D(C),D(D),D(E)- give an understanding of land as a resource.
- 61. D(B), D(C),D(D),D(E)- when matched with the existing land use give directions to a master plan

HOUSING STUDIES

- 62. D1(A),D1(B)- Open vs covered area
- 63. 4. D1(C) to D1(H)-Housing typology, Habitat morphology
- 64. 5. D1(I)+ B(10)-Housing Gap
- 65. 6.D2(A) to D2(F)- Construction Typology
- 66. 7. D2(E1) & D2(E2)-Scheme/policy related to housing
- 67. D2F – through the age of the house we get to know the time during which the transformations began in the villages.
- 68. D1G – presence of *chowk* indicates the formation of organized clusters.
- 69. D1D – presence of *Dalan* indicate an open community
- 70. D1F – presence of *Chabutras* indicate cohesive community
- 71. D1D and D1C- *Dalans* in courtyards indicate community introversion
- 72. Housing condition and measures to be taken
- 73. D1(D) and D1(C) , Traditional Typology / Modern
- 74. D2(F) Housing Age
- 75. D2(A), D2(B), D2(C), D2(D) Housing Material

E. SERVICES								
	Service	E.A. Availability	E.B. Frequency / Duration / Coverage	E.C. Source				
1	E.1	Water Supply		Well / Hand Pump / Bore Well / Private tap / Public Tap				
2	E.2	Solid Waste		Open Dumping / Compost / Collection Cart				
3	E.3	Electricity		Household / Irrigation				
4	E.4	Transport		Bus / Tempo / Tractor / Bullock Cart / 2 W / 4W / Cycle				
5	E.5	Is there a Toilet?	Y / N	E.6. If No, Then what do they use?	Public / Private / Community / Open Def.			
6	E.7.	Amount Received Under Such Scheme?		If Yes, Then	E.8. Under Scheme / Own Construction			
F. Monthly Expenditure								
	Type	Food	Education	Transport	Health	Rent	Leisure	
7	F.1.	Ranking						
8	F.2.	Lump-Sum Monthly Expenditure						
9		If Paying Interest Then How Much	F.3.	Time Period of Interest	F.4	Loan - Bank/ Private	F.5	
10								

ENVIRONMENT

- 76. C1F - Soil Fertility
- 77. E1 and Water sample (to be tested for water quality)
- 78. E2 Hygiene and sanitation
- 79. Surface water inventory and water quality through physical water sample testing

BUSINESS/AGRICULTURE ENVIRONMENT SPATIAL INDEX

- 80. D and C Area under irrigation
- 81. C1(K) & C1(L) – Availability of Market / Mandi
- 82. C1(H) Seed Availability
- 83. D&C Area under cultivation
- 84. C1(J) Change in cropping pattern
- 85. C1(L) Nearness to Urban Centre
- 86. C1(K) Warehousing
- 87. H(Range) – Livestock, Animal Husbandry & poultry etc

INFRASTRUCTURE SPATIAL INDEX

- 88. Physical Infrastructure
- 89. E1 Water Availability - well, borebell, handpump, taps
- 90. Road network - Maps
- 91. B8, C2C, C3C, E4, G4 Public Transport Availability

92. E5 & E6 Sanitation

HOUSEHOLD EXPENDITURE

- 93. F1-Ranking for expenditure in Food/Edu/Transport /Health sectors)
- 94. F2-Household expenditure (in Rs)
- 95. F3,F4,F5-Role of Financial institutions-(F5 Lending Agency –govt/pvt)
- 96. K-Type of assets owned
- 97. A generic view reveals how the agricultural produce in the village balances with the need for liquidity. A measure of the economics that is not a part of the village.
- 98. F5 – access of people to financial institutions and schemes.
- 99. F2 indicates gross annual income

RECREATION & LEISURE

- 100. Indicated through F1
- 101. D1G, D1E, D1H are indicators of leisure and recreation
- 102. Comments and questioning at the end indicate awareness on leisure, festivals and recreation.

		G. Health				
		G.1. Vaccination? Y / N	G.2. Prominent Disease	G.3. Nearest Hospital		
		G.4 Mode of Transport		G.5 Fees paid for 1 time visit.		
		H. ANIMAL HUSBANDARY			I. Tools / Implements	
		H.1. Nos.	H.2. Problem / Disease	H.3. Commercial Use (Y / N)	I.1 Farming	I.2 Others
28		Cow			I.A. Mechanical	
29		Buffalo			I.B. Motorised	
30		Ok			J. Energy Source	
31		Goat			J.1.	J.2.
32		Chicken			LPG	Under any Scheme (Y / N)
33		Horse			Kerosene	
34		Donkey			Wood/ Coal	
35		Others			Biogas	
36					Cow Dung Cake	
37		K. Other Assets			Others	
38		Radio			L. Vocational Training Center	
39		Telephone / Mobile				
40	[NAME]	Solar				
41		Stove	Issues	L.1.		
42		T.V	Expectations	L.2.		
43		Computer	Suggestions	L.3.		
44		Internet				
45		Motorcycle				
46		Car				
47						

Page 1

PHYSICAL INFRASTRUCTURE

- 103. E1-Water supply(+EA=Availability, +EB=Frequency, +EC= source)
- 104. E2-Solid waste(+EA= Availability, +EB=Frequency, +EC= Collection mode)
- 105. E3-Electricity(+EA=Availability, +EB=Metered/Non Metered,+E3 = Use)

NATURAL RESOURCE MANAGEMENT

- 106. D&C – Agriculture and land spread
- 107. D – Wasteland
- 108. Map – Watershed
- 109. E1 + C1(G) – Ground Water Potential
- 110. C1 G – Water Resource Management

TRANSPORTATION

- 111. E4+EC=Vehicle ownership type
- 112. B8-Mode of transport (availability for residents-pvt/public/IPT)
- 113. B8-Mode of transport +B2 & B3-for family members
- 114. B8-Mode of transport +B5- for education
- 115. Frequency of visits outside the village

SANITATION

- 116. E5-Toilet availability
- 117. E6-Alternatives-community toilers/open defecation
- 118. Open drains – guidelines to a master plan

ENERGY FOR HOUSEHOLD

- 119. J1-Type of energy source
- 120. J2-Scheme of government if any

SOCIAL INFRASTRUCTURE

- 121. B2,B3,B5,B6,B7-Schooling(distance/mode of transport/share of school going population of male vs female)
- 122. G1-Vaccination(no of children vaccinated/type of vaccine)
- 123. G2-Major diseases-cross check with hospitals
- 124. G3-Nearest hospital/PHC

- 125. G4-Mode of transport
- 126. G5-Cost of visit

ADMIN SCHEMES & INITIATIVES

- 127. Sulabh scheme, NABARD etc
- 128. E7 + E8- Funding amount or pvt construct

ANIMAL HUSBANDRY

- 129. H1-Cattle type, if one cattle type is prominent, an integrated model of cattle is to be adopted.
- 130. H2-Prob/Diseases
- 131. H3-Commercial use of animals/ in Agriculture
- 132. H & C when put together reveal how much of cattle is being used in agriculture, milk production or for sale.
- 133. Critical measures – like gaushala or animal care.
- 134. Understanding of commerce through animal products
- 135. Overall H1 – indicates the availability of pasture land and fodder

SUGGESTIONS

- 136. Suggestions made during the interviews indicate the limit of perception of the people.
- 137. Suggestions made during the interviews indicate the immediate need.
- 138. Suggestions made during the interviews indicate their aspirations.
- 139. Suggestions made during the interviews indicate the direction of future growth of the village if planned intervention is not made.
- 140. When viewed with B5, Suggestions made during the interviews indicate the limit impact of education.
- 141. Questioning indicates their awareness of jan dhan yojna and pm kisan-scheme or pm awas-yojna.
- 142. Indicate their relationship with *Panchayat* and hence indicate the changes needed in the structure of *Panchayat* as a third tier government.
- 143. Help setting of priorities / Training of people
- 144. Suggestions for *higher* education for women
- 145. Suggestion for waste management

146. Suggestions for Women technology park and Cottage Industry
147. Suggestion for water bodies / waste water treatment
148. Suggestions for adding agricultural land to the village or better crop education/ organic architecture/ new agriculture economics.
149. Suggestion for establishing surface run off channelization to avoid flooding which happens nowadays in village
150. Rural tourism as a measure to invite economy
151. Awareness and a sense of confidence in people to understand that Rural is a beneficial typology
152. Tree plantation – absence of and diminishing green cover in the village.
153. Interdependence in between *gram Panchayats* for an integrated vision of the rural areas. Economic unity in the village network and plans.
154. Disposal of dead animals / cattle
155. Economic potential of weekly markets.