Site Profiles

Sustainable Agriculture and Transformative Rural and Agrarian Strategies (START) Project, Transforming India's Green Revolution by Research and Empowerment for Sustainable food Supplies (TIGR2ESS) Programme

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Preface

'Sustainable and Transformative Rural and Agrarian Strategies' (START) is a flagship research project under the Transforming India's Green Revolution by Research and Empowerment for Sustainable food Supplies (TIGR2ESS) Programme, funded by the UK's Global Challenges Research Fund (GCRF). The research was undertaken collaboratively between institutions across UK and India: University of Cambridge (Department of Geography and Centre for Science and Policy), University of East Anglia (School of International Development), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), MS Swaminathan Research Foundation (MSSRF), Professional Assistance for Development Action (PRADAN) and Lok Chetna Manch (LCM).

Running between 2018 and 2021, START aimed at understanding the political economy and policy challenges of building a sustainable agricultural and food system in India while critically evaluating the legacy of the Green Revolution across different regions of the country. While remaining cognizant of structural constraints, the collective approach of the team was to engage with, even foreground, the agency, knowledge and experience of agrarian and rural communities in shaping the possibilities for making agriculture and food systems economically viable, socially just and ecologically robust.

A driving motivation of this research project was to capture the diversity of socio-economic and environmental conditions of agriculture and through this, to underline that one-size-fits-all or top-down solutions would be unlikely to address the mounting challenges of rural India. Therefore, in keeping with the expertise of different institutions and individual researchers in the team, the research was conducted across five regions of the country: forested plateau region of south Bihar, hill zone of Uttarakhand, irrigated plains of Punjab, rainfed plains of Telangana and the coastal plains of Tamil Nadu. Within these regions, a specific block (sub-district administrative unit) was chosen to represent a specific type of socio-environmental, policy or programmatic issue. Within each block, one or more villages were selected for in-depth study by the respective team/researcher.

So, for instance, Chakai block in south Bihar was chosen to represent the livelihood challenges of Santhal Adivasis while a focus on Sirkazhi in Tamil Nadu allowed a focus on the commonly-overlooked predicament of coastal agriculture and agriculturists. Similarly, Atmakur block in Telangana was chosen to explore the impact of a recently-revived tank irrigation system, Bathinda block in Punjab to represent the changing cropping patterns in a successful Green Revolution region and Bhaisiya Chhana block in Uttarakhand to demonstrate the specificities of agricultural systems in the mountains.

This document is a unique compilation of the profiles of these diverse field sites. Drawing on both secondary data and primary research, these profiles outline the demographic, social, economic, environmental, infrastructural, administrative and policy issues that constitute the lifeworld of local communities. The most up-to-date secondary data has been used, some of which predates the primary research conducted 2019 onwards.

The document serves as a reminder of the range of issues shaping trajectories of development for particular social groups and geographical areas, while also demonstrating the depth and breadth of the START project. We hope that this will be a useful resource for researchers, students, policy-makers and practitioners in the field to assist with conceptualizing and developing new research agendas and practical interventions.

Funding

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List of Abbreviations

ASHA	Accredited Social Health Activist
AWC	Anganwadi Center
BC	Backward Caste
CSC	Common Service Centre
Cwc	Cold sub-tropical highland climate/monsoon influenced temperate oceanic climate
DWCRA	Development of Women and Children in Rural Areas
FWC	Family Welfare Centre
GC	General Caste
GP	Gram Panchayat
GPDP	Gram Panchayat Development Plan
HQ	Headquarters
IAY	Indira Awas Yojana
ICDS	Integrated Child Development Services
IKP	Indira Kranthi Pathakam
IOB	Indian Overseas Brank
MBC	Most Backward Caste
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Act
MSP	Minimum Support Price
NFBS	/National Family Benefit Scheme
NGO	Non-governmental Organisation
NSAP	National Social Assistance Programme
OC	Open Category
PMAY-G	Pradhan Mantri Awas Yojana- Gramin
PMJAY	Pradhan Mantri Jan Arogya Yojana
PMUY	Pradhan Mantri Ujjwala Yojana
RUTF	Ready-to-use Therapeutic Foods
SC	Scheduled Caste
SDG	Sustainable Development Goals
SHG	Self-help Group
SPTA	Santhal Pargana Tenancy Act
ST	Scheduled Tribe
THR	Take Home Ration
TNCSC	Tamil Nadu Civil Supplies Corporation
VPKAS	Vivekanand Parvatiya Anusandhan Kendra, Almora

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Chakai Block

Chakai block is located in the Jamui district of the state of Bihar in India. It is one of ten blocks in the district. Jamui is among the most marginalized districts in the country, performing poorly with regard to the sustainable development goals (SDGs), and is also characterized by the presence of left-wing extremism.

The block has a total of 23 panchayats and approximately 600 villages. This profile focuses on the Nawadih panchayat situated in the south of Chakai and Bamdah panchayat situated in the north. These panchayats were selected because of their locational differences: Nawadih, which is closer to the town and lies at a lower elevation, and Bamdah panchayat, which is more remote, closer to the forest and at a higher elevation. Two villages were then selected from within each panchayat based on their poor socio-economic conditions and remoteness. These villages are Naiadih and Gobindpur (from Nawadih panchayat) and Barmasia and Piprasol (from Bamdah panchayat). Before providing detailed village-level data, we will first provide some context on Chakai block.

Climate

The block is classified as Cwc (cold subtropical highland climate or a monsoon-influenced temperate oceanic climate) according to the Köppen climate system. Mean monthly temperatures range from highs of 37°C in May to lows of 19°C in January. The highest recorded temperature in the last two decades was 43°C, and the lowest has been 10°C. The annual precipitation average is 1103 mm.

This zone lies in the Eastern Plateau region. There are four rivers that run through the block, including Puthro, Ajay, Barnar, and Ulai. In addition, there is also a river that flows down from the Hanuman reservoir located in the neighbouring Banka district. The area is classified as having upland plains with tropical, dry deciduous forest cover. Hypabyssal volcanic rocks are the main geological component within this area. The evasion of the block ranges from 250-350 meters above sea level.

Box 1: Administrative Marginalisation of the Santhal population

Chakai block has a tribal population of 1.76 million, the majority of whom are Santhals. Approximately 17% of the block's population is tribal compared to just 4.5% of the district's population.

Chakai shares a border with the Santhal Parganas region of Jharkhand and shares close cultural ties with the region. Following the 2000 bifurcation of Bihar state, into Bihar and Jharkhand, most of the Santhal population were encompassed by the latter. As a result, the Santhals in Chakai suffer from political and administrative marginalisation. They do not benefit from the same legal rights afforded to Santhals in Jharkhand under the Santhal Pargana Tenancy Act (SPTA) of 1949. In addition, they are not included in the Provisions of the Panchayats (Extension to Scheduled Areas) Act of 1996. This means the customary rights of the Santhals in Chakai to self-govern are not formally recognised.

Migration

Most migration from Chakai block is distress-driven, with food insecurity and inadequate income being the two main stressors. As a result, remittances contribute to household food security and capacity to meet irregular monetary demands (e.g. roof repairs, medical emergencies, etc). Many of the older male migrant workers, particularly those married and with children, aspire to earn a livelihood within

the village. Though they can earn more money through migrating, this removes them from their families.

The majority of migrants from the block are male, and between the ages of 16 to 35. Their patterns of migration are seasonal and circular, enabling migrants to fit around the demands of the agricultural calendar. For example, men can leave after ploughing their paddy land but return before the next planting season. These migrants tended to travel to and work in wealthier states like Kerala, Gujarat, Uttar Pradesh, Maharashtra, Tamil Nadu, Telangana and Haryana and did unskilled or semi-skilled work (e.g. construction workers, factory workers). In contrast, the patterns of migration of women in the Chakai block operate on a smaller spatial and temporal scale. When women migrate, they do so locally (to neighbouring hamlets and villages) either on a daily basis or for a few days at a stretch. These women tend to work as agricultural labourers, brick kiln workers or sell forest produce as an additional source of income.

Migration patterns have changed over time, with the instances of female migration to the neighbouring state of West Bengal to work on farms substantially decreasing over the past 20 years. This is because employment opportunities have been reduced as a result of farm mechanisation, the replacement of labour-intensive paddy varieties, and the reduction in paddy cultivation altogether. Some male migrant workers who are married still prefer West Bengal as a destination to stay close to their families.

Box 2: Vulnerability to Food Insecurity in Chakai

Food insecurity is a major challenge within Chakai block with many families finding they have insufficient food, particularly during the summer season from April to June, also referred to as the ‘hunger period’. During this lean period, coping strategies include sale of livestock or loans from Self Help Groups (SHGs)).

Most staple foods (e.g. rice, wheat flour, millet flour and pulses) are produced by the local population on their own or leased-in land. For landholders, this provides sufficient food for approximately 6-10 months each year. However, for leased landholdings, this is only sufficient to provide food for 3 months. This means for the rest of the year, staple foods are accessed via the Public Distribution System (PDS) and/or purchased using the remittances sent back by male household members.

Gender Roles

Within the Chakai block, prevailing gender norms include the belief that women should primarily work in the households and as agricultural labour. During paddy transplanting and harvesting, women work in the fields to earn a wage of approximately ₹120 per day. However, the main role of women is domestic labour (childcare and household work). In instances where some women are working, other women in the household (e.g. older daughters, grandparents) take on domestic responsibilities (e.g. childcare, cooking).

For young women and girls in Chakai, responsibilities include cleaning, fetching water, helping their mothers prepare food, and caring for younger siblings. Often these responsibilities leave little time for girls to play with friends and study for school whereas this is not the case for boys. Although most girls in the block attend local government schools, and get free education, during the agricultural season they often miss school. Girls were also absent from school if they were menstruating.

Box 3: Case Study of Jivan Marshal Mahila Sangh (JMMS)

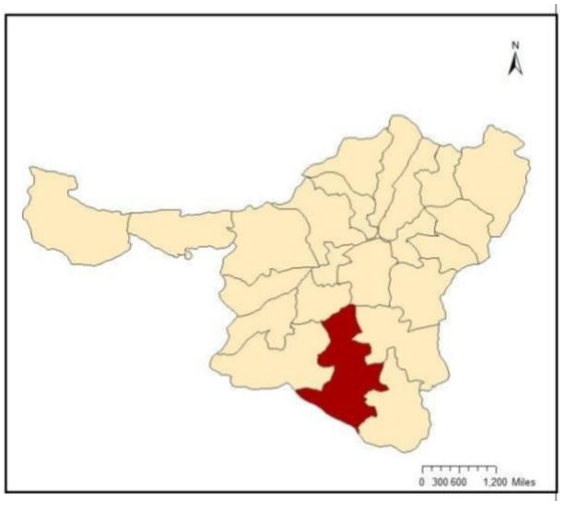
Jivan Marshal Mahila Sangh (JMMS) is a block level women's collective formed by PRADAN in 2013, with the aim of instilling a sense of solidarity amongst women from both tribal (Santhal) and non-tribal communities. Initially the group had 1,500 members but has since expanded to over 8,000, operating across 11 panchayats with 700 SHGs.

On average, SHGs have approximately 10 members each, drawn from households residing in close proximity to each other (preferably in one hamlet of a village). PRADAN primarily works with tribal households. Each group has a President, Secretary and Treasurer who are called office bearers. Approximately 10-12 such groups are linked together in a Village Organisation (VO) comprising the office bearers for each SHG. In turn, the leaders of approximately 10-20 VOs constitute a cluster-level federation (CLF) at the block level that serves as an umbrella institution for around 1,200 to 1,400 members.

The group began by focusing on savings and credit, water and in-situ management and livelihood activities (e.g. agriculture). The group also worked with the NABARD-TDF-WADI (National Bank for Agriculture and Rural Development- Tribal Development Fund) project to create irrigation facilities for tribal villages. This contributed to a considerable increase in agricultural produce amongst the 1,500 household beneficiaries. The group has also worked to increase member's awareness of MGNREGS and how they can claim their right to work under the Act. The SHG works to do so by bridging the gap between villagers and the local government and by facilitating collective action. An example of this is the 2017 protests by JMMS members against the corrupt implementation of MGNREGS in the block.

Nawadih Panchayat

Nawadih panchayat lies in the southern part of Chakai block. The panchayat is representative of the rolling topography in the southern parts of Chakai. With a mean elevation of 318 m, it lies within the watershed of the Ajay river.



Nawadih panchayat has a population of 10,904, 67% of which are engaged in some kind of work. The panchayat has a sex ratio of 938:1000. Within the panchayat, there are 33 villages.

Climate and Soils

Nawadih falls under the Eastern Plateau (Chotanagpur) and Eastern Ghats, with hot, sub-humid conditions and a pediment and pediplain complex. Barren unculturable lands cover the area with stabilized dunes influencing the regional geomorphology.

The area is covered with aridisol soils which form in an arid or semi-arid climate. The organic content of the soils ranges from 2.4%-3.0%.

Land Use

In total, the panchayat has an area of 223,088 km². Of the total land area, 35% is cultivable land (78,080 km²). An additional 19% is forested (42,386 km²).

Naiadih village

Naiadih village is part of Nawadih Panchayat within the Chakai block of the Jamui district in the state of Bihar, India. The village has a population of 391 and comprises approximately 64 households. Of the total population, 196 are male and 195 are female. The average sex ratio of Naiadih village is 995:1000, higher than the state average of 918:1000.

The village has a child population (age 0-6) of 70, representing 17.90 % of the total village population. It has a child sex ratio of 1414:1000, substantially higher than the child sex ratio of 935:1000 for Bihar.

Education and Literacy

The overall literacy rate of the village is 51.40%, over 20% lower than the average for Jamui district (74.85%) and ten percent lower than the Bihar state average (61.80%). In addition, the village has a female literacy rate that is 16.42% lower than the male literacy rate. However, this mirrors the disparity between the genders present at the district (16.91%) and state level (19.70%).

Table 1: Literacy rates (%) comparing village, district and state averages

	Naiadih	Jamui district	Bihar state
Total	51.40	74.85	61.80
Male	59.28	82.86	71.20
Female	42.86	65.95	51.50

Source: Census (2011)

Caste Groups

The majority of the village population (84.65%) are Scheduled Tribes (ST). A further 13.81% belongs to Scheduled Castes (SC).

Table 2: Population of Naiadih Village by caste/tribe

Caste	Total	Male	Female
SC	54	24	30
ST	331	170	161

Source: Census (2011)

Employment

In total, 186 people were engaged in work activities in the Naiadih village. Of the working population, 27.96% (52) are engaged in main work (full time/employment or earning for more than 6 months). The remaining 72.04% (134) are engaged in marginal work (part time/employment or earning for less than 6 months). Of those engaged in main work, none were cultivators (owners or co-owners) but 48 were agricultural labourers.

Of the total working population, 102 are male (54.84%) and a further 84 are female (45.26%). While most of the female working population are engaged in marginal activities (91.67%), the male working population is more evenly split between main (55.88%) and marginal (44.12%) work.

Gobindpur Village

Gobindpur village is also part of Nawadih Panchayat, within the Chakai block of the Jamui district in the state of Bihar, India. The village has a population of 507 and comprises approximately 88 households. Of the total population, 258 are male and 249 are female. The average sex ratio of Gobindpur village is 965:1000, higher than the Bihar state average of 918:1000. The village has a child population (age 0-6) of 78, representing 15.38% of the total village population. It has a child sex ratio of 1168:1000, substantially higher than the child sex ratio of 935:1000 for Bihar state.

Education and Literacy

The overall literacy rate of the village is 53.85%, over 20% lower than the average for Jamui district (74.85%) and almost ten percent lower than the Bihar state average (61.80%). The female literacy of the village is 23.77%

lower than the male literacy rate, slightly higher than the gender at the district (16.91%) and state levels (19.70%).

Table 3: Literacy rates (%) comparing village, district and state averages

	Gobindpur	Jamui district	Bihar state
Total	53.85	74.85	61.80
Male	65.32	82.86	71.20
Female	41.55	65.95	51.50

Source: Census (2011)

Caste Groups

Most of the village population are from Scheduled Tribes (ST). Scheduled Tribes constitute 88.56% of the population. There is no Scheduled Caste (SC) population in Gobindpur.

Table 4: Population of Gobindpur Village by caste/tribe

Caste	Total	Male	Female
SC	0	0	0
ST	449	228	221

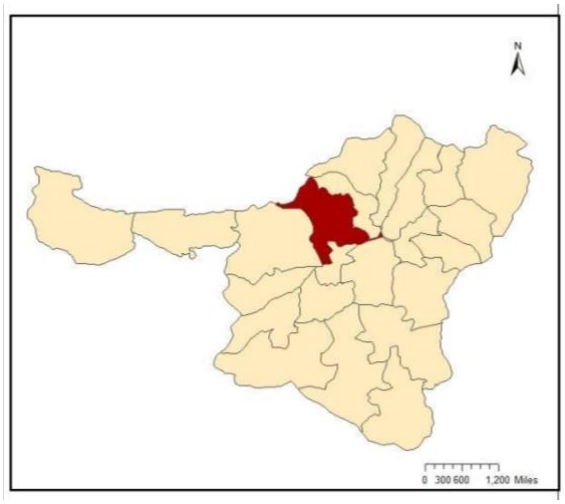
Source: Census (2011)

Employment

In total, 297 people were engaged in work activities in Gobindpur. Of the working population, 99.33% (295) are engaged in main work (full time/employment or earning for more than 6 months). The remaining 0.67% (2) are engaged in marginal work (part time/employment or earning for less than 6 months). Of those engaged in main work, 188 were cultivators (owners or co-owners) and 101 were agricultural labourers. Of the total working population, 157 are male (52.86%) and 140 are female (47.14%)

Bamdah Panchayat

Bamdah panchayat lies in the northern part of Chakai block. The panchayat, with its forested and hilly terrain, is representative of northern Chakai. With a mean elevation of 297 m, it lies within the watershed of the Barnar river.



Bamdah panchayat has a population of 10,733, 66% of which are engaged in work. The panchayat has a sex ratio of 938:1000. Within the panchayat, there are 19 villages.

Climate

The panchayat falls in the Eastern plain and has hot, humid, and moist conditions, moderately dissected by hills and valleys. The geomorphology of the region has been shaped by sheet and gully erosion. With regard to soils, the area is covered with ultisols soils. These are reddish, clay-rich, acidic soils that have an organic content from 5.3% to 6.3%. These soils support mixed forest vegetation prior to cultivation.

Land Use

In total, the panchayat has an area of 112,745 km². Of the total land area, 41% is cultivable land (46,225 km²). An additional 36% is forested (21,421 km²).

Barmasia Village

Barmasia village is part of Bamdah Panchayat within the Chakai block of the Jamui district in the state of Bihar, India. The village has a population of 328 and comprises approximately 78 households. Of the total population, 168 are male and 160 are female. The average sex ratio of Barmasia village is 952:1000. This is higher than the Bihar state average of 918:1000.

The village has a child population (age 0-6) of 53, representing 16.16% of the total village population. It has a child sex ratio of 1038:1000, much higher than the child sex ratio of 935:1000 for the state.

Education and Literacy

The overall literacy rate of the village is 55.64%, almost 20% lower than the average for Jamui district (74.85%) and ten percent lower than the state average (61.80%). The female literacy rate of the village is 45.13% lower than the male literacy rate. This is substantially greater than the disparity that exists between the genders at the district (16.91%) and state levels (19.70%).

Table 5: Literacy rates (%) comparing village, district and state averages

	Barmasia	Jamui district	Bihar state
Total	55.64	74.85	61.80
Male	74.85	82.86	71.20
Female	32.33	65.95	51.50

Source: Census (2011)

Caste Groups

The vast majority of the population in Barmasia are from Scheduled Tribes (ST). Scheduled Tribes constitute 99.7% of the village population. There is no Scheduled Caste (SC) population within Barmasia.

Table 6: Population of Barmasia Village by caste/tribe

Caste	Total	Male	Female
SC	0	0	0
ST	327	167	160

Source: Census (2011)

Employment

In total, 69.82% (229) of the village population were engaged in work activities. Of the working population, 39.30% (90) are engaged in main work (full time/employment or earning for more than 6 months). The remaining 60.70% (139) are engaged in marginal work (part time/employment or earning for less than 6 months). Of those engaged in main work, nine were cultivators (owners or co-owners) while 50 were agricultural labourers.

Of the total working population, 115 are male (50.22%) and 114 are female (49.88%). While the majority of the female working population are engaged in marginal activities (70.18%), the male working population is more evenly split between main (51.30%) and marginal (48.69%) work.

Piprasol Village

Piprasol village is part of Bamdah Panchayat, within the Chakai block of the Jamui district in the state of Bihar, India. The village has a population of 391 and comprises approximately 86 households. Of the total population, 198 are male and 193 are female. The average sex ratio of Piprasol village is 975:1000. This is higher than the Bihar state average of 918:1000.

The village has a child population (age 0-6) of 49, representing 12.53 % of the total village population. It has a child sex ratio of 960:1000, also higher than the child sex ratio of 935:1000 for Bihar state.

Education and Literacy

The overall literacy rate of the village is 57.60%, lower than both the Jamiu district (74.85%) and Bihar state (61.80%) averages. The female literacy rate of the village is 35.5% lower than the male literacy rate. Though there is a disparity between female and male literacy rates at the district (16.91%) and state level (19.70%), the gap at the village level is substantially greater.

Table 7: Literacy rates (%) comparing village, district, and state averages.

	Piprasol	**Jamui district**	**Bihar state**
Total	57.60	74.85	61.80
Male	75.14	82.86	71.20
Female	39.64	65.95	51.50

Source: Census (2011).

Caste Groups

Of the village population, the majority are from Scheduled Tribes (ST), constituting 96.42% of the population. There is no Scheduled Caste (SC) population in Piprasol village.

Table 8: Population of Piprasol Village by caste/tribe

Caste:	**Total**	**Male**	**Female**
SC	0	0	0
ST	377	188	189

Source: Census (2011)

Employment

In total, 277 people were engaged in work activities in Piprasol village. Of the working population, 31.41% (87) are engaged in main work (full time/employment or earning for more than 6 months). The remaining 68.59% (190) are engaged in marginal work (part time/employment or earning for less than 6 months). Of those engaged in main work, 75 were cultivators (owners or co-owners) while only seven were agricultural labourers.

Of the total working population, 143 are male (51.62%) and 134 are female (48.37%). While most of the female working population are engaged in marginal activities (85.07%), the male working population is more evenly split between main (46.85%) and marginal (53.14%) work.

Aspirations across the field sites

Across the study villages for this project, Santhal men and women expressed an overwhelming desire for local employment opportunities and for ways in which local agriculture may be made more profitable. This is not surprising as migration among Santhal Adivasis in this area is distress-driven and involves extremely poor working conditions. The experiences of many male migrants in these villages as a result of the harsh COVID-19 lockdown in India in March 2020 have further underlined these aspirations. However, nothing appeared to be changing to promote employment locally at the time of writing this draft. Another set of aspirations exist vis-à-vis the state. People hope for the government to implement more effective welfare programmes that would support their livelihoods (e.g., improvements in the MGNREGS, PDS etc). They also wish to able to access forests for the collection of non-timber forest produce as food or for sale without harassment and to have more secure rights to land.

Information Sources

Information	**Source**
Administrative Marginalisation (Box 1)	Sinha, Narain and Bhanjdeo (working paper)
Vulnerability to Food Insecurity (Box 2)	Community Needs Assessment (CNA) Survey (n.d.)
JMMS case study (Box 3)	Chakraborty (2017)
Migration	Rao et al. (2020)
Climate	India Meteorological Department (2020)
Population Statistics	Census (2011)
Education and Literacy (Table 1,3,5,7)	Census (2011)
Caste Groups (Table 2,4,6,8)	Census (2011)
Employment	Census (2011)
Photographs	Shreya Sinha

Bhaisiya Chhana Block

Bhaisiya Chhana is one of the 12 blocks in the Almora district of the hilly state of Uttarakhand, India. Uttarakhand was created in 2001 out of Uttar Pradesh. Bhaisiya Chhana is located in the north eastern part of the Almora district, nestled in the lap of the Lesser or Middle Himalaya. The block's landscape is heavily covered by moist mixed deciduous forest.

Though the region is characterised by its high biodiversity, it is also remote, inaccessible and faces several challenges including marginal agricultural productivity, widespread rural poverty, vulnerability to climatic variability and to natural disasters.

Population Statistics

In total, the block has a population of 26,634 and comprises 96 villages and 5,741 households. The population of the block increased slightly by 0.85% between 2001-2011.

Within the population of Bhaisiya Chhana, there are 12,784 males and 13,850 females. This indicates a sex ratio of 1116:1000. This high sex ratio is primarily attributable to the high outmigration of men seeking employment opportunities. In contrast, the child sex ratio (0-6 years old) is far lower with just 848:1000. This is the lowest child sex ratio of all the blocks within the Almora district, which has an overall child sex ratio of 927:1000.

Table 9: Sex ratio and child sex ratio for Bhaisiya Chhana block, Almora district and Uttarakhand state

	Block	District	State
Sex Ratio	1116:1000	1139:1000	1015:1000
Child Sex Ratio	848: 1000	927:1000	918:1000

Source: Census (2011)

Bhaisiya Chhana block has a slightly lower total literacy rate than the average for Almora district and Uttarakhand state. Additionally, the gap between male and female literacy rates is more pronounced at the block level (25.16%) than at the district (24.38%) and state levels (17.39%).

Table 10: Percentage of the population literate in Bhaisiya Chhana block, Almora district and Uttarakhand state

	Block	District	State
Total	77.62	78.85	78.82
Male	90.89	92.26	87.40
Female	65.73	67.88	70.01

Source: Census (2011)

Livelihoods

44.5% Bhaisiya Chhana's population are engaged in either main (full time) or marginal (part time) work. Almost half (46.9%) of the male population are engaged in work, slightly higher than that of the females (42.3%).

Within the total working population, workers are more likely to be engaged in main work (57.9%) over marginal work (42.1%). Similarly, within the female working population, a slightly higher proportion of women work in main work (55.2%) than in marginal activities (44.8%). This is more pronounced in the male working population, 60.5% of which are engaged in main work and the remaining 39.5% are engaged in marginal work.

Table 11: Employment by sector and gender in Bhaisiya Chhana block

Sector	Total	Male	Female
Cultivators	8383 (70.8%)	3148 (52.6%)	5245 (89.5%)
Agricultural Labourers	233 (2.0%)	132 (2.2%)	101 (1.7%)
Households Industries	161 (1.4%)	110 (1.8%)	51 (0.87%)
Other	3063 (25.9%)	2599 (43.4%)	464 (7.9%)
Total Working population	11850 (100%)	5989 (100%)	5861 (100%)

Source: Census (2011)

Lingunta Panchayat

Lingunta (also known as Ligurata) is a gram panchayat (GP) located in the Bhaisiya Chhana block of the Almora district in the state of Uttarakhand, India. It is situated 1,300 meters above sea level and has a total area of 243.5 hectares. Within Lingunta, there are nine hamlets, which have a combined population of 1,042.

Education and Literacy

The gram panchayat has primary and secondary educational facilities within the hamlets. In contrast, the closest college is 8-10 km away in Naugaon. There are two types of schools in the gram panchayat, private and government schools. Government schools are free of charge (until class 8) whereas private schools charge for uniforms, books and lessons. Despite this, many prefer to send their children to private schools because of the better quality of education. Both types of school are located 1-3 km away from the hamlets, a distance walked by children every day. Almost all the boys and girls attend school.

Caste Groups

There are approximately 300 households in the gram panchayat. Of these, 44 (11.33%) are Scheduled Castes (SC) whereas the remaining 266 (88.67%) are upper castes (Brahmins and Thakurs). The gram panchayat has no Scheduled Tribe (ST) population.

Land Use

Table 12: Land area by use (hectares) and percentage area covered in Lingunta

Land Use	Area (Hectares)	% of total area
Forests	28.9	11.87
Non-Agricultural uses	28.6	11.75
Barren/Uncultivable land	24.1	9.90
Grazing (permanent pastures and other grazing land)	23.6	9.69
Miscellaneous (Tree, Crops etc.)	0	0
Cultivable land	27.5	11.29
Current Fallows	0	0
Other fallow lands	30.4	12.48
Net Area Sown	80.4	33.02
Total Land Area	243.5	100

Source: Census (2011)

Land Ownership

Because a significant portion of the land is taken up by forests, there is little land available for cultivation. As a result, the majority of landowners control less than one hectare of land. This means that, as is the case for Almora district as a whole, the majority of land holdings are classified as marginal (0-1 ha, as classified by the Government of India), with a handful described as small. An even fewer number of landholdings are classed as large.

Livelihoods

Agriculture is an important source of livelihood in the gram panchayat. However, agricultural production has decreased over the past ten years, due to changes in the climate, damage to crops by wildlife and a loss of interest within the local population in agricultural livelihoods. High outmigration has also reduced the pool of available agricultural labour.

Migration

Migration has increased considerably over the past decade, as is the case for the Almora district as a whole. Primarily, migrants are young boys and men who leave Lingunta to seek employment elsewhere. In some cases, entire families migrate away to seek better educational and employment opportunities. However, this tends to only be the case for upper caste families.

Climate and Rainfall

In Almora district, there is a high dependence on the monsoon and erratic rainfall for agricultural cultivation. The recent changes in rainfall patterns associated with climate change have resulted in water shortages in Almora district. In Lingunta specifically, the population have observed changes in the weather patterns (temperature and rainfall) and how these have impacted their lives. For example, the rising temperatures have contributed to the escalation of diseases and forest fires whereas rainfall changes have affected water levels.

In general, the soil cover of mountainous parts of the region is thin. Thick layers of soils are distributed mainly in the valleys and broad river tracts.

Water Resources

The main water resources in Lingunta are the river, *gadhera* (streams) and natural water springs. There is only one river in Lingunta, situated 0.5 km away, which is the primary source for irrigation. However, very few households have irrigated land. River water is also used to some extent for drinking purposes (both humans and animals). On the whole, the availability of river water is satisfactory throughout the year.

In addition to the river, there are several *naulas* (groundwater springs) in every hamlet, each with differing water levels. In recent years, the water level has notably decreased, e.g. the water level of streams decreasing by 10-20% over the past 20 years. Around 8-10 years ago, there was a watershed programme implemented by the state government, but this is no longer functioning.

With regard to piped water, around 40 general caste (GC, or upper caste) households in the Mangalta hamlet within Lingunta have access to personal water pipelines. In the other hamlets, the majority of people have community connections, though there are a minority with personal pipelines. Pey Jal Nigam (the department for rural water supply) laid down pipelines many years ago, and these are maintained by the gram panchayat.

Crops

There are two agricultural seasons: rabi (winter crop) and kharif (monsoon crop). Table 13 details some of the main crops grown in the gram panchayat.

Table 13: Crops grown in Lingunta

Variety	Crop name
Cereals	Wheat Paddy *Jau* (barley) Millets (finger millet, barnyard millet, amaranth)
Oil seeds	Mustard Sesame Soybean
Pulses	Peas *Masoor* (lentil) Black soybean Horse gram Gram
Vegetables	Potato Cauliflower *Lai* (mustard greens) Radish Bitter gourd Pumpkin Jackfruit *Methi* (fenugreek) Spinach Tomatoes *Bakula* (bean variety) Cabbage Coriander *Gadheri* (Taro variety)
Fruits	Lemon *Malta* (citrus fruit variety) Mangoes Guava Banana

Source: Primary Data (LCM, n.d.)

Consumption of non-cultivable varieties (wild growing edible plants) is on the decline now as knowledge of these varieties has been lost. Within the gram panchayat, it is Dalit communities that have the most knowledge of these non-cultivatable varieties.

Gender Roles

With the exception of ploughing and harrowing, which are predominantly male activities, women are responsible for the rest of the tasks associated with crop cultivation, many of which are highly laborious. This includes land levelling, manuring, planting, sowing, weeding, harvesting and post-harvest activities. Women are also responsible for all compost preparation and head-loading this compost to the fields and the crops from the field to the home.

In the case of traditional crops like *mandua* (finger millet), women are in control of seed preparation, selection, storage, etc. This means women hold the knowledge of traditional seeds, composting and bio-pesticides. In contrast, because men have greater access to markets and information on agriculture, natural resources and land-related issues, they dominate decisions and sales relating to cash crops. There are several activities in which men dominate. For example, in relation to cash crops (e.g. cauliflower, onion, paddy), men make the decisions on sowing times and are responsible for the purchase of seeds or seedling transplants.

Adolescent girls also play an important role in agricultural activities across all crops, especially compared to boys. In the case of paddy, girls contribute even more than adult men. In addition, girls help the women in the family in all agricultural, forest, water and livestock-rearing activities. Boys participate in the activities mostly performed by men (e.g. ploughing, harrowing, and seed sowing).

Infrastructure

Table 14: Key infrastructure in Lingunta

Available power supply	Yes - there is access to power for domestic and agricultural uses (but not for commercial use).
Available road connections	Yes - the GP is connected to a major state highway and major district road.
Public transport facility	Yes - the GP is connected to a public and private bus service. There is also a railway station, but this is 10+ km away.
Drinking water facility	Yes - the GP has tap water facilities.
Community toilet facility	No - there is no available public toilet facility, with or without a bath.
Phone connections	Yes - There is mobile phone coverage, a public call office and landline phones.

Source: Census (2011)

In relation to energy sources, a handful of households have access to solar energy. Around 95 households have LPG gas connections, but they are only rarely used as it is costly, not easily available and difficult to carry across uneven terrain. Biomass is also an important resource for the gram panchayat, with women walking several kilometres to the reserve forest each day to gather it.

Box 4: Case Study of the Nari Ekta Swayatt Sehkarita (Nari Ekta Self-Reliant Co-Operative)

The Nari Ekta Swayatt Sehkarita is a co-operative of self-help groups (SHG) working in Bhaisiya Chhana across 19 different gram panchayats, including Lingunta. The group has a total of 1,336 members, the vast majority of whom are women (1,316). Similarly, of the 794 shareholders, 82% (655) are women and 18% (146) are men. The group aims to:

- Improve the access of women within the group to technical services, loans and business services
- Conduct essential activities for social and economic uplift of community-based groups and individuals
- Promote small-scale business development via technical support and capacity building
- Extend services to reduce women's workload in agricultural and agriculture-related activities, as well as non-farm activities.

The group focused on agriculture, dairy production, poultry-rearing and farm machinery. The group completed its final phase of work in the region in 2020. Its main achievements include:

- Improved the input supply services for commodities like seeds and planting material from seed corporations
- Built capacity in vermicomposting, bio pesticide preparation, poultry farming and weaving
- Improved market access through the aggregation of farm produce and their marketing (raw and value added) to local consumers and outsiders
- Worked with Integrated Child Development Service (ICDS) in producing, processing (cleaning, grading), packaging and distributing Take Home Ration (THR) and Ready-to-use Therapeutic Food (RUTF) to beneficiaries
- Made farm machinery from VPKAS (Vivekanand Parvatiya Anusandhan Kendra, Almora) available at subsidised rates.

Local Institutions and Amenities

Table 15: Key amenities and institutions (formal and informal), inside and outside Lingunta.

Location	Key amenities and institutions
Inside village:	Primary schools
	Middle schools
	Secondary school
	Family welfare centre (FWC)
	Veterinary Hospital
	Hospital- allopathic
	Sub-post office
	Agricultural Credit Societies
	Self-Help Group
	Anganwadi Centre (Nutritional Centres)
	ASHA (Accredited Social Health Activist)
	Newspaper Supply
	Assembly Polling Station
	Birth and Death Registration Office
Outside village (location):	Pre-primary school (<5 km)
	Senior Secondary School (5-10 km)
	Public distribution system (PDS) shop (5-10 km)
	Community Health Centre (10+ km)
	Primary Health Centre (10+ km)
	Primary Health Sub-centre (10+ km)
	Maternity and Child Welfare Centre (10+ km)
	T.B Clinic (10+ km)
	Hospital - Alternative Medicine (20+ km)
	Dispensary (20+ km)
	Mobile Health Clinic (10+ km)
	Degree college of arts, science and commerce (ASC) (10+ km)
	Engineering college (10+ km)
	Medical college (10+ km)
	Management institute (10+ km)
	Polytechnic (10+ km)
	Vocational Training school/ITI (10+ km)
	Non-formal training centre (10+ km)
	Special school for disabled (10+ km)
	Post and Telegraph office (10+ km)
	Internet cafes/Common Service Centres (CSC) (10+ km)
	Commercial and cooperative banks (20+ km)
	ATM (10+ km)
	Mandis/regular market (10+ km)
	Weekly Haat (10+ km)
	Agricultural marketing society (10+ km)
	Integrated child development scheme (10+ km)
	Community centre (10+ km)
	Sports field (10+ km)
	Sports club/recreational centre (10+ km)
	Cinema/Video Hall (10+ km)
	Public Library (10+ km)
	Public reading room

Source: Census (2011)

As Table 15 shows, health care facilities are situated quite far away from most of the hamlets in the gram panchayat. The nearest Public Health Centre is 7 km away and the nearest hospital, veterinary hospital and dispensary are at least 21 km away. This is a problem given the population face common health complaints like pneumonia and fever (especially amongst children), typhoid, jaundice, leg pain and uterus related problems amongst women. The elderly population also commonly suffer from asthma.

Aspirations

Joining the army continues to be one of the major aspirations amongst young men, and now increasingly amongst young women. The majority of young people do not seem interested in doing agriculture anymore due to grave challenges that agriculture faces as well as the fact it is considered more as a source of subsistence livelihood rather than as an option for lucrative income generation. This includes mostly male as well as a small fraction of the young female population now. They aspire to take a small job (mostly in restaurants, hotels, as guards, household help) somewhere in the city and earn money. Unlike earlier times, when they would be staying back at home with their in-laws and working in fields, young women look forward to leaving their homes and migrating with their husbands to towns and cities.

One of the reasons behind the outmigration of families is to access better opportunities of education as parents want their children to get good education and take up jobs in cities later on. Meanwhile, middle-aged and elderly women, as well as men (of the same age group) continue to practice agriculture and feel it to be a bad omen to leave the entire land fallow.

Information Sources

Information:	**Source:**
Population Statistics (Table 9)	Census (2011)
Education and Literacy (Table 10)	Census (2011)
Employment (Table 11)	Census (2011)
Land Use (Table 12)	Census
Crops	Primary data (LCM, n.d.)
Livelihoods	Census (2011) and National Institute for Rural Development and Panchayati Raj (2015),
Nari Ekta Swayatt Sehkarita (Nari Ekta Self-Reliant Co-Operative) (Box. 4)	Primary data (LMC, 2020)
Infrastructure and local amenities/institutions (Tables 14 and 15)	Census (2011)
Photographs	Reetu Sogani

Bathinda Block

Bathinda is one of eight development blocks within Bathinda district, situated in the Malwa region of Punjab state, India. The block has a total population of 171,499, making it the most populous of all the blocks in the Bathinda district. The block comprises 29,356 households, 11,565 of which are of Scheduled Caste (SC), who also constitute the majority of the 12,466 landless labour households. An additional 2,825 households are Backward Caste (BC). The block has no Scheduled Tribes (ST) population.

Climate and Rainfall

Bathinda block lies in the southwestern region of the state of Punjab. This means it is close to the Thar desert of Rajasthan and far away from major river lines that run through the state. As a result, the climatic conditions experienced in the block are extreme, with very hot summers and very cold winters. The year is divided into three seasons: the cold winter (November to February), the hot dry summer (March to June) and the mild rainy season (June to September). Much of the annual rainfall is received during this period, with few showers occurring during the winter months. In contrast, dust storms are common in the summer seasons.

Table 16: Average monthly and annual rainfall (mm) for Bathinda district (2008-2013)

	2008	2009	2010	2011	2012	2013
Jan	7.0	13.3	5.0	-	4.3	4.7
Feb	-	19.0	23.9	40.0	-	60.0
Mar	-	3.0	1.4	-	-	9.66
April	14.7	4.3	1.3	4.2	11.1	3.67
May	27.3	3.3	1.3	14.5	-	-
June	176.4	2.4	30.8	46.2	11.3	106
July	30.2	99.4	133.5	87.3	56.2	102
Aug	123.6	25.6	84.0	163.9	102.6	-
Sept	56.8	74.9	103.2	271.0	47.1	-
Oct	3.2	-	-	-	5.4	-
Nov	-	0.8	-	-	-	-
Dec	-	-	8.3	-	5.1	-
Total	**439.2**	**246.1**	**392.9**	**626.9**	**243.2**	**-**

Source: Department of Agriculture, Punjab (n.d.)

The topography of the Bathinda block is predominantly constituted by plains with sandy to loamy-sandy soils.

Water Resources

Bathinda block is irrigated by a combination of canals and tube wells. As of 2012, canals were responsible for irrigating 48,646 hectares in the Bathinda block, which represents 20% of the total irrigated area of the entire Bathinda district. In contrast, tube wells were responsible for irrigating just 367 hectares in the block, representing just 1% of the total irrigated area in Bathinda district.

Along with other blocks in the northern part of the Bathinda district, Bathinda block has witnessed a decline in the water level. This is due to the extensive withdrawal of groundwater by farmers for the purpose of paddy and wheat crop irrigation. However, unlike the majority of blocks in the Bathinda district, groundwater exploitation in Bathinda block falls into the 'safe' category. Groundwater development in the Bathinda block lies at 75%, lower than the district average of 93%.

Table 17: Groundwater position and depth in Bathinda block (2002-2012)

Ground Water Trend	Figure for Bathinda Block
Average rise/fall (m) in 10 years (2002-2011)	-0.18
Average rise/fall (m) annual (2011-2012)	-0.33
Depth to water level range (m) in 2002	4.20 to 11.95
Depth to water level range (m) in 2011	4.25 to 15.35
Depth to water level range (m) in 2012	4.44 to 15.97

Source: Department of Agriculture, Punjab (n.d.)

Land ownership

Table 18: Number and area of land holdings by size for Bathinda block (2015-2016)

Size of holding (hectares)	Percentage of total holdings (%)	Percentage of total area (%)
Marginal	13.16	1.89
Small	15.8	5.31
Semi-medium	30.62	20.47
Medium	32.71	46.39
Large	7.71	25.94
Total:	100	100

Source: Agricultural Census (2015-2016)

Box 5: Southwest Punjab and the Green Revolution

The state of Punjab is often held up as a success story of the Green Revolution. Introduced in the late 1960s as a set of practices for production (including seeds, water use, chemical application) of wheat and paddy, Punjab experienced massive increases in acreage and productivity of these crops. In southwest Punjab, however, this was limited to wheat. Cotton remained the main monsoon crop till the 1990s, and cotton-growing farmers are widely considered to be among the most distressed in the state. The increase of paddy production in this region in recent decades threatens to create a ground water crisis as severe as in the rest of the state. On the other hand, the wider institutional changes associated with the Green Revolution in the form of village-level credit cooperatives and regulated wholesale markets also benefitted farmers, especially larger farmers, in this region.

Jodhpur Romana Village

Jodhpur Romana is a village located in the Bathinda block of the Bathinda district located in the state of Punjab, India. It has a population of 2,348.

Population Statistics

Jodhpur Romana village is made up of approximately 458 households. The village's population comprised of 1,215 males and 1,133 females, with a sex ratio of 933:1000. This is higher than the average sex ratio for both the Bathinda block (900:1000) and Bathinda district (889:1000).

As of 2011, only 114 of the 260 children under 6 years were female whereas 146 were male. This means the village has a child sex ratio of 781:1000.

Education and Literacy

In total, 1,358 people within Jodhpur Romana are literate whereas 990 are illiterate. This means approximately 57.84% of the total village population (all ages) are literate. This is slightly higher than the 55.95% of the population of the Bathinda block who are literate. Of the village's total male population, 64.36% (782) are literate compared to 50.84% (576) of the total female population. This gendered disparity between the proportion of the population who are literate broadly mirrors that present at the block level between the male (61.24%) and female (50.06%) populations.

Caste Groups

A significant portion of the village population belongs to the Scheduled Caste (SC) category (40.08%). Most of the remaining 59.02% are from the Jatt caste, the dominant agrarian caste in Punjab. Agricultural land in the village is almost entirely owned by the Jatts. A handful of households belong to the Other Backward Classes. Some among them own extremely small plots of land but overall, their marginalization is comparable to that of the Scheduled Castes.

Land Use

In 1986, some of the land of the village was acquired by the Punjab Agriculture University, the leading state-level agricultural university. PAU's Regional Research Centre was constructed on part of this land. An All India Institute of Medical Science (AIIMS) was constructed on the rest of this land recently, opening formally in early 2020.
Farmers who were affected by this acquisition claim resent that they were poorly compensated for this acquisition even by the standards of the time.

Livelihoods

In Jodhpur Romana village, 44.76% of the population is employed. Of the total working population, 58.71% are engaged in main (full time) work. An additional 41.29% are engaged in marginal (part time) work.

Of the male working population, the majority are engaged in main work (72.50%). In contrast, the majority of the female working population is engaged in marginal work (75.50%).

Table 19: Working population of Jodhpur Romana by sector and gender

Employment type		Total	Male	Female
Main work	Cultivator	338	316	22
	Agricultural labourer	113	94	19
	Household Industries	17	16	1
	Other	149	117	32
	Main work total	617	543	74
Marginal work	Cultivator	51	17	34
	Agricultural labourer	261	139	122
	Household industries	15	4	11
	Other	107	46	61
	Marginal work total	434	206	228

Source: Census (2011)

Agriculture is the most important source of livelihood in the village, with the majority of the working population engaged in either cultivation or agricultural labour. Jatt landowners manage, and occasionally also perform, farming operations. For many landless SC women, on the other hand, cotton-picking is a major source of income. In 2019, these women were being paid by the weight of cotton picked at the rate of 550/650 rupees per quintal. Depending on the number of hours worked and skill level, these women could pick between 20-70kg each day, thereby earning a daily wage between ₹120 and ₹420.

Landless SC men's work as agricultural labour is relatively limited, including activities such as spraying crop chemicals, assisting with sowing or cutting cotton stalks after harvesting. A

handful of men from SC households were also employed as *siri* or attached labour, although this is a practice that appeared firmly on the decline at the time of the field study. Many work as daily wage workers (e.g. in construction or as drivers) in Bathinda city or neighbouring villages.

Notably, most landowning Jatt households also own some livestock, mostly buffaloes and sometimes cows. Lower caste households, if they have any livestock, would have goats.

Markets

After harvest, farmers take the raw cotton crop to the regulated wholesale market or *mandi.* Here, the crop is meant to be sold for at least the Minimum Support Price (MSP), with the actual price determined by the ginning mills. The price of cotton is strongly linked to national and global supply chains within the garment industry. In addition, farmers are also impacted by the global demand for raw cotton, which is dominated by private interests that have control over the supply, demand, pricing, and production of cotton. This is a huge source of uncertainty for farmers in villages like Jodphur Romana in southwest Punjab. In addition, the value of the cotton crop is sensitive to the weather conditions, illustrating once again the uncertainty associated with cotton cultivation for farmers who rely upon it as a primary source of income.

The paddy varieties grown in the village are also sold in the regulated wholesale market at the MSP to the Food Corporation of India and state-level agencies. It is redistributed to other states via the Public Distribution System (PDS). This means there is little open market demand for paddy in southwest Punjab, particularly given paddy is not a staple food crop in the region (unlike wheat).

Crops

The main crops cultivated in Jodhpur Romana are paddy, cotton, and wheat. The cotton crop is sown in April or May, with harvesting beginning in September or early October and lasting until early December. Cotton is harvested largely by hand and is fairly labour intensive.

In comparison to the cotton crop, paddy has a shorter crop duration and doesn't require as much labour. This is because the harvesting process is mechanized, and weeding is not required because of the use of pesticides. The main labour-intensive aspect of paddy cultivation is the transplanting process, which takes approximately one month.

Cotton remains the dominant monsoon crop in the village but there is some shift towards paddy cultivation since the 1990s. This shift is attributable to several factors, mainly the availability of tube well irrigation supported by connection to free electricity. This has allowed

larger landholdings to cultivate paddy instead of cotton, and reap the associated benefits (e.g. more secure crop prices and more stable source of income).

Wheat is the main winter crop, sown in December or January and harvested in April. Harvesting of wheat is done almost entirely by combine harvesters, with the exception of a few marginal land-owning households. Importantly, not all wheat is sold by households and some is kept for consumption at home.

Migration

The shift away from cotton and towards paddy has changed the demands for agricultural labour in Jodhpur Romana. This has manifested in a greater reliance on male migrant labour from Bihar to do paddy transplanting. As a result, these men often seasonally migrate to Jodhpur Romana.

There is no significant outmigration from SC households in the village. However, there has been some international migration of young Jatt men to Canada.

Policies and Programmes

Farmers in the village had benefitted, albeit quite unevenly, from schemes such as the PM Kisan Samman Nidhi, subsidies on agricultural implements and from access to the mKrishi app. Landless agricultural workers had benefitted from works done under the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), although here too the work was not regular or enough. The non-governmental organisation, Better Cotton Initiative, is active in this village.

Institutions and Infrastructure

Jodhpur Romana has three Anganwadis or rural childcare centres where children are also given one meal during the day. There is one primary school in the village. The village also has one primary agricultural credit society, a privately-owned small flour mill and some petty shops.

Gender Roles

Across caste groups, mainstream gender roles apply whereby women are expected to be in-charge of household work, childcare, and caring for livestock while men are seen as the main breadwinners. While lower caste women often have to work for Jatt farmers or for MGNREGS programmes, Jatt women are rarely seen in public space, especially unattended. Political authority in the village is completely monopolized by powerful and large landowning Jatt men.

Aspirations

As agricultural incomes are increasingly under stress, there is tremendous disillusionment vis-à-vis agriculture among the Jatt households. Meanwhile, people from across caste groups aspire for government or private sector jobs, but even these are scarce.

As a result, and in keeping with Punjab's long history of international migration, there is a widespread desire among youth to migrate abroad to countries such as Canada and Australia. Some youth from Jatt households were pursuing or trying to pursue courses in International English Language Testing System (IELTS) on the basis of which they could get 'study visas' to emigrate.

Information Sources

Information:	**Source:**
Climate and Rainfall (Table 16)	Department of Agriculture, Punjab (n.d.)
Water Resources (Table 17)	Department of Agriculture, Punjab (n.d.)
Land Ownership (Table 18)	Agricultural Census (2015-2016)
Population Statistics, Education/Literacy, and Caste Groups	Census (2011)
Crops, Markets and Migration	Sinha (2021)
Livelihoods (Table 19)	Census (2011)
Photographs	Shreya Sinha

Atmakur Block

Atmakur is a block or *mandal* situated in the Warangal Rural district of Telangana state, India. The block has a total population of 59,540, of which 30,063 are male and 29,477 are female. The sex ratio of Atmakur is 981:1000. There are approximately 15,492 households within the block, with an average of 4 persons in every family.

The Warangal rural district, within which Atmakur block is located, is also known for the farmer suicides of 2002. During this period, there were even some instances of widows killing themselves after their husband's suicides, leaving their children orphaned. In more recent years, a severe drought has blighted the area pushing many already vulnerable communities into poverty.

Soil Characteristics

Telangana state is divided into three agro-climatic zones based on regional geographic characteristics (e.g. nature of soils, rainfall, climate, etc). Atmakur falls within the Central Telangana Zone. In this zone, red and black soils are predominant. This includes chalks, red sands, red loams and deep black cotton soils.

Rainfall

Table 20: Normal and actual rainfall (mm) for Atmakur block (2017-2018)

Month	Rainfall (mm)	
	Normal	Actual
June	159.0	189.9
July	331	205.4
Aug	284.5	300.2
Sept	148.6	206.2
Oct	88.4	80.4
Nov	29.4	8.4

Source: Department of Agriculture, Warangal Rural (2018)

Box 6: Katakshapur Tank Irrigation

Figure 1: Katakshapur Tank showing sluice gates.

Source: Irrigation Department (Warangal Rural)

Hydrology of the Tank:

Total Ayacut	546.50 Ha
Free	7.60 Sq. Miles
Intercepted	16.32 Sq. Miles
Combined	23.92 Sq. Miles
Yield Tank	185.65 Sq. Miles
Length of bund	4250.00 Meters

Currently, the tank irrigates agricultural land in the surrounding villages of Katakshapur (502 acres), House Buzurg (530 acres) and Neerukulla (348 acres). Over the last five years, a 'gap ayacut' (a gap between the irrigation potential and irrigation utilisation) of 101 hectares has been created. This is because the tank is currently unable to store water due to leakages of water from the weir and sluices as well as the improper maintenance of channels. The tank system has four contour irrigation channels, all of which are currently functioning with a reduced capacity.

Katakshapur Village

Katakshapur village is located in the Atmakur block or *mandal* of the Warangal Rural district in the state of Telangana, India. It has a population of 895, making it the 4th least populous village in Atmakur. The population of Katakshapur has decreased by 1.4% over the past 10 years, falling from 908 recorded by the 2001 census to 895 as recorded by the 2011 census. Its geographic area is 7.33 km² making it the 9th largest in the block. The population density of the village is 122 people per km², lower than average for both the Warangal Rural district (330 people per km²) and Telangana state (312 people per km²).

Historically, Katakshapur and the nearby village of House Buzurg were once one gram panchayat. However, following the reorganisation of Telangana state districts in 2014, the two were separated. From Katakshapur village, the sub-district HQ of Atmakur is 8 km away. Warangal, the district HQ and closest town, is situated 28 km away.

Population Statistics

Katakshapur village is made up of approximately 251 households, with an average of 4 persons per family. The village's population comprised of 444 males and 451 females, with a sex ratio of 1016:1000. This is higher than the average sex ratio for both Atmakur block (981:1000) and Telangana state (988:1000). However, the village has a child sex ratio of just 826:1000, considerably lower than that of Telangana state (932:1000). In addition, the total child population of the village decreased by 42.9% between 2001 and 2011.

Education and Literacy

The total literacy rate of the village is 51.96%, almost ten percent lower than the average for Atmakur block (61.74%) and almost fifteen percent lower than the average for Telangana state (66.54%). However, from 2001 to 2011 the overall literacy rate of the village increased by 14%, with male literacy increasing by 11% and female literacy increasing by 17%.

Table 21: Literacy rates (%) comparing village, block and state averages

	Katakshapur village	**Atmakur Block**	**Telangana state**
Total	51.96	61.74	66.54
Male	62.39	65.78	75.04
Female	41.69	46.22	57.99

Source: Census (2011)

Caste Groups

Of the village population, 83% are from general caste (GC, or upper caste), 12% are from Scheduled Tribes (ST) and 5% are from Scheduled Castes (SC). Between 2001-2011, the general caste population decreased by 3% compared to an increase in the SC and ST population by 5% and 4% respectively.

Table 22: Population growth in Katakshapur Village (%) by caste/tribe (2001-2011)

	GC	**SC**	**ST**	**Total**
Total	-3	5	4	-1
Male	-3	10	6	-2
Female	-2	0	2	-1

Source: Census (2011)

Land Use

Most land around Katakshapur village is used for agriculture (cultivation of crops and keeping livestock). In the village, there is approximately 1,263 acres of cultivable land. However, land use is changing in Katakshapur, primarily due to a government house-building scheme. The scheme aims to construct 60 new, double

bedroom houses. This project will convert agricultural land to residential land.

Land Ownership

Of the 313 agricultural land holdings in Katakshapur village, 73.3% (214) are marginal in size (up to 1 ha). The other 27.7% (78) of land holdings are all small (between 1 and 2 ha). There are no holdings larger than this within the village. The majority of these holdings belong to upper castes.

Table 23: Land holdings in Katakshapur village by caste/tribe

	SC	ST	Other	Total
No. of Holdings	1	4	308	313
Area Operated (Hectares)	0.4	0.9	235	236.3

Source: State department of Agriculture, Warangal Rural (2016)

A significant change in the patterns of land ownership has occurred in recent decades. Largely this is a result of a local stone crushing business owner buying up agricultural land for 10 times the actual rates. This was because farmers had complained about stone dust ruining their crops. As a result, agricultural land prices have drastically increased to well above the reach of most farmers and villagers.

Livelihoods

In Katakshapur village, 58% of the population are engaged in main (full time) or marginal (part time) work. Of the male population, 57% are main workers and 1% are marginal workers. Of the female population, 53% are main workers and 6% are marginal workers.

Agriculture is an important source of livelihood and major source of food for many in the village. In Katakshapur, there are 292 farmers, representing 56% of the total working population. As well as tending to crops (e.g. paddy, maize and cotton), many also rear livestock (e.g. cattle, goats and sheep) and some are engaged in fishing. During the rainy season, small fish are brought into the local ponds/lakes (e.g. Katakshapur pond). Around November, when they have grown, they are caught and sold. A handful of villagers also run small businesses (e.g. chicken/mutton shops, small provisional stores, eateries).

Additionally, stone cutting is an important non-agricultural source of livelihood. Villagers travel to the nearby rock hills to cut stone, but cannot do so during the rainy season (June-September) because the roads are not suitable to travel then.

Migration

The village has very little permanent or cyclical in or out migration. However, labourers often travel to the surrounding villages to do work, returning during the evening. During the peak agricultural season, there is often a shortage of labour within the village. As a result, labourers from nearby villages are brought in to work temporarily.

Water Resources

In Katakshapur, water is available for approximately 6 months each year. Because of this, different sources of water are utilised depending on the time of year. In addition to the Katakshapur Tank (Box1), an important source of water for the village is a local pond called Chintala Cheruvu. This pond fills with water during the rainy season. Throughout the Kharif season, water from Chintala Cheruvu is distributed to farmers by an appointed village head. If the pond overflows, excess water is held in the nearby Katakshapur pond.

Although in the past, villagers were able to use borewells to access groundwater, this is no longer possible. Approximately 20 years ago, 45 deep borewells were deep enough to reach water but now 200- or 300-foot wells do not

yield sufficient water. The quantity of groundwater has also severely depleted over the past 5 years. However, during the rainy season, borewells still fill with water and are used by the village.

Table 24: Cultivated land area (in acres) by water source (2017-2018)

Irrigation Source:		**Area Covered (Acres)**
Irrigated Area	Tank	502
	Borewells	0
	Dug wells	798
	Kunta (Pond)	82
Un-Irrigated Area		131
Total Area:		1513

Source: State department of Agriculture, Warangal Rural (2018)

Crops

During the Kharif season, the main crops grown are paddy, maize, and groundnut. Of these, paddy is grown on a large scale. Crop cultivation during this season is greatly dependent on the availability of water. For those with water in the kharif season, cotton is also grown. In the rabi season, cotton, paddy, and maize are the main crops grown and villagers are more dependent on water in the borewells.

Table 25: Crops cultivated and acreage (2017-2018)

Kharif		**Rabi**		**Perennial**	
Crop	Acre	Crop	Acre	Crop	Acre
Maize	129	Maize	98	Cotton	450
Mango	35	Paddy	40	Chillies	10
Jamoil	150	Bengal gram	10	Turmeric	54
Red gram	1	Other	4	Other	10
Total:	215	Total:	152	Total:	524

Source: State department of Agriculture, Warangal Rural (2018)

Along with paddy and maize, cotton is one of the most important crops of Katakshapur. However, in recent years a pest called Errapurugu has been destroying the crop, especially during the winter season. Previously, there was a yield of 10 quintal per acre, but this has fallen to just 4-6 quintal per acre. In addition, yields and prices of all crops are sensitive to the amount of rain stored in the rainy season.

Markets

There is no crop market in Katakshapur village or the surrounding villages. Therefore, farmers have to travel to the Enumamula agricultural market in Warangal (28 km away) to sell their produce. Currently, the closest government procurement/IKP (Indira Kranthi Pathakam) centre is in Neerukulla village. This means many are forced to sell their crops at lower prices to private dealers. As a result, some in the village are requesting an IKP be set up to sell grains in Katakshapur village.

The main commodities sold in the Enumamula Market are paddy, cotton and maize. The paddy crop is sold during November and December. Generally, 50% of the crop is sold to private traders and 50% is sold to the IKP. Maize is taken to market in October-November and then in March-April and is sold for approx. ₹ 1800-2000/quintal. Cotton is also taken to the market in October, immediately after harvesting. This is because if stored, the cotton may turn black, reducing the market price.

Typically, cotton is sold for between ₹4,500-5,000/quintal.

In addition, there is also no weekly market for vegetables in Katakshapur. As a result, villagers travel to nearby Mallampally (2 km) to purchase fresh vegetables and fruit. However, some villagers grow and sell vegetables at the Mallampally market.

Infrastructure

Table 26: Key infrastructure in Katakshapur

Village electrification	Yes -100% of the village has electricity (70% metered, 30% non-metered).
Tar/metal/ cement road to village	Yes - 90% of roads in the village are Pakka roads (paved), 10% are Kacha roads (unpaved).
Public transport facility	Yes - there is a request bus stop but no train station.
Drinking water facility	Yes- the village has a drinking water well.
Tap connections available	Yes - All houses in the village have Mission Bhagiratha tap connections

Source: Key informants' survey (2019)

Local Institutions

Table 27: Key institutions (formal and informal), groups and individuals inside and outside Katakshapur village

Inside village:	**Outside village (location):**
Primary School	High School (Mallampally)
Gram panchayat	College (Warangal or Hyderabad)
Self Help Group (SHG)	Rice Mill (House Buzurg)
Public Distribution System (PDS)	IKP (Neerukulla)
Anganwadi Center (AWC)	Agricultural Market (Warangal)
Village Revenue Officer	Vegetable Market (Mallampally)
Sarpanch	Post Office (Ghousepally)
Committee hall	Police Station
RMP Doctor	Veterinary Hospital (Warangal)
Gram Party	Library
Input Shop	Bank (Mallampally)
Community Leaders	Hospital (Warangal)
	Medical Shop (Mallampally)
	Temple/Church

Source: Key informants' survey (2019)

Policies and Programmes

Table 28: Government programmes/policies and their beneficiaries in the village

Name of Government Policy/Programmes	**No. of Beneficiaries**
Family Planning	15
Anganwadi	40-50
Old aged pension	40
Widows pension	50
Women's Self-Help Groups (SHGs/DWCRA)	150
Mid-day meal scheme	30
Land distribution (allotment of land)	30
Subsidy for agricultural machinery	5

Source: Semi-Structured Interviews with Village Key Informants (2019)

Gender Roles

In Katakshapur, the proportion of men and women who are in work (main or marginal) is broadly equal (58% of men and 59% of women). However, the majority of female labourers are paid ₹200 per day whereas male labourers are paid ₹400 to 450 per day. As a result, village employers often hire female labourers because they can afford more workers for the same price. As a result, the majority of agricultural operations are done by women. However, in recent years some of the tasks performed by female labourers have been mechanised (e.g., paddy and maize cultivation). In addition, though in the past women were responsible for harvesting the paddy crop, many now do not because of health problems.

Though women in the village often partake in agricultural labour, very few women (approx. 15) own and operate their own agricultural land. It is only when a woman is widowed, or her husband is an alcoholic, that a woman may purchase, sell and inherit land. As the market for sale of crops is situated at some distance, in Warangal city, women rarely participate in marketing activities.

With regard to education, girls and boys both attend the primary school in the village. In recent years, female literacy rates have increased significantly. However, when students are older, they must travel outside the village to College in either Warangal or Hyderabad. As a result, there is often fear for the safety of female students, especially if they need to travel late in the evening.

House Buzurg Village

House Buzurg village is located in the Atmakur block or *mandal* of the Warangal Rural district, situated within the state of Telangana, India. The village has a population of 1359, making it the 8th least populous village in Atmakur. The population of House Buzurg has increased by 20.4% over the past 10 years, rising from 1,129 recorded by the 2001 census to 1,,359, as recorded by the 2011 census. The geographic area of the village is 5.03 km² making it the 8th smallest in the block. The population density of the village is 270 people per km², lower than average for both the Warangal Rural district (330 people per km²) and Telangana state (312 people per km²).

Historically, House Buzurg village and the nearby Katakshapur village were once one gram panchayat. However, following the reorganisation of Telangana state districts in 2014, the two were separated. From House Buzurg village, the sub-district headquarters of Atmakur is 6 km away. Warangal, the district headquarters, and closest town is situated 26 km away.

Population Statistics

House Buzurg village is made up of approximately 348 households, with an average of 4 persons per family. The village's population comprised of 688 males and 671 females, with a sex ratio of 975:1000. This is lower than the average sex ratio for both the Atmakur block (981:1000) and Telangana state (988:1000). Between 2001-2011, the village's female population growth rate was 22.2%, 3.6% higher than the male population growth rate of 18.6%. As a result, the overall sex ratio of the village increased by 28 females per 1000 males between 2001-2011.

However, during this same ten-year period, the child (under 6 years of age) sex ratio has decreased by 79 girls per 1000 boys. This means the village has a child sex ratio of 910:1000, lower than that of Telangana state (932:1000). In addition, the total child population of the village has increased by 2.1% between 2001-2011.

Education and Literacy

The total literacy rate of the village is 54%, lower than the average for Atmakur block (61.74%) and Telangana state (66.54%). However, from 2001 to 2011 the overall literacy rate of the village increased by 9%, with male literacy increasing by 7% and female literacy increasing by 13%.

Table 29: Literacy rates (%) comparing village, district and state averages

	House Buzurg	Atmakur Block	Telangana state
Total	54.07	61.74	66.54
Male	63.00	65.78	75.04
Female	46.00	46.22	57.99

Source: Census (2011)

Caste Groups

Of the village population, 87% are from general castes (GC, or upper caste), 13% are from Scheduled Caste (SC) and 0% are from Scheduled Tribes (ST). Between 2001-2011, the general caste population increased by 24% whereas the SC population decreased by 2% and the ST population remained unchanged.

Table 30: Population growth of House Buzurg Village (%) by caste/tribe (2001-2011)

	GC	SC	ST	Total
Total	24	-2	0	20
Male	22	-1	0	19
Female	26	2	0	22

Source: Census (2011)

Land Use

In the village there is approximately 907 acres of cultivable land. As a result, agriculture is undertaken on a relatively small scale.

Land Ownership

Of the 694 agricultural land holdings in the village, 66.6% are marginal in size (up to 2.5 acres/1 ha). A further 31.3% (106) of land holdings are all small (between 2.5 and 5.0 Aares/1 and 2 ha). The remaining 2.1% of land holdings are semi medium (5 to 10 acres/2 to 4 ha). The majority of these holdings belong to general caste households.

Table 31: Land holdings in House Buzurg Village by caste/tribe

	SC	ST	Other	Total
No. of Holdings	14	9	671	694
Area Operated (Hectares)	3.2	3.1	221.6	227.8

Source: State department of Agriculture, Warangal Rural (2016)

During the Chandra Babu Naidu period (2002-2003), 18 acres of land were distributed between 36 SC households. Though the land was near lake Katakshapur, there is no irrigation because the land is above the canal. Most landowners in the village live in cities like Hanamkonda, Warangal but lease out their land.

Livelihoods

In House Buzurg, 60% of the population are engaged in main (full time) or marginal (part time) work. Of the male population, 57% are main workers and 3% are marginal workers. Of the female population, 30% are main workers and 30% are marginal workers. In the village, there are 339 farmers, representing 42% of the total working population. Alongside tending to crops (e.g. paddy, cotton, maize and pigeon pea), many also rear livestock (e.g. goats and sheep). Most of the goat and sheep rearing is done by SC households.

Fishing is also an important source of livelihood and is the caste occupation of the Mudiraj people (fish hunters) The Mudiraj people in House Buzurg, Katakshapur, Relakunta and Nandigama formed a group with around 250 members. Together they constructed a community hall near House Buzurg called Mudiraj Sangam. Community members would contract people to bring baby fish and grow them in the Katakshapur pond during the rainy season (July). When the fish were grown, contractors paid a commission of ₹50 per kg for the use of the pond. This commission was then divided equally between the villages and in turn the members.

Stone-cutting is a non-agricultural source of livelihood in House Buzurg. Villagers travel to the nearby rock hills to cut stone, but cannot do so during the rainy season (June-September) because the roads are not suitable. In addition, toddy extraction is the caste occupation of the Goud community. The demand for toddy is highest in the summer season as many villagers regularly consume toddy in these months.

Migration

The village has very little/no permanent or cyclical in or out migration.

Water Resources

In House Buzurg, water is available all year round from the tank. The tank is filled in the rainy season (July-August) but the water level is low during the summer. Though the village has no borewells used for agriculture, there is an open well used for paddy cultivation.

In addition, the village receives water from the first canal flowing out of the Katakshapur Lake. Around 70% of fields are present along this canal. Water from the first canal is used to irrigate crops during the kharif season. During the rainy season, the lake sometimes overflows and floods the nearby road. For the past 20 years, villagers have proposed the construction of a bridge and a water storage system so as not to waste water. So far, these proposals have not been acted upon by the state.

Table 32: Cultivated land area (in acres) by water source (2017-2018)

Irrigation Source:		**Area Covered (Acres)**
Irrigated Area	Tank	530
	Borewells	0
	Dug well	757
	Kunta (Pond)	0
Un-Irrigated Area		123
Total Area:		1410

Source: State department of Agriculture, Warangal Rural (2018)

Crops

Depending on the availability of water, crop cultivation is done in the summer. However, over the past four years, there have been no summer crops grown because of the unavailability of canal water. Several other problems are faced by farmers in House Buzurg when cultivating crops. Firstly, the seeds available are of poor quality. Secondly, there are no fertilizers or pesticides provided by the government to the farmers. Finally, there is a shortage of agricultural labourers.

Table 33: Crops cultivated and acreage (2017-2018)

Kharif		**Rabi**		**Perennial**	
Crop	Acre	Crop	Acre	Crop	Acre
Maize	145	Maize	88	Cotton	550
Red gram	3	Paddy	258	Chillies	14
		Bengal gram	10	Turmeric	77
		Other	3	Other	20
Total:	148	Total:	359	Total:	661

Source: State department of Agriculture, Warangal Rural (2018)

Infrastructure

Table 34: Key infrastructure in House Buzurg

Village electrification	Yes - 100% of the village has electricity (40% metered, 60% unmetered).
Tar/metal/ cement road to village	Yes - 70% of roads in the village are Pakka roads (paved), 30% are Kacha roads (unpaved).
Public transport facility	Yes - there is a request bus stop but no train station.
Drinking water facility	Yes - the village has a public drinking water tank, but this is currently out of service.
Tap connections available	Yes - 80% of villagers have Mission Bhagiratha tap connections. 20% rely on a hand pump and water from neighbours.

Source: Key informants' survey (2019)

Markets

There is no agricultural market in House Buzurg village or the surrounding villages. However, because agricultural production in the village is low, crops are mostly kept by the villagers for household food consumption. Additionally, small quantities of crops are sold to private businessmen. For commodities like cotton however, farmers travel to the agricultural market in Warangal (28 km away). Cotton is taken to the market in October and is sold around ₹4,800/quintal. The paddy crop is sold during November and December and is sold for approx. ₹1,850/quintal. Maize is also taken to market in December, mand is sold for approx. ₹1,200/quintal.

In addition, there is no vegetable market in the village so people have to travel to the weekly vegetable market in nearby Mallampally. However, this is inconvenient because there are inadequate facilities to refrigerate vegetables bought in bulk. Some vendors in the village do sell vegetables but at a relatively higher price.

Local Institutions

Table 35: Key Institutions (formal and informal), groups and individuals inside and outside House Buzurg village

Inside village:	**Outside village (location):**
Primary School	High School (Mallampally)
Gram panchayat	College (Warangal or Hyderabad)
Self Help Group (SHG)	Meeseva centre (Atmakur or Mallampally)
Public Distribution System (PDS)	IKP (Neerukulla)
Anganwadi Center (AWC)	Agricultural Market (Warangal)
Village Revenue Officer	Vegetable Market (Mallampally)
Sarpanch	Post Office (Neredupally)
Committee hall	Police Station
RMP Doctor	Veterinary Hospital (Warangal)
Gram Party	Agricultural input Shop (Atmakur, Mallampally or Warangal)
Temple	Bank (Mallampally of Atmakur)
Rice Mill	Hospital (Warangal)
	Youth Organization

Source: Key informants' survey (2019)

Policies and Programmes

Table 36: Government programmes/policies and their beneficiaries in the village

Name of Government Policy/Programmes	No. of Beneficiaries
Crop insurance	-
Anganwadi	40
Old aged pension	120
Widows pension	40
Women's Self-Help Groups (SHGs/DWCRA)	-
Land distribution (allotment of land)	36
Fish farmers' development programmes	250
Subsidized toilet construction (health scheme)	235
Subsidy of home construction	20
Targeted public distribution systems	720
Subsidy on agricultural machinery	3

Source: Semi-Structured Interviews with Village Key Informants (2019)

Gender Roles

In House Buzurg village, 60% of the male and of the female population are engaged in work (main or marginal). However, while the majority of the male working population are engaged in main (full time) work, female workers are as likely to be marginal (part time) workers as they are to be main workers.

Most agricultural labour is performed by women. In House Buzurg, women undertake most of the seed transplanting, harvesting, weeding and sowing. Because demand for agricultural labourers increases during the rainy season, the wage rate for female labourers increases during this period from ₹150-200 per day to ₹200-250 per day. However, since the mechanisation of some agricultural work (e.g. harvesting paddy), there has been a loss of work for some female labourers.

Though women in the village often partake in agricultural labour, very few women (approx. 20) own land themselves. Women buy, sell and inherit land almost only if they are widows or if a woman's husband is an alcoholic.

With regard to education, girls and boys both attend the primary school in the village. In recent years, female literacy rates have increased significantly (12% between 2001-2011).

Neerukulla Village

Neerukulla village is located in the Atmakur block or *mandal* of the Warangal Rural district, situated within the state of Telangana, India. It has a population of 4,225, making it the 4th most populous village in Atmakur. The population of Neerukulla has decreased by 9.2% over the past 10 years, falling from 4,652 recorded by the 2001 census to 4,225 as recorded by the 2011 census. Its geographic area is 14 km² making it the 4th largest village by area in the block. The population density of the village is 311 people per km², lower than average for both the Warangal Rural district (330 people per km²) but broadly in line with the average for Telangana state (312 people per km²).

From Neerukulla village, the sub-district HQ of Atmakur is 7 km away. Warangal, the district HQ and closest town, is 27 km away.

Population Statistics

Neerukulla village is made up of approximately 1,147 households, with an average of 4 persons per family. The village's population comprises of 2,101 males and 2,124 females, with a sex ratio of 1011:1000. This is higher than the average sex ratio for both Atmakur block (918:1000) and Telangana state (988:1000). The village has a child sex ratio of 956:1000, which although lower than the adult sex ratio, is higher than the child sex ratio of Telangana state (932:1000). In addition, the total child population of the village has decreased by 39.7% between 2001 and 2011.

Education and Literacy

The total literacy rate of the village is 62%, broadly in line with the average for Warangal Rural district (61.26%), but slightly lower than the average for Telangana state (66.54%). However, from 2001 to 2011 the overall literacy rate of the village increased by 9%, with male literacy increasing by 7% and female literacy increasing by 12%.

Table 37: Literacy rates (%) comparing village, district and state averages

	Neerukulla	Atmakur Block	Telangana state
Total	62.0	61.74	66.54
Male	73.0	65.78	75.04
Female	51.0	46.22	57.99

Source: Census (2011)

Caste Groups

Of the village population, 64% are from general caste (GC, or upper caste), 36% are from Scheduled Castes (SC) and 0% are from Scheduled Tribes (ST). Between 2001-2011, the general caste population decreased by 20% compared to an increase in the SC population of 18%. The ST population remained unchanged during this period.

Table 38: Population growth in Neerukulla Village (%) by caste/tribe (2001-2011)

	GC	SC	ST	Total
Total	-20	18	0	-9
Male	-22	17	0	-11
Female	-18	18	0	-7

Source: Census (2011)

Land Use

Most land around Neerukulla village is used for agriculture (cultivation of crops and keeping livestock). The village has approximately 2,890 acres of cultivable land.

Land Ownership

Of the 1,626 agricultural land holdings in Neerukulla village, 81% are marginal in size (up to 2.5 acres/1 ha). A further 12.6% of land holdings are all small (between 2.5 and 5.0 acres/1 and 2 ha). The remaining 6.4% are semi-medium in size (between 5.0 and 10.0 acres/2 to 4 ha). The majority of these holdings belong to those of general caste households.

Table 39: Land holdings in Neerukulla village by caste/tribe

	SC	ST	Other	Total
No. of Holdings	205	15	1,400	1,626
Area Operated (Hectares)	76.7	6.8	806.1	889.7

Source: State department of Agriculture, Warangal Rural (2016)

Livelihoods

In Neerukulla village, 59% of the population are engaged in main (full time) or marginal (part time) work. Of the male population, 45% are main workers and 16% are marginal workers. Of the female population, 38% are main workers and 19% are marginal workers. Agriculture is an important source of livelihood for many in the village. In Neerukulla, there are 985 farmers, representing 39% of the total working population. Alongside tending to crops (e.g. paddy, maize and cotton), many also rear livestock (e.g. cattle, goats and sheep). During the Dussehra festival, demand for sheep and goats is high so they are often sold then. Furthermore, some are engaged in fishing. During the rainy season, small fish are brought into the local ponds/lakes (e.g. Neerukulla cheruvu). Around November, when they have grown, they are caught and sold.

Toddy extraction is another livelihood activity in Neerukulla. Though toddy is extracted all year, the demand is highest in the summer season because labourers working in the summer consume toddy on a daily basis to relieve the pain from performing manual work.

Migration

The village has very little permanent or cyclical in or out migration. However, labourers often travel to the surrounding villages to do work, returning during the evening.

Water Resources

A major source of water in Neerukulla village is the Neerukulla cheruvu (pond). The pond was built during the Kakatiya period and once covered an area of 250 acres but now only covers 170 acres. In 1967-1968, heavy floods destroyed Neerukulla pond and it was subsequently reconstructed and desilted. The pond is rainfed and irrigates approximately 450 acres of agricultural land, 95% of which is covered in paddy crop and 5% in cotton crop. The irrigation system consists of three command canals. The first canal irrigates 85 acres, the second irrigates 110 acres and the third irrigates 195 acres.

In addition, the pond has three catchment canals: the first from Muthyampally pond, the second from Muchyampally pond and the third from Mallampally pond. Water comes from these canals only when their respective ponds are filled, and their respective villages have sufficient water. This happens once in 2-3 years, following good rainfall. In these years, farmers close to the catchment canals use motor pumps to irrigate approximately 50-69 acres of land.

Other water resources include a small canal called Sali Vaagu, which is filled by rainwater. This water is used to cultivate paddy crops. The village also has two other small ponds, one of which is called Barjara Kunta. Water from the Duggondi River fills this small pond and is used to cultivate paddy crops. The other small pond is called Pedamma Kunta. This pond is filled by rainwater and irrigates a total of 54 acres. Additionally, approximately 12 acres of land is irrigated by the Katakshapur pond canal.

The village has 48 open wells and four agricultural borewells. Ten years ago, water would be accessible if a borewell was 100 feet deep. Five years ago, water would be accessible at 150-180 feet but now borewells must be 300 feet deep to get water. This

illustrates the decline in groundwater. The same is true for water access from dug wells. Historically, the villagers could also access water from a dug well that was approximately 60 feet deep. Now, villagers must dig more than 250 feet to reach water.

Table 40: Cultivated land area (in acres) by water source (2017-2018)

Irrigation Source:		**Area Covered (Acres)**
Irrigated Area	Tank	348
	Borewells	0
	Dug well	1323
	Kunta (Pond)	30
Un-Irrigated Area		711
Total Area:		2412

Source: State department of Agriculture, Warangal Rural (2018)

Crops

During the Kharif season, the main crops grown are paddy and cotton. Land for the paddy crop is ploughed and prepared in June (after the first rainfall). If a farmer is close to a well, sowing/transplanting of the paddy takes place in July. If they are by the canal, this process occurs in August. Harvesting is done by a harvester in November, December and January due to water availability. For the cotton crop, land is prepared in April-May, before the first rain. Seeds are sown in July, after the first rain. Harvesting then occurs in October and is mostly done by hand (by female labourers). In the rabi season, maize and paddy are the main crops grown.

Table 41: Crops cultivated and acreage (2017-2018)

Kharif		**Rabi**		**Perennial**	
Crop	Acre	Crop	Acre	Crop	Acre
Maize	233	Maize	194	Cotton	1503
Jamoil	12	Paddy	118	Chillies	21
Red gram	10	Bengal gram	20	Turmeric	98
Other	11	Other	15	Other	16
Total:	266	Total:	347	Total:	1638

Source: State department of Agriculture, Warangal Rural (2018)

Along with paddy and maize, cotton is one of the most important crops in Neerukulla. However, in recent years a pest called Errapurugu has been destroying the crop, especially during the winter season. Previously, there was a yield of 10 quintal per acre but this has fallen to just 4-6 quintal per acre.

Infrastructure

Table 42: Key infrastructure in Neerukulla

Village electrification	Yes - 100% of the village has electricity (40% metered, 60% non-metered).
Tar/metal/ cement road to village	Yes - 50% of roads in the village are Pakka roads (paved), 50% are Kacha roads (unpaved).
Public transport facility	Yes - there is a bus stop but no train station.
Drinking water facility	Yes- the village has a public tap, public well and hand pump.
Tap connections available	Yes - 70% houses in the village have functioning tap connections

Source: Key informants' survey (2019)

Markets

There is no agricultural market in Neerukulla village or the surrounding villages. Therefore, some farmers have to travel to the agricultural market in Warangal (27 km away) to sell their

produce. However, Neerukulla has a government procurement/IKP (Indira Kranthi Pathakam) centre. This allows farmers to sell crops locally. The main commodity sold at the IKP centre is paddy. The paddy crop is sold shortly after harvest (November-January) at approximately c1750/quintal at the IKP. Some farmers sell to private businessmen for slightly below this rate (₹1,700/quintal). Most farmers say they need a higher price than they are currently receiving for the paddy crop.

Unlike paddy, cotton is not bought at the IKP. As a result, it is sold at the Enumamula Market (Warangal). Cotton is taken to market in October, immediately after harvesting. This is because if stored, the cotton may turn black, reducing the market price. Typically, cotton is sold for between ₹4,500-5,000/quintal. Maize is also taken to market during October-November and from March-April and is sold for approx. ₹1,800-2,000/quintal.

While Neerukulla does not have an agricultural market, it does have a weekly vegetable market enabling villagers to buy fresh fruits, vegetables and other produce.

Local Institutions

Table 43: Institutions (formal/informal), groups and individuals inside/outside Neerukulla

Location	Institutions
Inside village	Primary School Gram panchayat Self Help Group (SHG) Public Distribution System (PDS) Anganwadi Center (AWC) Village Revenue Officer Meeseva Centre Sarpanch Post Office Committee Hall RMP Doctor Gram Party Input Shop IKP Centre High School Youth Organization Bank Vegetable Market Temple Sub Centre Poultry Farm Rice Mill
Outside village (location)	College (Warangal or Hyderabad) Police Station Hospital (Warangal) Agricultural Market (Warangal)

Source: Key informants' survey (2019)

Policies and Programmes

Table 44: Government programmes/policies and their beneficiaries in the village

Name of Government Policy/Programme:	No. of Beneficiaries
Free health camps (for those with Tuberculosis, Malaria, etc).	70-80
Jatiya Prasuthi Sahaya (Nutritional programme for pregnant women).	100
Deepam Padakam (LPG gas connection)	1200
Old aged pension	500
Widows pension	300
Pension for the physically handicapped	150
Women's Self-Help Groups (SHGs/DWCRA)	520
Subsidy on livestock (e.g. sheep, goats, bullocks).	12-15
Indiramma Illu (Housing Scheme)	800
Land distribution (allotment of land)	24

Source: Semi-Structured Interviews with Key Informants (2019)

Gender Roles

In Neerukulla village, 57% of the female population are engaged in work (main or marginal). This is slightly lower than the 61% of

the male population. In addition, male labourers are paid an average of ₹400-450 per day compared to ₹200 per day for female labourers. As a result, this means many employers choose to hire more female labourers because they can hire two female employees for the same price as one male employee.

As a result, the majority of sowing, weeding, and harvesting is done by female labourers. However, since the mechanisation of some agricultural work (e.g. harvesting paddy), there has been a loss of work for some female labourers. Though women in the village often partake in agricultural labour, very few women (approx. 25) own and operate agricultural land themselves. Though women can inherit land this is often only true for widows or when a woman's husband is an alcoholic.

With regard to education, girls and boys both attend the primary and high school in the village. In recent years, female literacy rate has increased significantly (12% between 2001-2011).

Aspirations across the field sites

The older generation of farmers in Katakshapur, House Buzurg and Neerukulla have aspirations beyond agriculture for the next generation. This is because agriculture is associated with considerable uncertainty and income insecurity. Non-farm livelihoods in turn are viewed as more reliable sources of income. In landed households, many aspire for their sons to work in cities, in the formal sector or in a government job. For their daughters, agriculture is not aspired to either. Instead, learning a skill (e.g., computer typing or tailoring) is preferred. The desirability of non-farm employment is reflected in marital preferences, with agricultural households viewed as less desirable marital matches than those with jobs in the non-farm sector. This illustrates how the social respectability of farming influences aspirations in the region. Education is an important facet to consider in relation to aspirations across the villages. The majority of families want their children to access higher education to unlock better employment opportunities outside of the farm sector. This is the case regardless of gender. However, these aspirations can be impeded by the unaffordability and inaccessibility of higher education opportunities. For example, though poor and landless households still aspire for their children to obtain higher education, they often resort to allowing their daughters to engage in agricultural activities to finance their education.

Information Sources

Information:	**Source:**
Rainfall (Table 20)	Department of Agriculture, Warangal Rural (2018)
Katakshapur Tank (Box 5 and Figure 1)	Irrigation department, Warangal Rural
Demographic (population, education, caste groups) (Table 21, 22, 29, 30, 37, 38).	Census (2011)
Agriculture, land use and ownership (Table 23, 24, 25, 31, 32, 33, 39, 40, 41).	State department of Agriculture, Warangal Rural: Agricultural Census (2015-2016 and 2017-2018)
Water Resources.	Information from key informants during village resource/social mapping (2019)
Livelihoods, migration, markets and crops.	Information from key informants - Seasonal Calendar (2019)
Programmes and Policies (Table 28, 36, 44)	Semi-structured interviews with key village informants (2019)
Local Institutions and infrastructure (Table 26, 27, 34, 35, 42, 43)	Key informants survey (2019)
Gender roles	Information from key informants' survey (2019)
Photographs	Toby Smith

Sirkazhi Block

Sirkazhi is a block situated in the Mayiladuthurai district of Tamil Nadu state, India. Historically, Sirkazhi was part of the coastal area which flourished during the classical Sangam era. The name 'Sirkazhi' is found in the history of the Chola king Kocengannan from the Sangam Age (3rd Century BCE to 4th Century CE), who is believed to have won a bloody battle here. The Chola Kings ruled over the region for more than four centuries, from 850 to 1280. In 1532, Sirkazhi region fell under the control of Pandyas, later becoming part of the Thanjavur Navakkar kingdom. By the mid-18th Century, Sirkazhi had been part of the British East India Company as a constituent part of Tanjore district. After India's independence, Sirkazhi continued to be a part of the Thanjavur district until 1991, when it became part of the newly created Nagapattinam district. However, in 2020, Mayiladuthurai was carved out as a separate district from Nagapattinam.

In total, Sirkazhi block has a population of 128,768 and comprises 39 villages. It has a total area of 18953.71 hectares. Sirkazhi block, has a high percentage of irrigated land area (96.91%) to its total net sown area, which indicates that all cultivable lands in this block are well networked with irrigation canals from Cauvery river. However, the agricultural production in the coastal panchayats of Sirkazhi block are heavily dependent on the Cauvery river water as well as on timely monsoon.

Population Statistics

Within the population of Sirkazhi block, there are 63,868 males and 64,900 females. This indicates sex ratio of 1016:1000, higher than the state average for Tamil Nadu (996:1000). Just over a third (38.05%) of the total population belong to Scheduled Castes (SC), and a much smaller portion of the population (0.24%) belonging to Scheduled Tribes (ST). The overall literacy rate of the block is 80.20%, broadly in line with the average for Tamil Nadu state (80.09%).

Vanagiri Village

Vanagiri village is a coastal village panchayat near the historical town of Poompuhar. Vanagiri village is located in the Sirkazhi block or *mandal* of the Mayiladuthurai district, situated within the state of Tamil Nadu, India. The village has a total population of 6,853 and an area of 801.08 hectares. It comprises seven hamlets: Naganathankovil, Pazhayakaram, Thosaikulam, Vanagiri, Keelavanagiri, Melavanagiri, and Erampalayam. This profile includes primary data on five of these seven (Naganathankovil, Thosaikulam, Keelavanagiri, Melavanagiri, and Erampalayam) where farming remains an important means of livelihood. Secondary data sources include information on the entire village panchayat (all seven hamlets).

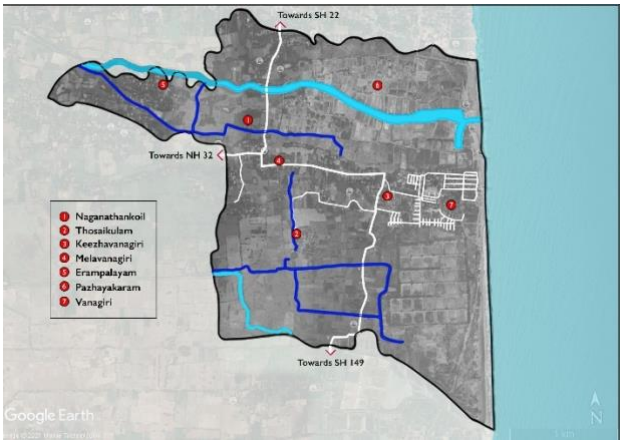


Figure 2. Map of hamlets within the study area of Vanagiri (MSSRF, 2021)

The village lies at the tail end of the Cauvery delta zone, where the river meets the Bay of Bengal. It has a coastal agro-ecosystem and is located 2-3 km from the sea. Vanagiri is situated 25 km from the district headquarters in Mayiladuthurai, 16 km from Sirkazhi and 257 km from the state capital in Chennai.

Box 7: Vanagiri's archaeological significance

Vanagiri is an archaeologically significant region as it was a part of erstwhile Kaveripattinam (also known as 'Puhar') – the chief port of the Chola empire. Puhar is mentioned in numerous works of Sangam literature, particularly in the verses of the second century anthology 'Pattinappalai', and the twin epics - Silappadikaram and Manimekalai. 'Kaveripattinam' can be roughly translated to 'city at the mouth of the Cauvery River'. It is described as a bustling port with a harbour, well laid-out streets, fortified walls, temples, monasteries and mansions. Archaeological excavations have revealed ruins of the ancient port, believed to have been lost to the sea due to a natural disaster.

Today, a panchayat in Sirkazhi block bears the name of 'Poompuhar', meaning 'the town with prosperity', and was once a flourishing ancient port city. Poompuhar is situated 5.1 km away from Vanagiri. Excavations in and around Vanagiri have uncovered habitation sites with ring wells, black and red pottery ware, copper coins with the royal Chola crest, semi-precious beads etc. The region continued to function as an important centre for trade under the subsequent rule of the Pallavas, Nayakas, Marathas as well as the Portuguese, French and British colonial powers. The irrigation system of the lower Cauvery basin level is still regulated through the 'Grand Anicut' (commonly known as the Kallanai dam) built in the Chola period.

Population Statistics

Vanagiri village is made up of approximately 2,148 households. The village's population comprised of 3,351 males and 3,502 females, with a sex ratio of 1045:1000.

Education and Literacy

The total literacy rate of the village is 73.71%, lower than the average for the Sirkazhi block (80.20%) and Tamil Nadu state (80.09%).

Table 45: Literacy rates (%) for Vanagiri Village by gender

	Literacy rate	Total literate	Total Illiterate
Total	73.73	4405	2448
Male	82.55	2394	957
Female	65.38	2011	1491

Source: Census (2011)

Caste Groups

The village has a multi-caste structure, primarily composed of the Most Backward Caste (MBC) and the Scheduled Caste (SC) communities. Other caste groups in the area include the Backward Classes (BC) and Open Category (OC, oe upper castes) communities. No tribes reside in the area.

Table 46: Caste groups by hamlet in Vanagiri panchayat

Hamlet	Caste Group	Hamlet Population
Naganthankovil	SC	156
Thosaikulam	SC	288
Keezhavanagiri	MBC, SC	207
Melavanagiri	MBC, BC	1683
Erampalayam	MBC, BC	3951
Pazhayakaram	MBC, OC	935
Vanagiri	MBC	3189

Source: GPDP (2019)

Land Use

Table 47: Land classification for Vanagiri village

Land Category	Extend (hectares)
Wet land	413.41
Wet land - Fallow	6.77
Dry land	172.03
Dry land - Fallow	34.76
Fallow land	4.69
Rain-fed land	14.57
Uncultivated land	9.15
Poramboke land	145.10
Total	800.75

Source: Village Administrative Office (2019)

Land Ownership

Most of the land is owned by men. Female landowners are mostly from MBC and OC communities, some of whom are widows. Of these women (of MBC or OC), 42 own wetland, 24 own dry land (including residence), and 10 have joint ownership of wet and dry land (VAO office, 2020). Some SC women also owned land but have since been forced to sell it to meet financial needs.

Most of the agricultural land in the hamlets of Erampalayam, Keezhavangiri and Melavanagiri is inherited, with some land given as a dowry. However, the majority of people from these hamlets are landless. For example, only 40 out of the 154 households in Erampalyam own agricultural land. The SC community are most likely to be landless.

In 1994, poor SC households in Naganthankoil, Thosaikulam and Ambedkar street settlements were each given one acre of land. After the 2004 tsunami, most of these land holdings were sold to a private company which kept the land idle. The villagers informally accessed their farmland and continue to cultivate it for agriculture, despite the fact that their landholdings are no longer legally recognised.

Livelihoods

In Vanagiri village, 38.3% (2,628) of the population are classed as ‘workers’. Of the male population, 53.4% (1,791) work. Of the female population, 23.9% (837) work. Agriculture and fishing are the primary sources of livelihood for many in the hamlets. In total, there are 152 cultivators and 416 agricultural labourers. However, in recent years there has been a shift toward non-farm activities with farming becoming a seasonal and secondary occupation. This shift is also attributable to unfavourable environmental conditions (e.g., soil and water salinity, the unavailability of canal water), lack of access to new technology, and the low income and seasonal nature of farm work. In addition, human labour is being replaced by farm machinery which further reduces employment opportunities for both men and women.

Shrimp culture was introduced as a possible alternative to farming in the 1990s due to a dip in agricultural yields. It took off in the 2000s and became a large-scale activity. The use of unsustainable practices in the shrimp ponds of Vanagiri has resulted in pollution and increased water and soil salinity.

Other non-farm activities include construction work, livestock rearing, supervision of shrimp culture units, brick making, loading, driving, food processing (e.g. curd/yoghurt), firewood selling, floriculture, etc. In addition, some young women are employed as contract workers in textile mills. These mills are located far away from the village and therefore workers stay in accommodation provided by the mills.

The highest-paid amongst these roles is the construction workers, who are often employed in temple construction or masonry work. Generally, only members of the MBC community are employed as temple construction workers as it requires skilled labour for which only they are trained. Many members of the MBC community own vehicles and all five of the brick kilns in the village, employing SC persons as workers. In contrast, those in the SC community are often employed as labourers and occasionally, drivers. Food processing is largely done by MBC women. SC women are limited to selling their products within the SC community due to social stigma and notions of caste purity. Of all jobs, fish loading and unloading is considered the lowest and is only performed by those from disadvantaged socio-economic backgrounds.

Migration

Unemployed or under-employed farmers and agricultural labourers often migrate to find better opportunities and higher wages in the non-farm sector. In 2019, there were 250 instances of inter-state migration, 28 of intra-state migration and 66 of overseas migration. Most of these workers seasonally migrate and return to work on their paddy fields in the period from September (for sowing) to January (for harvesting). Migrants belonging to the MBC community are usually employed in skilled work like construction (mason work and temple construction) or as drivers and office assistants. In contrast, those from the SC community occupy mainly unskilled positions like assistants of masons.

Rainfall and Soil Types

Vanagiri has an average annual rainfall of 1,230 mm. The majority of this rainfall comes from the northwest monsoon from October to December. Like the rest of the district, Vanagiri receives approximately 60% of its annual rainfall during this season.

The vast majority of Vanagiri contains sandy loam soil. Soil salinity is very high in the village because of the seawater, particularly following the 2004 Tsunami.

Water Resources

With regard to sources of irrigation, Vanagiri receives around 80% of its water from the Cauvery River via canals. Some of the more financially stable farmers also use borewells for crop cultivation. Prior to the 2004 Tsunami, the total cultivated area (from both rain and irrigation) was 440.08 hectares (1991 Census). However, after the disaster, this was reduced to just 284.1 hectares (2011 Census).

Paddy cultivation relies upon a combination of rainwater and river water from the Cauvery river, which is channelled through canals. In contrast, cotton cultivation relies on water from borewells and farm ponds. Other crops also rely on water from farm ponds, coupled with rainwater.

Most groundwater in Vanagiri is saline due to the extraction of groundwater for shrimp culture practices, saltwater intrusion post-Tsunami, etc. As a result, those unable to afford canned water are forced to use salt water for cooking and drinking purposes. This has caused severe health problems, such as kidney/renal failure.

Natural Disasters

Due to its proximity to the coast and low elevation, Vanagiri is prone to natural disasters such as cyclones, floods, and tsunamis. These

disasters have consistently caused widespread damage to infrastructure, water bodies and farms. The lives and livelihoods of coastal communities are particularly vulnerable to the severe impacts of such disasters, which have been intensified by climate variability and change in recent years.

Table 48: List of major natural disasters in Vanagiri (1992-2021)

Year	Natural Disaster
1992	Drought
1996	Cyclone, Flood
2004	**Tsunami**
2005	Baaz Cyclone
2008	Nisha Cyclone
2011	Thane Cyclone
2012	Nilam Cyclone
2015	Drought
2016	Vardah Cyclone
2017	Ockhi Cyclone
2018	Gaja Cyclone
2019	Fani Cyclone
2020	Nivar and Burevi
2021	Cyclones
	Tauktae Cyclone

Box 8: Vanagiri and the 2004 Tsunami

Much like the catastrophic waves that engulfed the illustrious port-city of Puhar described in ancient Sangam Tamil literature, a deadly tsunami struck the region in 2004. Triggered by an earthquake in the Sumatran west coast in Indonesia, the tsunami caused widespread damage and devastation to coastal regions, predominantly occupied by fishing communities. The then Nagapattinam district reported 6,064 of the 8,009 deaths in Tamil Nadu, with Vanagiri one of the worst affected villages. The Tsunami also caused severe entry of seawater into the hamlets of Vanagiri panchayat. This resulted in the stagnation of seawater in the fields for a prolonged period, causing both water and soil to become saline. This continues to plague residents and farmers today, over 15 years later.

Crops and Livestock

The major agricultural crops cultivated in the village are paddy, groundnut, and cotton. Plantation crops like coconut, mango, and cashew are also widely grown. In addition, many villagers cultivate crops in their backyards for personal use and on dry land. These include casuarina, teakwood, tamarind, banana, sapota, neem, eucalyptus, pomegranate, sandalwood, snake gourd, bottle gourd, ribbed gourd, bitter gourd, ash gourd, okra, bamboo, palmyra, brinjal, cluster beans, maize, chilly, jackfruit, lemon and guava.

Table 49: Change in cropping pattern in Vanagiri

Time Period	Crops Cultivated by Season		
	Kuruvai-Kharif (June-Aug)	Samba-Rabi (Sept-Jan)	Thaladi-Rice Fallow (Jan-March)
Pre-1980	Traditional Paddy varieties	Traditional Paddy varieties	Green gram, Black gram, millets, groundnut, vegetables
1980-2000	Paddy (hybrid varieties)	Paddy (high yield varieties)	Green gram, Black gram, vegetables
Post-2000	No cultivation	Paddy (high yield varieties)	Green gram, Black gram, cotton

Source: Primary data (MSSRF, 2019)

Over the past few decades, groundwater salinity and the scarcity of river water have led

to a change in the cropping patterns of Vanagiri. The main shift has been the transition from cultivating three crops in a year to only one. There has also been a shift away from food crops to cotton due to the extensive soil and water salinization in the area.

In addition to crops, livestock such as poultry, goats and cattle are raised in the village. Some of the young men of the village are interested in animal husbandry, especially in raising exotic birds such as battle roosters, fancy pigeon breeds, guinea and turkey.

Infrastructure

Table 50: Key infrastructure in Vanagiri

Village electrification and cooking fuel	Electric supply (for domestic use) for 8-12 hours.
	1,053 households using clean energy (e.g. biogas/LPG)
	16 households using non-conventional energy sources (e.g. solar, wind)
Tar/metal/ cement road to village	Yes - Internal paved (brick/concrete) roads in the village
Public transport facility	Yes - there is a bus service to the village and bus depot in Poompuhar (4.3 km).
Communication facilities	Yes- landlines, mobile phones, radio and TV sets in the village.
Tap connections available	Less than 50% of households have piped water connections but the quality of water supplied is highly saline.

Source: Primary data (MSSRF, 2019)

Markets

Farmers mostly sell produce through the TNCSC (Tamil Nadu Civil Supplies Corporation) to private traders at *Sandhai* (village level markets) and at Poompuhar market. Some of the produce, such as lemon, yam and moringa, are also sold within the village.

Though women are involved in almost all aspects of farming, they are absent from marketing. This could be due to several reasons such as existing social perceptions which have traditionally confined women to the domestic sphere, lack of access to market information, transportation, labour-related issues etc.

Table 51: Commodity markets and produce sold (Prices as of 2019)

Commodity Market	**Produce**	**Price**
		Price (per bag)
Direct procurement by traders	Paddy BPT 5204	Rs. 1050-1100
	Cotton	
	Black Gram	
	Coconut	
	Mango	
	Cotton (MCU 7)	40-60/Kg
	Black gram (traditional)	80-90/Kg
	Green gram (traditional)	75-85/Kg
DPC/ TNCSC	ADT 45 (Paddy)	Rs. 900- 960
	ADT 38 (Paddy)	Rs. 900- 960
Local Markets	Fruits/ Vegetables	

Source: Primary data (MSSRF, 2019)

Vanagiri does not have a designated livestock market. Therefore, most farmers sell animals based on their needs through local traders.

Typically, poultry are sold in the village itself, and chicks are occasionally sold in the local 'Saayavanam' or Sunday market. Additionally, cattle are sold in bulk to known traders.

Local Institutions

Table 52: Key institutions and groups inside and outside Vanagiri

Inside village:	Outside village (location):
Primary school	Private senior secondary school (Melaiyur, 6.9 km)
Middle school	Private Disabled School (Sattanathapuram, 23 km)
High school	Colleges (e.g. Melaiyur, 6 km, Puthur, 33 km)
Anganwadi Center (AWC)	Government hospital (Poompuhar, 4.3 km)
Vocational Training Centre	Sivagami clinic (Poompuhar, 4.4 km)
Post Office	Primary Health Centre (Chinnangudi, 4.8 km, Melapperumpallam, 6.4km).
Adult Education Centre	Government Primary Health Centre (Chinnangudi, 4.4 km, Melapperumpallam, 6.4 km)
Library	Banks (IOB, Poompuhar, 4.3km, The Kumbakonam Central Co-op Bank, 6.2 km)
Public Distribution System (PDS)	ATM (IOB, Indi Bank, Amman Agencies Western Union, Axis Bank- Poompuhar, 4.3 km).

Source: Census (2011)

Policies and Programmes

There were over 64 self-help groups in Vanagiri in 2019. One example is a group supported by the NGO Kalangarai Villakam. This NGO provides monetary assistance of ₹1,00,000 to a group of widows from Naganathankoil. These women were employed in agribusiness through paddy and cotton cultivation on leased land and repaid the loan once in every six months. Table 10 shows other self-help groups, government and NGO programmes implemented in Vanagiri and their beneficiaries.

Table 53: Programmes/policies and their beneficiaries in the village

Name of Policy/Programme:	No. of Beneficiaries
Public Distribution System	2148 (households)
Anganwadi	712 (children)
National Social Assistance Programme (NSAP) (Old Age/Disability/Widow/National Family Benefit Scheme (NFBS)-Pension scheme	530 (households)
Greenhouse Initiative (2011-2018)	48
Mid-day Meal Scheme	-
Mahatma Gandhi National Rural Employment Gurantee Act (NREGA) - 2020-2021	18267
No. of households mobilized into Producer Groups (PGs)	146 (households)
No. of households mobilized into Self-Help Groups (SHGs)	932 (households)
No. of SHGs (2019)	64 (groups)
No. of SHGs federated into Village Organisations (VOs)	64 (groups)
No. of SHGs that have accessed bank loans	46 (groups)
Pradhan Mantri Fasal Bima Yojana (Crop insurance)	2
Pradhan Mantri Ujjwala Yojana (PMUY)	476 (households)
Pradhan Mantri Jan Arogya Yojana (PMJAY)	1,721 (households)
Aayushman Bharat-Pradhan Mantri Jan Arogya Yojana	23

Rural housing- Indira Awas Yojana (IAY) (2011-12 to 2015-16)	244
Rural housing- Pradhan Mantri Awas Yojana- Gramin (PMAY-G) (2016-17 to 2018-19)	51
Scholarship Programme for SC/ST/Minority students (2019)	155 (students)
Swatchh Bharat mission (Gramin)	662 (target)
Repairs to houses (2018-19)	47 (households)
Solid Waste Management	12

Source: BDO office, Mission Antyodaya Survey (2019)

Gender Roles

The role of women varies between the different hamlets of Vanagiri and across caste groups. Traditionally, women from upper caste and well-off middle caste households have been discouraged from seeking employment outside the household and were typically confined to the domestic sphere. Generally, women still do not have an active role in local politics (apart from casting their vote) due to lack of time and money. However, as male out migration from the area increased steadily, women from these households have also become involved with farm management and operations.

Women from relatively poorer middle caste households and lower caste households, on the other hand, also perform agricultural labour during the agricultural season. Some among them are also employed at minimum wages as labourers and assistants to masons in construction. Often this means women are expected to complete their domestic duties (e.g. cleaning, cooking, and feeding) before leaving for work early in the morning.

Table 54: Division of agricultural labour by gender in Vanagiri village

Women	Men
Paddy cultivation	Paddy cultivation
Cotton cultivation	Bund forming
Transplantation	Sowing
Weeding	Fertiliser/Pesticide application
Cotton Sowing	Paddy cleaning
Plucking	Hay stacking

Source: Primary data (MSSRF, 2019)

Overall, patriarchal values are dominant irrespective of caste and class, which has implications for both the domestic and economic domains. A wide wage gap exists despite the fact that more women are employed in farm work than men. This can perhaps be attributed to the perception that women are merely ‘farm labourers’ and not ‘farmers’. During cultivation days, women are employed for 7-8 hours on the field, from 8am-12pm in the morning and 3-6pm in the evening. For this work, they are typically paid just ₹150–180 per day. This is measly compared to the ₹500-550 earned daily by their male counterparts.

Aspirations

In Vanagiri, though young people often wish to take up agricultural livelihoods, the uncertainty surrounding employment and income often prevents them from doing so. Therefore, they often pursue construction work as this is viewed as an assured source of income. As a result, some migrate to other states for better opportunities. Many of the young women in the village stay back to take care of children and

elders and also to manage the meagre assets the households own. Because they have knowledge of soil and ecological management practices and floriculture, they engage themselves farming and waged work within the village. They also claim to share an emotional connection to their land as their ancestors have traditionally practiced farming there. However, the older generation often encourages their children to take up alternative occupations through better education or in services sectors with semi-skilled and skilled work, such as construction work, to secure their future. Most elders practice farming as a tradition but also as a supplementary source of income and to increase food security. In addition, parents tend to prefer their daughters to marry those with secondary occupations (e.g. drivers or masons) over farmers.

Recommendations

Summary of the factors that have contributed to a decline in agriculture in Vanagiri:

- Unsustainable shrimp culture practices
- Increasing salinization of soil and water
- Poor access to water resources
- Low incomes and job insecurity

The following recommendations outline three approaches to improve livelihoods in Vanagiri:

- Develop community-based conservation strategies for the coastal agro-ecosystem that tackle the impacts of climate change and address the vulnerability of the area to natural disaster.
- Government, research organisations and NGOs must collaborate to provide, context specific policies, financial assistance and expert agricultural advice. This is particularly important for farmers rejuvenating groundwater and soil degraded by salinization.
- Develop a holistic approach that considers the archaeological significance of Vanagiri (as a node of the larger Poompuhar site dating back to the Sangam period), and the traditional farming knowledge and living traditions of the communities in the Cauvery delta region.

Information Sources

Information:	**Source:**
Map of hamlets within study area (Figure. 2)	MSSRF (2021)
Archaeological Significance (Box 6)	Primary data (MSSRF)
Education and Literacy (Table 45)	Census (2011)
Caste Groups (Table 46)	Gram Panchayat Development Plan (GDPD) (2019)
Land Use (Table 47)	BDO (2019)
Water resources and Cropping patterns (Table 49)	Primary data (MSSRF)
Natural Disasters (Table 48 and Box 7)	Primary data (MSSRF)
Markets (Table 51)	Primary data (MSSRF)
Infrastructure and institutions (Tables 50 and 52)	Census (2011)
Programmes/Policies (Table 53)	BDO (2019) and Mission Antyodaya Survey (2019)
Gender roles and Aspirations (Table 54)	Primary data (MSSRF)
Photographs	Toby Smith