

Tapi District **Farmer's Mapping Study—**

SEWA Federation
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Glossary of Terms (and Acronyms)

- **Adivasi** Indigenous people
- **APLS** Above Poverty Line Status
- **APMC** Agricultural Produce Market Committee
- **Ayushman Bharat Yojana** Government healthcare scheme for the underprivileged
- **Bighas** Indian measure for land area, varying locally
- **BPLS** Below Poverty Line Status
- **ICDS** Integrated Child Development Scheme
- **Jowar** Sorghum
- **Kaccha house** Houses made from mud, thatch, or low quality materials
- **Kaccha-Pucca house** Houses made with a mixture of low quality and substantial materials
- **Kharif crop** Monsoon crops
- **Kisan** Farmer
- **KVK** Krishi Vigyan Kendra
- **MGNREGA** Mahatma Gandhi National Rural Employment Guarantee Act
- **NGO** Non-government Organisation
- **PHC** Primary Health Centres
- **Pucca house** Houses made of substantial materials such as bricks, concrete, cement, or timber
- **Rabi crop** Spring crops
- **SEWA** Self Employed Women's Association
- **SRI** System of Rice Intensification
- **Talukas** Blocks or sub-districts
- **Valavala** Green leafy vegetables

Introduction

This report is a comprehensive farmer study, in Tapi district, where SEWA Federation's member cooperative - The Tapi District Megha Adivasi Mahila Agriculture Producers' Cooperative (Megha Mandali) - operates. The purpose of the report is to give Megha Mandali a bird's eye view of the district, enabling them to streamline their activities, both from the supply and demand side.

This report provides an overview of Tapi district, its infrastructure, its agricultural practices and the status of its women. In doing so, it hopes to fill in the gaps in knowledge that will allow for a more streamlined and optimal business strategy for existing services, as well as mark out avenues worth exploring for new initiatives. Moreover, the fieldwork in the study has been conducted by leaders in the Megha Mandali co-operative. This works to both give them exposure, but also go some steps towards building more relationships and connections across the villages of the district.

The report is structured in three parts. The first section deals with background information that puts this particular study in context. It includes brief overviews of both SEWA Federation and Megha Mandali, as well as a presentation of secondary research from other studies on the district, looking specifically at education, health and economic indicators in order to shed light on Tapi's socio-economic dynamics. This section ends with a note on the methodology that recounts the manner in which this study was conceived, planned and carried out.

Section Two deals with the central matter of the study, presenting and analysing the data that has been collected. It will be divided into a section that looks at the larger farmer's mapping study, and one that deals with village profiles. In each, data analyses will be conducted at both an aggregate and sub-district/taluka level, and significant data points/questions will be given additional treatment separately.

Finally, Section Three will sum up the results of the data analysis, and conclude by using the insights of the study to provide some general recommendations for Megha Mandali's approach

in the future. It will also mark out areas of interest that have been brought into focus by the study, but which call for additional research in order to fully clarify and understand.

Section One: Background and Context

SEWA Federation: Brief overview

SEWA Cooperative Federation has been working with and for women workers of the informal economy since 1992. Promoted by the Self-Employed Women's Association, SEWA, the Federation is committed to women's economic empowerment and self-reliance through their own collective enterprises.

Over the last 25 years, the Federation has organized 300,00 women into 106 primary cooperatives with an annual turnover of over Rs. 300 crores. All of these collective enterprises are used, managed and owned by women. It is they who are the shareholders and are democratically elected to their own boards.

Through our work, we also focus on sustainability and climate change action, youth inclusion, and digitalisation. By incubating new collectives, we enable women to diversify their skills, as well as break gender barriers in male-dominated sectors. Our role is to provide a support system to women's enterprises, nationally and internationally, so they can compete and scale.

Vision/objectives:

SEWA Federation works to promote and support women-led, women-owned collective enterprises, so they can achieve full employment and self-reliance. We envision an environment where women-run collective enterprises can grow, enabling women to be economically empowered. Through this, we foresee a change in their decision-making capacity, leadership, thereby enhancing their position both within the household and in their communities.

What we do:

Through a team of qualified and experienced professionals and a panel of experts, we provide

quality services to our member cooperatives and other women's collectives, across sectors.

We provide support in:

1. Capacity building
2. Business development
3. Knowledge management (including research, communication and digital inclusion)
4. Financial services
5. Marketing

Our history

SEWA Federation's history can be traced back to the struggle for workers' rights led by the Self-Employed Women's Association (SEWA). Since its inception in 1971 and recognition in 1972, the SEWA trade union has worked actively to promote the rights of women working in the informal economy. But, alongside the struggle for rights was the existing need of the women to earn a livelihood. SEWA initiated several cooperatives for these workers, across sectors. SEWA believes that the cooperative/collective model creates fair employment and decent work, accounting for the needs of women in the informal economy.

Through our struggles, the Federation also learned that providing an alternative source of livelihood to the women is a direct and effective intervention in the labour market. With the new source of livelihood, informal women workers no longer have to depend on exploitative landlords, merchants or other middle agents for their survival. This, through their grassroots experiences of organising women workers, they developed the joint strategy of struggle and development through union cooperatives. The constructive development, essentially a Gandhian way, is undertaken mainly through cooperatives. These also provide an alternative source of livelihood for women. The cooperative model, SEWA believes, creates fair employment and decent work, and importantly this form of collective organisation results in women being the users, owners and managers of their own economic organisations- the cooperatives and their Federation.

Gradually, SEWA built up cooperatives of six kinds: agriculture and allied activities; handicrafts;

service providers; finance; social security and vending

By the year 1992, there were 33 cooperatives of the six sectors mentioned above. Women then expressed the need for support to develop their cooperatives further in terms of business, strengthen governance and financial management, obtain marketing support, undertake capacity-building of the members and finally, assistance to remove the various policy, legal and regulatory barriers they have faced through policy action. 900 women came together from these 33 cooperatives and resolved to set up SEWA Federation to assist them to grow further and meet their needs. Thus, on December 31st, 1992, the Federation was formally launched by Elaben Bhatt, the Founder of the SEWA movement. This was India's first women's cooperative federation: the Gujarat State Women's SEWA Cooperative Federation Limited. The first board was democratically elected from among the member cooperatives and began to chart its course.

Megha Mandali: Brief Overview

The Tapi District Megha Adivasi Mahila Agriculture Producers' Cooperative (Megha Mandali), is a cooperative of Adivasi or indigenous women farmers, located in South Gujarat region, in the Tapi District. It is a first-of-its kind women's cooperative in the district.

History

It was only in 2005 that SEWA made inroads in Tapi district. While SEWA had worked extensively in North and Central Gujarat for over four decades, South Gujarat was a new region. The Surat Credit Cooperative provided access to credit for the construction of toilets as the government subsidy provided for these was inadequate. While the need for credit was being addressed by the credit cooperative, another issue emerged.

When SEWA colleagues visited the village of Rampura Najik in the Vyara block of Tapi district in 2009, an agricultural labourer from that village, Lataben, and her husband pointed out that the wages under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) were not paid to the villagers. SEWA advised the women to unite and prepare a petition to the local authorities. Despite the threat of violence by the sarpanch who is responsible for

processing of wage payments, the women went ahead with their petition, and within two weeks they received their outstanding payments. This first union action led to trust among the workers and similar organizing initiatives in the neighbouring villages.

As SEWA extended its organizing efforts in Rampura Najik and the surrounding villages, it learned that sickle-cell anemia was prevalent in the region and the local women knew nothing about this genetic condition. Training and awareness-raising, health camps and referral service programmes were started by Lok Swasthya SEWA Mandli, a state-level healthcare cooperative, around major health issues. Insurance was another pressing area. Registered in 2014, Megha Mandli started providing integrated livelihood, insurance, savings and credit and healthcare services with SEWA's support. Since this was one of the later cooperatives, an integrated package of services was initiated right from the beginning by design.

Key activities

SEWA's experience over the decades has demonstrated that engaging with just one or two issues in isolation does not result in significant change in the women members' lives. Broadly, Megha Mandali strives to engage in five key activities: 1) livelihood support, both input-based and market-linked; 2) healthcare, including preventive care and access to health services and childcare; 3) housing, with basic amenities like water, sanitation and energy; 4) financial services, including savings, credit and insurance; and 5) capacity-building, including leadership training (LSST, 2016).

Specifically for livelihood support, the cooperative provides useful agricultural inputs like farm tools and seeds at rates that are significantly lower than those offered in the market, by connecting with government institutions like Krishi Vigyan Kendra (KVK) and some non-governmental organizations. In order to encourage farmers to follow farming practices that are sustainable, a number of farmers have been given training on organic farming. Better farming methods, such as a system of rice intensification (SRI), have also been introduced to the members. Further initiatives that have been undertaken in order to provide members with better exposure and access to different markets include securing market licences and space in the Agricultural Produce Market Committee (APMC) yard to sell vegetables and facilitating their participation in organic farming fairs in the city of Ahmedabad. With respect to health-related

services, low-cost Ayurvedic medicines, manufactured by the health cooperative of SEWA, are made available. Health awareness training workshops are conducted every month, various health camps are held in villages through collaboration with governmental and non-governmental organizations, and referral services to government hospitals are provided to members through the Sanklit Saathis. Additionally, housing and financial services like insurance are also made available to members.

Methodology

Having consulted a series of secondary sources of research on Tapi district, it was apparent that there were considerable gaps in the available data, especially with respect to indicators that this initiative was engaged in wanting to better understand. To begin with, much of what was already there was significantly dated, with few studies having been taken up after 2015/2016. Furthermore, particular aspects of the agricultural lives and practices of Tapi's inhabitants did not seem to have been probed in much depth.

As a result, the present study was conceived and designed in order to do two things: One was to provide an overview of the Tapi district, and have a small but representative sample of data that was up-to-date and captured the general profile of villagers in different parts of the district and their overall condition. Furthermore, it aimed to give a more detailed account of certain particular aspects: a general profile of the households in various blocks and an overview of the practices and chief obstacles that characterized the agricultural domain. Finally, given the dearth of information on the subject, it would aim to probe some details regarding the specific condition of women in Tapi as well.

A survey was subsequently designed with these requirements in view. SEWA Federation's in-house agricultural expert was in charge of designing the questionnaire along with relevant inputs from members of Megha Mandali, and others from the research team. The final document comprised **7** sections and about **300** questions. In addition to this farmer's mapping questionnaire, a smaller village profile survey was conducted with the village head (sarpanch), ICDS¹ centre (Anganwadi) and Primary Health Centre (PHC) of each of the villages in the

¹ Integrated Child Development Scheme

sample. It was conducted to supplement the more detailed and specific data-points of the farmer's mapping survey with a broader, synoptic view of the general conditions and state of infrastructure across the various blocks of Tapi district.

The decision was made to use the KOBO toolbox as the core software to organize the data. However, given various constraints (lack of smartphones in the field, unfamiliarity with the software amongst our co-operative women, language and literacy barriers) the data-collection had to occur in a two-step procedure. It was collected in the field manually on paper, and then computerized afterwards.

In view of our particular needs, we decided to employ a form of cluster sampling. We wanted to speak to respondents across all seven districts of Tapi (5 already had Megha Mandali members working in them, while two were new areas for the co-operative to explore). We identified five villages in each of these localities, and aimed to speak to 25 families in each village. Thus, we expected to gather 875 responses.

Additionally, it was stipulated that the families themselves be selected through another layer of cluster sampling, so as to ensure that we had a representative picture of the village as a whole and not one restricted to particular neighbourhoods or subsections within it. Moreover, given the larger aim of expanding Megha Mandali's outreach, we chose to have members of the co-operative themselves take up the task of going into the field and conducting the surveys. This would allow them to personally form new networks and contacts and also generate greater rapport and recognition amongst the local communities they were working in. This first-hand exposure in the field also allowed them to gain a wealth of qualitative information about these villages, some of which turned out to be directly significant for the aims of this study.

While the overall scope of the survey has been mentioned earlier. It is worth noting some of the specific data points that it aimed to gather. These include: demographic details, land holdings, cropping pattern, present practices, cost and benefit, irrigation sources, present status of horticultural crops and animal husbandry, existing veterinary services, market linkages, annual household income, migration, primary infrastructure & transport facilities, social security, status of village/community based institutions and status of women in interventions related to their existing livelihood.

While for the most part, the data collection phase went smoothly, there were a few unforeseen obstacles that ought to be mentioned here. First, many villagers complained of survey fatigue given that the census was also being carried out at the same time. Moreover, certain information was being withheld by several respondents. This had to do mainly for two reasons. One, the political climate in the country made any questions regarding ancestry and religion extremely sensitive. Second, certain information such as house-type and number of cattle were linked to government welfare schemes, and respondents were wary of making disclosures that they felt could result in such aid being discontinued. Finally, with the eruption of the COVID-19 crisis, the survey could not be carried out in two of the villages that we had planned to include, and because all movement was restricted, certain data forms were held up and this led to some delay in the data-entry process.

Background of Tapi District:

Named after the major Indian river that flows through the land, the Tapi district is situated on the south-eastern corner of the state. It borders the state of Maharashtra on one side, and is surrounded by Gujarat's Dang, Narmada and Surat districts on the other. It is in fact a recent entity, having been split from Surat and organized as an independent district a little over a decade ago, in 2007. This decision was taken because of the vast differences between the affluent and urban character of Surat as opposed to the largely rural and tribal regions that comprise Tapi. There was a consensus amongst policy-makers that the two areas required very different strategies and approaches at the administrative level, and the best way to pursue better governance would be to make them independent districts.

Thus, as the new boundaries were drawn, Tapi emerged as a new district spanning across 3500 square kilometers. As per the last census (2011), it was inhabited by 8.7 lakh (800 thousand) people, the majority being from the scheduled tribes demographic, and 75% relying on agriculture as a means of sustenance. Around 9.8% of the state's population reside in urban areas, with almost 9/10ths of the state continuing to dwell in rural villages.

Tapi has seven 'talukas' (or blocks/sub-districts): Vyara, Uchchhal, Nizar, Valod, Songadh, Dolvan, and Kukarmunda. Altogether, the district possesses 504 villages and 283 Gram panchayats. Vyara and Songadh form the largest, most developed and most urban regions of the district, together comprising 319 villages and 186 Gram panchayats. Conversely, Uchchhal and Nizar form the most remote parts of the district. They are hilly regions with dense forests and are the least equipped in terms of economic development, infrastructure and connectivity.

Geographically, the district has large quantities of forest coverage, with a large production of bamboo. It is crossed by the paths of four rivers: Tapi, Midoda, Purna and Ambika; and possesses a sub-tropical climate with temperatures reaching a height of around 45 degrees Celsius (113 Fahrenheit). It also has a reasonably robust monsoon season, with an average rainfall of 1926 mm.

Educational Indicators in Tapi:

There is little data on the Tapi district from the last five years so it is difficult to capture the most recent infrastructural developments and/or problems across various indicators. However, with education, the prior data seems to point to steady progress over the last couple of decades.

According to the 2011 census, the average literacy rate in the district stood at 69.29%, a more than 10 point increase from the previous census in 2001 which recorded the rate at 57.05%. Moreover, the literacy gap between men and women in the district came down from 18.3 to 14.3 percent during this time period. This is better than the Gujarat state's literacy gap, which remains at around 16%. That said, there is a considerable difference in the level of development and progress when one looks across specific regions. For instance, the literacy rate is quite high in the urban areas of Vyara and Songadh (82% and 86% respectively), while it is considerably lower (around 56/57%) in the hills of Uchchhal and Nizar. A similar divergence exists also with regard to the gender gap in literacy.

When it comes to infrastructure, Tapi district seems relatively well-equipped and making gradual improvements. A 2016 UNDP report tracks the development of education in Tapi over a

five-year period (2009 - 2013). According to its results, the district had 842 primary schools in the year 2013-2014. It has seen a significant increase in the number of schools with secondary and higher education over this period, from a mere 9 to 163.

The report also states that nearly all of Tapi's schools are equipped with basic physical amenities such as electricity, sanitation, drinking water and compound walls. More advanced facilities such as playgrounds and computer labs aren't ubiquitous, but are also well-represented, even in the poorer talukas within the district. Moreover, as of 2013, the enrollment rate for primary education is more than 90%, and the dropout rates for the same age-group have been steadily decreasing from 4.76 in 2010 to 1.34 in 2013. Finally, when it comes to personnel, for 2013 the district held a student-teacher ratio of 25-1, which is better than the state average. Additionally, the quality of these teachers seems to be improving as is shown by the reported improvement in students grades, as well as the increase in the number of post-graduate degrees amongst the teaching staff (going from 355 in 2011 to 598 in 2013).

On the whole then, the status and infrastructure of education in the district of Tapi has been on a consistent upward trend over the past two decades, and seems to be faring relatively well. That said, there are certain problems that persist and require greater attention. To begin with, Tapi is home to a significant number of migrant workers who come to work on sugarcane plantations. As the UNDP report points out, ,any of these workers come to Tapi with their children, but often do not have the means to send them to school, and even when they do, the children feel alienated and often do not themselves want to go to classes. This leads to many children who end up simply working from a young age. In fact, a 2016 UNICEF report noted that 5.6% (around 7800 children) of the minor population within the district was engaged in child labour. The local government has attempted to address this situation by creating special education camps and separate schools that cater specifically to migrant workers' children. While there has been some success in this, a more sustained intervention is necessary.

Another cause for concern is that while the state of educational infrastructure has improved in Tapi, this has (as per data from the UNDP report) been tied to an increased privatization of schools. This is not a problem as such, but it translates to a regional imbalance, with the urban blocks of Tapi having the majority of its better educational infrastructure. Moreover, private schools are more expensive, and this cost can be inhibiting for many of the poorer families

within the district. In order to avoid such outcomes, it is important for the government to invest in improving the quality and infrastructure of the public schools in Tapi.

Health Indicators in Tapi

Again, while there is a lack of data that would provide a picture of Tapi's health indicators in the last 3-5 years, studies from the early and middle part of this decade paint a broad sketch regarding the state of infrastructure and the most significant health-related issues that currently persist within the district.

To begin describing the structure of health-care in Tapi, it is important to note that the state of Gujarat has, since the 1980s, instituted a three-tier model for healthcare provision. The first tiers consist of subcenters (SCs), which are available for various everyday health inputs, but are focused on child and maternity health. Above this, the second tier consists of Primary Health Centers (PHCs), these comprise a mini-clinic with 4-6 beds and close to a dozen medical staff. Finally, at the top-tier, there are Community Health Centers (CHCs) which are the equivalent of small hospitals- they have around 30 beds, specialized doctors, and relatively advanced medical equipment.

Health Institution	Population Norms		
	Hilly Area	Plain Area	Urban Area
Sub-center	5,000	5,000	10,000
Primary Health Center	20,000	30,000	50,000
Community Health Center	80,000	120,000	N/A

The above table represents data from the Gujarat Ministry of Health and Family Welfare and represents the stipulated norms for infrastructure provision. Hence, for instance, there is to be a Sub-Centre for every 5000 people in a district, a PHC for every 30,000 people and so forth.

District / Talukas	Numbers			Per 3000 Population	Per 20000 Population	Per 80000 Population
	SCs	PHCs	CHCs	SCs	PHCs	CHCs
Tapi	235	30	5	0.87	0.74	0.50
Nizar	41	5	1	0.95	0.77	0.62
Uchchhal	28	4	1	0.95	0.90	0.90
Songadh	62	8	1	0.81	0.70	0.35
Vyara	74	9	1	0.83	0.67	0.30
Valod	30	4	1	0.99	0.88	0.88
<i>Source: Compiled from the data of CDHO, Commissionerate of Health, Medical Services, Medical Education and Research, Gandhinagar</i>						

The second table is taken from the UNDP's 2016 report on Tapi, and represents the state of the district's health infrastructure at the time. As is visible, there are a decent quantity of Sub-Centres but Tapi is lagging behind the norms considerably when it comes to the two higher tiers of health-care facilities. This is especially the case when it comes to PHCs.

It is worth noting that although they are generally considered the more under-developed regions within the district, Uchchhal and Nizar fare relatively well and are close to the population norms with respect to public health provision. In fact, it is Songadh and Vyara which are lagging behind. However, this is counteracted by the fact that these are two well-developed, urban areas where there is greater access to private health-care. According to the same UNDP report, while these private clinics are few, they also end up being the only source for specialized care, as CHCs across the district are often understaffed and lack trained medical professionals in specialized fields. That said, the report maintains, certain aspects of the health-care infrastructure is to be commended. For instance, 108 ambulance services are accessible within 30 minutes of even the most remote villages. Also, maternal and child-care has seen considerable improvement: This can be seen by the fact that the percentage of women registering for Ante-Natal Care is higher than the state average, and the number of institutional child deliveries has also been steadily rising. Similarly, there has been a significant drop in the infant mortality rate, and 82% of children are reported to be at good levels of nutrition. Moreover, immunization rates for diseases like BGC, DPT-3, and measles are also above the state average and over the course of the last few decades, cases of smallpox and guinea worm disease have all but disappeared.

In terms of diseases that need to be addressed: incidence of tuberculosis and leprosy remains a problem despite some government efforts to curtail these, and more work is needed here. Moreover, two other diseases that have specific prevalence in Tapi and require a more concerted effort at combating are sickle-cell anemia and Leptospirosis.

Finally, a major health-indicator on which the district of Tapi has fared particularly badly has to do with household amenities, specifically access to safe drinking water, drainage and sanitation. Indeed, as per the 2011 census, only 26 percent of the population had access to tap-water, with the majority being led to use hand-pumps and bore/tube wells; especially in the rural areas. Parallely, as the following data demonstrates, sanitation facilities are in a similarly poor state.

State / District	Total / Rural / Urban	HH having Latrine Facilities within Premises	No Latrine within premises	
			Public Latrine	Open Defecation
Tapi	Total	28.14	1.36	70.51
	Rural	22.98	1.16	75.86
	Urban	77.46	3.25	19.28
Gujarat	Total	57.35	2.25	40.41
	Rural	33.04	1.19	65.76
	Urban	87.70	3.56	8.74

Source: Census 2011

As the table indicates, only a little over a quarter of homes had toilets in 2011 and the rates of open defecation in the district were worryingly high and much above the state average.

It is worth noting however that in response to this 2011 data, the local government initiated a variety of schemes and a significant push to address these problems, and many of these have seen a good deal of success. Thus, the UNDP report indicates that as of 2015, the percentage of households with access to tap water had been raised to 54% and 161 villages had been turned into 'Nirmal Grams', or open-defecation free zones. These are both heartening results, but much more needs to be done to improve the house infrastructure of the district in order to deal with these problems in a comprehensive manner.

Economic Indicators in Tapi

The economic profile of Tapi was a large part of the reason it ended up being separated into an independent district. For unlike the largely affluent, industrialized and urban character of Surat, which it was attached to; Tapi is almost entirely a rural economy with 3/4ths of its activity being subsumed under agriculture. There are a number of reasons for this. For one, the large blocs of adivasis who inhabit Tapi are deeply rooted in their agricultural practice, and given the marginal status of these communities, there have been few attempts to channel new economic opportunities towards them. Additionally, Tapi's vast forest cover, climate and level of rainfall does make it a suitable region for agricultural cultivation. It is also, conversely, a region sorely lacking in major mineral deposits. So, for the most part, working the fields is understandably the default option for most families that live here.

According to the 2016 UNDP report, just under 50% of the district's land was under cultivation and around 75% of its population was dependent on agricultural activities. The same report also reports on a series of trends in labour data by comparing indicators between the 2001 and 2011 Census. Some of its key tables and findings are reproduced here:

Tapi	P/M/F	Total Workers		Cultivators		Agri. Lab.		HH Inds.		Others	
		2001	2011	2001	2011	2001	2011	2001	2011	2001	2011
Total	Persons	316656	450902	37.94	23.45	34.67	56.51	2.37	2.15	22.62	17.90
	Male	199907	251049	40.61	29.02	29.04	47.03	2.13	1.83	25.80	22.13
	Female	116749	199853	33.37	16.45	44.32	68.41	2.78	2.55	17.17	12.59
Rural	Persons	295776	421201	37.35	25.00	29.74	60.00	2.18	2.15	17.78	12.85
	Male	182879	228595	40.59	31.72	25.61	51.16	1.98	1.84	19.58	15.28
	Female	112897	192606	32.10	17.03	36.43	70.49	2.51	2.52	14.88	9.96
Urban	Persons	20880	29701	1.34	1.43	5.74	7.00	1.79	2.07	91.13	89.50
	Male	17028	22454	1.43	1.54	4.24	4.97	1.63	1.66	92.69	91.82
	Female	3852	7247	0.91	1.10	12.38	13.26	2.49	3.34	84.22	82.30
Source: Census 2001 and 2011											

This first table tracks the number of workers in various categories of employment. Looking at it, one can see that the general workforce (across both genders) has been growing over the decade. Also, there have been only mild changes in the level of employment sustained in the 'household industries' and 'Others' category. The major trend seems to indicate that there has been a significant drop in the number of 'cultivators' and a related rise in 'agricultural labourers'. While more research is required to properly understand this development, it points towards a consolidation of ownership with far more people working on land they do not own.

Name	Total Workers	Main Workers	Marginal Workers	Main Workers (%)	Marginal Workers (%)
Tapi	450902	337579	113323	74.87	25.13
Nizar	68909	54767	14142	79.48	20.52
Uchchhal	53695	38697	14998	72.07	27.93
Songadh	129603	86732	42871	66.92	33.08
Vyara	150948	115406	35542	76.45	23.55
Valod	47747	41977	5770	87.92	12.08
Source: Census 2011					

The second table gives a taluka-wise breakdown of the marginal and main workforce from the 2011 census (note: there are only five sub-districts in the table because at the time, the remaining two had yet to be carved out) . Now, according to statistical norms, a marginal worker is one who is employed for less than 180 days a year, while a main worker is employed for more. As is visible from the data, there is generally a substantial quantity of the labour force that qualify as ‘main workers’. However, in some places like Uchchhal and Songadh, the marginal category seems to cover nearly a third of the workforce. This is slightly worrying given that since 2011, larger economic trends make it likely that more casual and temporary forms of labour have been growing.

Agriculture

According to figures from the Government of Gujarat’s Agriculture and Cooperation Department (2013), Tapi has a total area of an estimated 5 lakh hectares. Out of this, almost half (or 47.78% to be precise) is under agricultural cultivation. Furthermore, of the land that is cultivated, around 38.63% is irrigated land. This leads to considerable disparity between sub-districts. In Valod, for instance, 91 percent of all cultivable land is irrigated. Whereas, in Songadh, only 19% is the same; with the rest entirely dependent on rainfall.

In terms of crops, paddy is the main kharif crop in the region, comprising 36% percent of all land that is allocated to kharif crops. It is followed by cotton, oil-seeds, sorghum and pulses. Sugarcane is, by far, the biggest Rabi crop, taking almost 90% of the area dedicated to Rabi produce. The other principle crop being wheat. Generally in the region: paddy, oil-seeds, wheat and pulses are considered the main staple crops, while sugarcane, cotton, soybean and sunflower are the primary cash crops.

As regards fruits and vegetables, the following two tables from the UNDP report display crop trends from 2012 - 2015:

Crop	Area in Ha., Prod. In Metric Tonnes, Yield in Metric Tonnes/Ha								
	2012-13			2013-14			2014-15		
	Area	Prod.	Yield	Area	Prod.	Yield	Area	Prod.	Yield
Mango	4800	36000	7.50	5480	39300	7.17	5573	38398	6.89
Chiku	75	950	12.67	87	1010	11.61	90	1045	11.61
Bananas	1850	114700	62.00	1665	85464	51.33	1126	50816	45.13
Pomegranate	25	352	14.08	51	467	9.16	51	516	10.12
Papayas	1850	122400	66.16	2150	96750	45.00	1925	86625	45.00
Sitafal	41	293	7.15	39	273	7.00	42	294	7.00
Cashew Nuts	270	87	0.32	275	81	0.29	275	80	0.29
Coconut	55	440	8.00	60	520	8.67	62	538	8.68
Others	165	1155	51.17	210	1424	6.78	263	1682	6.40
Total	9169	276744	259.72	10067	225754	22.43	9469	180552	19.07
Source: District Horticulture Office, Tapi (Vyara)									

Crop	Area in Ha., Prod. In Metric Tonnes, Yield in Metric Tonnes/Ha								
	2012-13			2013-14			2014-15		
	Area	Prod.	Yield	Area	Prod.	Yield	Area	Prod.	Yield
Potato	20	500	25.00	1	23	23.00	*	*	*
Onion	740	24420	33.00	397	13101	33.00	210	4410	21.00
Brinjals	3850	71940	18.69	3157	56921	18.03	3050	54992	18.03
Cabbage	180	4140	23.00	127	2785	19.57	96	1879	19.57
Lady Finger (Okra)	9150	112080	12.25	9327	125821	13.94	9473	132054	13.94
Tomato	680	16320	24.00	660	13893	21.05	575	12104	21.05
Cauliflower	415	8300	20.00	380	7345	19.33	290	5606	19.33
Cluster Bean (Guar)	980	6630	6.77	616	4127	6.70	622	4167	6.70
French Beans	810	6480	8.00	785	5785	7.37	630	4643	7.37
Velavala	3045	68950	22.64	3287	73859	22.47	3420	61187	17.89
Others	390	8910	22.85	455	10465	23.00	1687	23799	14.11
Total	20260	328670	16.22	19192	314125	16.35	20053	304841	15.20
Source: District Horticulture Office, Tapi (Vyara)									
* Data Not Available									

As is visible, banana, mango and papayas form the major fruits of the region while okra, brinjals and valavala (green leafy vegetables) are the primary vegetables. Also, it is worth noting that while the yield and produce for particular crops has been rising in this time period, the aggregate level of produce has actually been on the decline, and was lowest at the end of 2015. Why this has been the case is a question worth investigating and should be marked as a topic for further research.

When it comes to livestock, the following table that represents data from the 2012 Animal survey gives one an impression of the industry:

Animals	Number	Percentage
Cows	234953	47.02
Buffaloes	172359	34.49
Sheep	145	0.03
Goat	92134	18.44
Horses and Ponies	45	0.01
Donkeys and Mules	42	0.01
Total	499678	100
<i>Source: Animal Census 2012</i>		

While the survey is certainly dated, some of the overarching trends still hold. Cows and Buffalos, for instance, remain the most common forms of cattle in the region, with goats being a somewhat distant third. It has been noted by multiple reports that Tapi's large bovine population holds the potential for producing organic manure at scale and promoting organic farming within the local villages. However, sustained attempts towards this project have yet to be made.

Finally, while there is ample opportunity for fresh-water fishing in the rivers that cross through Tapi district, it is not an area that has seen a great deal of economic activity. According to the 2016 UNDP report, Uchchhal is the region with most number of people dependent on fishing to make a living, and this is only around 5% of the population. In Songadh, which has the maximum levels of production in fisheries (3348 tonnes in 2014), only 1.67% of the population depends on the industry. The same report also notes a consistent decline in fish production from 2009 - 2014. This clearly indicates that fishing is on the wane within the district's economy.

Industry

While Tapi remains a predominantly agrarian economy, with more 70% of its people relying on agriculture for their livelihoods, there are some industrial avenues that have been explored and there are a variety of small scale production units within the area (although only a handful that would be categorized within the medium to large scale). The industrial base of Tapi is related to agro-based commodities (say, sugar and paper manufacturing), mining/quarrying, and some textile-based production.

Year	MICRO			SMALL			Total		
	Units	Invest-ment	Employ-ment	Units	Invest-ments	Employ-ment	Units	Invest-ments	Employ-ment
2010-11	72	627.25	504	5	388	51	77	1015.25	555
2011-12	91	752.4	778	9	1001.88	149	100	1754.28	927
2012-13	114	1270.03	1216	14	1133.65	218	128	2403.68	1434
2013-14	109	1812.67	896	16	2502	607	125	4314.67	1503
2014-15	109	2363.27	775	16	1660.81	296	125	4024.08	1071
Total	495	6825.62	4169	60	6686.34	1321	555	13511.96	5490
<i>Source: District Industrial Centre, Tapi (Vyara)</i>									

The above data from the 2016 UNDP report illustrates trends in micro and small industry from 2010 to 2015. As is visible, there is a sustained increase in levels of employment and investment in these enterprises throughout the period, and the number of both types of firms have more than tripled within the duration. While such bustling activity is absent for larger scale initiatives, there seems to be a healthy and growing ecosystem of smaller companies.

When it comes to minerals, limestone and lignite are the mainstay of the industry, while blacktrap, sand, brick and common clay are other important industries. There also a significant number of stone quarries across the district, with 24 each in both Vyara and Songadh.

Infrastructure

While many aspects of Tapi's social infrastructure and the functioning of its institutions has been covered in the Education and Health sections, the following will pay specific attention to the more economic elements in the field. It will examine such issues as Land-use, transport

infrastructure, irrigation, and finance. Such an overview hopes to supplement the preceding discussion on the state of Tapi's economy, trends in its development and the potential avenues it may take in the future.

To begin with land-use, 2014 data from UNDP report states that around 48% of Tapi's land is cultivated for agriculture, 21% comprises forest land, around 3% is used as pastures for grazing, 13% is land that cannot be cultivated, while 14% is non-agricultural land (urban areas etc). It is also worth noting that Valod and Vyara hold the most cultivable land at 88% and 68% respectively. Conversely, Nizar has the highest amount of land that cannot be cultivated, at around 40%. This is a significant obstacle to expanding agricultural production there.

With respect to forests, it is important to note that they have conventionally been a vital part of the everyday livelihoods of much of Tapi's population, regardless of their principal occupations. The forests provide the wood that many use for fuel and for constructing/repairing their homes, and it is also the source of various commodities like honey, gums, seeds, oil, and various animal products.

In terms of the nature of this land, the majority of forests are deciduous. They are populated most of all by teak trees, but there is also a considerable amount of bamboo growing here. Also, out of the total forest land, 97% falls under the reserved category, while an additional 1.7% is marked as 'protected'. Breaking things down by sub-district, Uchchhal and Songadh have the largest quantity of forest land, while Valod has basically none at all.

While Tapi has a fairly robust monsoon season, many villages are still dependent on irrigation, and it is a vital part of the agricultural infrastructure of the region. A little more than 40% of the district's cultivated land is under irrigation, with a taluka-wise breakdown represented in the following table:

Talukas	Net Area under Irrigation	Share of Irrigated Area
Tapi	67145	41.86
Nizar	7453	37.53
Uchchhal	3758	33.79
Songadh	15264	25.24
Vyara	23991	44.39
Valod	16047	90.52
<i>Source-Directorate of Agriculture, Gandhinagar</i>		

The above data only covers 5 of the seven talukas, and is a little dated (being from 2014), however it illustrates the general distribution of irrigated land. Vyara and Valod have the largest areas under irrigation, while Uchchhal and Nizar have the least.

As regards transport and amenities-related infrastructure, Tapi is actually fairly well-equipped. The road network within the district is wide and of decent quality, and various state and national highways allow it to be connected with the rest of Gujarat and other parts of the country. The railways are also well developed, with Vyara being the central station that connects directly to Vapi, Valsad and Mumbai to the South, and Bharuch, Vadodara and Ahmedabad to the north.

Finally, as regards financial infrastructure, there is little data available. The UNDP report provides a table of 2014 data that enumerates the commercial and co-operative banks across five Talukas in the district:

Taluka	Commercial Banks	Co-operative Banks
Tapi	52	13
Nizar	6	3
Uchchhal	4	1
Songadh	10	2
Vyara	27	3
Valod	5	4
<i>Source: Lead Bank Manager, Tapi</i>		

While again, this data is 6 years old, it seems to show that banks are concentrated in the urban regions of Vyara and Songadh. This can be a problem as the absence of such channels of credit can lead to dependence of predatory money lenders.

Section Two: Data Analysis

Village Profiles

In comparing the data we have gained from our village profile survey to previous studies, one comes away with the impression that the wider trends that previous investigations had established seem to still persist, although it is noteworthy to observe how many indicators differ considerably from region to region.

For instance, the literacy rate - on average - remains similar to what it was in the previous census, around 70%. Although in our sample at least, there seem to have been improvements in the more remote regions of Uchchhal and Nizar, and the gender gap in literacy has shrunk, with Vyara even having a higher rate of literacy among women than men. In keeping with the subject of education, virtually every village that we surveyed had functioning anganwadi centres, and more than 90% of them had good primary education institutions. This is certainly an improvement from the time of previous studies. However, secondary and higher education remains scarce, with not even a single block in Tapi having fully developed institutes spread out across its villages. Indeed, in Kukarmunda, only one out of the ten villages we surveyed even had a high school.

Moving on to the state of health care: it is clear that access to PHCs is growing, but with an uneven distribution--70% of the villages we surveyed in Dolvan and Kukarmunda had easy access to these centres, whereas less than half of the villages in the other blocks could say the same. In fact, in regions such as Uchchhal, Nizar and even Songadh, only a couple of villages had PHCs nearby. This is a problem given that private health care is very limited in supply across the district.

Apart from this, household amenities for hygiene seem to also be improving. Functioning toilets have seen a 15 - 20% increase from the last measured average, within our sample. It is true that tap water facilities are still inadequate, with only 20% of the villages (except for those in

Dolvan and Vyara) reporting having these facilities. That said, access to water through tube and bore wells, public taps, and hand pumps is generally plentiful. Finally, our data shows that close to a 100% of villages have active ASHA workers, while at the same time there is a considerable shortage in access to both medicine shops and veterinary healthcare. Indeed, 4 out of 7 villages (Dolvan, Songadh, Vyara and Valod) reported no medicine shops in all the villages in our sample, and across the board, access to veterinary treatment for livestock was on average 15%.

Moving on to the economic profiles of the villages, the percentage of average-labour force participation was in the late 90s, with a generally equitable distribution across gender. One exception here is Songadh however, where the metric remained at 64%. Further study ought to be conducted to investigate the reasons for this. In terms of economic infrastructure, the transport networks within the blocks are fairly robust. While the railway lines are mainly centred around Vyara, there is good road connectivity to even the more remote regions of Tapi, and almost all villages have pucca roads that link to various highways. Financial infrastructure, on the other hand, is consistently poor across the district. There are only a handful of commercial and co-operative banks, and many villages lack access to a single one. Also there is very little by way of agricultural credit societies in the region as well. Almost all the blocks in Tapi still have very little industry to speak of.

When it comes to agriculture, 70% of the villages we encountered continue to grow principally food crops, though a number of them in blocks like Songadh, Vyara and Kukurminda have switched to cash crops (in fact, all the 10 surveyed villages in Kukurminda listed cash crops as primary). The most common grown items were: sugar cane, cotton, rice, paddy, sorghum, tuvar, wheat, chickpeas and corn. The number of livestock differed widely from village to village, ranging from a few hundred to a few thousand, but it was a consistent element of the agrarian economy everywhere.

One metric that was especially noteworthy, given the aim of this study, was the number of small and large agricultural equipment per village. It was observed in our sample that there was generally a shortage of this equipment. In fact, in blocks like Nizar, Uchchhal and Kukurmunda, a number of villages reported to possess no small equipment at all; and with large equipment,

every block had numbers that could be improved on. This would serve as a very good opportunity to supply agricultural inputs for Megha Mandali.

Finally, almost all villages reported some form of NGO activity, most often in the form of self-help groups, but also initiatives towards microfinance and organic farming. Also, in urban areas (mainly Songadh and Vyara), 70% of villages reported to have members migrating out of Tapi in search of better wages. Despite having harsher economic conditions, the number was less (30 - 40%) in the more remote regions of the district. This is notable given that in places like Nizar, many villagers have had to migrate simply from being displaced due to the construction of Ukai dam.

Farmer's Mapping Study

In this section, we will go over some of the main consolidated findings from the survey, looking particularly at a set of themes around which to organize our analysis. These will include (demographic, economic) profiles of the households in Tapi's villages, a look at some of the statistics related to the agricultural practices of our respondents, a specific focus on questions related to the lives of women in Tapi, as well as general feedback we received regarding what our respondents felt were their most pressing problems and concerns.

It is worth noting, of course, that while this will be an extensive look at significant points of the data we have generated, it is not a comprehensive elaboration of the entirety of this data. One may look at the collated summaries of this data in the appendix for a more detailed list of figures, or any datapoint that may not have been mentioned here.

Household Profiles:

To begin with what our dataset reveals about the kind of households that populate the district, we can observe that, on average, there are five members per household. However, there are notable differences between blocks on how many of these are earning members. While in most blocks, there are 2-3 people in every family that are earning, in both the urban centres (songadh and vyara), the average number reported was just one. This is connected to the relatively lower rate of labour participation that was observed in Songadh and is worth investigating further. For one would expect a greater rate of employment in these areas in particular. Moreover, there does not seem to be sufficient evidence of demographic factors (having disproportionately old populations, or great quantities of young children) to explain this.

Moving on, when it comes to family structure, there is a trend towards a predominance of joint families vis a vis nuclear ones. In fact, in most blocks, one finds a ratio of around 70:30. The two exceptions are Dolvan and Nizar, which have a greater level of nuclear families and thus a more equitable distribution (close to 55:45). With regards to education, by far the most common response amongst the respondents was 'no education'. Here, particularly in Uchchhal, Nizar and Kukarmunda, the majority of our sample reported that they had not had any schooling, and even those that did had usually not passed the secondary school level. The remaining blocks

also tended to also have a high rate of 'no education' respondents, but also reported higher proportions of those who had been to school; there being also many more instances of high-school and even college graduates. In Vyara, the educated population was even marginally greater than the uneducated segment.

Speaking about the houses themselves, there was a clear trend in the sample: close to 70% of all houses were kaccha houses. There were a moderate amount of mixed (kaccha-pucca) homes, and fully pucca houses were reported least. Most blocks reported having clay-tile roofs considerably more than tin roofs, the exceptions being Nizar and Kukurmunda, where the opposite was true. In terms of electricity, close to 90% of all households claimed they had few power-cuts, all possessing continuous power for more than six hours. Surprisingly, Vyara reported a considerably lower number. Being the most developed area in Tapi, this seems unlikely, and may be caused by something in our sample that skewed the result. If not, it certainly requires further investigation.

Across the board, the most common form of cooking fuels (in descending order) were LPG, Wood, Crop Residue and Dung Cakes. In terms of drinking water, the most common sources were (again, from highest to lowest) public taps and hand-pumps, followed shortly after by borewells. Notably, house taps were scarce, with Vyara being the only region where a significant portion of the public possessed them. Also, a relative small percentage (10-15%) of families purified their water before consumption.

When it came to documentation and availing of services, it was observed that 90% of all houses had Ration and Job Cards. Around an average of 40-60%, had APLs and BPLs (the latter being as high 90% in Uchchhal and Nizar), while around 30% had MA cards. The rest of documents/services (Kisan credit cards, Old-age/widow pensions, Ayushman Bharat Yojna) were all very scarce, often not possessed at all, or only among 10% or less of the sample. In terms of household amenities, televisions and telephones/mobiles were the most common items, and were present in close to 70% of the households within our sample. Motorcycles were also fairly well represented, being reported in around 40% of households (Valod being the only block where cycles were observed to be a more common possession). The presence of refrigerators varied across regions. In places like Vyara and Dolvan, 30-40% of the sample had one. Whereas, in areas like Uchchhal, Nizar and Kukurmunda, it was less than 10%.

Finally, in looking at the financial profile of the households in our survey: around 5-8% households held mortgaged land. Around 10-15% had active loans, mainly with SHGs or with private banks. That said, because of the spare access to credit, this may actually say more about the lack of access to loans than about the lack of demand for them. Also noteworthy, even fewer households (7 - 10%) had any form of insurance coverage. In fact, in a number of regions (Kukarmunda, Nizar, Valod), less than 50% of households reported even being aware of insurance schemes.

State of Agriculture

One of the most basic metrics in our survey with regards to agriculture asked about patterns and type of land ownership. Here, it was observed that the most common form of land held was medium land, amounting for the majority of households across blocks. There was a substantial amount of upland also represented around the district, but all other forms were marginal except for certain blocks. Thus, Kukurmudna, for instance, was the one region with a sizable amount of low and homestead land ownership. Similarly, Uchchhal was the only area where it was common to hold forest land. In terms of average land held, this was around 3.5 bighas² for medium land, 3 bighas for upland, and 3.7 bighas for the forest land in Uchchhal. Finally, the most common sources of irrigation were boring and seasonal rivers.

Before breaking things down and looking at statistics for particular types of crops, it is worth noting the incomes generated from agriculture at an aggregate level. Thus, in our sample, the average annual income from agricultural crops ranged from Rs. 12,000 to around Rs. 44,000. However, this range represents two extremes. On the lower end is Uchchhal, which is one of the remotest and least economically developed regions. On the higher end is Kukarmunda, which has switched largely to cash crops in recent times (even then, the Rs. 44,000 seems high, and it might be that our sample has been skewed by some particularly wealthy households). All the remaining five blocks have a much smaller range of between Rs. 18,000 to 25,000. Closely linked to this statistic, the average annual income from Animal Husbandry ranges from around Rs. 6000 (Valod) to around Rs. 15000 (Nizar), while the average annual income from local unskilled labour ranged from Rs. 1000 (Dolvan) to Rs. 9000 (Kukurmunda).

² 5 bighas = 1 acre

Now looking at more specific agricultural practices in the district, it must be mentioned that - in our sample at least - there were barely any respondent households who answered questions regarding growing summer and horticultural crops, and so we do not have sufficient data to analyze these sectors. Furthermore, while we do have data on Kharif and Rabi crops, here too there is a difference in scale. While almost 80-90% of households across all blocks reported growing kharif, the number for Rabi crops was only around 10-15%, and the data there is restricted to a couple of blocks. These restrictions must be borne in mind when thinking about the generalizability of the following analysis.

To begin with Kharif crops then: As mentioned, the vast majority of households in our sample seem to allocate some of their land - on average, around 2 bigha - to growing kharif crops. The main crops in this category would be: Rice, jowar, castor oil, soybean and sugarcane. The average total investment in Kharif crops ranges - by size of plantation - from around 4500 up to 17000-18000. The lower end being in the remote regions of Tapi, while the upper end being what one might spend in Dolvan or Vyara. Breaking this figure down, the largest expense is on the labour and machine cost (again, ranging from Rs. 2000-14,000). The next major expenses are fertilizers and seeds, with irrigation and chemicals being the lowest costs of the lot.

The average quantity of production per household for these crops ranges from 700 to 1400 kilograms, and according to our respondents, 80-100% of this successfully finds a buyer. Again the income from these sales varied with regions, however the mean was in the Rs. 12000-15000 range. On the extremes, it went from as low as Rs. 2000, to as high as more than Rs. 100,000.

Moving on to Rabi crops, this again might have to do with the composition of our sample, but a much smaller number of respondents represented Rabi farming (10-15% of households). The main crops grown were wheat, corn, peanuts, okra, and cotton. The average land allocated to these crops was 2 bigha, and the average seasonal investment in them ranged from Rs. 14,000 to Rs. 22,000. Here, again, labour and machine costs (Rs. 8000-11000) were consistently the largest expenditure, followed by fertilizer (Rs. 2000-5000) and Seed (Rs. 1500-3000) costs, with chemical and irrigation (both around Rs. 1000-2000 or less) being lowest expenses. The average quantity produced ranged from 1500-2250 kilograms, and in our sample, between 50 -

80% of this produce was sold. There was insufficient data to get a reliable and precise average of the income gained from Rabi crops, but it would fall between the Rs. 10,000-12,000 range.

Taking a look at some more general indicators regarding the agricultural practices of Tapi, our data showed that monsoon was consistently rated as the best season for business, with the highest number of sales for produce. Conversely, Summer was consistently chosen as the season which had the lowest sales. An interesting fact about this indicator is that winter received an ambivalent response. It was sometimes reported as a high-performing, high sales season. While other respondents claimed it was generally an inactive period with low sales. This was not easy to attribute to geography, because often different villages from the same block, and even different households from the same village gave countervailing responses. So, more investigation is needed as to the factors determining agricultural business during the winter. Of course, here our sample's bias should be noted, given that almost none of the households we surveyed allocated significant land to summer and horticultural crops. If they had, especially with the sale of mangos, their revenues during summer are likely to have been much higher.

As regards points of sale, our sample showed that per block, only one or two villages hosted local markets (in fact, in some blocks, this number was zero). The distance to weekly haat markets for farmers in other villages was between 5 to 10 km, and generally private vehicles had to be hired to transport the produce to these areas. This cost between Rs. 200-600, and for certain villages, especially in remote regions like Uchchhal and Nizar, this was a significant impediment to sales.

One of the questions asked as part of this section was whether farmers were satisfied with the procedure for selling their goods. While there was considerable divergence across certain areas, surprisingly the majority responded with yes. Indeed, between 60-80% of respondents in Uchchhal, Nizar, Kukurmunda, and Songdah all claimed to be satisfied with the current system. In Vyara and Valod, the exact opposite was the case, with almost 80% of our sample complaining that prices were too low and they were unhappy with the set up. Dolvan was the only block which had a roughly even distribution between satisfied and unsatisfied respondents. This certainly raises some questions, especially when the remote regions which have the least access to markets seem to report such a high level of satisfaction.

Rounding off the information about agricultural practices with some final statistics: Across all the blocks, 85% of farmers value-processed their commodities. The most common extension services in the district were other farmers, Government KVKs, and Universities. In keeping with this, the most common mediums of the extension services were newspapers, mobile messages and interpersonal communication. In terms of farming equipment, as indicated in the village profile section, our data suggested a considerable shortage in every block of the district. Indeed, the highest number of tractors reported were 4 in Kukarmunda, whereas others had only 1 or 2. Tools like sprayers and bullock carts were present in some quantity (20-30) in a couple of blocks, but many others reported having zero. Finally, with power-tillers, irrigation pump sets, weeders, drips and paddy threshers, there were only a handful reported in our entire dataset.

Finally moving out of numbers, and into some of the insights we gained from qualitative engagement. From a series of interactions, there were two main points related to our research that our aagewans (leaders) conveyed to us after their time in the field. Firstly, given that Songadh was a dry area with inadequate irrigation infrastructure, there was a large demand there for hybrid seeds, as they were much more resilient and needed considerably less water to grow. Secondly, for areas where there are large quantities of livestock (Dolvan, Nizar, Uchchhal), there was a high demand for certified seeds as this led to crops growing higher and being more amenable to being used as cattle feed.

We also gained some qualitative information from our survey- our last section included an open-ended question asking respondents what they believed were the principal obstacles they faced and what factors might improve their agricultural productivity. In response, we received essentially the same four points from almost everywhere in the district. Firstly, water and irrigation facilities were not up to the mark. Second, the input prices were too high. Third, that the quality of seeds and fertilizers was bad and they needed access to better alternatives. Finally, being trained in organic farming seemed to them like a path that might lead to better results for them, and they were interested in taking it up.

Women in Tapi

Apart from profiling households and taking a detailed look at various aspects of agricultural production, our farmer's mapping survey also included a short section that aimed to gather data specifically on the conditions for women within Tapi district. While our survey offers only a brief overview of a small set of indicators, we thought it was a worthwhile exercise because of the paucity of studies/information on the subject.

Looking at our findings, we observed that in most blocks, 90% of the women in our sample listed 'agricultural work' as their main occupation, with around 10% listing household work instead. The exceptions here were Songadh, where the distribution was closer to 60-40 between the two, and Kukarmunda, where 'household work' was the most common response given. Of course, even in the blocks where women listed agricultural work as their primary job, they all mentioned unpaid household labour when questioned about their main activities outside their job. Most women in our sample said that they were generally of good health and that their most common mode of travel was either on foot or through public transport.

On average, women who worked in agriculture reported spending 6 hours in the fields everyday. However, given that 60% of our respondents also claimed they did not leave the house before 6am and after 6pm, the time they spend in the fields would be the only time outside the household for many women. In terms of decision making, 95% of all households in our sample reported that men and women made joint decisions regarding both agriculture and animal husbandry. There were a few instances in every block that reported that men exclusively made decisions. Conversely, in Uchchhal, 5 households were observed where it was the women who were the primary decision-maker.

In terms of assets and amenities, between 5-15% of households reported that they had land mortgaged in the women's name, and generally 50-60% reported that they held savings in the woman's name. These were decisions made for tax benefits and to avail government schemes. The vast majority of women claimed they had their own bank accounts, while two thirds claimed that they had mobile phones. However, the level of women's own savings differed considerably by region. For instance, while Nizar showed that 90% of women had savings of their own, in Dolvan, Vyara and Valod, the number was close to 50%; while in Songadh, Kukurmunda and

Uchchhal it was even lower, around 20%. Also worth noting is that many of these women (especially in Dolvan and Vyara) chose to keep their savings with the self-help groups they participated in, as opposed to with private banks.

Section Three: Conclusion

Having revisited earlier studies on the region and conducted an analysis of our own data, we hope this report has succeeded in providing a clear overview of the district, and especially of the agricultural economy of its various blocks. In the following, we will cull through our own data and analysis in order to consolidate insights and conclusions that we can glean for Megha Mandli to be able to improve the scope, productivity and efficiency of their operations.

Insights and Recommendations

As was mentioned in the background section on the Megha Mandali cooperative, its key activities fall into five broad categories: livelihood, healthcare, housing, financial services, and capacity building. Looking at the data that we collected, there are clear opportunities for growth in each of these areas.

To begin with livelihood, which is the commercial base of the cooperative's operations, and whose expansion was a key motivation behind taking up this study. Here, as mentioned, Megha Mandli's central business is the sale of agricultural inputs such as seeds, tools and fertilizers. Now, one of the consistent responses that we received from our survey was a complaint about the price and quality of both seeds and fertilizers. Not only was this a recurring complaint, it was also a pervasive one. We recorded it in every single one of Tapi's seven blocks. Thus, it is clear that if the cooperative can organize lower-priced versions to current products on the market, as well as better quality alternatives, the demand for this would be widespread within the district.

Moreover, some of the qualitative information that we gained from our fieldwork also helped locate very specific area-related demands for these inputs. As mentioned, the lack of irrigation in Songadh calls for hybrid seeds, as they require less water. Similarly, blocks with large quantities of livestock (Uchchhal, Nizar and Dolvan) tend to prefer certified seeds, as they lead to taller crops; whose excess can be used to feed cattle. Also, certain villages in different regions complained of poor soil quality, which has significant bearing on the kind of the fertilizers that would be effective there.

In fact, apart from seeds and fertilizers, our survey also pointed out the sheer scarcity of agricultural equipment across the district. Our data clearly points out deficiencies in both large and small agricultural equipment (from tractors and paddy threshers, to irrigation pump sets, sprinklers and so forth) as well as the areas where there is a shortage of particular tools. The

data can be used by Megha Mandli to map out people's needs at a block-wise (sometimes even village-wise) level, in order to streamline their approach to sales.

All of these recommendations are on the demand-side. However, the cooperative also works towards finding new markets (in cities like Ahmedabad) for agricultural commodities from Tapi. With our survey data providing an extensive map of where particular crops are being grown (at least with respect to kharif and rabi crops), the cooperative can optimize supply-side operations as well. Particularly, it will now know exactly where to source goods in response to bulk orders it may receive. It will also have the supply chains ready for any value-added goods or services it may embark on incorporating into its business

Now, moving on to Megha Mandli's next two key activities- 'healthcare' and 'housing'. While these are not core areas of the cooperatives' business, they are domains that the wider network of SEWA Federation's collective enterprises are active in, and Megha Mandali can coordinate with these organizations to make a number of valuable interventions. The data obtained here goes some way in isolating some of the points within the infrastructure in Tapi where interventions are clearly necessary. For example, when it comes to health care, almost the entirety of our sample showed a dearth of access to both medicine shops and veterinary healthcare. These are both big problems, both for keeping the villagers themselves healthy, but also for the health of their livestock which are an indispensable part of the district's economy.

Similarly, the levels of sanitation and the quality of housing in Tapi is still far from adequate. Many still lack functioning toilets, household tap-water is extremely scarce (at least in our sample), and the majority still seem to live in kaccha houses. Any initiative to make improvements in these areas - be it through direct intervention, through advocacy or help in availing government schemes - will considerably improve the living standards of villagers and generate much support and goodwill.

Such avenues for engagement are present for Megha Mandli's fourth key activity of financial services as well. Indeed, here our data shows that banking and financial services are underdeveloped in the district, and as a result, very few households in our sample had active loans. Not only private banks, but even co-operative banks and agricultural credit societies were few and far between, and many of the villages that our women visited did not have access to any substantial line of credit. Closely related to this, our data showed that insurance services too hardly availed within the population and information about them was insufficiently available. According to our data, less than 50% of households in several blocks were even aware of insurance schemes that they could adopt. Here, intervening by creating awareness, as well as partnering with other SEWA and non-SEWA organizations, Megha Mandali could add another arm to their activities that would likely succeed as a commercial venture whilst also filling a significant gap within the infrastructure of the district.

Finally, when it comes to the last key activity of 'capacity building', our analysis reveals that there seems to be considerable potential for educational endeavours. indeed, from common

responses we received, it was clear that there was a general sense amongst many villagers that methods of organic farming could be beneficial to them, and there was a desire to explore them. Megha Mandali could help facilitate programmes that raise awareness and train farmers to this end. It would resonate with SEWA Federation's commitment to promoting sustainability, answer to a desire amongst the local population, and if successful, help bolster the long-term resilience of the region's crops against climate factors.

On the whole, then, this discussion serves to illustrate that the results of our survey unquestionably affirm the need and demand within Tapi for many of the activities that are central to the Megha Mandali Cooperative. Moreover, as ought to be clear, the raw data generated in this exercise can effectively be used as a map that will help optimize business plans, target particular markets, allocate resources, and chart out paths towards new partnerships and initiatives.

Areas for Further Study

Given the generally under-studied nature of Tapi district and the considerable dearth of large scale, and current studies on the region, the gaps in information are large. Thus, pinpointing smaller areas of study might seem premature when many more general inquiries are required in order to better understand the district. That said, it is important for those using this report/data as a base to build upon to know the points at which this inquiry encountered details that called for further investigation. Hence, the following will attempt to bring together and organize such material.

To a large extent, one can present the areas for further study uncovered in this inquiry under two broad categories: the first has to do with those factors that have to do with the limited scope of the sample, and so have a bearing on the generalizability of the patterns we observed here. In this regard, one may want to explore, for instance, whether families that grew summer and horticultural crops had similar levels of incomes and costs, and whether they faced the same kinds of problems as those enumerated by the respondents of this survey. Relatedly, there were various aspects of social life that were encountered but not probed further given the scope of our inquiry. For example, the production and consumption of illicit alcohol seems to be an integral part of the history and economy of the region, and also a significant problem. We hear various accounts of how alcoholism amongst men in Tapi has led to many cases of gender-based violence and premature death. Indeed, there are over a thousand widowed women in Tapi who have lost their husbands to alcoholism. A better understanding of such a phenomenon is vital to a proper understanding of larger social and economic dynamics in the region as well. As is another subject that was not encroached on by our study- the various relationships between groups of ethnicity, religion and caste. This would be an indispensable addition to scholarship in the region, although given reluctance amongst villagers to talk about these things, as well as the general political climate, it would be difficult to conduct such

research. On the question of gender as well, while our study did attempt to compile data on certain aspects, it is a largely understudied domain, and more research into the topic would be valuable.

The second broad category would comprise phenomena that were discovered over the course of this study, but which require further analysis in order to unearth the causal factors and context that are determining them. There are various instances of such facts in our data analysis.

To begin with, there were a number of datapoints that seemed vague: the considerably lower rate of labour force participation that was observed in Songadh, the lower rates of electricity provision in Vyara. Why did both of these urban centres report a lower average of earning members per household than the other blocks? Why have certain blocks like Kukurmunda have seemed to switch so dramatically to cash crops? Why, despite having the most economic constraints and lowest returns, remote regions of Tapi (like Uchchhal and Nizar) reported high rates of satisfaction when asked about the current procedure for selling goods?

All of these results are questionable because they seem counterintuitive and defy expectation. Therefore it is important for further research to be conducted to understand if there are causal factors involved here that had not been anticipated, or whether there was something in our particular sample that skewed the results, and that general expectations actually continue to hold?

Apart from this, there is also the need to understand the causes and contexts of the general trends that this study seems to demonstrate. For instance, what is the reason behind the various disproportionalities in development when it comes to educational, health and economic infrastructure between blocks? What are the causes that have led to the various shortages that our results point out, for instance in agricultural equipment, veterinary medicine, medicine shops and financial services?

An answer to these questions is important not only for a better sociological picture of Tapi's current state and development, it would be directly relevant for Megha Mandali and other organizations who wish to intervene and provide some of these goods and services. For being able to analyze why earlier attempts to solve these problems have not been forthcoming or have failed would help one understand and strategize novel approaches to tackle these issues.

We hope that these questions help stimulate and organize the thinking of others interested in developing scholarship in Tapi district.

Bibliography

United Nations Development Programme and Government of Gujarat. (2016). *District Human Development Report - Tapi*. Gujarat Social Infrastructure Development Society.

https://www.undp.org/content/dam/india/docs/human-development/District%20HDRs/8.%20Tapi_DHDR_May_2016.pdf

Talmaki, R. (2014). *Empowerment of Tribal Women through Self-Help Groups in Tapi District, South Gujarat*. SNDT Women's University.

<https://shodhganga.inflibnet.ac.in/handle/10603/55946>

UNICEF India (2016). *State of Children Workers in India - Mapping Trends*. V. V Giri National Labour Institute.

<https://vvgnli.gov.in/sites/default/files/State%20of%20Child%20Workers%20in%20India-Mapping%20Trends.pdf>

Government of Gujarat. (2011). *District Census Handbook - Tapi*. Directorate of Census Operations, Gujarat.

Vansiya, Y. (2015). Rural Poverty in Gujarat: A Study of Tapi District, in *Kakadia International Journal of Research in Multidiscipline*.