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Introduction

A central theme in all the studies of Palanpur that have been undertaken to date has been the changing nature of agriculture. One of the reasons for selecting Palanpur from amongst the many villages that Christopher Bliss and Nicholas Stern considered prior to launching the 1974-75 survey was that this village was suitable for analyzing the changing nature of agriculture, particularly the impact of technological changes in the wheat economy¹. This focus on agriculture is evident in the first book on Palanpur by Bliss and Stern (1982) which documented the structure of agricultural production in detail. Importantly, in that study Palanpur was also used as a testing ground for many of the existing economic theories concerning production in agriculture relevant to developing countries. Notable among these were the various theories of tenancy (under certainty as well as uncertainty), factor market inter-linkages and formation of wage rates. The theories were probed using data which were carefully and meticulously collected by a team led by Christopher Bliss and Nicholas Stern through active observation during an extended stay in the village. It was the care and detail with which the data were collected and verified which allowed the authors to shed light on many dimensions of agrarian transformation in Palanpur that had hitherto not been available from secondary data sources².

This approach of painstaking, detailed data collection was also followed in the 1983-84 round, led by Jean Drèze and Naresh Sharma, in close collaboration with Nicholas Stern. The subsequent survey round in 1993 was relatively short, however, and did not collect information in as great detail as was collected in the previous two surveys. Nonetheless, information on land ownership details, along with demographic characteristics, was collected. And since this round was again carried out by the same team which had led the 1983-84 survey, it could draw on the experience of 1983-84 fieldwork as well as the numerous visits that had occurred in the intervening years. The current survey round (2008-2010) is the most detailed yet of the Palanpur surveys. Although the scope of the survey extends well beyond agriculture to also include data on social, political, gender and income dimensions, a substantial part of the effort of data collection in this round also revolved around agriculture.

The uniqueness of the Palanpur data arises not only from its universal coverage and the multiple waves of data that are available but also from the way the data were collected. Both canvassing on the basis of formal questionnaires as well as wide-ranging, open-ended, discussions were held, during the course of an extended stay in the village. Importantly, the richness of the data also arises from the active participation of the various researchers in the process of data collection. It is this uniqueness which has allowed past researchers to test various theories of agrarian change and production conditions in Indian agriculture. In this paper we attempt to undertake a similar

¹ See Introduction, Bliss and Stern (1982). In particular, they were keen to analyse the impact of the “green revolution”. An important factor which favoured Palanpur was the existence of two previous surveys by Agro-Economic Research Centre (AERC) of the University of Delhi, for the pre green revolution period. Also, wheat was the predominant crop in the village and tenancy was frequent.

² Palanpur was surveyed twice earlier by the Agro-Economic Research Centre in 1957-58 and 1962-63. Even for these two surveys the primary focus was agriculture.

exercise using the new dataset made available from the 2008-10 survey. As with earlier analysis on Palanpur, the purpose is not restricted to documenting the changes in agricultural production in the village, but also to explore and understand the various dimensions of interaction between agriculture and non-agriculture as well as within agriculture across the various factors of production. However, since a significant share of the data is yet to be analysed, the results and conclusions drawn in this paper should be treated as preliminary.

In many parts of India, agriculture remains a key driver of change and source of dynamism for the rural economy. Palanpur is no exception to this and a preliminary reading of the evolution of agriculture in Palanpur suggests that this assessment holds not only with respect to changing cropping patterns, intensification of mechanisation and irrigation, but also in the evolution of factor markets such as the land and labour markets. For example, the introduction of new forms of tenancy alongside the continuation of old forms, albeit on a smaller scale, also points to a degree of dynamism in this setting. Palanpur's agricultural economy is not only responding to globalisation and liberalisation of the Indian economy through introduction of new crops such as mentha; its ability to transform itself in response to new challenges of migration and outside employment are yet further signals of dynamism in a rural economy which in many other respects changes only slowly. At the same time, the developments in agriculture have also continued to influence the choice of livelihood and diversification of income and employment opportunities both as a recipient of investment and as a source of surplus and livelihood.

While the introduction of mentha indicates dynamism, the decline in the village's operated land and deceleration in yield growth suggest the need for situating agrarian change within the larger changes and reforms experienced in the Indian economy since the 1990s. Some of this is also evident in the evolution of credit markets and in the distress sales of land by the villagers. While the percentage of total leased area has increased marginally – counter to the widespread prediction of all those who expected a decline in tenancy - the changing nature of tenancy contracts with specialised contracts such as fixed rents and labour contracts gaining prominence also point to a greater interaction of the agricultural land market with the labour market. These changes confirm the inadequacy of attempting to characterise the nature of agricultural production in India in simplistic categories of “semi-feudal” or “capitalistic” modes of production. The complexity of the production system, the linkages in the factor markets, which remain imperfect, and the broader context of a rapidly changing non-farm economy also suggest that any attempt to study tenancy or farm size productivity in isolation would suffer serious limitations. This paper looks at some possible explanations of the changing nature of tenancy in the village, highlighting the importance of the context and linkages, and thus the shortcomings of such standalone exercises. The main objective of this paper is to describe the changing contour of agricultural production in the village economy, particularly in relation to the changing nature of tenancy and its linkage with the changes in the land and labour markets. It is beyond the scope of the present paper, however, to provide a detailed analysis of the inter-linkages in factor markets. In particular, we have not yet been able to analyse our data for the most recent agricultural year and to make full use of our special and detailed survey of credit and inter-linkages. The availability of data on Kharif 2010 would not only enable us to compare variations in agricultural practices for two consecutive years, it will also allow us to delineate the impact of changing natural factors such as drought in the village economy.

This paper is organised in four sections. The first section describes certain salient features of data collection for this round of the survey and of our empirical methodologies. Section II describes some of the basic characteristics of agricultural production in Palanpur. This is followed by section three which looks at the changing nature of production in agriculture with respect to cropping patterns and tenancy. The final section concludes with some issues for future research.

This paper is largely descriptive and is concerned about highlighting changes in the agricultural economy of Palanpur over the years, in particular since 1983. The paper does not undertake any in-depth analysis of household decision making, such as choice of tenancy contract, and extent of involvement in the tenancy market. These issues are discussed in a companion.

Data and Methodology

The present round of data collection was the longest-running of all the survey rounds undertaken so far. It was spread over two agricultural years, 2008-09 and 2009-10. Data for two rabi seasons (2008 and 2009) and two kharif seasons (2009 and 2010) were collected as part of the survey. Alongside maintaining continuity over the subjects of data collection, the fieldwork methodology was also similar to that applied in previous surveys of 1974-75 and 1983-84. However, in addition to the usual focus on agricultural practices, this round also collected extensive data on inter-linkages across factor markets, in particular credit and tenancy. The methodology was largely questionnaire-based but was supplemented with a discussion questionnaire aimed at collecting qualitative information on various aspects of agricultural production and tenancy. This was further supplemented by the information collected through a daily diary which was distributed to a selected sample of households. These were followed rigorously and data from the diaries was also utilised to validate some of the information on expenditures and outputs in agriculture.

As with the previous surveys, a great deal of effort was spent on ensuring internal consistency across various rounds of questionnaires and also validating the information collected through the questionnaires through secondary sources such as land records and through internal consistency checks. In particular, our data on the rabi 2008 is not as good as the subsequent rounds because of under-reporting of tenancy arrangements and land data. These were later made consistent with secondary data as well as through a physical verification of each and every plot. For the purpose of the present paper, we draw only on data for kharif 2008 and rabi 2009 which have been cleaned and validated. In our analysis we have used only rabi and kharif as relevant seasons although some plots of the village are also cultivated during the intervening period between these two seasons. In these cases cultivation data of these plots have been merged with the season which is closest to their sowing. One of the problems encountered during our survey was the differences in estimates of input use and outputs as reported by the tenant and landlord. In the case of a conflict between the two estimates, the data were cross-checked again and in most cases these were resolved at the field level. However in some cases, discrepancies did remain and in those cases we have used the estimates provided by the actual cultivator. The exercises underline the great importance of data quality for us and how much time, care and attention is necessary to produce accurate information.

While the land data were scrutinised in great detail using secondary data sources as well as physical verification, data on inputs used and outputs from cultivation were collected from questionnaires. Data on both inputs and outputs were collected in quantities as well as value terms. In those cases, where output was self consumed or home produced quantities were used, and imputations for values were produced using locally prevalent prices in the village at that time of survey. No depreciation was imputed at any stage. Information on labour use, both hired as well as family labour and exchange labour were recorded in the questionnaire but are subject to recall problems in some cases. Days of labour use has largely been taken as the actual number of days reported by the respondents. However, in some cases information on labour use was also verified

³ Agricultural year refers to July to June. This is the standard periodization for agricultural year used in literature. Rabi refers to the winter season with crops sown in November or December while kharif refers to the monsoon season with crops sown generally in late June or early July.

using diaries and cross-verification with tenants/landlords. The valuation of family labour was done at the locally prevalent wages which were taken to be the wages reported by the hired labourers. Since there is quite a bit of mixed cropping in Palanpur, the inputs were apportioned correspondingly across the two crops grown jointly.

Basic Indicators of Agricultural Production in Palanpur

A key focus throughout the Palanpur studies has been the changing nature of agricultural production. This was a special focus of the first book on Palanpur by Bliss and Stern (1982). This was reaffirmed in the later studies with a second book covering the two surveys of 1983-84 and 1993 identifying technological change in agriculture as one of the key drivers of change in the village economy, together with population growth and expanding outside opportunities (Lanjouw and Stern, 1998). Since then, the Indian economy has seen significant changes led by the economic reforms initiated since the early 1990s. Over the years, agriculture has become less significant in accounting for growth of the overall Indian economy or for changes in distribution of income in the economy. At present, the share of agriculture in national GDP is less than 15%. However, even though it is less relevant for growth, it still employs more than 50% of the national workforce.

Some of these changes are also reflected in Palanpur with non-farm employment and income now accounting for a significantly larger share of the total workforce and income of the village. These processes had already been noticed in previous work on Palanpur, notably in Lanjouw and Stern (1998). Nonetheless changes in agriculture remain central to an understanding of change in the overall village economy. Table 1 and table 2 present some basic indicators of the agricultural economy of the village. Note that since the 1993 survey did not collect detailed information on agriculture, the relevant comparison in most cases is with the 1983-84 and 1974-75 surveys.

There are four important observations that need to be highlighted. First is the decline in land owned and land operated per capita. These show a declining trend although there is no evidence of an accelerating decline over previous rounds. Unlike previous years, when population growth was seen as the major factor behind the decline in land holdings, this no longer appears to be the central explanation. A large part of the decline in land holding between 1983 and 2008-09 is driven by the decline in aggregate land owned by the villagers: a decline of more than 500 bigha between 1983 and 2008, from a total of around 2600 in 1983. This is in contrast to the trend seen between 1962-63 and 1983-84 when land ownership by the villagers was rising. The decline in operational landholding for the village as a whole is smaller because some of the land which is now owned by the outsiders is still cultivated by the residents of Palanpur.

The dual impact of decline in land ownership and increasing population pressure has led to the continued reduction in the size of individual land holdings. On the other hand, the number of landless households shows only a marginal increase compared to 1993 – although there are now almost twice the number of landless households as in 1983. Tenancy appears to work towards reducing inequalities in cultivated holdings arising out of unequal per capita land ownership. The percentage of leased in land has increased to almost one third of total cultivated land compared to just over a quarter in 1983. While inequality in land ownership as measured by the Gini coefficient does not show any worsening over the years, there is a significant decline in the Gini coefficient for land cultivated. The difference between the Gini coefficient for per capita land ownership and that for per capita operational holding is higher than any other survey year. However, despite the “equalizing” effect of tenancy, per capita operational holdings are still marked by high inequality.

A Second observation is that there is a clear continuation in the trend towards use of modern technologies, in particular irrigation and machine power. Persian wheels which were once an important source of irrigation have now disappeared with almost all irrigation being carried out through pump sets (diesel) and tube wells (large bore, electric). The number of tube wells in the village has increased from only one functional tube well in 1983 to 13 by 2008. Similarly as against 27 pump sets in 1983, there are now 85 pump sets in the village. Bullocks as a source of ploughing and other agricultural work has seen a steady decline with the number of bullocks falling from 141 in 1983 to 51 in 2008. Such draught power is being replaced by mechanised agricultural equipment such as tractors and threshers. There were no tractors in the village in 1983; the number in 2008 stands at 13. However, with the exception of a few cases in paddy cultivation, increased mechanization in Palanpur does not appear to be accompanied by further expansion of new seeds. Together with irrigation and double cropping, new seeds and fertilizers had contributed in a major way to rising yields in the 1970s and 1980s.

Nonetheless, there is some increase in yields of most of the major crops grown in Palanpur. There has been a perceptible and significant increase in productivity of crops in the village compared to 1983. It is important to note however, that 1983 was a bad agricultural year while 2008 was a normal agricultural year, and so a better comparison might be with 1974-75. This rise in crop productivity is likely due to increased mechanization in agriculture such as use of tractors and also irrigation equipment. Rice is the only crop that has seen some introduction of new varieties.

Despite only sluggish increases in productivity for major crops such as wheat and rice, we do not see a substantial decline in area under cultivation of these crops. On the other hand, there has been substantial decline in coarse cereals and vegetables⁴. In addition, there has not been any substantial increase in area devoted to sugarcane (an annual crop) and if at all, it appears to have declined somewhat during recent years. However, sugarcane cultivation picked up again in 2010-11 owing to sudden increase in sugarcane prices. Map 1 and 2 show the cropping pattern in Kharif 2008 and Rabi 2009.

The third major change is the introduction of mentha. This crop did not exist in Palanpur until 1993. It is now sown on almost one third of area sown in rabi. Mentha, technically known as *Mentha Arvensis* or *Mentha Shivalik* is grown for peppermint oil which finds wide usage in toothpastes, mouth wash, menthol chewing gums and candies, body pain reliever and other medicines⁵. However, the cultivation of *Mentha Arvensis* or *Mentha Shivalik* as a major rabi crop did not pick up until late 1990s in the Moradabad region. The yields were too low to bring any suitable reward for major cropping pattern shift for the farmers. The Central Institute of Medicinal and Aromatic Plants introduced improved varieties of *Mentha Arvensis* in the 1990s and some other varieties were imported from China, which was the dominant producer of *Mentha Arvensis* in the world market at that time. By the end of the 1990s, *Mentha Arvensis* had become a major rabi crop in the Moradabad region. As of now, India is the largest producer of mentha oil with almost 80% of the total world production coming from India. Around 80% of the total crop is grown in Uttar Pradesh in which the Moradabad region (Moradabad, Sambhal, Rampur, Bareilly and Chandausi) account for 40 percent. Chandausi, is in fact, a major international trading centre for mentha oil.

⁴ The decline in vegetables was explained as being primarily due to the large increase in the monkey population in the village.

⁵ *Mentha Arvensis* was first grown in Japan around 1870 and was not produced in India until 1964. Regional research Laboratory, Jammu first brought the crop to India in 1964. A cheap method of steam distillation was introduced by a US-based Multinational in early 70s and soon, many distillation units came up in the Terai region of Uttar Pradesh, including Moradabad.

There is no clear answer to the question as to who was the first farmer to grow mentha in the village and when⁶. One possible explanation (based on various discussions) is that farmers of Palanpur learned of *Mentha Arvensis* from farmers in neighbouring villages (which are more prosperous and more resourceful in adopting new crops) in the late 1990s and started cultivating the crop. In the early 2000s the price of mentha jumped to Rs 1900 a litre, up from Rs 300 a litre in the preceding season and the farmers were lured by the massive profit opportunities and started to cultivate mentha as a major Rabi crop. Unfortunately, mentha prices have not remained at those levels since then.

Mentha Arvensis is a shrubby plant sown in the first half of January, and maturing by the last week of June. Sowing takes place through root transplantation and the plant, therefore, is maintained even in the kharif season by a few farmers on a small piece of land in order to provide roots in the rabi season. *Mentha* can be easily mix-cropped with wheat and sugarcane in the rabi season with a few furrows left for *Mentha Arvensis* while sowing wheat in December. The crop is highly water intensive as the plant has to survive the hot summer days of May and June when the temperature sometimes soars to 48 degree Celsius. Providing timely and adequate irrigation during these months can be a real challenge as the groundwater tables generally decline around this time as well and Palanpur farmers are completely reliant on groundwater for irrigation purposes. The shrubs of *Mentha Arvensis* are cut in the first week of July and taken to a steam distillation unit for processing. The oil is extracted from the leaves, with the shrubs left to dry near the distillation plant for a day or two prior to distillation in order to reduce moisture content of the leaves. Lower moisture content helps in extraction of more oil from the leaves. However, the month of July is a rainy period and if it happens to rain while the shrubs are lying outside to dry, the yield of the whole crop can be dramatically reduced. Timing of the harvest is thus very important. After extraction, the mentha oil can act as a store of value as it is non-perishable for long periods. Households can choose to not sell their output after harvesting and wait for the best price to maximize their returns. For Palanpur farmers, mentha oil is the final product they are involved with. The oil, however, is not the final product; it is eventually converted into crystals or flakes.

Considering the harsh summer weather, the long duration of the crop and the uncertainties related with oil extraction, *Mentha Arvensis* is certainly much more risky than wheat, bajra or urad. Its inherent riskiness is exacerbated by the volatility of prices which depend to a large extent on global demand and supply conditions. There is also a great deal of speculative activity as far as mentha prices are concerned; it was one of the crops that were significantly affected by the boom in primary commodity prices in 2008. For better or for worse, *Mentha Arvensis* has connected Palanpur farmers with global agricultural markets. During times of high prices the crop has brought clear benefits in the form of higher farm incomes.

⁶ In fact, none of the previous books or articles of Palanpur has referred to mentha being grown in the village. It appears more likely that the crop was introduced in the village in late 1990s.

Table 1: Palanpur 1957–2009: Selected Indicators

	1957-58	1962-63	1974-75 ^a	1983-84	1993	2008-09
Number of households	100	106	117	143	193	218
Population	528	585	790	960	1133	1265
Average Household Size	5.3	5.5	6.8	6.7	5.9	5.8
Owned Area	2747	2331	2498	2596	2380	2075
Operational Area ^b	2723	2783	2438	2650	n.a.	2264
Number of Landless Households	14	12	17	27	44	42
Land owned per capita (bighas)	5.2	4.7	3.3	2.7	2.1	1.6
Land cultivated per capita ^b (bighas)	4.1	4.8	3.2	2.8	2.1	1.8
Proportion of leased-in land to cultivated land (%)	10	12	22	28	26	36
Proportion of irrigated land to owned land (%)	52	46	96	96	96	100
Gini coefficient: land owned per capita	0.49	0.47	0.49	0.5	0.52	0.52
Gini coefficient: land cultivated per capita	0.48	0.45	0.44	0.51	0.52	0.47
Index of agricultural productivity ^c	25.1	24.6	57.3	34.6	n/a	40.55
<i>Ownership of selected productive assets (number per 1,000 persons in parentheses)</i>						
Bullocks and male buffaloes	124 (235)	138 (236)	157 (199)	141 (147)	104 (92)	51 (40)
Cows and She-Bufferaloes	89 (169)	79 (135)	109 (138)	129 (134)	156 (138)	242 (191)
Persian Wheels ^c	11 (21)	17 (29)	22 (28)	22 (23)	0 (0)	0 (0)
Pumpsets	0 (0)	0 (0)	7 (9)	27 (28)	40 (35)	85 (67)
Tubewells	0 (0)	0 (0)	0 (0)	1 (1)	Na	13 (10)
Tractors	0 (0)	0 (0)	0 (0)	0 (0)	9(8)	13 (10)

^a The 1974–5 reference population excludes 6 households discarded by Bliss and Stern (1982), who restricted their sample to households with at least some involvement in cultivation; figures with an asterisk include these 6 households.

^b 'Land cultivated' or 'Operational area' is calculated as (land owned) + (land leased in) - (land leased out). The figures for leased area are based on the rabi season; since most leases in Palanpur last for a whole year, this can be taken as representative for the full agricultural year.

^c Including non-functional or unused Persian wheels (quite common in 1983–4).

Table 2: Cultivation Details for Selected Major Crops in Palanpur¹

Crop	1957-8^a	1962-3^b	1974-5	1983-4	2008-09
1. Wheat					
a) Area cultivated (bighas)	879	767	1030	1573	984 (1438)
b) % of total cultivated area ²	52	48	46	57	48 (71)
c) Yield (kg/bigha)	41	41	114	101	224 (223)
d) 'Normal' Yield (kg/bigha)	40-50	50	100	150-60	230
d) Real Output Value/bigha ³	16	22	41	27	69 (69)
2. Mentha					
a) Area cultivated (bighas)	0	0	0	0	226 (728)
b) % of total cultivated area ²	0	0	0	0	11 (36)
c) Yield (litres/bigha)	n/a	n/a	n/a	n/a	3.9 (2.9)
d) Real Output Value/bigha ³	n/a	n/a	n/a	n/a	62 (47)
3. Paddy					
a) Area cultivated (bighas)	70	274	125	266	493
b) % of total cultivated area ²	5	17	6	12	24
c) Yield (kg/bigha)	11	26	103	130	186
d) Real Output Value/bigha ³	2	10	33	34	96
4. Bajra (Pearl Millet)					
a) Area cultivated (bighas)	644	638	610 (730)	137 (363)	208 (425)
b) % of total cultivated area ²	46	40	29	6	10 (21)
c) Yield (kg/bigha)	34	27	59	48	79 (54)
d) Real Output Value/bigha ³	10	12	20 (20)	12 (14)	16 (11)
5. Sugarcane					
a) Area cultivated (bighas)	391	430	463	886	214 (388)
b) % of total cultivated area	28	27	22	39	11 (19)
c) Yield (quintal/bigha)	n/a	n/a	21.3	12	31
d) Real Output Value/bigha ³	34	34	72	43	99
Index of agricultural productivity^c	25.1	24.6	57.3	34.6	40.55

Notes:

1. The figures in brackets show total figure including plots sown with mixed crops. In these cases the area figures are upper bounds on the effective areas.
 2. Proportion of area cultivated refers to percentage of area under the specified crop for the relevant season (rabi for wheat & mentha; kharif for paddy and bajra; kharif has also been taken as the reference area for sugarcane).
 3. Real values are obtained by deflating with price deflators based on the Consumer Price Index for Agricultural Labourers (CPIAL) for Uttar Pradesh. All values are in 1960-1 rupees.
- a. The 1957-8 figures are based on direct calculations from the household questionnaire, and are consistent with the corresponding figures given in Ansari (1964), reported in Bliss and Stern (1982).
- b. The average yield figures for 1962-3 in this table are somewhat misleading in that they exclude cases of zero output, which were not uncommon in that year due to total crop failure on a number of plots. The true average yields, inclusive of cases of zero output, would be lower.
- ^c value of agricultural production at 1960-1 prices divided by land cultivated

However, cultivation of mentha also comes with its own problems. First, mentha is a resource-intensive crop and the majority of Palanpur farmers are short of credit. Most of them follow the system of '*laut-badal*' in which the proceeds from the last season's cultivation are used to finance the costs for the current season. Only rich farm households store the mentha oil in substantial quantities and wait for the best price. Second, mentha oil is a valuable commodity and is an easy target for robbers. Storing large quantities of oil in the house poses serious dangers to life and property⁷. Finally, in our discussions with farmers it was clear that they have little understanding of the mechanisms of futures trading. They know that mentha oil prices fluctuate but are unable to predict even broad trends. Many of them incurred heavy losses as a result of having anticipated continued price rises and then panicking when the bull market corrected itself by selling all their output at very low prices. Nonetheless, volatility in mentha prices does not seem to have deterred farmers from sowing mentha in the way that price volatility has often been seen to act as a negative influence on decisions to cultivate traditional crops.

Along with an increase in land area devoted to the cultivation of mentha, there has been a marked decline in the acreage to sugarcane, even though yields and the real value per bigha for sugarcane have shot up. Sugarcane used to be the leading cash crop for the village and there are many reasons for the shift away from sugarcane cultivation. The most important among them is the consistently low prices of sugarcane in Uttar Pradesh during the period between 2000-01 and 2008-09. Sugarcane prices are regulated by the state government before every season and they are one of the important political issues in Uttar Pradesh. Sugar mills are one of the strongest lobbies in this political equation. Farmers complain of the government being lobbied by the sugar mills who press for sugarcane prices being kept unrealistically low. Moreover, the mills are not always punctual in their payments; there are cases where substantial sums are outstanding to farmers even 4 to 5 years after the cane was originally sold to the mill. In the end it is unclear if mentha cultivation was boosted primarily because of problems associated with sugarcane market (a 'push' factor) or if mentha cultivation lured the farmers away from sugarcane (a 'pull' factor). Most likely both factors played a role. However, there is a reversal of this trend in the last two years. This appears primarily because of a consistent fall in the acreage of sugarcane in Northern India combined with a poor crop in the south (not to mention ill advised government policies allowing the export of sugar at a time when national stocks were already low). This led to a shortage of sugar beginning in 2008-09. In that year, sugar prices sky-rocketed and sugar mills scrambled to procure as much sugarcane as they could. Sugarcane prices received by farmers, which were between Rs 60-80 per quintal in the period 2000 to 2007, shot up to Rs 110 in late kharif 2008 and touched a high of Rs 140-160 per quintal in kharif 2009.

A fourth observation about agriculture in Palanpur is that its profitability (per bigha) seems to have increased only slightly during the years, if at all. Normal wheat yields, reported in Table 2, represent the "usual" wheat yields expected in a normal season. An increase of 70-80 Kgs in 25 years works out to an annual increase in yield of around 1.6%. This is not large⁸. At the same time, however, daily wages denoted in terms of wheat per kg have doubled over the last 25 years. Along with monetisation of certain inputs, the cost of cultivation in real terms seems to have increased. An Index of agricultural productivity, which is the value of Gross Annual Output (total output for the agricultural year valued at suitable market prices which are deflated at 1960-61 prices for comparison's sake) divided by land cultivated, has not increased much. A 6 percentage point

⁷ There has been no robbery in the village during our stay of two years but the local newspapers reported incidences of mentha oil robbery in the region quite frequently.

⁸ The average annual growth rate of wheat yield has been close to 5% throughout the previous survey years. Average annual increase in wheat yield was 4.6% during 1957-62, 5.9% during 1962-74 and 5% during 1974-83.

increase over the last 25 years is a meagre increase by any yardstick. This assessment is further reinforced by the fact that 1983-84 was a not a good year for cultivation and therefore, the normal Index of agricultural productivity per bigha in 1983-84 would have been closer to the value recorded 2008-09 than the 1983-84 number presented here. Nonetheless, overall productivity per unit of land does seem to have increased because of the increase in cropping intensity and choice of cropping pattern with a move towards cash crops. We will return to calculations of changing profitability in subsequent analyses.

Along with these broad changes which suggest a strengthening of technological intensification and of changes in cropping pattern towards cash crops, there is also a significant change in the way agricultural production is organised in the village. While a large part of these changes are related to the developments in the village land and labour market, some of these are also driven by external factors - particularly those in the external labour market.

Changing Nature of Agricultural Production

An important feature of the agrarian economy of Palanpur is the absence of any dominant landlord farmer. It is essentially a small holder village economy comprising a large number of medium and small peasants. As mentioned above, recent years have seen ongoing fragmentation of land holdings. Although population pressure has been an important factor in the reduction of land holdings per capita, a new development is the reduction in the area owned by the residents of the village. Further, with the intensification of mechanisation and irrigation in the village new forms of markets have evolved around these factors of production. However, the two factor markets which continue to dominate the nature of agrarian production in the village are still the land and labour markets.

Clearly, land continues to be the major factor in agricultural production. Although there has been a steady decline in land owned by the residents of Palanpur since 1983-84 as a result of sales to outsiders, this has been partially offset by leasing-in some of the land that belongs to these outsiders. As has been reported in the previous surveys, land sales and purchases are not frequent in the village. However, we did track the land sales and purchases in Palanpur during the past fifteen years. These are based on recall and may not cover all the land transactions in the village. A detailed analysis of land sales, and the terms and conditions of such sales, will be undertaken in a separate paper. However, preliminary analysis of land transactions suggests that most of the land transactions have been a result of distress sale. These were primarily to repay loans outstanding to both institutional sources such as banks, and moneylenders in the village. The reason for taking loans in many cases was marriage, court cases, and consumption loans. A significant fraction of the total amount of land sold went to one particular moneylender in a neighbouring village. The land had been mortgaged to the moneylender. Approximately 100 bighas of land, out of net sale figure of 500 bighas between 1983-84 and 2008-09, were acquired by this moneylender via this method. Another category of land sales occurred as a result of households who completely migrated out of the village during this period. In only a handful of cases were land sales made in order to acquire productive assets. Map 3 illustrated the distribution and location of land owned by various caste groups.

Alongside changes in land ownership, changes in labour market behaviour have also shaped the decision of households regarding their involvement in agriculture. Prominent among the changes in the labour market has been a consolidation of the trend towards non-farm employment opportunities inside as well as outside the village. Some of these changes are documented in Mukhopadhyay (2011). But from the perspective of the agricultural labour market, two things stand

out. First, the category of agricultural labourers as a primary occupation has more or less disappeared from the village. While there were 17 households with primary involvement in agricultural labour in 1983, there are only two households that can be treated as agricultural labour households in 2008. Secondly, the availability of employment opportunities outside Palanpur as self-employed and casual workers has reduced the dependence of casual labour households on agricultural work and has thereby contributed to a tightening of the labour market in agriculture. This second factor has been influenced both by the increase in number of landless casual labour households who have moved away from agriculture and by those who have regular employment and for whom dependence on agriculture is now a secondary choice. Along with availability of public employment such as MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act), this has meant that finding hired labour in agriculture is not as easy as it used to be⁹. A related consequence of this has been strengthening of the tendency towards exchange labour and tenancy to circumvent labour shortages¹⁰.

Alongside developments in the land and labour markets, there have also been new developments in other agricultural markets, notably monetisation of a significant portion of input costs such as irrigation, harvesting and threshing. There is now a small but growing market for tractors and bore wells. Although there is no evidence of these markets exhibiting any signs of inter-linkages, the increased monetisation of input costs has meant that availability of cash is an increasingly important determinant of a household's ability to undertake cultivation.

Independently, and in conjunction with each other, these developments have shaped the market for tenancy which has seen significant changes since 1983. One of the important findings of the previous surveys was relative constancy in the nature of tenancy contracts over the years with sharecropping and its variants dominating the lease market. Although fixed rent tenancy was on the rise after 1983, it represented only a small fraction of the total lease market at the time. This is no longer the case today, and even though batai is still the dominant form of tenancy, it now accounts for less than 50% of total tenanted land compared to almost 80% in 1983.

Before analysing the changing nature of tenancy in Palanpur, we first offer a brief description of how this institution operates in Palanpur.

Tenancy contracts in Palanpur

There are three major standardised tenancy contracts in Palanpur along with other small contracts which are basically a mix of the three major standardized contracts.

Peshgi: Peshgi is a fixed rent contract and the terms of such contracts have not changed much since 1983. The landlord receives a rent payment and then hands over the land to the tenant for a specific duration. The tenant bears all the costs of cultivation and keeps all the proceeds to himself. The contract is oral and the rent payments can be made in cash or kind, as per the agreed arrangement. Cash payments are made before the season begins and kind payments are made generally in wheat, after the rabi season ends. The annual rent during rabi 2009 was around Rs 950 per bigha. The shorter duration leases command more rent than the longer duration on annual basis.

⁹ MGNREGA was introduced in the village in 2008 and although its performance has been less than satisfactory, there is evidence of MGNREGA creating public employment in the village.

¹⁰ While previous surveys do mention the existence of exchange labour (working on each other's farm), there is no quantification of the amount of exchange labour in the village. There is no such information even for this round but from diaries and discussions with the farmers it appears to be an important source of labour use in agriculture. It has also been reported that there has been increase in exchange labour over the years.

Batai: Batai (one-half) is a sharecropping arrangement where the tenants and landlords share costs in a specific, but not rigid, proportion and both receive equal shares of the output. In rabi 83, it was common for the landlord contribute land and half of 'cash inputs'. Tenants used to bear the full cost of land preparation (which was done by bullocks), seeds (except for certain crops like sugarcane, vegetables etc, in which case seed costs were shared equally) and the full cost of labour. Harvesting is a labour intensive process and was the full responsibility of the tenant. Irrigation, fertiliser, threshing and other cash inputs were shared equally between landlord and tenant.

In 2008, land preparation is now mostly a mechanical process involving the use of tractors instead of bullocks, and has become a cash input. However the cost of land preparation is still paid by the tenant. It is interesting to compare this transition between technology change from bullocks to tractors with the mechanical change which took place in the threshing process between 1974 and 1983. When threshing was a labour process, it was the full responsibility of a tenant under batai and the landlord did not share in the costs.. After it became a mechanical process between 1974 and 1983, the costs were shared in half. However, this is not the case with land preparation. The tenant still bears the full cost of land preparation. Whether and how this might change in the future is an interesting question.

One possible reason for the sharing of threshing costs as part of batai arrangements, but not land preparation, could be the length of the contract. It appears that most of the lease contracts involving batai are concluded or settled at the time of harvesting. Once the crop is harvested, both the tenant and landlord share the output in half. However, since threshing is a post-harvest activity, the costs are shared by the tenant and landlord irrespective of whether it is done manually or through machines. In other words, each party has possession of its share of the un-threshed output and it is their decision and responsibility over what happens next. On the other hand, land preparation is part of the cultivation activity and since it has traditionally been undertaken by the tenant, the arrangement persists even after mechanisation.

However, adjustments in cost sharing for irrigation depend on the ownership of pump sets. Cost sharing in irrigation can take different forms. If neither of the partners owns an engine/tube well, then the cost shared equally. If the landlord owns the engine, then the tenant pays the full cost of petrol and the landlord's engine is used for irrigation. This is a profitable arrangement for a landlord considering the high prices of diesel. If both partners own an engine, then they reach an arrangement which can be one of the following: they bear the cost of every alternate irrigation; the engine of the landlord will be used and the tenant will always provide diesel; or the tenant's engine will be used and the diesel cost will be shared in half. If the landlord or tenant owns a tube well, then half the cost is paid by the non-tube well owner partner based on the market rate for irrigation through tube wells. On the whole, considering the rent for hiring in a diesel pump set or a tube well service, the costs are more or less shared equally on average.

Chauthai: Chauthai (one-fourth) is a lease contract where the tenant provides only his labour and the landlord bears the costs of all the other inputs. At the end of the season, the tenant is entitled to a 25% share in output. It is essentially a labour contract with the tenant providing all the labour and no other cost. However, it must be made clear that the chauthai contract now common in the village is different from the one that was mentioned in 1983 survey. In 1983, the tenant was expected to pay 50% of the labour and seed cost, 25% of all the other costs in return for 25% output. The chauthai contract now emphasizes the benefit of family labour a marginal farmer can offer. The contract is very simple; the tenant is responsible for all the labour costs and 25% of the threshing cost (which are paid in kind when the output is threshed). The tenant is supposed to be a care taker of the crop. It is his duty to tell the landlord when the time is right for irrigation,

application of fertilizer, threshing etc. In a chauthai contract, the tenant will tend to employ family labour before hiring in labour (to save cash outflow and also for better supervision) and in general a higher quality of work can be expected. The chauthai contract tends to attract poor households with few assets and a large family because the tenant is not expected to pay for any cash input. The contract is of limited utility to landless households however, because the tenant is expected to take charge of cultivation and hence, landlords typically look out for a good and responsible farmer. Landless households cannot generally claim to be good farmers and hence, they seldom receive a chauthai contract. There is a question as to whether to call it land-tenancy or a labour contract. In our view, the answer has changed over time.

Sharma and Dreze (1996) described the chauthai contract in Palanpur as essentially a batai contract: *“It is worth noting that all sharecropping contracts in Palanpur are essentially ‘modelled’ after the batai contract. For instance, sajha batai is really a batai contract with two co-tenants, and chauthai can be formally interpreted as a special case of sajha batai (where the landlord is also one of the two co-tenants). Batai is, therefore, clearly the central sharecropping contract in Palanpur.”* This description is not obviously correct anymore; with chauthai now a very different contract from what it was 25 years ago. We have changed our classification accordingly for sharecropping and non-sharecropping contracts. For 1983-84, we include chauthai in the sharecropped farms category, but for 2008-09, we regard chauthai as a labour-contract, not sharecropping.

Other contracts: Apart from the three major standard contracts, there are other contracts as well, which are mainly combination of one or more of the above contracts. A farmer may lease in land on fixed-rent and lease it on labour-contract ‘chauthai’ or sharecropping contract ‘batai’. These are mainly sub-letting contracts where the tenant sublets the land leased in to another tenant. Another contract is “sajha batai” or joint lease where two tenants come together to lease land under sharecropping with a landlord. The cost sharing remains simple, instead of one tenant bearing all the cost, the two tenants share the costs and responsibilities and also share the output equally. This type of lease is mainly found when the plot under tenancy is larger than the input sharing ability of the tenant. Instead of managing two different tenancy contracts, it is in landlord’s interest if the tenant recommends a co-tenant. This is essentially a version of the standard Batai contract.

Table 3 indicates the breakup of area under various kinds of lease and the proportion of total leased in area under various lease arrangements. Although the total area under lease has remained almost the same as in 1983, as a share of the operated land it shows an increase from 28% to 33% of the operated land area of the village. But more importantly, the shares of various tenancy contracts have seen a change between 1983 and 2008. The area under batai has seen a massive decline in favour of a rise in all the other contracts. The area leased in under peshgi almost doubled while that under chauthai increased by a factor of four. Sharecropping used to account for 80 per cent of total leased-in area in 1983-84, but its share declined to 47 per cent in 2008-09. It should be noted that chauthai in 2008-09 is more appropriately regarded as a labour contract, not a sharecropping contract. The emergence of this new form of labour tenancy is a significant development in the village even though at present it still represents only a small share of total leased in land.

We have argued above that that the only land-labour contract which can be treated as a sharecropping arrangement is the batai contract. An important feature of sharecropping arrangements compared to other tenancy contracts is the joint management of cultivation including sharing of costs and of output. The second feature of sharecropping contracts is the joint decision making regarding cropping pattern and frequency of application of various inputs. The remaining

contracts, such as peshgi and chauthai, have none of these features. While peshgi is a lease agreement where the tenant pays the land rent in advance but then undertakes cultivation without any supervision or sharing from the landlord, chauthai is essentially self-cultivation with attached labour where the labour is attached to the land but gets his wages as kind payment which is one-fourth of the produce. However, unlike the general notion of attached labour, the tenant is free to work on other farms and non-farm jobs in his spare time. But more importantly, the tenant has no decision making power regarding the choice of crop grown or the choice of inputs and the timing of input use. He does, however, retain an incentive to increase output and the landlord shares a moderate part of the risk with him.

Table 3: Tenancy Contracts: 1983-84 and 2008-09

Contracts	Area under specified contracts		Proportion of leased-in area under specified contract ^a		
	1983-84	2008-09	1983-84	2008-09	
Peshgi	Advanced Cash Rent	83.3	151	11 (3.1)	20 (6.7)
	Fixed Kind Rent	23	53	3 (0.9)	7 (2.3)
Batai		564	351	76 (21.3)	47 (15.5)
Chauthai ^b		31.7	118	4 (1.2)	16 (5.2)
Other Contracts		45	78	6 (1.8)	10 (3.4)
Total		747	751	100 (28.2)	100 (36.2)

a. Figures in brackets indicate leased in area under the specific contract as a proportion of total operated area in percentages.

b. Chauthai should be counted as a sharecropping contract in 1983-84 but a labour-contract in 2008-09

With this re-categorisation, sharecropping as represented by batai has seen a considerable decline as a share of total leased in land. As against 80% of all land under batai in 1983, it is now less than 50%. There has been a significant increase in Peshgi and Chauthai contracts in the village. Interestingly, even though the total leased area in absolute terms has remained relatively unchanged with percentage of leased area increasing, the percentage of households who are actively involved in the tenancy market has gone down considerably. While 74% of households were involved in the tenancy market in 1983, only 59% of households were engaged in the tenancy market in 2008. A second important development is that unlike 1983 when there were 16 households (11% of all households) who were both tenants and landlords, there are now only two households who are simultaneously engaging in leasing and leasing out. These exceptional cases are primarily associated with sub-letting because they are tied to longer lease contracts. Otherwise, this category is almost non-existent.

Table 4 : Incidence of Tenancy in Palanpur (2008-09 and 1983-84), by Caste and Land Ownership Class

	Proportion of households in the specified group (%)	Proportion of area owned (%)	Proportion of operational area (%)	Proportion of households leasing in (%)	Proportion of households leasing out (%)	Leased-in area as a proportion of operated area (%)	Leased-out area as a proportion of owned area (%)
Caste ^a							
Thakur	23 (21)	29 (29)	23.5 (22)	23 (27)	52 (67)	30 (20)	37 (38)
Murao	26 (19)	42 (42)	35.5 (42)	39 (52)	39 (37)	18 (14)	24 (12)
Muslim	13 (14)	7 (5)	12 (10)	50 (60)	31 (20)	66 (63)	37 (18)
Jatab	16(13)	7.5 (8)	16 (9)	67 (47)	14 (63)	60 (35)	10 (33)
Others	22 (33)	14.5 (16)	13 (17)	17 (23)	15 (47)	27 (49)	28 (39)
Land ownership class (bighas)							
0^b	19 (19)	0 (0)	4 (3)	33 (19)	- (n.a.)	100 (100)	--
I 0.1–5	25 (13)	8 (2)	17 (6)	49 (71)	25 (43)	67 (94)	24 (37)
II 5.1–15	40 (25)	41 (12)	43 (14)	36 (36)	37 (60)	34 (57)	23(48)
II 15.1–30	10 (25)	24 (32)	20 (32)	32 (53)	38 (50)	14 (27)	24 (25)
IV 30.1–50	4 (10)	17 (22)	11 (19)	11 (27)	82 (73)	5 (6)	34 (19)
V above 50	2 (8)	10 (32)	5 (26)	33 (36)	100 (73)	5 (10)	49 (24)
All households	100 (100)	100 (100)	100 (100)	36 (38)	31 (48)	33 (28)	28 (26)

a. In decreasing order of social status (except for the 'other' category); Muslims are listed as one of the 'castes', for convenience, but strictly speaking that term does not apply to them.

Notes:

- (i) The table pertains to only the households living in the village and excludes non-resident landlords or tenants.
- (ii) The tenancy information on which this table is based pertains to the Rabi 2009 season; most tenancy contracts last for a whole year, but some last for a single season.
- (iii) In parentheses, corresponding 1983-84 numbers are presented.

It is interesting to note that households who are simultaneously engaged in leasing-in and leasing out do not find any mention in Bliss and Stern (1982). The two exceptional cases that have been reported in 2008 are doing so because of special circumstances. These are either that the household has taken some land on a long-term fixed rent lease but is unable to cultivate due to unavoidable factors such as shortage of labour or it concerns a household that possesses land outside the village. In the first case, since fixed rent has already been paid, leaving the land fallow does not allow the farmer to recover the rent he has already paid. However, since he is unable to

cultivate himself, he leases it out on chauthai or batai. In the second case the farmer owns land outside the village boundary but it is inconvenient for him to cultivate this. As a result he leases out this land and instead leases-in some land in Palanpur. A third possible category would be those households who would like to benefit from the arbitrage that is offered by the difference in returns to various tenancy arrangements. A possible example of this could be a farmer leasing-in land on peshgi and leasing-out on chauthai. The number and nature of households in 1983 who were simultaneously engaged in the lease market as landlords and tenants is a subject that deserves to be explored further in more detail.

Some clues as to the change in tenancy contracts and the emergence of chauthai as a new form of tenancy is available by looking at the characteristics of the tenants and landlords. Table 4 gives the basic description of leasing-in and leasing-out households by caste and land size class. In the table, the figures in brackets indicate corresponding figures for 1983-84. Among the traditional castes, Thakurs are the highest in the so-called caste hierarchy, followed by Muraos, while Jatabs are among the lowest in social status. Muslims are not under the caste system as such, but in the village, their status is somewhere above Jatabs but below Muraos.

The distribution of the owned area across castes has not changed much over the last 25 years. Muraos are the major land owners, followed by Thakurs. Jatabs and Muslims own very little land. However, the caste share in the operational area has seen some major changes. Jatabs have significantly increased their operational area share and two-thirds of the Jatabs household are now engaged in leasing-in land. Three-fifths of the operational area of Jatabs is leased-in. The proportion of households engaged in leasing-out has reduced significantly amongst the Jatabs and similarly, the leased-out area as a proportion of owned area has also fallen. For the other group which owns very little land, i.e. the Muslims, we see an opposite tendency of leasing-out more. Fewer households among the Muslims are leasing-in while more are leasing-out. Leased-in area as proportion of operated has increased very slightly but leased-out area as a proportion of owned area has doubled.

For the Thakurs, the share in owned and operational holdings has remained almost the same. Thakurs in 1983-84 evinced little interest in cultivation and relatively few Thakur households leased-in land while two-thirds leased-out some land. The behaviour has not changed much over the years as far as leasing out is concerned. Although fewer Thakur households lease-out land the proportion of leased-out area as a fraction of land owned is almost the same as in 1983-84. However, leased-in area now counts as a higher proportion of operated area among Thakurs. Muraos, the caste group which own the highest share of Palanpur land, experienced a decline in the share in operated area. Muraos have historically been reluctant to participate in the lease market. Although they were the largest landowners as a group, their traditional affinity towards cultivation led them to self-cultivate. They were the caste group with lowest area under tenanted cultivation already in 1983. For the Muraos, the proportion of households leasing-in has declined; but leased-in area now accounts for a higher percentage of operational area. Leased-out area as proportion of owned area has doubled.

The distribution of tenants and landlords by land size categories is also similar as compared to 1983-84 with larger farms leasing out more and smaller farms leasing-in more. Overall, there is a decline in land holding size for reasons discussed earlier. It has also meant relative decline of large farmer category and an increase in small and marginal farmers. Almost 85% of all households in the village have landholding of 15 bighas (1 hectare) or less.

Tenants and landlords

Table 5a and 5b display the distribution of tenant and landlord households by caste and by landownership class respectively. Several interesting observations emerge from this table. First, the number of landlord households is 56, with a corresponding number of tenant households of 76. In 1983-84, there were fewer tenant households than landlord households. Further, as discussed above, the number of households which are both landlord and tenant is almost negligible now. The rise in number of tenants relative to landlords is partly a result of increasing landlessness since 1983 and partly the consequence of fragmentation of landholdings over the years. Distribution by caste also reveals the increasing presence of Jatabs in the lease market, mostly as tenants, while Thakurs can be seen to primarily lease-out. There is also a marginal presence of Muslims as tenants.

Table 5a : Distribution of Tenants and Landlords by Land Ownership Class

Land ownership class (bighas)	Number of households belonging to the specified land ownership class					
	'Landlord' households		'Tenant' households		All households	
	1983-84	2008-09	1983-84	2008-09	1983-84	2008-09
0	0	2 (4)	5 (9.2)	14 (16)	27 (18.9)	42 (19.5)
I 0.1-5	3 (4.4)	12 (21)	5 (9.2)	30 (36)	7 (4.9)	55 (25.5)
II 5.1-15	28 (41.2)	28 (50)	17 (31.5)	33 (39)	47 (32.9)	87 (40)
III 15.1-30	18 (26.5)	5 (9)	19 (35.2)	7 (7)	36 (25.2)	22 (10)
IV 30.1-50	11 (16.2)	6 (11)	4 (15)	1 (1)	15 (10.5)	9 (4)
V above 50	8 (11.7)	3 (5)	4 (7.4)	1 (1)	11 (7.9)	3 (1)
Total	68 (100)	56 (100)	54 (100)	76 (100)	143 (100)	218 (100)

Note:

(i) Percentage distribution in brackets.

(ii) 2 households are both landlord and tenant in 2008-09 and sixteen were in 1983-84. 88 households are neither landlord nor tenant in 2008-09, the number was 37 in 1983-84.

Table 5b : Distribution of Tenants and Landlords by Caste in 2008

Caste	Number of households belonging to the specified Caste ^a		
	'Landlord' households	'Tenant' households	All households
Thakur	30 (43)	12 (14)	50 (23)
Murao	22 (32)	25 (30)	56 (26)
Muslims^b	11 (11)	16 (17)	29 (13)
Jatabs	6 (5)	25 (29)	36 (16)
Others	7 (9)	8 (9)	47 (22)
Total	56 (100)	76 (100)	218 (100)

^a Percentage distribution in brackets.

convenience, but strictly speaking that term does not apply to them.

Further probing on the background of tenants and landlords offers an interesting insight into the role of caste in the lease market. Table 6a indicates the distribution of leased out area by the caste of landlord and caste of tenant. In 1983, for both Muraos and Thakurs, most of the area leased out was among themselves. In fact, for both Muraos and Thakurs, the largest area leased out was to their own caste groups. This situation has now altered, with leasing within these two caste groups no longer the dominant category. The largest caste group in terms of leasing in from Thakurs and Muraos is now the Jatab caste group. At the same time, no Thakur household leases in land from Muslims or Jatabs. Similarly, while Muraos do lease in a small amount of land from Muslims, none of them lease in from the Jatabs.

Table 6b provides a cross-tabulation of landlords and tenants by land size holding. The distribution of leased out land by size class of land ownership suggests that it is primarily small and marginal farmers of less than 15 bigha who lease in and lease out among themselves. There are very few cases of reverse tenancy where small and marginal farmers lease out to large farmers. This does not appear to be an important phenomenon in Palanpur.

Table 6a : Caste Distribution of Leased Area Rabi 2009

		Tenants									
Landlords	Castes	Thakur	Muraos	Muslim	Jatab	Other	Sub-total	Outsiders		Outsider	Total
								Native	Non-native	Total	
	Thakur	39 (61)	20 (27)	31 (29)	65 (12)	19 (54)	174 (183)	0	21	21 (109)	195 (292)
	Muraos	10 (4)	41 (59)	41 (27)	88 (21)	0 (5)	180 (116)	0	17	17 (12)	197 (128)
	Muslim	0 (0)	11 (10)	18 (4)	4 (4)	0 (0)	33 (18)	2	12	14 (4)	47 (22)
	Jatab	0 (13)	0 (6)	3 (22)	6 (28)	0 (0)	9 (69)	0	3	3 (4)	12 (73)
	Others	0 (5)	15 (44)	12 (36)	8 (9)	24 (77)	59 (171)	0	20	20 (4)	79 (175)
	Sub-total	49 (83)	87 (146)	105 (118)	171 (74)	43 (77)	455 (557)	2	73	75 (133)	530 (690)
	Outsiders Native	53	35	20	3	5	116	--	--	--	--
	Outsiders Non-native	43	5	21	9	25	103	--	--	--	--
	Outsider Total	96 (31)	40 (9)	41 (52)	12 (6)	30 (88)	219 (186)	--	--	--	--
	Total	145 (114)	127 (155)	146 (170)	183 (80)	73 (224)	674 (743)	--	--	--	--

Note:

(i) Each entry in the table indicates the total area (in bighas) leased out by the castes on the left hand side to the tenants listed caste-wise on the top.

(ii) Values in parentheses are corresponding 1983-84 values.

To summarise, it appears that the tenant class is associated with lower land ownership class and weaker caste groups which puts them in a weaker position as far as socio-economic factors are concerned. Moreover, the number of tenant households is considerably greater than the number of landlord households and therefore, a great deal of competition is expected among the tenant class. We may describe the tenancy market in Palanpur as having excess demand for land. In our discussions, we encountered many farmers who could not find suitable land for cultivation under tenancy and many settled for contracts which were not their preferred because they were unable to obtain a more attractive contract. Receiving land under tenancy is becoming increasingly difficult and therefore, when the tenants lease-in land from a household, they generally lease in as much the landlord is willing to lease out leaving the landlord with no other tenant. Considering the difficulties associated with leasing in land, there are very few tenants with more than one landlord. This also makes sense, given that when the landlord has many prospective tenants to choose from, he will prefer one who is not pre-occupied with cultivation of somebody else's tenancy so that his farm gets the desired attention and he can choose the highest quality tenant available. Overall, tenants appear to be in a weaker position vis-a-vis landlords, in the sense that they are less able to choose those options that are of greatest interest to them.

Table 6b : Land-class wise Distribution of Leased Area Rabi 2009

Classes	Tenants						Sub-total	Outsiders		Outsider Total	Total
	0	I	II	III	IV	V		Native	Non-native		
	Landless	0.1-5	5.1-15	15.1-30	30.1-50	Above 50					
Landless	0	0	0	0	0	0	0	0	0	0	0
0-5	8 (0)	4 (5)	10 (14)	7 (8)	5 (0)	0 (0)	34 (27)	2	9	11 (1)	45 (28)
5-15	24 (5)	49 (22)	36 (75)	9 (32)	6 (0)	0 (12)	124 (146)	0	43	43 (8)	167 (154)
15-30	9 (28)	29 (12)	52 (29)	7 (40)	0 (19)	0 (17)	97 (145)	0	12	12 (60)	109 (205)
30-50	0 (3)	44 (22)	52 (19)	0 (25)	0 (2)	0 (14)	96 (85)	0	9	9 (23)	105 (108)
Above 50	22 (1)	38 (54)	35 (23)	9 (50)	0 (7)	0 (19)	104 (154)	0	0	0 (41)	104 (195)
Sub-total	63 (37)	164 (115)	185 (160)	32 (155)	11 (28)	0 (62)	455 (557)	2	73	75 (133)	530 (690)
Outsiders Native	15	26	64	8	3	0	116	--	--	--	--
Outsiders Non-native	2	37	42	16	0	6	103	--	--	--	--
Outsiders Total	17 (34)	63 (21)	106 (38)	24 (78)	3 (4)	6 (11)	219 (186)	--	--	--	--
Total	80 (71)	227 (136)	291 (198)	56 (233)	14 (32)	6 (73)	674 (743)	--	--	--	--

Note:

- (i) Each entry in the table indicates the total area (in bighas) leased out by the castes on the left hand side to the tenants listed caste-wise on the top.
- (ii) Values in parentheses are 1983-84 values.

Conclusion:

It is always difficult to describe and document changes in all relevant dimensions of an agrarian economy which is changing quickly. This is difficult not just for a vast country such as India, but is also true in a single village such as Palanpur. Apart from the fact that 25 years (from 1983-84 to 2008-10) is a long period of time, what makes this analysis both difficult and interesting is also the nature of interaction that the village economy has with the local town, state, country and the globalised world as a whole. This paper represents a modest attempt at this difficult task. In the process, there are facts, interpretations and above all conjectures about the nature of interaction that various factors of production have among themselves but also with the outside world. Needless to say, our understanding of these interactions with the 'outside' world is limited at this stage. Nonetheless, the limited analysis does suggest that there are elements of change and continuity which characterise the nature of agricultural production in Palanpur.

The continuity is primarily the role of technological change in agriculture as a key driver of change in the Palanpur economy. However, within this story, the consolidation of machine-led technical change for irrigation, ploughing and threshing is a trend that was already visible in the 1970s and 1980s. On the other hand, the major technological innovation of high-yielding varieties which was a vital source of increase in productivity during earlier survey rounds is no longer an important source of productivity gain. The continuity is also seen in the rise in share of tenancy in operational land area of the village with batai contracts continuing to dominate the mode of tenancy. The trend towards an increased preference for fixed-rent tenancy was also already visible during previous survey rounds.

However, during the last two and half decades, Palanpur has also seen major changes in the way agriculture is organised. Some of these changes suggest a level of dynamism which is influenced by and is responding to new opportunities offered by expanding and changing markets in the growing Indian economy. Prominent among these is the introduction of mentha as a dominant cash crop. The opening of the economy and the improving access to new markets has allowed Palanpur farmers to experiment and take advantage of new crops and technologies. Important changes have also been observed in the way tenancy markets have adapted themselves to the changing labour markets in Moradabad and Uttar Pradesh. While outside jobs were already becoming an important force of change for the agricultural labour market during earlier survey rounds, this feature is still stronger in recent years with rising wage rates in the casual labour market outside Palanpur, external stimulus such as MGNREGA, and the expansion of educational attendance contributing to a labour market which was less dependent on agriculture for survival. The emergence of chauthai as a new form of tenancy to partly resolve problems of labour and supervision is a reflection of dynamism in the local factor market. What is also worth noticing is the evolution of new markets for irrigation and other machines such as tractors. At the same time, population growth continues to add pressure on land and to some extent, enhances the relative bargaining power landlords relative to tenants.

Issues for further research:

This survey has been the longest survey of Palanpur with data collected covering two entire agricultural years. Alongside the traditionally discussed features of North Indian agriculture such as

prevalence of tenancy, cultivation costs and farm output, we have also collected data on credit, inter-linkage of various factor markets and so on. Moreover, alongside questionnaire-based information, a large amount of information about agricultural practices in Palanpur is available from discussion questionnaires and diaries. The present analysis is based on only a subset of all the data and interviews on agriculture that have been collected. While the present analysis documents the elements of change and continuity in Palanpur agriculture, we hope to have a better understanding of these changes with the full data. Some of the issues that could merit additional attention with the final data set are described below. The list is not exhaustive of all the issues that can and shall be taken up for further research.

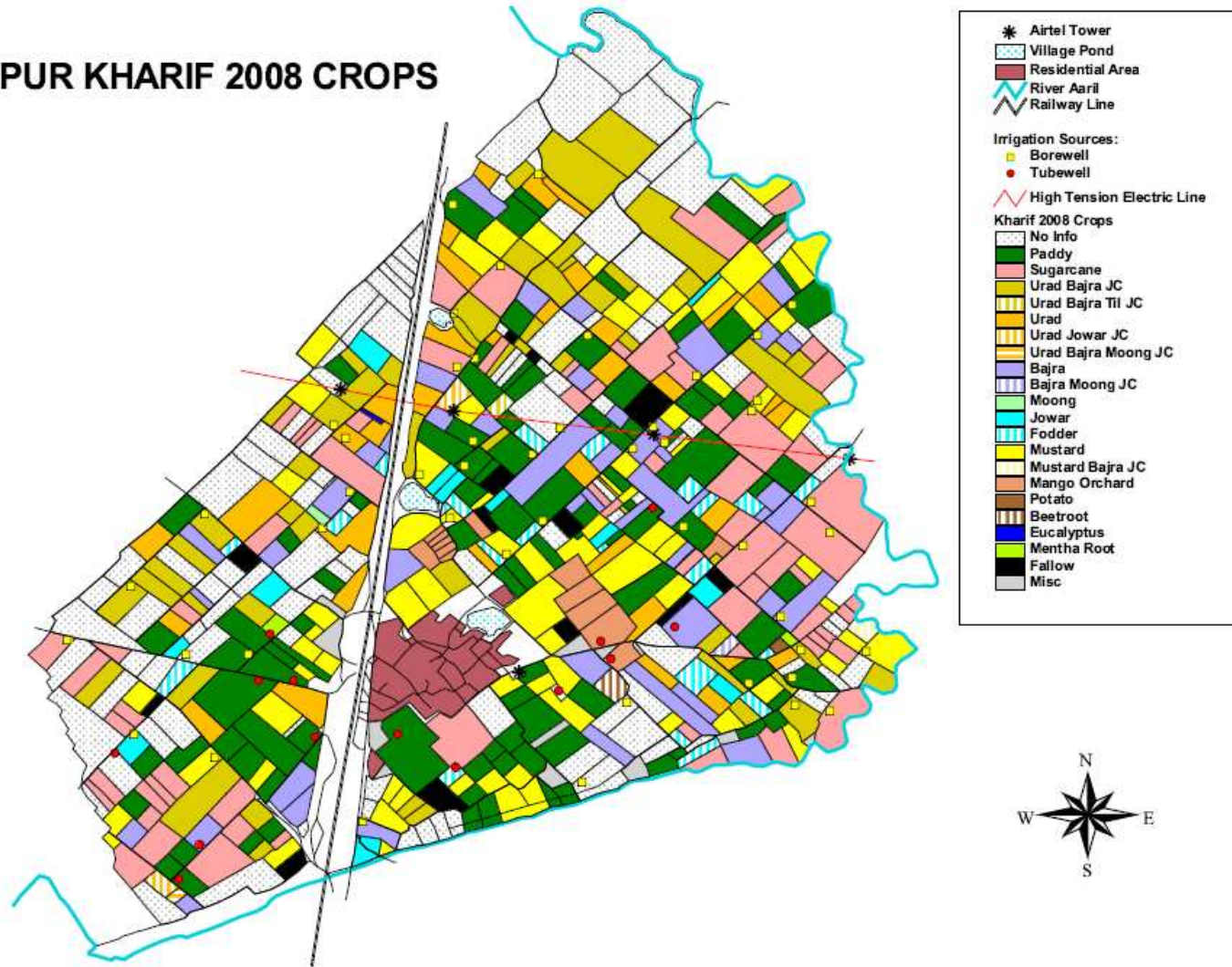
1. One of the important areas for which information has not been analysed is the role of credit markets. This information has been collected for the entire village and in various rounds. These are important not only as a standalone issue but also in conjunction with tenancy and capital formation in agriculture. Given that a large part of agricultural costs are now monetised, along with the introduction of new cash crops which are risky as well as profitable, one of the issues of research would be the nature of transactions and the terms of these contracts.
2. As mentioned earlier, this period (1983-2008) has also seen a decline in land owned by the villagers of Palanpur. Much of the land sold has been on account of distress sales to pay for loans. Some of the land lost had been mortgaged as part of the loan agreement with a moneylender outside the village. It would be interesting to see if these changes have led to a different behaviour of residents in the credit market. Preliminary reports suggest that there is reluctance on the part of borrowers to mortgage land. It would also be interesting to see if this has led to any change in the credit seeking behaviour in terms of sources of loans, institutional or non-institutional. The role of Kisan Credit cards and the recent farm loan waiver must be understood better in order to understand the borrowing options of Palanpur villagers.
3. A further dimension of the credit market relates to the way in which the market's operation influences the use of these loans. Currently, it appears that most transactions in the credit market are for consumption or "non-productive" uses. It would be interesting to analyse the reasons for such behaviour and the perceived reluctance to tap into available credit facilities for productive investments.
4. There is very little information about the inter-temporal nature of loan contracts and the enforcement mechanisms that lenders employ to recover bad loans. Although preliminary discussion with villagers suggest that it largely based on trust, it would be interesting to analyse the behaviour caste wise and by sources of income. It is expected that those with steady sources of income such as regular government employees and large landowners would be more credit worthy than small and marginal farmers.
5. An important issue which has not found much emphasis in previous surveys is the use of surplus in agriculture and capital formation in agriculture. This is also important in the context of income/employment diversification. The issue for research would be the use of surplus derived from agriculture. Whether such surplus is used to augment productivity in agriculture or is used to diversify income to non-farm sources merits close investigation. On the other hand, it is also possible that surplus generated in the non-farm sector is used to raise productivity in agriculture. The inter-linkage between agriculture and non-agriculture

in terms of source and use of surplus, could potentially inform an analysis of the drivers of rural non-farm diversification.

6. The issue of price formation and price sensitivity is crucial in understanding the cropping decisions of farmers. It is also important to link this with government policies such as minimum support prices and public procurement policies. These seem to have played some role at least in the case of wheat, paddy and sugarcane. It would also be interesting to understand better the price sensitivity and farmers' responses to international price movements for commercial crops.
7. A related issue is the analysis of marketing channels, the role of middlemen, access to information and transport in the farmer's decision to purchase inputs or sale of outputs. Although we have some data that has been collected on the sources of information about new technology for farmers, we have not been able to incorporate these in the present analysis.
8. Another promising direction for further research is the farmer's response and strategy of managing risk and natural disasters. Recent literature has pointed out the tendency of farmers to diversify their income sources to take care of risks in agriculture. It would be interesting to analyse such behaviour, notably to ask whether this is a strategy adopted only by large farmers or also by small and marginal farmers.
9. There is also the need to analyse further the Palanpur labour market and formation of wages in a holistic manner. This analysis would not only take into account the formation of wages and trends in the segmented labour markets but would also study the interaction within these markets. It would also be important to delineate the principle sources of wage rises during recent years. Several competing explanations such as MGNREGA, inflation, greater bargaining power of workers, and the availability of outside opportunities have been forwarded.
10. Although there is no systemic data that has been collected on environmental issues, it is crucial to analyse these in relation to agriculture. Such issues have already become important for the sustainability of agricultural growth in many states. While depletion of the groundwater table in the village is clearly a priority topic for further analysis, issues such as soil salinity, patterns of rainfall and temperature are also crucial for an understanding of the sustainability of the village's cropping system. This is particularly important in the case of water intensive crops such as mentha.

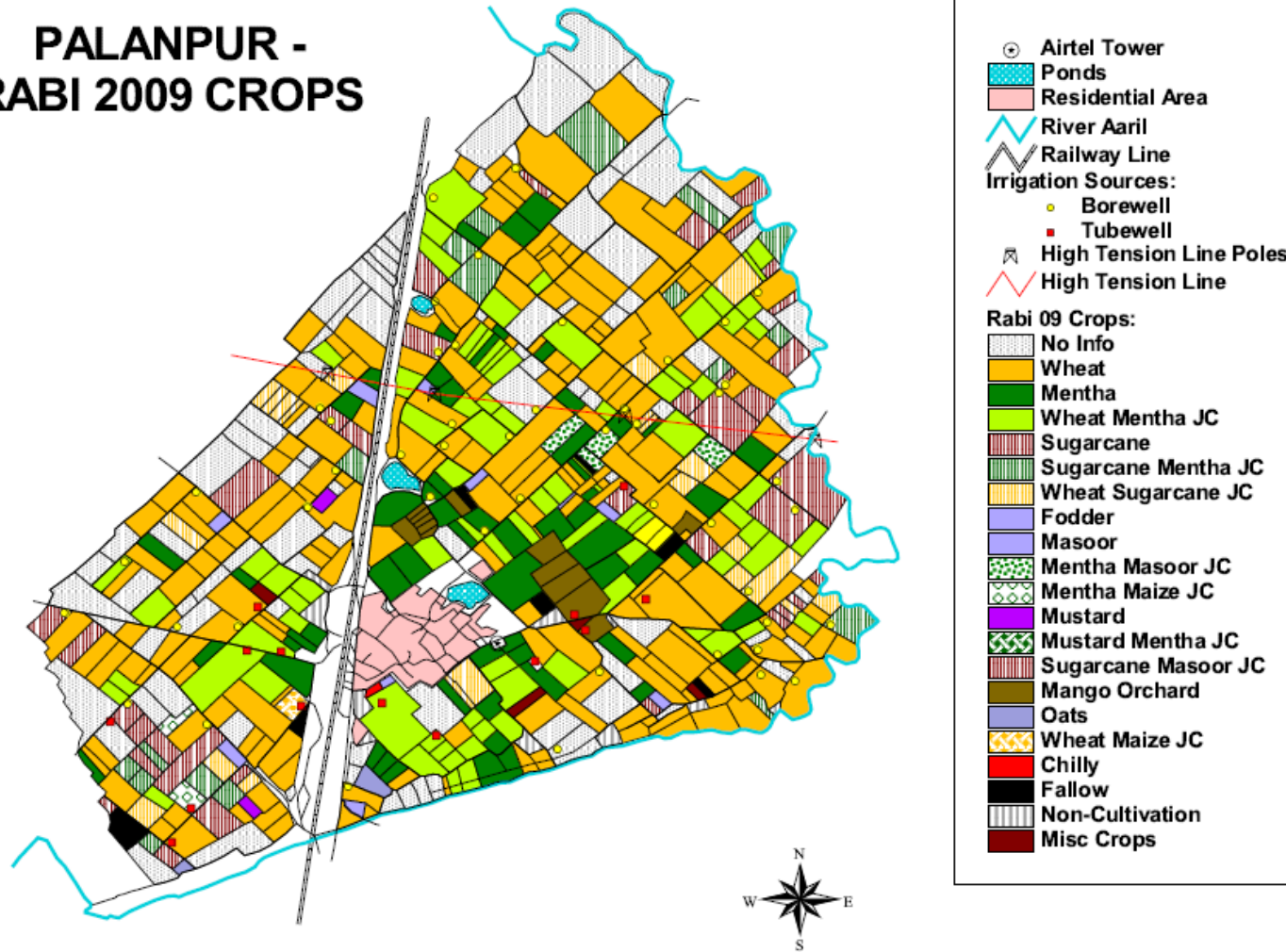
Map 1

PALANPUR KHARIF 2008 CROPS



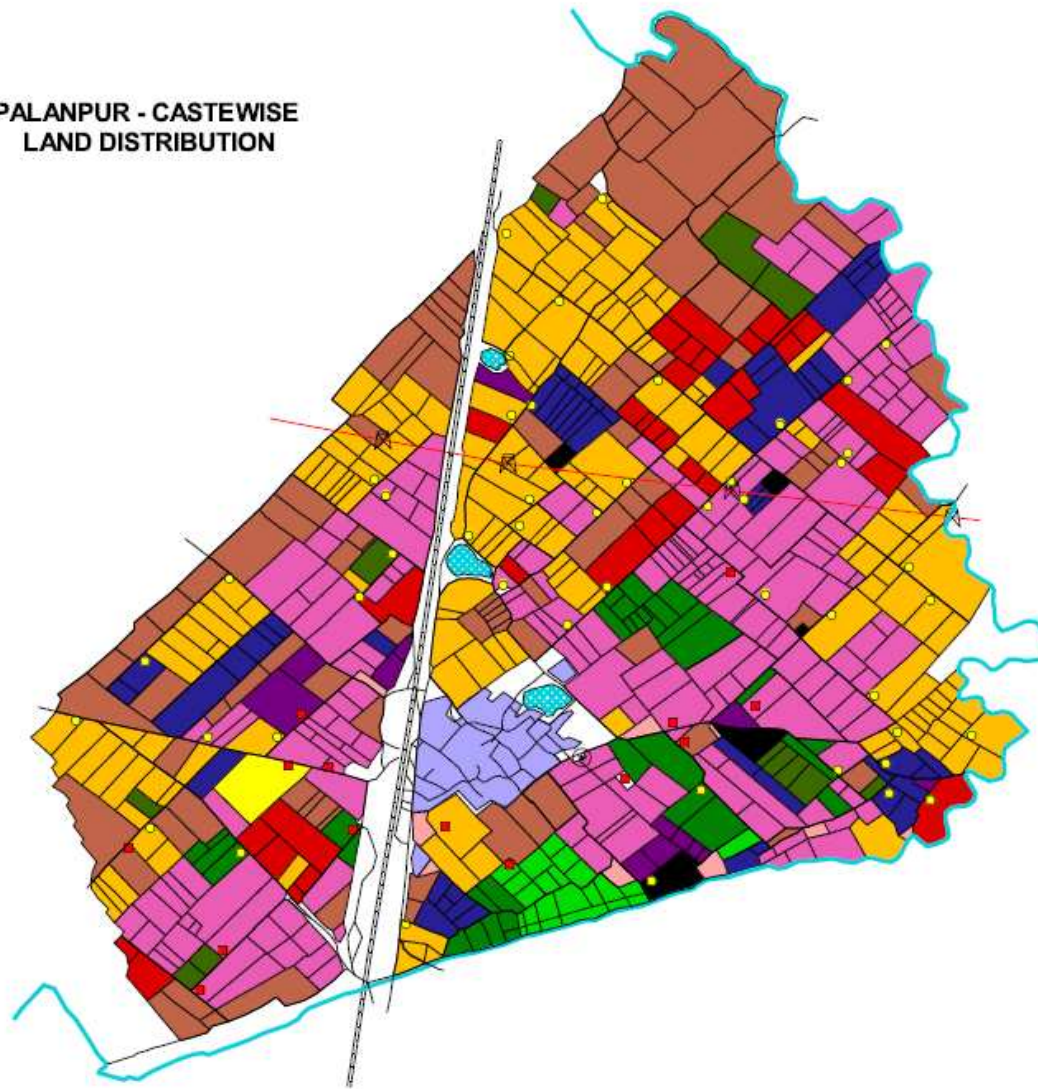
Map 2

PALANPUR - RABI 2009 CROPS



Map 3

**PALANPUR - CASTEWISE
LAND DISTRIBUTION**



INDEX:

- Airtel Tower
- Ponds
- Palanpur Water
- Residential Area
- Aaril River
- Railway Line
- Irrigation Sources**
- Borewell
- Tubewell
- High Tension Line Poles
- High Tension Electric Line

Owners:

- Non-natives
- Thakur
- Murao
- Dhimar
- Gadariya
- Dhobhi
- Teli
- Passi
- Jatab
- Others
- Government

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