RESEARCH ARTICLE

Cereal Production in the Sugarcane Belt: Commercialisation and Smallholder Tenants in a Western UP Village

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Abstract: This article examines the impact of the expansion of sugarcane cultivation on cereal production and certain features of agrarian relations in Harevli village in western Uttar Pradesh. It draws on longitudinal data collected in the village in 2006 and 2023. The expansion of sugarcane cultivation has reduced the area under wheat and paddy, though wheat output has remained stable because of rising yields. Relatively rich landowners focus more on sugarcane than cereal cultivation, and have increasingly leased out land for wheat and rice cultivation to land-poor Dalit and Other Backward Class households. This tenancy has enabled greater access to land for poor peasants from these caste groups, who now cultivate most of the cereal grown in the village. However, economic outcomes remain unequal as high rents and interlinked contracts depress profitability. Even though most poor peasants earn marginal or negative returns, tenancy endures as a means of ensuring household grain supply.

Keywords: Commercialisation, foodgrain, agrarian change, tenancy, interlinked markets, cash crop.

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Introduction

Uttar Pradesh is India's largest producer of foodgrain, contributing around one-fifth of the national output. Wheat and rice are the two main cereal crops grown (Ministry of Agriculture and Farmers' Welfare 2023). The last two decades have seen an expansion of sugarcane cultivation in Uttar Pradesh, especially in western Uttar Pradesh (Munjal 2024). In this context, using longitudinal data for a village in western Uttar Pradesh,

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I examine the impact of commercialisation on the production and distribution of cereals, and specifically, on the access of smallholders to foodgrain.

Despite the sugarcane boom in Uttar Pradesh, the output of wheat, the staple commodity in western Uttar Pradesh, remained stable in the study village. The output of rice, all of which was cultivated by poor peasants, declined. Poor peasants gained access, by means of complex tenancy arrangements, to operational holdings on which they grew rice. Although these tenancy relations constituted a system of unequal exchange, poor farmers entered into these arrangements in order to ensure a supply of rice for household consumption.

Methods and Data

This paper employs a mixed-methods approach, integrating quantitative and qualitative data. The quantitative data comes from the surveys conducted in Harevli village, Najibabad block, Bijnor district, western Uttar Pradesh under the Project on Agrarian Relations in India (PARI) by the Foundation for Agrarian Studies (FAS) in 2006 and 2023. The consumer price index for agricultural labourers (CPI-AL) has been used as a deflator at 2023 prices to adjust for inflation. Class forms the primary unit of analysis, wherein households were categorised based on their socio-economic position.[1]

The qualitative data is from the author's fieldwork in Harevli and nearby towns between 2022–24, particularly through detailed case studies of agrarian households with different caste–class backgrounds. The qualitative data relied on immediate as well as long-term recall methods to capture oral histories of changes in agrarian relations, including the inflow and outflow of grains in households.

Agrarian Structure and Cropping Pattern

In 2006, agriculture was the cornerstone of livelihood for the residents of Harevli. Work and employment in agriculture and allied activities contributed to 80 per cent of household income, with crop production alone contributing 43 per cent. The agrarian economy of Harevli was dynamic, with sugarcane dominating the cropping pattern followed by wheat, rice, and fodder crops. Sugarcane and wheat were cultivated by landlords, and rich and middle peasantry belonging to the Tyagi caste. Paddy cultivation was largely undertaken by poor peasant households. These land-poor households belonged to Jatava (Scheduled Caste) and Dhivar (Other Backward Class) castes. In 2023, all landlord/capitalist farmer and rich peasant households belonged to Tyagi caste. All poor peasant (except two) and manual worker households belonged to Jatava and Dhivar castes. The middle peasant class was caste heterogenous.

[1] The categorisation of socioeconomic classes is based on the paper "Socioeconomic Classes in Two Villages in Uttar Pradesh" by Niladri Dhar (2025).

Agrarian Structure

In 2006, the agrarian structure of Harevli was unequal with high land concentration. The Gini coefficient for ownership holdings was 0.77, and the Gini for operational holdings was 0.72. By 2023, the concentration of ownership holding remained more or less the same with upper classes (landlord, big capitalist farmers, and rich peasants) owning most of the land (62 per cent in 2006, 58 in 2023) (Appendix Table 1). However, the distribution of operational holdings changed significantly with a decline in upper classes' share from 58 to 35 per cent between 2006 and 2023. One of the two key reasons behind this decline was that one big Tyagi landlord became an absentee landowner and did not operate his land (around 20 ha). The other key reason was a rise in tenancy by resident Tyagi landowners, including this absentee landlord who now leased out land. The lower and middle peasantry gained the most from this change in agrarian structure (41 to 61 per cent) and operated around two-third of the land in the village in 2023. This increase was made possible through a rise in tenancy.

Cropping Pattern

The overall net sown area (NSA) for cultivation increased from 156.86 to 176.49 ha, largely due to a sharp decline in fallow land. However, this did not result in an increase in the gross cropped area (GCA) which remained the same between 2006 and 2023 (202 ha). Increasing NSA but stagnant GCA was mainly due to changes in the cropping pattern in Harevli with sugarcane, an annual cash crop, expanding from 52 to 66 per cent of GCA. This expansion of sugarcane cultivation came at the cost of lesser area being devoted to food crops. The area under wheat fell from 43.5 to 29.7 ha whereas the area under paddy halved (from 22.5 to 11.3 ha). Other crops such as vegetables, pulses, and green manure were negligible in the village and even area under fodder crops fell.

Upper classes (landlords/big capitalist farmers, and rich peasants) controlled a smaller share of sugarcane (60 to 37 per cent) and wheat (56 to 27 per cent) area in the village in 2023 as compared to 2006, though area under sugarcane increased in absolute terms (Appendix Table 2). Middle and poor peasant households were growing sugarcane as well as cereal crops. For middle peasants, the share in the village's sugarcane and wheat production reduced from 39 and 35 respectively to 28 per cent in each. Poor peasants experienced the largest gain in absolute area and share in total cultivation for both sugarcane (3 to 31 per cent) and wheat (7 to 36 per cent). They also cultivated the majority (two-third) of paddy in the village.

Crop Cycle

In Harevli, sugarcane shapes crop rotation and tenancy patterns with a two-year cycle – first planted, then as a ratoon. Sugarcane harvest runs from November to June. Most of the plots are devoted to replanting sugarcane after the ratoon harvest. However, on

the remaining plots, after the ratoon harvest (November–February), farmers grow wheat (December–April). Subsequently, sugarcane is replanted (March–April), and some plots are devoted to fodder or green manure (April–June) followed by paddy (July–November), followed by wheat/berseem (December–March) before sugarcane is replanted again (March–April).

Tenancy Arrangements and Outcomes

Tenancy in Harevli follows a class- and caste-based structure, with upper class Tyagi landowners leasing land to Jatava and Dhivar households, who form the majority of the poor peasantry and manual labourers. In 2006, tenancy between resident Tyagi landowners and poor peasants, mainly from Jatava caste, was largely for paddy cultivation and deeply tied to unfree labour, indebtedness, and additional work obligations (Rawal and Osmani 2009).[2] With sugarcane harvesting lasting seven months and limited mechanisation, landowners ensured a steady workforce by leasing paddy plots for four to five months, effectively binding tenants to long-term labour commitment. These contracts often extended beyond farm work, reinforcing smallholder tenants' dependence on upper classes.

By 2023, this tenancy arrangement between upper classes and poor peasants expanded significantly, in terms of area (47 to 73 ha), caste groups (including Dhivar), and crops (adding wheat and sugarcane to paddy). Tenancy contracts also took new forms, with a rise in in-kind fixed rent tenancy, largely driven by sugarcane, alongside share rent contracts.

Increased tenancy expanded land and crop access for smallholders. For poor peasants, crop income comprised 35 per cent of household income in 2023, up from 8 per cent in 2006. This relative improvement in contribution of crop incomes came via tenancy. However, the differences in absolute outcomes were stark. Across all crops annually, tenants generated a higher gross value of output (GVO) per hectare (Rs 152,469) compared to owner-cultivators (Rs 126,735), but owner-cultivators earned over three times the farm business income (Rs 65,417 per ha) of tenant farmers (Rs 20,830 per ha). This was mainly because of the 2.2 times higher cost of cultivation for tenants (Rs 131,639 as against Rs 59,529 per ha), primarily on account of rent. The profitability ratio (GVO/Cost A2) for tenants stood at 1.16 compared to 2.13 for owner-cultivators, who made 113 per cent over their paid-out costs. Crucially, these tenants, poor peasants leasing land for sugarcane, wheat, and paddy, relied heavily on family labour. When the imputed cost of family labour was included (Cost A2 + family labour), tenant farmers incurred an average loss of Rs 11,900 per ha, with a profitability ratio of 0.93, implying a 7 per cent loss on

[2] There were two other kinds of tenancy as well: (i) among Tyagi households: non-resident landowners leased land to resident landowners, primarily for sugarcane cultivation; (ii) among poor peasants: driven by capital constraints, some were unable to invest in farm inputs and leased land to others within their class.

investment/cost. In contrast, owner-cultivators earned Rs 49,438 per hectare even after accounting for family labour cost.

In 2023, nearly 90 per cent of crop income among poor peasants came from sugarcane, a significant shift from 2006, when over half their income was derived from wheat and rice. Sugarcane in the village (and the region) underwent expansion through an increase in yields from a new variety leading to real-term income growth. Yet, the distribution of these gains were highly uneven, as detailed in a study on the sugarcane economy of this village (Munjal and Swaminathan 2025). A critical question thus arises: when sugarcane accounts for the overwhelming majority of crop income, why do tenants, from marginalised castes such as Jatava and Dhivar, continue to expand land leasing, especially when sugarcane cultivation yields them negative returns? The answer, perhaps, lies not in sugarcane but in the production dynamics of wheat and rice.

However, differential outcomes seem to persist in wheat and rice production as well. In 2023, lower peasants generated 50 per cent of GVO but earned less than one-third of net incomes, while upper classes produced 24 per cent of GVO and earned 37 per cent of net incomes. This paper therefore turns to the restructuring of wheat and paddy cultivation amid sugarcane's dominance – tracing what drives differential outcomes, how poor peasants secure staple grain, and what roles tenancy continues to play. By analysing the production economics of wheat (linked to new tenancy exchanges) and paddy (central to earlier leasing patterns), the following sections explore how staple crop production is being reshaped under the weight of commercial sugarcane production, and what this reveals about agrarian transformation in the village.

Wheat Production and Marketing

Area

Area sown with wheat declined, though the number of households cultivating wheat rose from 48 to 66 between 2006 and 2023, with the largest increase among poor peasants belonging to Jatava (5 to 14) and Dhivar (13 to 25) castes (Table 1). This increase came at the cost of shrinking average operational landholding size per household from 0.91 to 0.40 ha, most profound for landlords/big capitalist farmers (from 3.94 to 0.85 ha) and rich peasants (from 1.40 to 0.57 ha).

Yields

In 2023, the PBW-226 variety, preferred for consumption, comprised nearly half of the area under wheat, unlike 2006 when several varieties were grown. The yield increased from 2.5 to 3.4 tonnes per hectare between 2006 and 2023, and the yield level remained at par with the district, state, and national average. The growth rate in yield was 1.83 per cent between 2006 and 2023, higher than the district (1.54 per cent) and national

Table 1 *Number of households, gross cropped area (GCA), production, yield, and share of GCA leased, and average land extent of wheat, by class, Harevli, 2006 and 2023* in numbers, hectares and per cent, quintals and per cent, quintal per hectare, per cent, and hectares

Class	Households	Gross cropped area (GCA)		Production		Yield	Share of GCA leased	Average land extent
				2006				
Landlord	3	11.82	28	292	27	22	17	3.94
Rich peasant	9	12.63	29	360	33	28	13	1.40
Upper middle peasant	13	9.87	23	227	21	23	20	0.76
Lower middle peasant	12	5.5	13	148	14	27	33	0.46
Lower peasant	9	3.12	7	47	4	22	74	0.35
Manual worker	-	-	-	-	-	-	-	-
All classes*	48	43.5	100	1074	100	25	23	0.91
				2023				
Landlord/big capitalist farmer	4	3.4	11	123	12	36	0	0.85
Rich peasant	8	4.57	15	182	17	38	0	0.57
Middle peasant	17	8.38	28	301	29	35	16	0.49
Lower peasant	27	10.83	36	354	34	32	67	0.40
Manual worker	9	2.54	9	75	7	30	64	0.27
All classes*	66	29.72	100	1043	100	34	34	0.40

Note: *The row for all classes also includes non-agrarian households (two in 2006 and one in 2023) cultivating minor plots not mentioned here. Thus, the total is higher than the total from the classes given.
1 quintal = 0.1 tonnes.

average (1.76 per cent) and slightly lower than the state average (1.93 per cent). In 2023, yields were positively related to class status, with upper and middle classes having higher productivity (3.5–3.8 tonnes per ha) compared to poor peasants and manual workers (3–3.2 tonnes per ha). Some of the factors contributing to poorer peasants' lower productivity were poorer land quality (near the river) and late sowing (December–January) along with general factors such as untimely rains and stray animals destroying crops. Several poor peasants remarked in case studies that upper class households often lease out poorer quality land, adding another reason that explains the yield differences.

Production

In Harevli, total wheat production did not change in the 17-year period from 2006 to 2023 (108.9 to 104.3 tonnes) (acreage decreased and yield increased). Major changes occurred in the control of wheat production with the share of upper classes reducing by half (60 to 29 per cent). The middle and poor peasantry were producing two-thirds of the total wheat in 2023. The share of Jatava and Dhivar households in wheat production doubled and tripled respectively.

Returns

Overall returns from wheat cultivation improved significantly: incomes per hectare tripled from Rs 10,283 to Rs 31,767 (constant at 2023 prices); profitability ratio rose from 1.20 to 1.53; and incidence of loss-making households fell from 42 to 11 per cent. However, outcomes were varied across classes. As we move from the upper classes to the middle and poor peasantry and manual workers, the per hectare cost of cultivation rose, whereas both GVO and incomes per hectare declined (Table 2). The differences between the classes were stark, with landlords/big capitalist farmers, and rich peasants generating value that was double their investment (profitability ratio: 2.15 and 1.96) whereas poor peasantry and manual workers were unable to earn even 50 per cent of the costs incurred (profitability ratio: 1.40 and 1.22 respectively).

Cost

The paid-out cost of cultivation (Cost A2) increased from Rs 52,687 to Rs 62,777 per hectare at constant prices (2023), at a rate of one per cent. In 2006, Cost A2 was lowest for upper classes, higher for middle and poor peasants. By 2023, per hectare Cost A2 was highest for poor peasants (Rs 66,235) and manual workers (Rs 68,360), while lowest for landlords/capitalist farmers (Rs 47,480), followed by rich (Rs 54,634) and middle peasants (Rs 59,166).

Input costs (seeds, fertilizer, manure, plant protection) remained 26 per cent of the Cost A2. Among input costs, that of manure surged (1.5 times overall, 2.2 times for poor peasants), and plant protection expenses, negligible in 2006, rose sharply (Appendix

Table 2 *Real gross value of output (GVO), cost of cultivation (Cost A2), farm business income (FBI), households with negative FBI, and profitability ratio of wheat, Harevli, by class, 2006 and 2023, at 2023 prices* in rupees per hectare and per cent

Class	GVO	Cost A2	FBI	Households with negative FBI (in per cent)	Profitability ratio (GVO/Cost A2)
			2006		
Landlord	47649	40758	6891	33	1.17
Rich peasant	69526	45273	24253	0	1.54
Upper middle peasant	66960	58443	8517	56	1.15
Lower middle peasant	64679	53192	11488	45	1.22
Lower peasant	50224	53998	-3774	71	0.93
All classes	62967	52687	10283	42	1.20
			2023		
Landlord/Big capitalist farmer	102130	47480	54650	0	2.15
Rich peasant	107149	54634	52514	0	1.96
Middle peasant	99104	59166	38227	12	1.68
Lower peasant	93057	66235	24705	15	1.40
Manual worker	83290	68360	14930	11	1.22
All Classes	95893	62777	31767	11	1.53

Table 3). Among different types of labour costs, animal labour nearly disappeared, used minimally by poor peasants. Long-term worker costs persisted only among landlords and big capitalist farmers. Casual labour costs doubled for upper classes at constant prices, forming 25 per cent of their costs. For poor peasants, real casual labour costs tripled, reflecting greater reliance on hired labour. Machine labour cost exceeded 20 per cent of Cost A2 in 2023, remaining stable for middle and lower peasants but doubling for upper classes, both in real terms and share in cost. Rent for leased land rose from 9 to 18 per cent of Cost A2, with poor peasants spending over one-fifth and manual workers half of paid-out costs, severely limiting profitability. Without rent, the Cost A2 would have been similar across classes.

When the imputed cost of family labour was included, Cost A2 + FL for poor peasants increased by 37 per cent, reducing per hectare net income from Rs 24,705 to Rs 2,549 – just 10 per cent of the original amount. Manual worker households incurred losses of Rs 11,686 per hectare after including family labour cost. In effect, poor peasants were barely able to break-even in wheat cultivation, with a profitability ratio of 1.03 – the same as that for tenants, who predominantly belonged to the same class. In both categories, more than half the households incurred losses when the value of family labour was accounted for. In contrast, landlords and big capitalist farmers along with rich and middle peasants witnessed only a 10 per cent increase in cost and were still able to generate net incomes in the range of Rs 33,000 to Rs 55,000 per hectare from wheat cultivation.

Profitability levels were low for poor peasants due to marginal landholdings and high rental costs. Poor peasants and manual workers leased two-third of their land for wheat, the rental burden thus restricting profitability.

Tenancy

Tyagi caste households were the primary lessors, leasing out land for wheat under a 50:50 crop-sharing arrangement, covering only irrigation costs. In some cases, the split shifted to 75:25, with Tyagi households covering all costs except labour that was provided by the tenant. Jatava households, the primary agricultural labour group, acquired wheat land under three crop-sharing arrangements: (i) 50:50, covering all costs except irrigation; (ii) 25:75, in which they provide only labour; and (iii) a two-year sugarcane lease, allowing wheat cultivation if cane was harvested on time, with rent paid only in sugarcane. This third arrangement was rare, exclusively with Tyagi landowners with prior relations, and reflects remnants of the old attached labour system (*naukri*), ensuring tenants' labour commitment during sugarcane harvest by offering concessions. Dhivar households leased from Tyagi households under an exclusive 50:50 crop-sharing arrangement.

Output

The total produce was allocated to wages, rent, consumption, and market sales (Table 3).[3] In Harevli, wheat, the staple commodity, was primarily consumed after the payment of rent and wages. Both were paid in kind. The share of output devoted to wages in kind increased at the aggregate level (17 to 19 per cent) and across classes, with harvesting (0.55 tonnes per ha) and threshing (10 per cent of produce) being key in-kind payments. Lower peasants had to pay rent in kind, which meant they had to give away nearly one-fifth of their output, while manual workers had to part with a staggering 43 per cent.

Since wheat was retained mainly for consumption, market sales by poor peasants and manual workers were minimal from the leased land. A peasant from the Jatava caste remarked, "Big landholders sell wheat, we don't." Their tiny operational holdings yield no scope of surplus generation. Landlord and big capitalist farmer households, once major sellers, now allocated more land to sugarcane, reducing wheat sales. Rich and middle peasants sell 30 and 17 per cent respectively, though overall market participation declined. Sales occurred mostly at the farm gate with local traders informally, who collected the produce in mini-trucks.[4] The average sale quantity dropped from 1.8 to 1.3 tonnes per household, all sold by upper and some middle class households (Table 4). In 2023, local wheat prices in the informal market were at par with the minimum support price (Rs 2,200 per quintal) possibly due to low

[3] Beyond wages and rent, remnants of the Jajmani system persist – Tyagi households provide fixed quantities of wheat and rice to barbers, carpenters, and priests, as well as to nomads (religious travellers (*babas*/*sadhus*), performers (*banjarey*/*kalabaaz*), and beggars, a practice observed frequently during the author's fieldwork.
[4] Some households sold small amounts locally to neighbours in need.

Table 3 *Quantity sold, price received, and market participation in wheat sale, Harevli, 2006 and 2023* in quintals, rupees per quintal, and per cent

Class	Average quantity sold	Price received	Share of households selling produce
	2006		
Landlord	55	750	100
Rich peasant	12	808	63
Upper middle peasant	8	837	33
Lower middle peasant	3	750	9
Lower peasant	2	900	14
All classes	18	807	34
	2023		
Landlord/Big capitalist Farmer	11	2300	40
Rich peasant	14	2200	50
Middle peasant	16	2200	24
Lower peasant	1.5	2000	4
Manual worker	-	-	-
All classes	13	2200	18

Note: 1 quintal = 0.1 tonnes.

government stocks, boosting demand from procurement centres and flour mills.[5] Some farmers fetched up to Rs 2,500 per quintal. Selling locally saves transport costs, though a few rich peasants reported that they sometimes transport surpluses to the *mandi* or mills when better prices were offered or marketable surplus was high. "For 5–10 quintals [0.5–1 tonnes], it's not worth the hassle," remarked a Tyagi farmer.

Decades ago, wheat rivalled sugarcane in importance. Rich Tyagi households would store surpluses in an earthen *kothi* (room-size, mud-based storage structures) for price speculation, while middle and poor peasants, selling on the spot in cash needs, faced underweighting and price manipulation. This *kothi* vanished post 2000, replaced by iron trunks.[6] As per the case studies, storage capacity varied – for the rich, it was 3–5 tonnes, for the middle peasant 2–3 tonnes, and for the poor, 0.5–1.5 tonnes.

Turning to wheat requirement for consumption, data from 16 case studies reveal that for land-poor Jatava and Dhivar households, wages in kind were once the only source of wheat inflow but this declined by 2023. "Now, we labour on our own (operational) land instead of others – more autonomy," said a Dhivar peasant. Harvests contribute to

[5] This insight is drawn from interviews with wheat traders, flour millers, and government officials in charge of procurement in Najibabad town.

[6] Among poorer households, these trunks (*tanki* in the local dialect) were a traditional marriage gift, symbolising status through grain storage capacity.

Table 4 *Share of components in distribution of wheat produce, by class, Harevli, 2006 and 2023*
in per cent

Class	Wages	Rent	Market sales	Consumption	Total production
			2006		
Landlord	20	0	57	23	100
Rich peasant	16	0	20	64	100
Upper middle peasant	20	0	13	67	100
Lower middle peasant	11	16	10	64	100
Lower peasant	15	15	4	66	100
All classes	17	3	26	54	100
			2023		
Landlord/Big capitalist farmer	23	0	27	50	100
Rich peasant	24	0	30	46	100
Middle peasant	22	4	17	58	100
Lower peasant	17	17	3	62	100
Manual worker	4	43	0	53	100
All classes	19	10	14	56	100

around 40–50 per cent of their household needs after payment of rent (Table 5). Poor peasants were able to access wheat through harvest that fulfils a major component of their household consumption needs, explaining their motivation to lease land. Another 15–25 per cent came from in wages in kind, higher for Jatava households due to greater farm labour participation than Dhivar households. The Public Distribution System (PDS) met one-fourth of their needs, a significant contribution, while wheat purchases rose during lean seasons when stocks depleted. "At the season's end, we often run dry and must buy," said a Jatava peasant. Tyagi households, in contrast, never bought wheat, relying entirely on harvests and rent. The lunches for farmworkers, prevalent during earlier attached labour system especially, are not provided anymore, replaced by piece-rated wages. "Now, if workers take food, wages are lower," noted a rich Tyagi farmer.

Paddy and Poor Peasants

A feature of Harevli's economy was that Tyagi households did not cultivate paddy themselves. No household from the landlord/big capitalist farmer class cultivated paddy in 2023.[7] Around 94 per cent of paddy GCA was leased out by Tyagi households to Jatava and Dhivar households, who were the primary paddy cultivators in the village.

[7] A few rich peasants cultivate Basmati paddy sometimes for cash, though recent attempts were unsuccessful.

Table 5 *Inflow of wheat, by channel and caste, Harevli, 2023* in per cent

Caste	Own harvest	Wages in kind	Rent received	Public Distribution System	Market purchase
Tyagi	70	0	30	0	0
Jatava	45	25	0	20	10
Dhivar	55	15	0	20	10

Source: Author's fieldwork (2024).

Between 2006 and 2023, area under paddy halved (from 22.5 to 11.3 ha), and the number of cultivating households fell from 50 to 29 (Table 6). Out of the 11.3 hectares of area under paddy, 8.1 hectares were cultivated by 24 poor peasant and manual worker class households. Tyagi landowners leased out tiny plots (averaging 0.3 ha) to poor peasants and manual workers from Jatava and Dhivar castes who operated 90 per cent of paddy on leased land. Yields dropped (from 4.7 to 3.8 tonnes per ha) but remained above the district, state, and national averages (27–28 tonnes per ha). Sharbati variety dominated GCA, comprising 90 per cent of area sown by poor peasants due to their preference for consumption.

The total production of paddy in the village declined from 103.4 to 36.7 tonnes. Except the Basmati grown by a few Tyagi households, most of the paddy was produced by poor peasant and manual worker classes. In 2023, the farm business income was around Rs 16,358 per hectare, much lower than wheat (Rs 31,767 per hectare). The incomes from paddy increased marginally at nominal prices from Rs 10,148 to Rs 16,358 per hectare (Table 7). At constant prices (2023), it declined by more than 40

Table 6 *No. of households, share in gross cropped area (GCA), average plot size, and share of leased land for paddy, by caste, Harevli, 2006 and 2023* in numbers and per cent

Caste	No. of households	Share in GCA	Average plot size (in hectares)	Share of leased in total operational land
		2006		
Tyagi	7	35	0.88	14
Jatava	21	32	0.34	84
Dhivar	16	26	0.37	93
		2023		
Tyagi	4	24	0.69	0
Jatava	13	32	0.28	90
Dhivar	9	35	0.44	89

Note: Muslim households (six in 2006 and three in 2023) also cultivated paddy but were not actively engaged in the agrarian economy of the village anymore.

Table 7 *Gross value of output (GVO), cost of cultivation (Cost A2), and farm business income (FBI) of paddy, by class, Harevli, 2006 and 2023, nominal prices* in rupees per hectare

Class	No. of cultivators	GVO	Cost A2	FBI	Households with negative FBI (in per cent)
		2006			
Lower middle peasant	10	34996	16417	18579	0
Lower peasant	26	32203	28309	3894	6
		2023			
Lower peasant	21	88639	71553	16033	33
Manual workers	3	82696	66493	16203	0

per cent. For lower peasant households, incomes per hectare declined from Rs 28,496 to Rs 16,033 (Appendix Table 5). Similarly, at constant prices, the gross value of output declined, to which a decline in yield was a major contributor. The cost of cultivation remained almost the same at constant prices, around Rs 70,000 per ha. Amidst different components of cost, the only major change was a rise in casual labour costs because for some operations of paddy, hiring labour was becoming more common, even among poor peasant and manual worker households. Rent was the largest cost component comprising a 50–60 per cent share in 2006. At constant prices, rental value remained the same over the 17-year period.

When the value of family labour was imputed, the cost of paddy cultivation for poor peasants rose by 60 per cent, reflecting the heavy reliance on own labour to contain expenses. Consequently, net returns for poor peasants declined from a profit of Rs 16,033 to a loss of Rs 27,549 per ha. The profitability ratio fell from 1.24 to 0.76, indicating a 25 per cent loss over the cost of production. Once family labour was accounted for, it was seen that more than two-thirds of households incurred losses.

Tyagi households source paddy exclusively through in kind rent, fulfilling 90 per cent of paddy requirements. They leased out land under three kinds of share-rent terms: (i) 66 per cent share, covering irrigation and seeds; (ii) 75 per cent share, covering all costs except labour; (iii) 50 per cent share, with no costs covered. These arrangements were with land-poor Jatava and Dhivar households, who accepted them for foodgrain inflow and stable grain supply. For Tyagi households, the tenancy arrangement for paddy served as a labour-tying mechanism, ensuring Dalit (and Dhivar) workers' availability for the seven-month sugarcane harvest.

Jatava households accounted for the majority of paddy cultivators in both 2006 and 2023, having the smallest average plot size (0.29 ha) and 90 per cent of land leased. Rental costs were significantly high as 51 per cent of the output was given as rent, comprising 52 per cent Cost A2 (Table 8). With minimal wage costs, as family

Table 8 *Distribution of total paddy output, by component and caste, Harevli, 2006 and 2023* in per cent

Caste	Rent	Wages	Consumption	Market sales	Total production
			2006		
Jatava	51	1	46	1	100
Dhivar	38	6	38	19	100
			2023		
Jatava	51	3	45	1	100
Dhivar	37	3	55	6	100

labour was primarily used, the remaining crop was used for household consumption and no market sales (except one household).

This leasing arrangement served an indirect purpose as a labour-tying mechanism between Tyagi and Dalit households. By leasing small plots of land seasonally for paddy, Tyagi households maintained a steady supply of Dalit labourers for the seven-month sugarcane harvest. Until two to three decades ago in the village, many Jatava and some Dhivar households were long-term farm and household workers (*naukar*) for a specific Tyagi household, and the labour relations involved extra-economic coercion. When asked about the decline of this *naukri* system, a Jatava tenant responded:

> Although things were improving slowly, it was during the early 2000s, Mayawati's time, that the *naukri* system transformed to lease arrangements of different forms across the region within a span of few years. Wage contracts shifted from attached labour to piece-rated, giving us more say over our terms.[8]

Since then, land–labour interlinkages increased, with several contracts in our data showing long-term leases dating from the late 1990s and early 2000s. Jatava tenants also reported that initial tenancy arrangements were on one-third and one-fourth (sometimes one-fifth) basis, exclusively for paddy. "Only when 50:50 crop sharing started, that we were able to see some earnings," he remarked. However, personal interviews with poor peasants also indicated that now they could choose to engage with any Tyagi household for leasing land in exchange for a commitment of labour supply for the sugarcane harvest, unlike earlier when the *naukar* had to lease the land from the employer only. "Now, we can negotiate. We can say that if we don't like this arrangement (say wage or tenancy), it then is modified and they agree to changed terms mostly," said another tenant from the Jatava caste. This leasing

[8] Findings by political scientists studying social conflicts in rural western Uttar Pradesh during the 1990s also discussed a rise of political consciousness among Dalits, especially among the Jatava caste, mobilised by the Bahujan Samaj Party (BSP) (Pai and Singh 1997).

arrangement was extremely important for the Tyagi households who face a big labour crunch during the seven-month sugarcane harvest season. A rich peasant complained:

> Labour availability was never a problem till 2000s. Since then, it has become a problem. Earlier we leased land for just paddy, now even for wheat and sugarcane we have to lease.

By leasing out in this form, they ensure regular commitment of the farm labouring members of Dalit (and Dhivar) tenant households during the harvest season.[9] Several big farmers reported that this was another mechanism to control out-migration among Dalits as without them (and this unequal arrangement), the nominal wage costs for Tyagi households would increase significantly, affecting the viability of their sugarcane business. This is why, over time, the relations between Tyagi landowners and Jatava households (labourers initially, tenants now) seem to have improved for the latter in terms of relative autonomy. However, economic outcomes remain poor because of high rent.

Dhivar peasants, who cover about one-third of the paddy GCA, also lease land under similar terms. The historical labour-tying system was less entrenched between Dhivar and Tyagi households. Dhivar households also experience high rental terms, with approximately 40 per cent of their paddy output going to rent, and rental costs exceeding half of the Cost A2. As a result, they had little marketable surplus (6 per cent), using most of the crop for household consumption as a critical food supply measure (Table 8).

Despite the overall reduction in paddy GCA between 2006 and 2023, this leasing arrangement remained largely unchanged. Tyagi households' continued preference for cultivating Basmati varieties themselves and leasing out small, unprofitable plots to land-poor households under unfair rental terms underscores the persistence of exploitative interlinkages in Harevli's agrarian economy despite the increasing commercialisation of the economy.

Income from paddy cultivation was lower than that from wheat, and only poor peasants and manual workers were cultivating it, not for cash income but mainly for consumption purposes. One-third of poor peasant households incurred losses from paddy cultivation in 2023. Grain inflow through harvest fulfilled half of the paddy requirement of poor peasant households, with another one-third contributed by the PDS (Table 9). Some worked for wages in kind and some ended up buying rice during the lean season.[10]

[9] Landlords/big capitalist farmers and rich peasants also have a strategy behind leasing out land and interlinking exchange arrangements. A detailed analysis of the sugarcane economy of this village is addressed in Munjal and Swaminathan (2025), which delves into the reasons behind big landowners leasing out land.

[10] Inflow of other food items also varies by class and caste: upper class Tyagi households marginally grow mustard, pulses, and vegetables for self-consumption, purchasing extras from Najibabad town. Jatava and Dhivar households relied on weekly markets in nearby village towns (Mandawali and Muazzampur Narayan), where essentials such as oil, pulses, and vegetables are more affordable.

Table 9 *Inflow of paddy, by channel and caste, Harevli, 2023* in per cent

Caste	Own harvest	Wages in kind	Rent received	PDS	Market purchase
Tyagi	0	0	90	0	10
Jatava	50	10	0	30	10
Dhivar	40	10	10	30	10

Source: Author's fieldwork (2024).

Gendered Division of Unpaid Family Labour

The poor peasantry, drawn almost exclusively from Scheduled Castes and Other Backward Classes, was increasingly involved in tenancy arrangements that rely heavily on the exploitation of family labour. In this context, the internal organisation of labour within tenant and smallholder households reflects a clear gendered division of unpaid work.

As shown in Figure 1, in cereal cultivation in 2023, the proportion of female (and child) labour in total family labour use was one-third or more for middle peasants, poor peasants, and manual worker households. This indicates a high degree of female participation in agricultural work among these classes. Key operations in cereal cultivation in which women were involved were: making bunds, removing saplings and transplanting (paddy), applying manure, weeding, manual harvesting and threshing (by beating), and winnowing among others.

All households that reported significant use of female family labour belonged to Jatava and Dhivar caste groups. In contrast, Tyagi households reported no such female labour

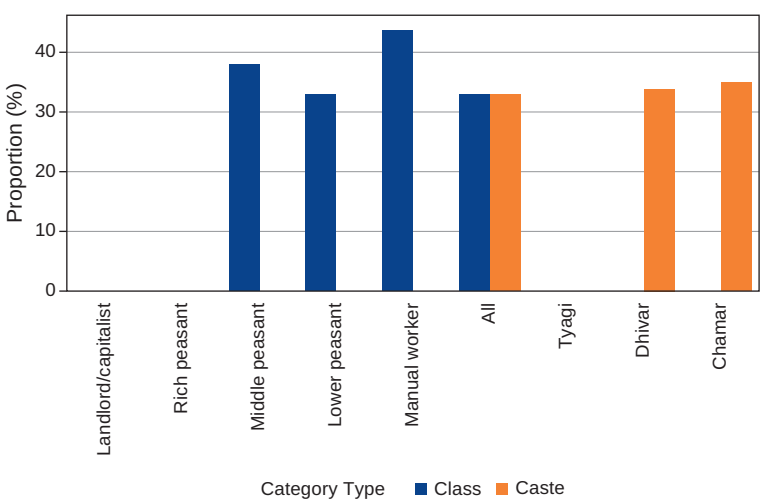

Figure 1 *Proportion of female and child labour in total family labour use, cereal crops, across class and caste, Harevli, 2023* in per cent

involvement. This points to a caste-specific gendered division of labour, wherein the burden of unpaid agricultural work falls disproportionately on women from oppressed caste groups.

This caste- and gender-based pattern helps explain why tenants continue to lease land even when cultivation yields low or negative returns. Female family members contribute unpaid labour on operational land, effectively subsidising household production. This unpaid labour becomes a hidden mechanism through which the poor peasantry economises on costs and sustains tenancy despite unfavourable economic conditions.

Discussion and Conclusion

The agricultural economy of Harevli village in western Uttar Pradesh was dynamic, and shaped by class- and caste-based relations of production and exchange. There was a major expansion of sugarcane in western Uttar Pradesh, including in the study village. This paper studied the implications of the expansion in sugarcane cultivation on the production of wheat and rice in the region.

As a consequence of the rise in area under sugarcane in the village, the area under wheat and rice declined. However, because of an increase in yield, the total production of wheat remained the same, while the production of rice declined.

There were important changes in agrarian relations associated with the expansion of the area cultivated with sugarcane. Landlords and big capitalist farmers and rich peasants, all from the Tyagi caste, reduced the extent of land on which they cultivated wheat (they did not traditionally cultivate rice). In 2023, the entire area under rice, and most of the area under wheat was on operational holdings held by middle and especially poor peasant and some manual worker households. Jatava households, which cultivated only rice in 2006, grew wheat as well in 2023. Dhivar households also increased the area on which they cultivated wheat.

As a consequence of tenancy arrangements that were put in place between the surveys of 2006 and 2023, more households from the Jatava and Dhivar castes had access to operational holdings of land in 2023 than in 2006. Traditionally, several Jatava and some Dhivar households were employed by specific Tyagi landlord households as long-term attached labourers (*naukar*) as farm and household workers. This system of long-term attached labour declined in the late 1990s and early 2000s in the region, and a new kind of tenancy arrangement evolved. By 2023, changes in occupational pattern and the rise in rental and non-farm sources of income among the rural rich also acted as a catalyst for leasing land that was previously cultivated directly.

In 2006, the main form of tenancy was sharecropping – on land leased out by rich Tyagi households to poor peasants (especially Jatava) for the seasonal cultivation of rice. This

leasing system was driven by rich farmers' need for workers to harvest sugarcane, a crop operation that was not mechanised (and remains unmechanised) in the region.

Today, rich farmers also leased out land for the cultivation of wheat and sugarcane. For wheat, there were different kinds of crop-specific sharecropping and fixed-rent arrangements, the specific arrangement being determined, ultimately, by the specific relations between tenant and landowner.

The absence of mechanised harvesting in sugarcane continues to be a crucial factor in sustaining tenancy, as big landowners need a stable labour supply for the extended sugarcane harvest. By leasing land for food (wheat-paddy) and cash (sugarcane) crops, they ensured a supply of labour from tenant households for multiple agricultural tasks, effectively tying labour through land arrangements. With rent continuing to be in kind, the product market was also interlinked. Tyagi households leasing out small plots for paddy, wheat, and sugarcane cultivation to poor peasants from the Jatava and Dhivar castes was an important feature of the agrarian structure in the village in 2023.

These tenancy arrangements in Harevli stand in contrast to trends reported from other highly commercialised agrarian regions in India. Recent studies have noted a tendency towards *reverse tenancy*, wherein large capitalist farmers increasingly lease in land to expand their operational holdings and harness economies of scale. Ramakumar and Raut (2024) document such a process in Maskawad, a banana-growing village in Jalgaon, Maharashtra. Similarly, Bansal (2020) and Bhattacharya (2023) observe large farmers leasing in land to consolidate control in the capitalist farming regions of Tehang (Jalandhar) and Hakamwala (Mansa) in Punjab, while Sinha (2021) reports similar dynamics in villages near Khanna, Ludhiana. In contrast, in Harevli, big landowners have increasingly leased out land as a mechanism for ensuring labour supply and retaining control over agrarian relations.

These arrangements remain highly unequal, and are characterised by complex tenancy features and interlinked market arrangements that reinforce dependency. Land-poor smallholders are unable to realise the potential of the value generated from the leased land because of high rents. There are systematic differences between classes with respect to the costs of cultivation, yields, the value of output, and net incomes, the outcomes in each case being worse for the rural poor.

Rice was cultivated exclusively by Jatava and Dhivar households. They paid high rents that affected profitability, and one-third of the households among them who cultivated rice incurred losses from rice cultivation.

Female and child labour made up one-third or more of total family labour among middle peasants, poor peasants, and manual worker households.

Poor peasants leased in land despite low returns in order to meet their grain requirements.[11] The study found that, in 2023, half the requirements of grain of cultivating tenants came from self-cultivation. (Grain from wages in kind was the primary source of wheat for household consumption for poor peasants in 2006.) Additionally, grain from the public distribution system contributed another 20–30 per cent of the grain consumed by a household. Unequal tenancy arrangements expanded, because they provided grain for poor peasant households.

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[11] Findings from secondary data also identify land-poor households from marginalised castes to be the most vulnerable group facing problems in accessing food in rural Uttar Pradesh (Goli *et al.* 2021).

Appendix Table 1 *Household distribution, operational and ownership holdings, by class, Harevli, 2006 and 2023* in hectares and percentage

Class	No. of households	Per cent of households	Operational holding (in hectares)	Operational holding (in percentage)	Ownership (in hectares)	Ownership (in percentage)
			2006			
Landlord	3	3	44	26	39	28
Rich peasant	10	10	54	32	48	34
Upper middle peasant	13	13	28	17	29	21
Lower middle peasant	16	16	26	15	18	13
Lower peasant	29	30	15	9	4	3
Manual worker	27	28	2	1	1	1
Total	98		170		139	
			2023			
Landlord/Big capitalist farmer	6	5	25	14	40	30
Rich peasant	11	10	37	21	38	28
Middle peasant	21	19	52	29	38	28
Lower peasant	39	35	57	32	17	13
Manual worker	33	30	8	4	2	1
Total	110		179		135	

Appendix Table 2 *Area under major crops, by class, Harevli, 2006 and 2023* in hectares

Class	Sugarcane	Wheat	Paddy	Fodder	Others	All
			2006			
Landlord	26.6	11.8	4.9	5.7	0	**49**
Rich peasant	37.0	12.6	1.2	10	1	**61.8**
Upper middle peasant	20.2	9.9	1.4	6.6	0	**38**
Lower middle peasant	17.7	5.5	2.7	2.5	0.1	**28.5**
Lower peasant	3.1	3.1	10.0	0.7	2.4	**19.4**
Manual worker	0	0	1.9	0.2	0	**2.1**
All classes*	**106**	**43.5**	**22.5**	**26.1**	**3.8**	**202.0**

(continued on next page)

Appendix Table 2 *(continued) Area under major crops, by class, Harevli, 2006 and 2023* in hectares

2023						
Landlord/Big capitalist Farmer	21.2	3.4	0	3	2.4	**30**
Rich peasant	28.2	4.6	2.0	5.3	4.6	**44.7**
Middle peasant	36.7	8.4	1.1	4.9	2.9	**54**
Lower peasant	41.5	10.8	7	3.4	1.2	**63.9**
Manual worker and Others	5.1	2.5	1.2	0.7	0.2	**9.6**
All classes	**132.7**	**29.7**	**11.3**	**17.3**	**11.2**	**202.1**

Note: *The total area cultivated also includes non-agrarian households cultivating minor plots not mentioned here. Thus, the total is higher than the total from the classes given.

Appendix Table 3 *Components of Cost A2 of cultivation of wheat, by class, Harevli, 2006 and 2023* in per cent

Cost component	Landlord	Rich peasant	Upper middle peasant	Lower middle peasant	Lower peasant	All classes
2006						
Seeds	8	9	7	8	6	8
Manure	9	7	4	9	7	7
Fertiliser	17	13	9	12	11	11
Plant protection	0	0	0	0	0	0
Irrigation	13	5	11	13	10	11
Casual labour	15	19	22	8	3	14
Machine labour	23	20	25	26	25	24
Animal labour	2	4	8	6	9	7
Long-term workers	3	3	1	0	0	1
Rent	2	8	2	14	16	9
Other costs	8	12	10	5	13	9

(continued on next page)

Appendix Table 3 *(continued) Components of Cost A2 of cultivation of wheat, by class, Harevli, 2006 and 2023* in per cent

	2023					
	Landlord/big capitalist farmer	Rich peasant	Middle peasant	Lower peasant	Manual worker	All classes
Seeds	17	8	8	7	5	8
Manure	0	7	6	12	8	9
Fertiliser	13	10	10	8	9	9
Plant protection	1	2	2	1	0	1
Irrigation	2	6	9	9	10	8
Casual labour	24	26	20	9	1	13
Machine labour	28	31	23	23	14	22
Animal labour	0	0	1	1	0	0
Long-term workers	5	0	0	0	0	0
Rent	0	0	4	22	50	18
Other costs	10	9	18	10	3	12

Appendix Table 4 *Components of Cost A2 of cultivation of paddy, by class, Harevli, 2006 and 2023* in per cent

Cost component	Class			
	2006		2023	
	Lower middle peasant	Lower peasant	Lower peasant	Manual worker
Seeds	3	1	2	1
Manure	8	2	6	0
Fertiliser	7	4	4	3
Plant protection	0	0	2	0
Irrigation	4	2	4	0
Casual labour	14	7	16	13
Machine labour	5	3	10	3
Animal labour	6	13	1	0
Long-term workers	0	0	0	0
Rent	48	62	49	75
Other costs	5	6	6	4

Appendix Table 5 *Real Gross value of output (GVO), cost of cultivation (Cost A2), and farm business income (FBI) of paddy, by class, Harevli, 2006 and 2023, constant prices* in rupees per hectare

Class	GVO	Cost A2	FBI
	2006		
Lower middle peasant	90426	79492	10934
Lower peasant	99706	71211	28496
	2023		
Lower peasant	88639	71553	16033
Manual workers	82696	66493	16203

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