

Determinants of Socio-economic Disparities in Agricultural Income and Consumption: Evidence from Districts of Western Uttar Pradesh

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Abstract

This study analyzed data from the 77th round of the National Sample Survey Office's (NSSO) Situation Assessment Survey of Agricultural Households (SASAH) conducted in 2019, covering 2,415 households in Western Uttar Pradesh. The survey examined socio-economic indicators, including land ownership, income, education, and resource access among predominantly male-headed (90.81%) and female-headed (9.19%) households. Using regression models, we assess the impacts of age, education, landholdings, caste, and religion on monthly consumption expenditures and agricultural income. Our findings reveal significant disparities in income and consumption expenditures, heavily influenced by religion and caste. Specifically, higher educational attainment and larger landholdings are associated with increased income and consumption. The study underscores the need for targeted educational programs, equitable land reforms, and region-specific economic strategies to boost employment and entrepreneurship. These policies are crucial for reducing socioeconomic disparities and promoting inclusive growth in Western Uttar Pradesh.

Keywords: Socioeconomic Indicators, Agricultural Households, Income, Consumption, Western UP

JEL Classification: D12, Q18, J15, O15, R58

Introduction

Agriculture plays a pivotal role in the economic growth and development of Western Uttar Pradesh. Despite its agricultural prosperity, the region continues to grapple with persistent socioeconomic disparities, including uneven access to resources and opportunities, income distribution, and consumption levels, which impede the livelihoods of millions of farmers and rural households. Western Uttar Pradesh, located in the heart of India, is characterized by diverse agro-climatic conditions, fertile land, and a rich agricultural tradition. With over 60 per cent of its population engaged in agriculture, the sector remains a vital source of employment and income generation. Nevertheless, the region faces the daunting challenge of addressing entrenched inequalities that hinder its full potential (Singh *et al.*, 2019; MOFPI 2019; John and Mutatkar 2005; Ranjitha and Mruthyunjaya 2005).

Western Uttar Pradesh boasts a rich cultural heritage and history, with its diverse landscape encompassing bustling cities, fertile farmlands, and vibrant rural communities. The region is significant to Uttar Pradesh, one of India's most populous states (Balaganesh *et al.*, 2020; CPI 2024). However, its socioeconomic landscape is complex, influenced

by demographics, historical legacies, and developmental challenges (GoU, 2022). Socioeconomic disparities are evident between urban and rural areas. Urban centers such as Ghaziabad, Meerut, Saharanpur, and Muzaffarnagar offer economic growth and employment opportunities in education, commerce, and industry (WFP and IHD 2010; R. Singh, Kumar, and Woodhead 2019). In contrast, rural areas predominantly rely on agriculture as a source of livelihood (Panneerselvam *et al.*, 2014). Rapid urbanization and industrialization have reshaped the region's socioeconomic dynamics, presenting both challenges and opportunities (Gupta and Mishra, 2018).

The data from the National Sample Survey (NSS) highlighted that the average monthly per capita expenditure (MPCE) on food in rural Western Uttar Pradesh was Rs.1,842, lower than the national rural average of Rs.2,134 (NSSO, 2017-18). This underscores the prevalence of food insecurity and economic hardship among rural households, emphasizing the urgent need to address these disparities. Socioeconomic inequalities in India, and specifically in Western Uttar Pradesh, are influenced by a complex interplay of factors (Filmer and Pritchett 2001; Deaton and Dreze 2010; Patnaik 2013; Bhardwaj and Sidana 2013; Antony and Rao 2007; Thakur *et al.* 2023; Singh *et al.* 2023). Despite development

efforts, poverty and inequality persist, with agrarian reforms falling short and healthcare services varying significantly across districts (Kumar and Ayyappan 2014; Chaudhuri and Gupta 2009). Caste-based inequalities continue to affect socioeconomic indicators such as landholding, education, and wealth distribution, underscoring the enduring impact of social hierarchies (Alkire and Seth 2015; Panagariya and Mukim 2014; Khan *et al.* 2021; Khan *et al.* 2022). Economic growth has been uneven, with Western districts outperforming their Eastern counterparts, indicating the need for policy measures to address regional imbalances effectively (Birthal, Joshi, *et al.* 2014; Chaudhuri and Gupta 2009; Banerjee, Bénabou, and Mookherjee 2006). Addressing these multifaceted issues requires targeted interventions sensitive to the unique challenges of different districts (Vatta and Sidhu 2010; Vatta and Sidhu 2007).

This study delves deeper into these disparities by analyzing data from the 77th round of the National Sample Survey Office's (NSSO) Situation Assessment Survey of Agricultural Households (SASAH), conducted in 2019. This nationally representative household survey examines factors such as land ownership, income levels, access to essential services, healthcare outcomes, educational attainment, and quality of life to identify key contributors to socioeconomic disparities. We focus on two main aspects to assess the disparity across socio-religious groups: monthly consumption expenditure and income levels. The link between food security and socioeconomic status is evident in the latest NFHS-5 report, which indicates marginal improvement in child malnutrition despite persistent challenges. Household income and consumption patterns are crucial determinants of disparity levels.

Against this backdrop, this study aims to analyze the socioeconomic disparity in income and inequality among agricultural households in Western Uttar Pradesh. By promoting inclusive development and equitable growth in the region, we can identify policies, community initiatives, and developmental strategies to reduce inequalities and empower all residents socioeconomically.

Data and Methodology

This study used a nationally representative survey, the Situation Assessment Survey of Agricultural Households (SASAH), conducted by the 77th round of the National Sample Survey Office (NSSO) of the GoI in 2019. It contains information from 45,714 farm households on several aspects of farm and farm households, including production patterns, production value, landholdings, irrigation, access to information, consumption expenditure, and various socioeconomic status information. We use the sub-sample of this survey for our study region, i.e., Western Uttar Pradesh. There are 29 districts in the Western Uttar Pradesh region of Uttar Pradesh. However, we have detailed information on

farmers for 26 districts. Three districts, Hapur, Amroha, and Sambhal, have recently bifurcated; hence, these districts are not part of the survey. Thus, our sample comprises 26 districts comprising 2415 households, in which 2193 (i.e., 90.81 per cent of the sample) are male-headed households. Each district has, on average, 92 households. The levels of monthly consumption expenditure and annual net farm income are the critical variables for understanding the socio-economic disparities in income and inequality at the district level.

To measure the determinants of monthly consumption expenditure and agricultural income, we use the ordinary least square regression (OLS) method. The OLS methods are as follows:

$$Y_i = \alpha + \beta X_i + \epsilon_i \quad (1)$$

The determinants of monthly consumption expenditure are explained as follows:

$$\begin{aligned} \text{MPCE} = & \beta_0 + \beta_1 * \text{Age} + \beta_2 * (\text{Age})^2 + \beta_3 * \text{Female} + \beta_4 \\ & * \text{Islam} + \beta_5 * \text{Christianity} + \beta_6 * \text{OBC} + \beta_7 * \text{Others} + \beta_8 \\ & * \text{Primary} + \beta_9 * \text{Middle} + \beta_{10} * \text{Secondary} + \beta_{11} \\ & * \text{HigherSec} + \beta_{12} * \text{Graduation} + \epsilon \end{aligned} \quad (2)$$

Where β_0 is the intercept. β_1 and β_2 are coefficients for Age and Age squared, respectively, capturing age's linear and quadratic effects on MPCE. β_3 , β_4 , and β_5 represent coefficients for females, Islam, and Christianity, respectively, indicating the effect of gender and religious affiliation on MPCE. β_6 and β_7 are coefficients for OBC and others, reflecting the effect of social group affiliation on MPCE. β_8 to β_{12} represent coefficients for different levels of education (Primary to Graduation), showing the impact of education on MPCE. ϵ represents the error term, capturing unexplained variability in MPCE not accounted for by the independent variables. The determinants of agriculture income is explained as follows:

$$\begin{aligned} \text{Agriculture Income} = & \beta_0 + \beta_1 * \text{Age} + \beta_2 * (\text{Age})^2 + \beta_3 * \\ & \text{Gender}_{\text{Male}} + \beta_4 * \text{Religion}_{\text{Hinduism}} + \beta_5 * \text{Religion}_{\text{Islam}} \\ & + \beta_6 * \text{Religion}_{\text{Christianity}} + \beta_7 * \text{SocialGroup}_{\text{ST}\backslash\text{SC}} \\ & + \beta_8 * \text{OBC} + \beta_9 * \text{Others} + \beta_{10} * \text{Education}_{\text{Illiterate}} \\ & + \beta_{11} * \text{Education}_{\text{Primary}} + \beta_{12} * \text{Education}_{\text{Middle}} \\ & + \beta_{13} * \text{Education}_{\text{Secondary}} + \beta_{14} * \text{Education}_{\text{HigherSec}} + \beta_{15} \\ & * \text{Education}_{\text{Graduation}} + \beta_{16} * \text{FPO}_{\text{No}} + \beta_{17} * \text{KKC}_{\text{No}} \\ & + \beta_{18} * \text{SoilCard}_{\text{No}} + \beta_{19} * \text{InsuredCrop}_{\text{ad}} + \epsilon \end{aligned} \quad (3)$$

Where, β_i represents the expected coefficients of explanatory variables and, ϵ represents the error term, capturing unexplained variability in agriculture income not accounted for by the explanatory variables.

Results and Discussion

The socio-economic conditions of the people in Western Uttar Pradesh have been displayed in the analysis below. The contribution of people to the economy and their socio-religious structure is displayed in the Annexure-1, there are significant variations across different districts. Hinduism

is the predominant religion, with 82.23 per cent of the population adhering to it, followed by Islam at 17.55 per cent. Christianity has a minimal presence at 0.22 per cent. Within social groups, Scheduled Castes (SC) and Other Backward Classes (OBC) hold substantial representation, with an average of 20.25 per cent and 60.13 per cent respectively. This emphasizes the importance of caste dynamics in the region. However, there are notable differences among districts. For example, Baghpat has a sizable Muslim population compared to others, indicating regional variations in religious demography. Understanding these demographic patterns is crucial for policymakers to formulate targeted interventions addressing socioeconomic disparities among religious and caste groups. Such insights facilitate informed decision-making, enabling inclusive policies to uplift marginalized communities and foster socio-religious harmony in Western Uttar Pradesh (Singh *et al.*, 2021).

Table 1 shows the gender-specific distribution of socio-religious populations in Western Uttar Pradesh. The data indicates that males and females comprise a significant portion of the population within the Hindu community, with 81.76 per cent and 86.54 per cent, respectively. Similarly, within the Muslim community, males account for 18.07 per cent and females for 12.80 per cent. Christianity has a minimal presence overall. The data suggests that the overall socio-religious composition remains mainly consistent, with Hinduism being the dominant religion and other backward classes forming the most significant social group (Nigam *et al.*, 2014). These insights are crucial for policymakers and researchers to be aware of gender-specific socio-religious

dynamics. It can help tailor interventions and initiatives to address disparities or promote inclusivity within Western Uttar Pradesh. Further, the detailed educational distribution among different religious and social groups in Western Uttar Pradesh. Looking at the religious distribution, Hindus are the largest group, with 32.97 per cent of them being illiterate, 17.28 per cent having primary education, and a gradual decline in percentages through middle (22.53 %), secondary (12.48%), higher secondary (9.72%), and graduation (5.02%) levels.

Conversely, the Muslim population has significantly higher illiteracy rates at 60.61 per cent, with only 0.69 per cent of them being graduates. Christians have a varied profile, with 38.48 per cent of them being illiterate and 6.18 per cent being graduates. Moving on to social groups, Scheduled Castes/Scheduled Tribes (SC/ST) have the highest illiteracy rate at 44.13 per cent, followed by Other Backward Classes (OBC) at 37.05 per cent and Others at 33.75 per cent. The distribution across education levels is consistent, with slight percentage variations (Singh and Bishi, 2020). The data highlights significant disparities in educational attainment among religious and social groups, underscoring the need for targeted interventions to bridge these gaps and promote equitable access to education for all segments of the population in Western Uttar Pradesh (Chakrabarty, 2016).

Moreover, the detailed breakdown of land distribution in Western Uttar Pradesh is based on religion and social groups. The data is divided into four categories: Marginal, Small, Medium, and Large. Hindus hold the most significant percentage of land in the Marginal category at 91.17 per

Table 1: Distribution of socio-religious population in Western Uttar Pradesh

		Religion			Social group		
		Hinduism	Islam	Christianity	Scheduled Tribe	Other Backward Class	Others
Gender	Male	81.76	18.07	0.17	20.56	60.58	18.86
	Female	86.54	12.8	0.66	17.47	56.05	26.49
Religion	Illiterate	32.97	60.61	38.48	44.13	37.05	33.75
	Primary	17.28	25.86	7.85	15.3	21.28	14.64
	Middle	22.53	6.18	23.34	20.9	19.57	18.67
	Secondary	12.48	4.6	22.76	10.48	9.51	16.72
	Higher Sec	9.72	2.06	1.38	5.31	8.7	10.45
	Graduation	5.02	0.69	6.18	3.88	3.9	5.77
	Land Holding	Marginal	91.17	95.43	64.06	96.78	91.81
	Small	5.48	3.34	4.17	2.75	5.17	7.29
	Medium	2.37	0.92	12.44	0.38	1.94	4.58
	Large	0.98	0.31	19.33	0.08	1.08	1.19

Source: NSSO's 77th round of Situation Assessment Survey of Agricultural Households (SASAH), 2019–2021.

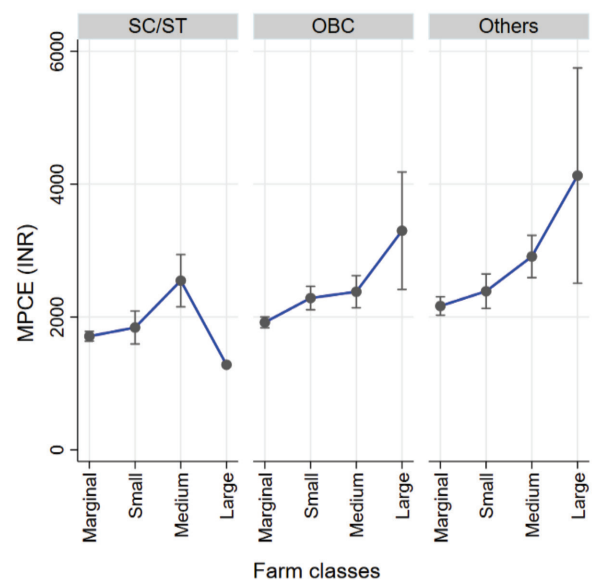
Table 2: Land possessed and monthly per capita consumption expenditure across farm categories and social groups

	Land possessed (ha)	Monthly per capita consumption expenditure (Rs.)
Marginal (≤ 1 ha)		
Scheduled Caste/Tribe	0.16	1709.28
Other Backward Caste	0.17	1918.80
Others	0.18	2164.93
Total	0.17	1933.83
Small (1 to 2 ha)		
Scheduled Caste/Tribe	1.29	1841.05
Other Backward Caste	1.36	2284.84
Others	1.39	2387.51
Total	1.37	2279.65
Medium (2 - 4 ha)		
Scheduled Caste/Tribe	2.48	2546.54
Other Backward Caste	2.53	2380.05
Others	2.66	2909.87
Total	2.58	2617.70
Large (> 4 ha)		
Scheduled Caste/Tribe	4.17	1281.25
Other Backward Caste	5.70	3297.52
Others	6.38	4127.94
Total	5.98	3629.22

Source: Calculations based on SAS 2018-19

cent, followed by Islam at 95.43 per cent and Christianity at 64.06 per cent. However, Christianity presents a more even distribution across categories, with relatively higher percentages in the medium and large categories than Hinduism and Islam. Scheduled Tribes show the highest rate in the marginal category at 96.78 per cent, while Other Backward Classes and Others follow similar patterns to the overall population (Jatav et al., 2022). Overall, the data suggests a prevalence of Marginal land holdings across religious and social groups, with Christianity showing a more diverse distribution across land size categories than Hinduism and Islam. These findings provide valuable insights into landholding patterns in Western Uttar Pradesh, emphasizing potential inequalities and informing policies to promote fair access to land resources among various communities.

Table 2 and Figure 1 represent land possession and monthly per capita consumption expenditure across various farm categories and social groups. It categorizes land ownership into four groups: marginal (≤ 1 ha), small (1 to 2 ha), medium (2 - 4 ha), and large (> 4 ha), further segmented by Scheduled Caste/Tribe, Other Backward Caste, and Others. The analysis reveals distinct patterns: as land ownership increases, so does monthly per capita



Source: Author's estimates using SAS 2018-19

Figure 1: Land possessed and monthly per capita consumption expenditure across farm categories and social groups

Table 3: Percentage of population access to primary livelihood across social groups

	Category	SC/ST	OBC	Others	Western UP Overall
Bank account	Yes	99.38	97.76	98.99	98.28
	No	0.62	2.24	1.01	1.72
MGNREGA job card	Yes	38.56	15.4	5.61	16.83
	No	61.44	84.6	94.39	83.17
FPO member	Yes	1.29	5.68	4.97	4.85
	No	98.71	94.32	95.03	95.15
KCC card	Yes	24.3	39.69	51.7	39.94
	No	75.7	60.31	48.3	60.06
Soil health card	Yes	2.33	7.94	3.83	6.18
	No	97.67	92.06	96.17	93.82
Nakul swasthya patra	Yes	0.01	0.52	0.09	0.35
	No	99.99	99.48	99.91	99.65
PM Fasal Bima Yojana	Yes	1.1	2.44	8.7	3.61
	No	94.56	96.05	90.72	94.65
	NA	4.34	1.51	0.58	1.74
Crop Insurance	Insured when received Loan	5.92	4.06	9.05	5.47
	Insured additionally	94.08	95.94	90.95	94.53

Source: Author's estimates using SAS 2018-19

consumption expenditure. For instance, marginal landowners have the lowest consumption expenditure across all social groups, with Scheduled Caste/Tribe exhibiting the lowest average expenditure (Dev and Sharma, 2010). Conversely, large landowners, particularly in the category of Others, demonstrate significantly higher consumption expenditure, reflecting a positive correlation between land possession and economic well-being. Notably, disparities persist across social groups within each land possession category, emphasizing the intersectionality of land ownership and socioeconomic status (Nigam et al., 2014). Overall, the data underscores the importance of addressing inequalities in land distribution and economic opportunities to promote inclusive growth and poverty alleviation within agricultural communities.

Table 3 compares the percentage of the population with access to essential livelihood services across various social groups in Western Uttar Pradesh. The data reveals significant disparities in access to financial and agricultural services. Although access to bank accounts is widespread across all social groups, with percentages ranging from 97.76 per cent to 99.38 per cent, there are significant differences in access to other services. For instance, while 38.56 per cent of SC/ST individuals have MGNREG job cards, the percentage drops drastically for OBCs (15.4%) and Others (5.61%). Participation in farmer's producer organizations (FPOs) is relatively low across the board, with only around 1.29 per

cent to 5.68 per cent of the population members (Kumar, 2003; Chakravarty and Dand, 2005).

Access to Kisan Credit Cards (KCCs) varies, with the highest percentage among Others (51.7%), followed by OBCs (39.69%) and SC/ST (24.3%). Soil health card access remained low across all groups, ranging from 2.33 per cent to 7.94 per cent. Participation in the government's PM Fasal Bima Yojana scheme varies, with the highest percentage among the others category (8.7%), followed by OBCs (2.44%) and SC/ST (1.1%). Moreover, the data suggests a link between insurance participation and loan receipt, with insured-only individuals ranging from 4.06 per cent to 9.05 per cent and insured-additionally individuals making up the majority, ranging from 90.95 per cent to 94.08 per cent. These figures highlight significant disparities in access to crucial livelihood services among different social groups, emphasizing the need for targeted interventions to ensure equitable access to economic opportunities and resources in Western Uttar Pradesh (Ravi, 2023; Nigam et al., 2014).

Figure 2 shows the Monthly Per Capita Expenditure (MPCE) in four quantiles for the districts of western Uttar Pradesh. The map uses different colors to indicate the ranges of MPCE, with green being the highest, red being the lowest, and grey indicating no data available. The districts of Ghaziabad, Gautam Buddha Nagar, Meerut, Hapur, and Baghpat have the highest MPCE levels, as they

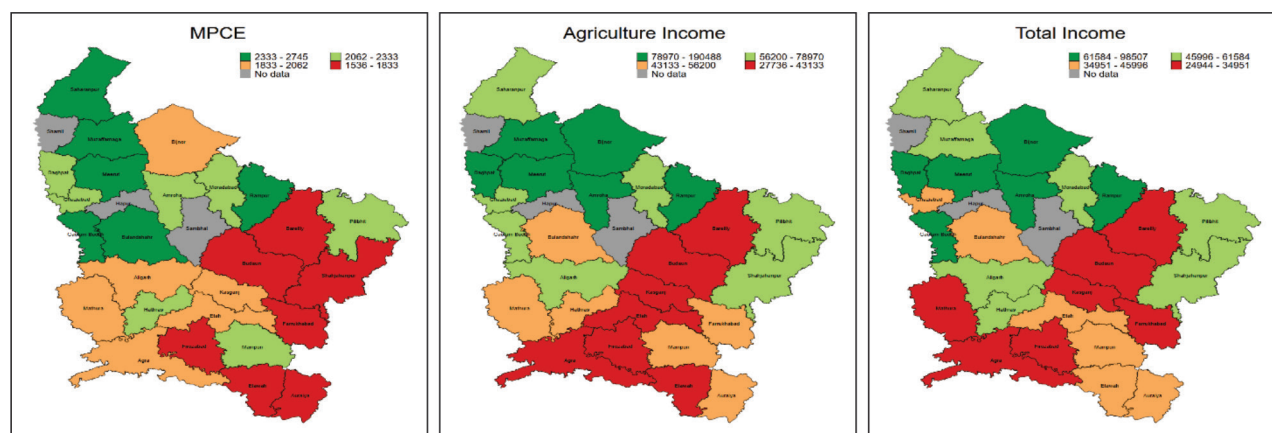


Figure 2: MPCE, Agriculture Income and Total Income across districts in Western Uttar Pradesh

are colored green and fall into the Q4 income group, with an average MPCE of Rs.2,745. The districts of Saharanpur, Muzaffarnagar, Shamli, Bulandshahr, Aligarh, and Mathura have the second highest MPCE levels, as they fall into the Q3 income group and are colored light green, with an average MPCE of Rs. 2,233. The districts of Bijnor, Moradabad, Rampur, Sambhal, Bareilly, Badaun, Pilibhit, Agra, and Firozabad have the third highest MPCE levels, as they are colored orange and fall into the Q2 income group, with an average MPCE of Rs.1,962. Finally, Amroha, Jyotiba Phule Nagar, Shahjahanpur, Etah, Mainpuri, Etawah, Auraiya, and Kannauj districts have the lowest MPCE levels (Singh and Bishi, 2020; Makkar et al., 2022). They are colored red and fall into the Q1 income group, with an average MPCE of Rs.1,683.

MPCE indicates a high degree of income inequality and disparity among the districts of western Uttar Pradesh. The income distribution is skewed towards the northern and eastern districts, which have more than one and a half times the MPCE of the southern and western districts. The region's urbanization, industrialization, and agricultural productivity influence the MPCE levels. The region needs more economic opportunities and social welfare programs to reduce the income gap and improve living standards.

The following figure illustrates the distribution of agricultural income across the district of Western Uttar Pradesh. The income brackets are indicated by different colours, with green representing the highest and red representing the lowest. The districts Saharanpur, Shamli, Muzaffarnagar, Meerut, Hapur, and Ghaziabad have the highest agriculture income levels, as they fall under the Q4 income group, coloured green, with an average annual income ranging from Rs.78970 to Rs. 1,90,488. Bulandshahr, Aligarh, Mathura, and Hathras come under the Q3 income group, coloured yellow, with an average annual income ranging from Rs.43133 to Rs.78,970. These districts have the second-highest agriculture income levels. Agra is the

district with the third-highest agriculture income level, falling under the Q2 income group, colored orange, with an average annual income of Rs.56,200. Firozabad, Mainpuri, Etawah, and Auraiya have the lowest agriculture income levels, falling under the Q1 income group, colored red, with an average annual income of Rs.27,736 (Annapoorani and Lakshmi, 2017; Shakeel and Islam Hashmi, 2019; Kumari, 2022; Pyne *et al.*, 2023). The map and data reveal a high level of income inequality and disparity among the districts of Western Uttar Pradesh. Income distribution is skewed towards the northern and eastern districts, which have more than six times the income of the southern and western districts. The income levels are influenced by the region's land holdings and agricultural productivity. The region requires more economic opportunities and social welfare programs to reduce the income gap and improve living standards.

In this queue, the figure displays the total income for four different income groups across districts in western Uttar Pradesh. Each district's income bracket is colour-coded, with green representing the highest and red representing the lowest. Shamli, Hapur, and Sambhal are marked in grey to indicate no data is available. The Q4 income group includes Bagpat, Meerut, Gautam Buddha Nagar, Bijnor, Amroha, and Rampur, with an average annual income range from Rs. 61584 to Rs.98560. The Q2 income group includes Saharanpur, Muzaffer Nagar, Moradabad, Aligarh, Hathras, Pilibhit, and Shjahanpur, with an average annual income range from Rs.45996 to Rs.61584. Ghaziabad, Bulandshar, Etah, Mainpuri, Etawah, and Aurria fall into the Q3 income group, with an average annual income range of Rs.34951 to Rs.45996. Mathura, Agra, Firozabad, Farukhabad, Kasganj, Badaun, Bareily, and other districts have the lowest income levels and belong to the Q1 income group, with an average annual income ranging from Rs.24944 to Rs.34951. It is important to note that land holdings and agricultural productivity also influence income levels in the region (Rukhsana, 2011; Mishra, Jain and A. A Broadway,

Table 4: Regression results of factors affecting MPCE and agriculture income in Western Uttar Pradesh

Variables	MPCE	Agriculture Income
Age	-.0103* (0.006)	0.003 (0.015)
Age*Age	0.0001 (0.001)	0.001 (0.001)
Gender (Base: Male)		
Female	0.111** (0.044)	-0.119 (0.119)
Religion (Base: Hinduism)		
Islam	-0.063 (0.058)	0.041 (0.108)
Christianity	0.379** (0.169)	1.391** (0.622)
Social Group (Base: SC/ST)		
OBC	0.033*** (0.038)	0.315*** (.097)
Others	0.141 (0.038)	0.483*** (0.112)
Education (Base: Illiterate)		
Primary	0.091** (0.042)	0.077 (0.096)
Middle	0.148*** (0.035)	.305*** (0.097)
Secondary	0.206*** (0.050)	0.284** (0.114)
Higher Sec	0.265*** (0.067)	0.326** (0.128)
Graduation	0.358*** (0.069)	0.193 (0.153)
FPO_No		-0.255* (0.141)
KKC_No		-.313*** (0.071)
Soil card_no		0.079 (0.140)
Insured crop		0.188 (0.148)
Constant	7.438*** (0.144)	9.30*** (0.465)
Number of observations	2415	1507

Source: Author's estimates using SAS 2018-19, Standard error is in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

2013; Chakrabarty, 2016; Gupta and Mishra, 2018; INDIA AMCHAM, 2020). The region needs more economic opportunities and social welfare programs to promote economic growth and improve living standards.

The regression analysis investigates agricultural income's determinants, considering several independent variables (Table 4). The dependent variable, agriculture income, is influenced by age, gender, religion, social group, education, household characteristics, and crop insurance status. Age exhibits a statistically insignificant effect on agricultural income. The constant term is also statistically insignificant, indicating no impact on agricultural income (John and Mutatkar, 2005). Among gender groups, females show a negative but statistically insignificant effect on agricultural income compared to males. Religion has a significant impact, particularly Christianity, which positively affects agricultural income. Social group classification also plays a significant role, with individuals categorized as "other backward class" and "others" exhibiting positive effects on agricultural income compared to the base category. Regarding education levels, middle and higher secondary education significantly positively affects agricultural income compared to illiterate individuals. Household characteristics, such as 'whether any member is employed' and 'whether the household owns the land', demonstrate significant effects on agricultural income (Rao *et al.*, 2006; Negi *et al.*, 2018). Specifically, households without employed members and those without land ownership negatively affect agricultural income.

Crop insurance status positively affects agricultural income, with insured households having a higher income than uninsured households, although the effect is not statistically significant (BIRTHAL *et al.*, 2022). The constant term represents the intercept, indicating the average agricultural income when all other variables are zero. In this case, the constant term suggests that the average agricultural income is approximately 9.30 per cent without considering other factors. Moreover, the regression analysis provides insights into the determinants of agricultural income, highlighting the significant influences of religion, social group, education, and household characteristics on agricultural earnings. Further, the study's results suggested that factors such as religion, agricultural income and MPCE significantly impacted disparity across social groups in Western Uttar Pradesh. Policymakers and researchers can use these findings to develop targeted interventions that address the specific needs of different social groups and identify areas that require further investigation. However, further research is needed to establish causal relationships and determine whether the findings apply to other regions in Uttar Pradesh and India.

Conclusion and Policy Implications

This analysis provides crucial insights into the intricate socioeconomic dynamics of Western Uttar Pradesh, revealing

a complex tapestry woven from the threads of religion, caste, and economic factors. Our findings highlight educational attainment as a pivotal determinant of socioeconomic status, with stark disparities among religious and caste groups. Hindus exhibit diverse educational profiles, while Muslims face higher illiteracy rates. This underscores the urgency for targeted educational interventions. Such initiatives are crucial for nurturing human capital, bridging socioeconomic gaps, and breaking the cycle of intergenerational poverty (Filmer and Pritchett 2001; Deaton and Dreze 2010). The alignment with existing literature reinforces the transformative power of education on social and economic outcomes. Additionally, religion such as Hinduism significantly influences the cultural landscape, yet the region also boasts a rich mosaic of religious diversity, including Islam and Christianity. These religious affiliations intersect with caste identities, underscoring the entwined nature of religion and caste in the social fabric (Singh *et al.*, 2019; MOFPI 2019). Land distribution patterns further reflect societal stratification. Hindus predominantly hold marginal land holdings, whereas Christianity presents a more equitable distribution. This suggests avenues for equitable land reform policies (Kumar and Ayyappan 2014; Chaudhuri and Gupta 2009). Addressing land disparities is essential for fostering economic empowerment and narrowing socioeconomic divides across religious and caste lines. Equitable land reforms could transform the economic landscape by providing marginalized groups with the necessary resources for financial stability and growth.

Income disparities among districts reveal regional heterogeneity in economic opportunities shaped by land holdings and agricultural productivity. Our findings indicate that as land ownership increases, so does monthly per capita consumption expenditure, with large landowners demonstrating significantly higher consumption expenditure. This supports the observations of Gupta and Mishra (2018) regarding the positive correlation between land ownership and economic well-being. Addressing these inequalities requires a multifaceted approach, including education, land reform, and inclusive economic development initiatives. Prioritizing interventions for marginalized communities, such as Muslims and Scheduled Castes, is crucial for fostering inclusive growth and social cohesion (Alkire and Seth 2015; Panagariya and Mukim 2014). Our regression analysis reveals that factors such as gender, religion, and social group significantly impact agricultural income and monthly per capita expenditure. For instance, Christianity positively affects agricultural income, and higher levels of education consistently correlate with increased agricultural income (John and Mutatkar, 2005; Singh and Bishi, 2020). These results highlight the critical role of tailored educational programs and economic policies that address the specific needs of different social groups, ensuring development efforts are equitable and inclusive.

Implementing robust land reform policies and inclusive

economic development strategies promises to level the playing field for all. Initiatives to bolster livelihood services, promote entrepreneurship, and enhance access to essential resources can strengthen economic resilience and uplift vulnerable populations (Rao, Birthal, and Joshi 2002). Regional development strategies must be finely calibrated to redress disparities among districts, fostering balanced growth and equitable access to infrastructure and social services. This approach will help in reducing the socioeconomic gaps that currently exist between different regions and communities. An intersectional approach, mindful of individuals' multifaceted identities, is indispensable in crafting inclusive policies that respond to diverse needs and vulnerabilities. The socioeconomic divide in Western Uttar Pradesh calls for concerted action across a spectrum of fronts (Negi et al., 2018). By prioritizing inclusive development agendas, policymakers can chart a course towards a more equitable and harmonious society, where every individual has the opportunity to flourish and contribute to the collective prosperity of the region (Singh and Bishi, 2020). In conclusion, this study underscores the importance of understanding and addressing the complex interplay of religion, caste, education, and land ownership in shaping socioeconomic outcomes. By implementing targeted, intersectional policies and promoting inclusive development, Western Uttar Pradesh can move towards a future where economic and social disparities are significantly reduced, paving the way for sustainable growth and prosperity for all its residents.

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Annexure 1: District-wise distribution of socio-religious population in Western Uttar Pradesh (%)

	Religion			Social Group		
	Hinduism	Islam	Christianity	SC/ST	OBC	Others
Agra	93.36	6.64	0.00	46.91	30.23	22.87
Aligarh	97.88	2.12	0.00	27.56	41.53	30.91
Auraiya	100.00	0.00	0.00	49.92	18.75	31.33
Baghpat	57.80	40.88	1.32	8.53	47.88	43.59
Bareilly	52.91	47.09	0.00	10.60	65.73	23.68
Bijnor	74.00	26.00	0.00	19.07	62.19	18.73
Budaun	85.38	13.94	0.68	15.34	67.50	17.16
Bulandshahar	98.62	1.38	0.00	27.27	50.38	22.35
Etah	92.16	7.84	0.00	3.71	76.75	19.54
Etawah	100.00	0.00	0.00	4.74	72.57	22.69
Farrukhabad	99.69	0.31	0.00	16.38	67.94	15.68
Firozabad	100.00	0.00	0.00	15.29	84.70	0.02
G. B. Nagar	99.99	0.01	0.00	36.26	21.52	42.22
Ghaziabad	81.07	18.93	0.00	12.51	65.30	22.18
Hathras	98.87	1.13	0.00	5.69	71.62	22.69
Jyotiba Phule Nagar	98.18	1.67	0.15	20.78	76.40	2.82
Kashiramnagar	99.85	0.15	0.00	28.95	54.23	16.82
Mainpuri	99.59	0.41	0.00	11.39	75.90	12.71
Mathura	81.51	18.49	0.00	10.90	58.45	30.65
Meerut	65.27	34.73	0.00	9.86	47.22	42.92
Moradabad	75.86	24.14	0.00	20.44	72.90	6.66
Muzaffarnagar	64.87	35.07	0.07	14.01	63.98	22.01
Pilibhit	82.79	14.72	2.49	23.13	73.60	3.27
Rampur	58.96	40.37	0.67	7.31	63.61	29.08
Saharanpur	66.41	33.57	0.02	53.72	34.60	11.68
Shahjahanpur	79.78	19.77	0.45	18.86	66.83	14.31
Total	82.23	17.55	0.22	20.25	60.13	19.62

Source: NSSO's 77th round of Situation Assessment Survey of Agricultural Households (SASAH), 2019–2021.