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IMPACT OF IRRIGATION ON LAND LEASE MARKET IN RURAL INDIA: A STATE LEVEL ANALYSIS

Y. Sreenivasulu
Assistant Professor
Center for Economic and Social Studies (CESS), Hyderabad.
e-mail: sreenucess@gmail.com

ABSTRACT

This paper attempts to analyze the impact of irrigation on the extent of tenancy and terms of lease. It observes that the states such as Haryana and Punjab were in the top position in the country, in terms of high proportion of leased-in extent as well as high proportion of irrigated land. The states with low proportion of leased-in land have represented lesser proportion of irrigated area. However, fixed rent form of lease was found to be high in high irrigated states such as Punjab and Haryana.

INTRODUCTION

Land continues to be of enormous economic, social, and symbolic relevance in our country, and the nature of ownership of land plays an important role in agricultural production ─ just as the documentation of ownership and access to land is the core of the livelihood of a vast majority of the poor. In this context, land transfers and pattern of cultivation need to be understood in rural areas. Apart from this, tenancy is an important production arrangement in agriculture because the tenancy system facilitates transfer of land from owners, who are unable to cultivate their land due to economic or personal reasons, to those who want to augment their land resources to make best use of the labour and other available resources. There are two conditions in the rural labour market which can lead to the existence of tenancy in rural economy: First, on the demand side, labour households may find that they are better off leasing-in land rather than seeking uncertain wage employment in the rural labour market; if there is employment uncertainty in the labour market, tenancy may be a preferred alternative (Newbery, 1975; Newbery and Stiglitz, 1979). Second, on the supply side, where scarcity of labour exists, particularly during peak seasons, land owners may prefer to lease-out land rather than depend on wage labour. In these conditions, tenancy plays an important role in the adjustment of resources such as land, labour, animals, and agricultural instruments.

Some studies tried to examine the impact of irrigation on the extent of tenancy. They have pointed out that irrigation has a positive effect on the extent of tenancy, which is found to be high in irrigated areas (Bardhan, 1979; Sharma, 2010; Singh, 2000; Subramanyam, 2000; Narayana and Nair, 1994). The macro-level evidence from the NSS data state level analysis has brought out detailed information that the leased-in area has a positive effect on irrigation in major states of India (Sharma, 2010; Sukhpal Singh, 2000). Similarly, micro-level studies have

also revealed that "the percentage of area under tenancy will be higher in areas where there is larger irrigation" (Bardhan, 1979, pp.1508).

Empirical evidences also show that irrigation has led to the displacement of shared tenancies by fixed rent contracts. Bhardwaj and Das (1975) reported that fixed cash rentals were displacing the traditional sharecropping in Orissa, especially in irrigated areas where High Yielding Varieties (HYVs) are extensively cultivated. However, under rain-fed situations, sharecropping seems to be a preferred arrangement (Rao, 1971). Fixed money/kind is the most dominant form of lease in the relatively developed states such as Punjab and Haryana (Haque, 2001). Studies in the agriculturally developed states/regions such as Punjab, Haryana, and Western Uttar Pradesh, have brought out increasing incidence of fixed rent tenancy, and participation of medium and large households in the lease market as lessees (Singh, 1989; Bhalla, 1983; Srivastava, 1989; Siddiqui, 1999). It is observed that cash rent tenancy is important in oilseeds and cotton growing areas, while fixed kind tenancy is important in plantation crop areas (Laxminarayana and Tyagi, 1977). On the other hand, where irrigation is not assured, a form of shared tenancy is observed to be high (Bardhan, 1976), and where output risk is high, there is a greater possibility of the existence of shared tenancy for risk-sharing between the two agents (Newbery and Stiglitz, 1979). The present study focuses on the nature of irrigation and tries to find out if it has any association with the extent of leased-in land across the states and the terms of lease.

EXTENT OF TENANCY

The National Sample Survey (NSS) estimates of different rounds, despite their limitations, form the basis for many discussions on the trends in the extent of leased-in land and forms of lease for the last three decades. The survey estimates the percentage of tenant holdings (holdings in the form of land) and the percentage share of tenanted land in the operated area for 15 major states[i]. One of the important data problems generated in the study is related to the formation of some new states in recent times. The State of Bihar was bifurcated into Bihar and Jharkhand, the State of Madhya Pradesh was bifurcated into Madhya Pradesh and Chhattisgarh, and the State of Uttar Pradesh (UP) was bifurcated into UP and Uttaranchal, in the year 1999. Given the prominence of cross-sectional analysis in the study, we do not think this adds major errors into the analysis. For the purpose of analysis, the study considers only the proportion of land under tenancy and not the tenant holdings, based on the data from NSS for the last three decades, i.e., 1981-82, 1991-92, and 2002-03.

The data for the extent of leased-in land are available from for 1953-54 (8th Round), 1961-62 (17th Round), 1970-71 (26th Round), 1981-82 (37th Round), 1991-92 (48th Round), and 2002-03 (59th Round). Historically, the extent of tenancy was observed to be changing in a majority of the states between 1953-54 and 2002-03; this phenomenon was observed across all the 15 major states. According to Sanyal (1972), there was a decline in agricultural tenancy during the period from 1953-54 to 1961-62. The 1953-54 data is not always comparable with later data because of the re-organization in the mid-50s, which changed the geographical boundaries of many states. Another study by Bardhan (1976) stated that between 1953-54 and 1970-71, the extent of tenancy declined in most states, with notable exceptions in Bihar, Orissa and UP, where it slightly went up. All the above-mentioned studies have expressed the same reason for the decline in the extent of tenancy ─ under-reporting the fear of tenancy reforms and due to modern

methods of cultivation introduced during these periods. Comparing the data during 1960-61 and 1970-71, it is observed that the extent of tenancy significantly declined in Punjab, Haryana, Kerala, Jammu and Kashmir, Tamil Nadu, Karnataka, Maharashtra, and Gujarat due to implementation of land reforms. According to Sharma (1995), the decline in the magnitude of tenancy between 1953-54 and 1971-72, at the all-India level, was particularly sharp in respect of large holdings, followed by small holdings. However in states such as Orissa, Uttar Pradesh, and Bihar, tenancy was observed to have actually increased ─ the increase was relatively more in large holdings in Orissa and medium holdings in Uttar Pradesh, while in Bihar, the sub-marginal and marginal holdings leased-in were higher as a proportion of the operated area during 1971-72, compared to 1983-54. On the other hand, the extent of tenancy significantly increased in UP, Bihar, Orissa and Assam due to high concentration of landholdings (Sanyal, 1972). Recent studies (Haque, 200) have revealed that the proportion of leased-in area increased between 1981-82 and 1991-92 in most of the states due to increasing leasing-in of large holdings. Furthermore, the incidence of tenancy in 1991-92 was practically lower in all the states compared to that of 1971-72 due to under-reporting.

Table-1: Proportion of Leased-in Area to Operated Area in Various States

States	Leased-in area as a percentage of the total operated area		
	1981-82	1991-92	2002-03
Andhra Pradesh	6.23	9.57	9
Assam	6.35	8.87	5.3
Bihar	10.27	3.91	8.9
Gujarat	1.95	3.34	5.1
Haryana	18.22	33.74	14.4
Karnataka	6.04	7.43	3.6
Kerala	2.05	2.88	4
MP	3.56	6.3	3.6
Maharashtra	5.2	5.48	4.7
Orissa	9.92	9.48	13
Punjab	16.07	18.83	16.8
Rajasthan	4.31	5.19	2.8
Tamil Nadu	10.92	10.89	6
Uttar Pradesh	10.24	10.49	9.5
West Bengal	12.34	10.4	9.3
All India	7.18	8.28	6.5

Source: Based on 37th, 48th and 59th Rounds of NSSO, Govt. of India, Report Nos. 331, 407 and 492.

However, there exist large inter-state variations in the proportion of land under lease. During the reference period, 1981-82, Haryana had the highest proportion of land under tenancy followed by Punjab. The lowest proportion of land under tenancy was in Gujarat followed by Kerala. During the second period also Haryana and Punjab had most of the operated land under tenancy; and by the third period, the State of Punjab was leading, with the highest proportion of land under tenancy, followed by Haryana, Karnataka and Kerala, which had the lowest proportion of

land under tenancy. The percentage of leased-in area in 2002-03 was highest in Punjab (17 per cent) and Haryana (14 per cent) ─ the same two states that had reported the highest percentage of leased-in area in 1981-82 and 1991-92. Orissa also reported a high percentage (13 per cent) of leased-in area in 2002-03, while in all other major states the percentage was less than 10. The percentage of leased-in land was lowest in the states such as Madhya Pradesh (3.6 per cent), Karnataka (3.6 per cent), Kerala (4 per cent), to a minimum of 2.8 per cent in Rajasthan[ii]. The two states, Haryana and Punjab, have consistently had a high proportion of land under tenancy during all the three reference periods. Between these two states, Haryana witnessed major fluctuations in the proportion of land under lease while Punjab witnessed minor fluctuations. These two states are generally identified as the agriculturally developed states, with large extent of land under tenancy, and also for the introduction of Green Revolution in agricultural practices. Included in the low tenancy states are Kerala and Gujarat during two reference periods, and Kerala and Karnataka during one reference period. The lower proportion in Kerala may be due to its lower proportion of land under operation and relatively successful tenancy regulations. Gujarat is generally identified as a non-agricultural state and so may be witnessing a lower extent of land under tenancy.

For the reference year 1981-82, the proportion of land leased-in (leased-in area as a proportion of the total operated land) was 7.18 per cent. This proportion increased to 8.28 per cent by 1991-92 and decreased to 6.5 per cent by 2002-03, due to the decrease in operated land as a result of unconditional weather and rainfall. So the proportion of land under tenancy was below 10 per cent of the operated land during the reference period, and showed a fluctuating tendency. One of the interesting features observed in Indian agriculture is that the proportion of land reported under tenancy is different in each state, i.e., there is a wide inter-state variation in the extent of land under tenancy among the 15 major states in India. Between the first and second periods, the land operated increased by approximately 4.5 per cent and the land under tenancy increased by less than 1 per cent, while there was a 5.4 per cent decline in the area under operation, and about 2 per cent decline in the area under cultivation. An expansion in the area under operation leads to an increase in the area under lease, but a decline in the area under operation leads to a more than proportionate decline in the area under tenancy. So when there is an increase in the operated land there is a larger proportion of land under owner operation when compared to lease; but when there is a decline in the area operated, the number households operating on lease declines at a higher rate, which may be due to the fact that the owner continues to operate but the lease households might not be demanding land in the market, leading to a decline in the proportion of leased-in land.

Table-2: High Tenancy and Low Tenancy States during 1981-82, 1991-92, and 2002-03

Years	High Tenancy States (HTS)	Low Tenancy States (LTS)
1981-82	Haryana, Punjab, West Bengal, Tamil Nadu, Bihar, UP & Orissa	Assam, AP, Karnataka, Maharashtra, Rajasthan, MP, Kerala & Gujarat
1991-92	Haryana, Punjab, Tamil Nadu, UP, West Bengal, AP, Orissa & Assam	Karnataka, MP, Maharashtra, Rajasthan, Bihar, Gujarat & Kerala
2002-03	Punjab, Haryana, Orissa, UP, West Bengal, AP & Bihar	Tamil Nadu, Assam, Gujarat, Maharashtra, Kerala, MP, Karnataka & Rajasthan

Source: 37th, 48th and 59th Rounds of NSSO, Govt. of India
Report Nos: 331, 407 and 492.

The top seven states in the list are considered as high tenancy states and the rest as low tenancy states. Among the high tenancy states, Haryana and Punjab occupied the top two positions for all the three decades. West Bengal, UP and Orissa are also observed to be under the high tenancy group in the three decades. Bihar was in the high tenancy group during 1981-82, but the extent of tenancy was reduced after 1981-82 ─ the reasons may be economic and political. Again during 2002-03 the state joined the high tenancy group. Andhra Pradesh was not in the group of high tenancy states during 1981-82, but it was classified under this group during 1991-92 and 2002-03. Gujarat and Kerala were the least tenancy states among the low tenancy group in 2002-03. Among the high tenancy states, Punjab and Haryana account for only 8.07 per cent of the total tenant households. The rest of states, i.e., Tamil Nadu, West Bengal, Uttar Pradesh, Bihar, Orissa, and AP accounted for 57.75 per cent of the total number of tenant households in the country ─ all of these recorded higher than average incidence of tenancy. Maharashtra and Karnataka also have pockets of high tenancy, and a large number of tenants, though they do not fall in the high tenancy category.

TERMS OF TENANCY

The present section discusses the distribution of the terms of lease (fixed money, fixed produce, share of produce, and others) over the states over the three time periods. It attempts to examine whether the terms of lease have changed over time and across the states, and also looks for any statistical regularity in the changes in the terms of lease. The terms of lease have been classified here into four groups as is generally done in the literature. They are: shared tenancy, fixed rent in cash, fixed rent in kind, and 'others', which includes service contract, share of produce together with other terms, under usufructuary mortgage, and lease from relatives under no specified terms. We observe that sharecropping continues to be the dominant form of lease contract over the three periods. During 1981-82, sharecropping forms nearly 42 per cent of the contracts which was reduced to 35 per cent by 1991-92, and later increased to 40 per cent by 2002-03. Fixed rent in kind as well as in cash witnessed a significant increase during all the periods. The terms of lease identified as 'others' has shown a significant fall from 41 per cent in 1981-82 to nearly 10 per cent by 2002-03.

Table-3: Percentage Distribution of Area Leased-in by Terms of Lease for each Major State (during 1981-82, 1991-92 and 2002-03).

States	Year	Fixed Money	Fixed Produce	Share of Produce	Others	All
Andhra Pradesh	2002-03	31.6	37.9	24	6.6	100
	1991-92	25.9	26.8	28.9	18.4	100
	1981-82	13	11.1	8.8	67.1	100
Assam	2002-03	15.8	3.6	55	25.6	100
	1991-92	17	4	27.8	51.2	100
	1981-82	15.4	8.4	35.3	40.9	100
Bihar	2002-03	12	17.5	67	3.5	100
	1991-92	9.5	12.8	43.5	34.2	100
	1981-82	6.5	3.6	73.3	16.6	100
Gujarat	2002-03	10.7	46.3	37.9	5.1	100
	1991-92	39.9	1.6	23.7	34.8	100
	1981-82	5.1	0.5	9.7	84.6	100
Haryana	2002-03	71.2	9.8	15.8	3.2	100
	1991-92	61.4	5.2	19.9	13.5	100
	1981-82	24.2	10.8	41.2	23.8	100
Karnataka	2002-03	32.4	41.1	24.8	1.7	100
	1991-92	20.4	14.7	28.6	36.3	100
	1981-82	3.6	4.7	29.3	62.4	100
Kerala	2002-03	39.9	7.5	12	40.8	100
	1991-92	15.9	0	2.1	82	100
	1981-82	3.4	0	13.2	83.9	100
Madhya Pradesh	2002-03	18.3	32.5	39	10.2	100
	1991-92	15.3	21.4	24.9	38.4	100
	1981-82	1.7	1.1	27.8	69.4	100
Maharashtra	2002-03	26.2	9	37.5	27.3	100
	1991-92	36.2	6.5	20.9	36.4	100
	1981-82	11	2.3	48.5	38.2	100
Orissa	2002-03	11.1	7.8	73	8.1	100
	1991-92	19.7	4.7	50.9	24.7	100
	1981-82	5.1	8.1	42	44.8	100
Punjab	2002-03	79.2	1.5	15.3	4	100
	1991-92	49.2	18.2	11.3	21.3	100
	1981-82	42.1	4.6	39.9	13.4	100
Rajasthan	2002-03	35	17.7	39.3	8	100
	1991-92	15.2	19.4	23.4	42	100
	1981-82	3.5	1.4	21.6	73.5	100
Tamil Nadu	2002-03	32	30	22.9	15.1	100
	1991-92	32.4	20.5	16.1	31	100
	1981-82	19.2	19.9	36.5	24.4	100

Uttar Pradesh	2002-03	23.8	12.9	52.9	10.4	100
	1991-92	9.2	15.2	46.5	29.1	100
	1981-82	8.6	4.9	50.1	36.4	100
West Bengal	2002-03	23.7	28.5	34.9	12.9	100
	1991-92	8.6	11.7	46.5	33.2	100
	1981-82	2.8	11.9	55.6	29.7	100
India	2002-03	29.5	20.3	40.3	9.9	100
	1991-92	19	14.5	34.4	32.1	100
	1981-82	10.9	6.3	41.9	40.9	100

Source: 37th, 48th and 59th Rounds of NSSO, Govt. of India.
Report Nos: 331, 407 and 492.

From Table 3, it can be observed that during 1981-82, the distributions for the individual states reveal a wide variation. Sharecropping is observed to be the most dominant form of lease in the states of Andhra Pradesh, Assam, Bihar, Karnataka, Madhya Pradesh, Orissa, Rajasthan, Uttar Pradesh, Tamil Nadu, and West Bengal during this period. These states are relatively under-developed from the point of view of agriculture. In the relatively developed states of Punjab and Haryana, fixed money/cash is the main term of lease, and except in Kerala, in all other states, crop-sharing tenancy accounts for a significant part of the leased-in area. There were also a significant number of 'other' forms of lease in most during 1981-82.

Further, Table 3 indicates that Haryana and Punjab are the two most agriculturally advanced states in the country, and the most prevalent forms of contracts are fixed rent in cash. Over 61 per cent and 49 per cent of the tenanted land was contracted for fixed money in Haryana and Punjab respectively. In Tamil Nadu and Andhra Pradesh, the, 'fixed rent' tenancies were observed to be the major components of the leased-in area. The combined share of 'fixed money' and 'fixed produce' in the total leased-in area was about 53 per cent. Sharecropping was found to be the most prevalent form of tenancy in Orissa (51 per cent), West Bengal (46 per cent), Uttar Pradesh (46 per cent), and Bihar (44 per cent). We observe that in Kerala, only 11.23 per cent of the leased-in area was under crop-sharing tenancy, and there is a considerable area under plantation crops. Moreover, fixed cash tenancy is seen to be commonly practiced in the state, while fixed produce is particularly negligible.

It is also observed that predominance of paddy in the area under crop-sharing tenancy is as high as 46.5 per cent in West Bengal and Uttar Pradesh, 43.5 per cent in Bihar, while the same is about 23.4 percent in Punjab, and 20 per cent in Haryana. Crop-sharing arrangements seem to be the common form of leasing-out land in predominantly paddy areas, particularly in the mono-crop areas. However, there was a significant decline in this aspect from 1981-82 to 1991-92 in the states of West Bengal, Uttar Pradesh, Tamil Nadu, Haryana, Punjab, and Bihar. Two states ─ Orissa and Rajasthan ─ witnessed an increased trend of sharecropping from 1981-82 to 1991-92. Cash-rent tenancy was important in Karnataka (20 per cent), Andhra Pradesh (25.9 per cent), Maharashtra (36.2 per cent), Gujarat (39.9 per cent), Haryana (61.4 per cent), and Punjab (49.2 per cent) in 1991-92. Most of these states witnessed considerable area under oilseeds and cotton during this period and cash-rent tenancy seems to be an important form of tenancy in areas where oilseeds and cotton are important crops. In Punjab also, a large number of persons engaged in services and professions were observed to have given their land on cash rent. Cash-rent tenancy

also seems to be relatively more important to big farmers, and it is observed to have increased in paddy-growing areas.

Fixed produce or fixed kind rent seemed to be important in Kerala (36.6 per cent) during 1971-72, but it suddenly disappeared. It also seemed to be important in several states such as AP (26.8 per cent), Madhya Pradesh (21.4 per cent), and Tamil Nadu (20.5 per cent). However it was observed to have increased, at the all-India level, between 1971-72 and 1991-92. Miscellaneous types of tenancies are observed to be important in Rajasthan (53 per cent), Madhya Pradesh (45.6 per cent), Assam (25.5 per cent), Gujarat (30 per cent), Kerala (36.5 per cent), Orissa (37.2 per cent), and UP (32.9 per cent). If one summarizes the inter-state variations in tenancies, it appears that crop-sharing tenancy is predominant in paddy and wheat growing areas; cash-rent tenancy is predominant in oilseeds and cotton growing areas; and fixed kind rent or fixed produce tenancy is predominant in plantation crop areas. According to Rao (1971), crop-sharing tenancy is predominant in areas of relative economic certainty (paddy areas, which also happen to command more irrigation than other crops), where the scope for decision making is limited; whereas cash-rent tenancy is more important in areas with relative economic uncertainty.

The changes in the terms of tenancy are presented in the Table 4. The proportion of operated area leased-in under shared tenancy is seen to decline continuously in about 10 major states. In the remaining states, it is seen to decline between 1971-72 and 1981-82, and increase between 1981-82 and 1991-92. The proportion of operated area leased-in under fixed rent tenancy, especially under fixed money, also exhibited a similar trend. However, in some states, notably in Andhra Pradesh, Gujarat, Tamil Nadu, and West Bengal, the proportion of operated area leased-in under 'other' terms increased during the 70s but declined thereafter.

IMPACT OF IRRIGATION ON LAND LEASE MARKET

The research on irrigation has identified predominantly two major effects on the outcome of agricultural production: On the one hand it increases the yield per hectare, and on the other hand it affects agrarian change. The study focuses on the aspect that the extent of leased-in area is high in high irrigated states. Moreover, the modes of irrigation are varied in terms of patterns of land ownership and control. When irrigation is privately owned, the landless and small peasants cannot enter the land lease market and hence, the extent of lease may be less or under developed in states having private irrigation. On the other hand, assured irrigation may change the agrarian relations – all farmers will receive water for irrigation, which leads to low variability in yield as irrigation is certain. This is expected to benefit all classes of farmers in the command area who have access to irrigation without any substantial cost for the access. However, though there is equal access to irrigation, land distribution is unequal, and the agrarian structure in public irrigated areas changes with the type of owners. A matter of concern is that the number of owner cultivators is decreasing, as more and more farmers are shifting to non-agriculture activities without shredding their ownership but continuing as absentee landowners.

The provisions for irrigation can affect the supply side of the land lease market in two ways: first, given the allocation of land-labour resources among the households, irrigation shifts the marginal product curve of labour outwards, leading to a potential for higher usage of land and in turn a decrease in the land leased by the households. This can decrease the proportion of land

leased-out. Empirical evidence shows that the farmers who were earlier leasing-out their lands are now taking to self-cultivation after the provision of irrigation facility. With the advantages of irrigation (technology), self-cultivation should increase the profitability of farming. In this condition, land owners are likely to resume land for self-cultivation of otherwise leased-out land (Mellor, 1976). Second, the provision of irrigation has the potential to increase non-agricultural employment in the economy. Agricultural output and irrigation stability would be important factors that generate viable and long-term opportunities for diversification towards non-agricultural activities (Basant, 1994). Basant and Kumar (1994) in their study pointed out that irrigation plays a positive role in the life of workers who shift from agricultural activities to non-agricultural activities during slack seasons.

The variations in tenancy are generally sought to be explained by the proportion of irrigated area. Parthasarathy and P. Rao (1969) pointed out that there was a positive relation between the extent of tenancy and the proportion of irrigated area. He has expressed that the high irrigated district of Godavari has high proportion of tenancy areas whereas Nizamabad has the lowest proportion of tenant areas because of the low proportion of irrigated area. State level NSS data shows that high irrigated states have a larger proportion of area under tenancy (see below table 4).

Table-4: High Tenancy States and High Irrigated States in India

High Tenancy States		
1981-82	1991-92	2002-03
Haryana (18.22)	Haryana (33.74)	Punjab (16.8)
Punjab (16.07)	Punjab (18.83)	Haryana (14.4)
West Bengal (12.34)	Tamil Nadu (10.89)	Orissa (13)
Tamil Nadu (10.92)	UP (10.49)	UP (9.5)
Bihar (10.27)	West Bengal (10.4)	West Bengal (9.3)
UP (10.24)	AP (9.57)	AP (9)
Orissa (9.92)	Orissa (9.48)	Bihar (8.9)
High Irrigated States		
Punjab (78)	Haryana (72.98)	Punjab (95)
Haryana (66.2)	Punjab (72.93)	Haryana (70)
UP (59.59)	UP (67.06)	Bihar (70)
Tamil Nadu (46.98)	Tamil Nadu (47.46)	UP (67)
Gujarat (26.47)	West Bengal (44.87)	Tamil Nadu (61)
Bihar (24.82)	Bihar (41.09)	West Bengal (43)
West Bengal (22.29)	AP (35.73)	AP (34)

Source: 37th, 48th and 59th Rounds of NSSO, Govt. of India.
Report Nos: 331, 407 and 492.

Out of the 15 major states, the top seven states in the list are considered as high tenancy states as well as high irrigated states. The high tenancy states and high irrigated states are the same during the three reference periods except for Orissa. Orissa is a peculiar state that was in the high tenancy group during all three reference years but not in the high irrigated states group. Tenancy was high here due to the high concentration of land and a large number of traditionally non-cultivating households. Gujarat is in the high irrigated group during 1981-82 but not in the high

tenancy group due to the high non-agricultural activities in the state. Bihar was under the high tenancy group during 1981-82, but the extent of tenancy was reduced after 1981-82; again during 2002-03 the state joined the high tenancy group. Andhra Pradesh was not in the group of high tenancy states during 1981-82, but it was classified under this group during 1991-92 and 2002-03.

Table-5: High Irrigated States and Terms of Lease

1981-82			1991-92			2002-03		
High Irrigated States	FR	SC	High Irrigated States	FR	SC	High Irrigated States	FR	SC
Punjab (78)	46.7	39.9	Haryana (72.98)	66.6	19.9	Punjab (95)	80.7	15.3
Haryana (66.2)	35	41.2	Punjab (72.93)	67.4	11.3	Haryana (70)	81	15.8
UP (59.59)	13.5	50.1	UP (67.06)	24.4	46.5	Bihar (70)	29.5	67
Tamil Nadu (46.98)	39.1	36.5	Tamil Nadu (47.46)	52.9	16.1	UP (67)	36.7	52.9
Gujarat (26.47)	5.6	9.7	West Bengal (44.87)	20.3	46.5	Tamil Nadu (61)	62	22.9
Bihar (24.82)	10.1	73.3	Bihar (41.09)	22.3	43.5	West Bengal (43)	52.2	34.9
West Bengal (22.29)	14.7	55.6	AP (35.73)	52.7	28.9	AP (34)	69.5	24

Source: 37th, 48th and 59th Rounds of NSSO, Govt. of India. Report Nos: 331, 407 and 492.
Note: FR means Fixed Rent and SC means Sharecropping.

In 1981-82, sharecropping was dominant in the high irrigated states except Punjab (46.7 per cent) and Tamil Nadu (39.1 per cent); and fixed rent increased in the high irrigated states such as Haryana (66.6 per cent), Punjab (67.4 per cent), Tamil Nadu (52.9 per cent), and AP (52.7 per cent). However, sharecropping was still dominant in UP (46.5 per cent), West Bengal (46.5 per cent), and Bihar (43.5 per cent) during 1991-92. This changed in 2002-03 – all high irrigated states had fixed rent as the dominant form of lease in Punjab (80.7 per cent), Haryana (81 per cent), Tamil Nadu (62 per cent), West Bengal (52.2 per cent), and AP (69.5 per cent); however, sharecropping was still pre-dominant in UP (52.9 per cent) and Bihar (67 per cent).

DETERMINANTS

Though the extent of tenancy is affected by many factors in the rural land lease market, irrigation is one of the important factors that determine the extent of leased-in area and terms of lease. For the purpose of the study we used regression analysis to understand the factors influencing the magnitude of tenancy. In this analysis, the proportion of leased-in area was used as the dependent variable[iii] and factors such as the area irrigated by canal, tanks, tube wells and wells were used as independent variables. The regression results, presented in Table 6, show that factors such as area of canal irrigation, tank irrigation, and tube well irrigation positively affected the proportion of leased-in area; the area of canal irrigation affected the proportion of leased-in area positively and significantly, while well irrigation had a negative relationship with the proportion of leased-in area.

Table-6: Determinates of Tenancy: Results of Regression Analysis

Explanatory variables	Dependent variable Leased-in area
Constant	3.68 (3.88)
Canal	0.49* (6.91)
Tank	0.32 (1.14)
Tube well	0.50 (1.99)
Well	-0.18 (-2.16)
R^2	0.74

*Note: * denotes levels of significance at 1 per cent.*
Figures in parentheses are 't' values.
Number of observations = 45; 15 each for 1981-82, 1991-92 and 2002-03.

The independent variables are the percentage of agricultural labour, non-cultivating households, and canal-irrigated area. For the analysis, we have used pooled data for the three reference periods. The regression results show that the impact of proportion of agricultural labourer households on the extent of lease is negative and insignificant. The proportion of non-cultivating households showed a positive relationship with the extent of lease, which was statistically insignificant. The analysis also shows that the impact of canal irrigation on the extent of lease is positive and significant. In the case of sharecropping as dependent variable, non-cultivating households were negative and significant, while for agricultural labourers, the result was positive and significant.

Table-7: Determinants of Terms of Tenancy: Results of Regression Analysis

Explanatory variables	Dependent variables Sharecropping	Fixed money	Fixed produce
Constant	37.85 (7.47)	8.51 (1.91)	7.95 (2.34)
Canal	0.75 (0.19)	0.42 (1.24)	-0.07 (-0.30)
Tank	1.19 (078)	-0.74 (-0.56)	1.68 (1.64)
Tube well	-0.07 (-0.51)	0.48* (3.88)	0.08 (0.85)
Well	-1.05 (-2.34)	0.65 (1.66)	0.32 (1.06)
R^2	0.13	0.39	0.14

*Note: * denotes levels of significant at 1 per cent.*
Figures in parentheses are 't' values.

Number of observations = 45; 15 each for 1981-82, 1991-92 and 2002-03.

Regarding the terms of tenancy, Table 7 shows that the effects of area of canal irrigation and tank irrigation have a positive effect whereas tube well and well irrigation had negative effect on the proportion of operated area leased-in under sharecropping. The proportion of tube well irrigated area had a positive and significant effect on the proportion of area under fixed money. The effect of area under tank irrigation was found to be negative whereas the proportion of area irrigated by canal and wells had a positive effect on the proportion of area under fixed money. With regards to fixed produce, the effect of tank, tube well, and well irrigation was positive, and the area of canal irrigation had a negative association with the proportion of area under fixed produce.

CONCLUSIONS

The study found that leased-in land as a percentage of the operated area varied widely from state to state over the period, ranging from 1.9 per cent in Gujarat to 18.22 per cent in Haryana (in 1981-82); from 2.9 per cent in Kerala to 33.7 per cent in Haryana (in 1991-92); and from 3.6 per cent in Karnataka to 16.8 per cent in Punjab (in 2002-03); in general, it was found to decline from 1991-92 to 2002-03. The study found that the states of Haryana and Punjab were in the top position in the country, in terms of high proportion of leased-in extent as well as high proportion of irrigated land. The states with low proportion of leased-in land have represented lesser proportion of irrigated area. However, fixed rent form of lease was found to be high in high irrigated states such as Punjab and Haryana.

In the case of regression analysis reveals that the share of land under canal irrigation is statistically significant to the extent of leased-in land. The variables such as tank and tube well irrigation witnessed positive effect on with the extent of leased-in land, though not statistically significant. In the case of terms of lease, the effects of area of canal irrigation and tank irrigation have a positive effect on the proportion of operated area leased-in under sharecropping. The proportion of tube well irrigated area had a positive and significant effect on the proportion of area under fixed money. With regards to fixed produce, the effect of tank, tube well, and well irrigation was positive, and the area of canal irrigation had a negative association with the proportion of area under fixed produce. We also observed the trend on terms of lease: most of the states including Andhra Pradesh, Haryana, Kerala, Punjab, and West Bengal have moved towards fixed rent form of lease, while some states such as Bihar, Orissa, Uttar Pradesh, Rajasthan, and Assam still have sharecropping as a dominant lease form; and in states like Kerala and Maharashtra, ‘other terms’ of lease are dominant, which are reportedly not proper forms of lease.

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NOTES

1. Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal.

2. NSSO 59th Round and Report No. 492 on "Some Aspects of Operational Holding in India", 2002-03.

3. For our analysis, we define as dependent variables the extent of leased-in land in terms of the actual percentage of land leased-in by the total area of operated land in 15 major states for three reference periods, i.e., 1981-82, 1991-92 and 2002-03, as a pooled data.

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