CHAPTER 2

REVIEW OF LITERATURE ON LAND LEASE MARKET AND IRRIGATION

2.0. Introduction
Tenancy is generally seen as an institution that arises under incompletely formed markets and/or when the transformation to the capitalist economy is not complete. The literature on tenancy concentrates on two issues, namely the forms of contractual arrangements, and the factors influencing the extent of land under tenancy. The first issue continues to baffle economic theory, discussed it in earlier chapter while the second aspect has seen some systemic results. In this chapter we would like to focuses on second aspect that impact of irrigation on land lease market. In post-independent India, one of the important instruments to initiate change has been the public provision of irrigation. The state initiated the construction of large dams, which in some places were multi-purpose: provision of irrigation, production of electricity, protection from floods, etc. The provision of assured water not only reduced dependence on nature but also included uncertainty factors unlearned by nature on the production system in the process. A related side effect of the provision of irrigation was the expansion of net cropped area.

In this background, this chapter attempts to understand the debates on tenancy including the possible impact of irrigation on the land lease market. This chapter is divided into four sections along with introduction. The second section focuses review on issues related on the impact of irrigation on rural economy. The third section presents issues on irrigation and its impact on land lease market and last section discusses the conclusions of the chapter.

2.1. Provision and Impact of Irrigation
Irrigation is one of the factors that contribute towards enhancing the levels of economic activity in a major way (Vaidyanathan, 1986). More particularly, the research on irrigation has identified predominantly two major effects of irrigation on the outcome of agricultural
production. On the one hand, it increases the yield per hectare, and on the other hand, it reduces the variability in yield (Majumdar et al., 1988). Nature-based uncertainty is reduced by irrigation if double cropping is practiced at the same time. In India, several researchers such as Vaidyanadan (1987) and Dhawan (1985) have touched upon different aspects of how irrigation may contribute to agricultural production. Many of the studies (Krishnamurthy, 1959; Jha, 1967; Mishra and Vivekanand, 1979; Bromley, 1982) have adopted a simple production function approach to show quantitatively how irrigation raises agricultural productivity under the *ceteris paribus* condition. The studies observed the differential impact of irrigation on different socio-economic conditions of people (Rajpurohit and Koilpilla, 1979; Alexander, 1979). Irrigation has led to an increase in agricultural productivity, rise in the standard of living of rural people, and induced social change and modernization. Some studies supported that irrigation brings prosperity to all of the command area. Irrigation development requires a successful blend of irrigation technology and appropriate institutions (Coward Jr., 1980), leading to enhancement of the decision-making abilities in agriculture (Bromley, 1982), which result in an increase in agricultural wages, more employment opportunities, and higher yield per acre.

Another set of studies have analyzed the impact of irrigation on yield, i.e., agricultural production. Pal (1985) has explained the nature of irrigation among the different sources of irrigation which would have a greater impact on yield per acre. However, tube well irrigation is generally considered better than other sources. Thus, tube well irrigation increases the possibility of double and multiple cropping under its command area. Some studies by Narain and Roy (1980), Mehra (1981), and Dhawan (1983b) have found that tube well irrigation increases productivity more than any other source. He found that the productivity under tube well irrigation is much superior to other sources of irrigation in Andhra Pradesh, Tamil Nadu, Punjab and Haryana. Irrigation is an instrument with which rural transformation and agricultural diversification can take place (Nair, 2005). A large number of studies have also looked into the relation between irrigation, physical yields and cropping intensity (Rao, 1975; 1976; Bharadwaj, 1974; Vaidyanathan, 1978). Irrigation can be a public provision (canals, tanks) or a private provision (wells and tube wells); the nature of irrigation plays an important role in the rural economy, not only impacting productivity.
but also employment and wages. The importance of irrigation is thus one that boosts productivity, employment and wages.

The present study tries to explain the relation between the nature of irrigation and the extent of land leased-in and land leased-out; and particularly on how irrigation influences in leasing-in and leasing-out the extent of land. At the same time, it also looks into the impact of irrigation on rural land lease market. A few studies tried to examine the relationship between irrigation and land lease market. The tenancy institution is predominant seen only in the irrigated areas (Bardhan, 1979; Subramanyam, 2000).

The post-independence period has witnessed a massive expansion in the area irrigated. In the 1950s the proportion of land irrigated was around 17.11 per cent. This proportion has increased to around 42.86 per cent by 2005-06. Table 2.1 provides some evidences of the increasing emphasis of irrigation. The State has taken the initiative for the expansion of the irrigation potential.

**Trends in Irrigation**

**Figure- 2.1: Trends in Irrigation**

![Trends in Irrigation](image)

Source: Statistical Abstract of India.
Figure 2.1 shows the trends of three major irrigated sources, i.e., tube wells, canals and tanks. The traditional irrigation systems are namely the tanks and wells; and modern irrigation systems are canal and tubewell. A salient feature of public provision of irrigation, namely the canal irrigation systems is an equity among the users of the land which in not true for all the rest of the source of irrigation. Tube well and canal irrigation in India shows an increasing trend over the period of time from 1950-51 to 2005-06. However, the rate of increase in the tube well irrigation is much sharper than the rate of increase in the area under canal irrigation. The area under tube well irrigation in India has witnessed a rapid increase after the 1970s. But after 2000-01 the area under tube well irrigation witnessed a stagnant trend. The trend of area under canal irrigation witnessed a stagnant trend after 1990s. On the other hand, the area under tank irrigation witnessed a declining trend. There was hardly any increase found in the area under tank irrigation after the 1960s. This shows that the private initiative for irrigation has increased in India while the government investment in the irrigation sector has declined and the traditional source of irrigation (tank) witnessed a further declining trend.

Table 2.1 shows the percentage of area irrigated by different sources during 1981-82, 1991-92, and 2002-03 in 15 major states of India. We see that in some states like Assam, Bihar, Karnataka, Kerala, Maharashtra, Orissa, Punjab and Tamil Nadu, the total irrigated area has increased from 1981-82 to 2002-03; while in states like Gujarat, Haryana, Rajasthan and West Bengal, the total irrigated area has declined. Andhra Pradesh, Madhya Pradesh and Uttar Pradesh are the states that have not shown much difference in percentage of irrigated area during the period.
Table 2.1: The Percentage of Irrigated Area by Different Sources during 1981-82, 1991-92 and 2001-02 in 15 Major States in India

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

When the distribution of irrigated land according to its sources across the states and over a period of time are considered, an interesting pattern appears (Table 2.1). Canals constitute the major source of irrigation over all periods and across all states. Out of the total proportion of area irrigated, canal irrigation accounted for 32.87 per cent in 1981-82; 26.04 per cent in 1991-92; and 22.22 per cent in 2002-03 — It is observed that the proportion of area irrigated through canals, has declined from 1981-82 to 2002-03. Canal is a predominant source of irrigation in Orissa, Haryana, Punjab and MP. If we look across the states, the proportion of canal irrigation during the three decades appears to be declining in states like Haryana, Punjab, MP, Maharashtra, Tamil Nadu, West Bengal and UP (from 1981-82 to 2002-03). The main reason for the decline is rainfall. However, Orissa, Bihar, Gujarat saw an increase in irrigated area through canals during the last three decades due to the coming up of major irrigation projects. We see that states like Andhra Pradesh, Tamil Nadu, West Bengal, Karnataka and Orissa are familiar only with tank irrigation. Even though, there was a greater decline in all states, yet the area irrigated by tanks has decreased in these states because of the fact that most of the tanks have lost their holding capacity. The percentage of...
irrigated area by tanks was only 2.77 percentages in 2002-03. There was no tank-irrigated system in some states like Assam, Gujarat and Rajasthan. It is further observed that tube wells are the prime source of irrigation in India. These accounted for about 52.78 per cent of the area irrigated in 2002-03. The area irrigated by tube wells has been increasing during the last three decades (1981-82 to 2002-03). The number of tube wells has registered a significant increase over the last three decades. Bihar, Haryana, Punjab and UP have more than 70 per cent of area under tube well irrigation. The reason for rapid increase in tube wells is that individuals give more importance for private sources of irrigation. All most all states have witnessed this phenomenon in all decades in progression.

2.2. Irrigation and its Impact on Land Lease Market:

Here one studies the impact of irrigation on the land lease market in terms of the extent and forms of lease. In the context of the land market being inactive (low turnover) and the labor market witnessing an excess supply of labor at the existing positive wages in the economy, the land lease market works as a substitute for the incompletely formed land and labor markets. As explained earlier, the necessary condition for the generation of the land lease market is the incompletely formed land market while sufficient conditions are the missing multiple markets. In other words, these are potential demanders of land, but their demand does not get realized, not due to lack of purchasing power but due to lack of land supply in the market (also called interim sales by Basu (1984)). With the missing land market, the lease market functions as a substitute market to access land resources. The extent of land leased is a result of the interaction of demand and supply side factors in the land lease market.

Given the initial allocation of land resource in the economy, a household has two options: One is to self cultivate (with family labor or casual labor) or to lease-out the land. The land in the lease market is supplied by households that own land but either do not want to cultivate the land (nor sell it) or wish to cultivate the land but have excess land when compared to the their labor resources. Such households can either lease-out land or interlink land lease and the labor market to access labor from households with surplus labor. In the same vein, households that want to operate land define the demand side in the market. These
operators could be those who have ‘enough’ lands based on the resources at their command or have more labor compared to their land at their command. The demanders could also be of two types: agricultural labor households or pure tenant households—these households have two options: either to enter the labor market or to enter the land lease market; and households that own land but want to expand their scale of operation—such households are also called mixed tenants.

One of the important explanatory variables to explain the existence of shared tenancy is decision making under uncertainty conditions. Given an uncertain environment, households may have different perceptions on risk factors. Some households can be risk-averse, while some might be risk neutral/loving. If the marginal farmers and/or landless labor are the leasing-in agents, and the large land owners with diversified portfolio are the leasing-out agents, one can hypothesize that the leasing-in agents are risk-averse and the leasing-out agents are the risk-neutral agents. In such a situation, the existence of shared tenancy can be explained in terms of trading in the risk market wherein insurance market is missing.

A second method of explaining the choice of contractual arrangements was presented by Rao (1971). His study has explained that the coexistence of the different lease arrangements may be influenced by the relative significance of entrepreneurial functions. The crop-sharing arrangements are seen to be common in areas of relative economic certainty, while fixed-cash tenancy seems to be common in areas where the crops are highly profitable. However, crop sharing may be a beneficial form of lease for modern profitable inputs. This leads to increased investment and scope for decision making. But one does not have any study relating to changes in the level of uncertainty and the extent of land under lease. Here an attempt is made to study this relationship.

The existence of tenancy arrangements in agriculture is usually seen as a response to some missing/incomplete markets in agriculture. This study is intended to investigate whether changes in levels of economic activity affects the form and/or extent of tenancy in organizing production. Irrigation is one factor that contributes in a major way to enhance/increase levels of economic activity. We propose to use this factor as a proxy for
levels of economic activity. Empirical evidence suggests that the regions with high irrigation are also witnessing higher extent of land under tenancy (Bardhan, 1976). Similarly, NSS data (2002-03) shows that high irrigated states have high proportion of land under tenancy. Irrigation has two effects on the outcome in agricultural production. On the one hand, it increases the yield per hectare of the production-unit-land, and on the other hand, it reduces the variability in yield per hectare. The reduction in the variability reduces the uncertainty faced by the production unit in the production activity. Irrigation not only reduces the impact of nature-based uncertainty on the production unit, but also can be a public provision or a private provision. If irrigation is through public investment, all the producers in the command area will have access to irrigation without any substantial costs to access irrigation. In the Indian context, public provision of irrigation is more important than private provision and therefore this study focuses only on the effects of public provision.

By reducing the variability in yield per hectare, irrigation also reduces the variability of rent paid per hectare. This increased certainty in the rental shares would have an impact on demand for leased-land as well as the supply of such leased-in land. For households that own land, the lower variability in rent implies that leasing transforms into a source of assured income. The supply therefore might increase. This is further augmented if there is an expansion in non-farm employment opportunities. On the demand side, labor-supplying households have an option to enter either the lease market or the labor market. Labor-supplying households prefer to enter the land lease market rather than the casual labor market. If the labor market witnesses high uncertainty when the land lease market witnesses lower uncertainty, there is a possibility that the labor-supplying households would shift to land lease market and in the process bid up the rental rates making it more favorable for land owning households to lease-out land (Sreenivasulu, 2002).

2.2.1. Supply Side in the Land Lease Market:

There are two sources of supply of land in the land lease market. One can be identified by following the resources adjustment model, where the households have an excess supply of land compared to other non-marketed resources. The second is those households that have
discontinued agriculture but still continue to own land. This condition is based on the idea of differentiated peasantry in the rural area, and the existence of either landlords or non-cultivating households that have interest in land. On this basis, one can identify four main conditions for the supply of leased-in land. They are:

1. A source of land is the product of the initial allocation of resources. If the land market (Basu, 1983; Bhaduri, 1984) is inactive, changes in the distribution do not take place historically. The resource adjustment model provides one important source of land in the land lease market. If a household has more land when compared to the non-marketed resources in the households (maybe labor or instruments), these households could use the opportunity to lease-out the ‘surplus’ land in the land market. Based on these causations, areas with high land concentration should be high on tenancy.

2. If one assumes the existence of a well-formed labor market, it provides higher returns for land owners as well as higher wage labor employment for laborers, when compared to marginal households that may lease-out land and enter the labor market for jobs. But under this trivial condition, the land lease market may not exist. History may play an important role in the supply of land in the land lease market. During the colonial period, the British administration evolved a system of revenue collection from land. These were called the land revenue settlements. The revenue collecting rights were given to the individuals in the ryotwari, zamindari, or mahalwari settlements. Ryotwari land revenue collections are the closest approximation in the Indian context to the individual property rights on land. The landlord-based system generated a series of intermediaries between the cultivators and the state — a by-product of the land settlement process introduced by the colonial government. One of the implications of the existence of intermediaries was the lack of incentive to invest among the cultivators, affecting the growth rate of the agrarian economy. The areas with ryotwari system or non-landlord-based land revenue system have a higher agricultural investment and productivity, even in the post-colonial period, and differences in the performance are due to differences in historical
institutions, leading to different policy choices (Banerjee and Iyer, 2004; Pattnaik, 2009). In conditions wherein the revenue collectors have given land rights to the poor (for example, in zamindari areas), and the land reforms are not successful, revenue collectors continue to have land rights but do not collect information on land lease arrangements. So one finds tenancy to be a more popular form of contractual arrangement in states like West Bengal, Bihar, etc., wherein the zamindari system was prevalent (Parthasarathy, 1967). According to Ojha (1965), the percentage of leased-in area in the total operated area in Bihar was 48.59 per cent before zamindari was abolished, and 38.12 per cent after zamindari was abolished. While in ex-zamindari states such as UP, Orissa, Bengal, Kerala and Gujarat, there was a decline in tenancy. In a related sense, culture could also play an important role in defining the supply of land. Culturally there could exist similar segments in the society that can own land but are restricted from cultivating the land. An illustration is the Brahmin households who can own land but do not cultivate the land. This results in either leasing-out the land or practicing cultivation using attached labor (Parthasarathy, 1967).

3. A third source of supply of leased-out land is where some households have access to non-agricultural employment or their labor has alternative uses outside the village economy. They could be school teachers, those serving in the army or also those who have left agriculture. National Sample Survey Organization (NSSO) data estimates indicate Haryana, Punjab, Assam and West Bengal as the high tenancy states, while Gujarat, Maharashtra, Madhya Pradesh, Rajasthan and Kerala as low tenancy states. According to Laxminarayan and Tyagi (1982), there are two main reasons for the existence of high tenancy in Punjab. Firstly, the HYV technology is capital intensive in nature and highly profitable (commercial agriculture). This has made it profitable to lease land. Secondly, Punjabis who are staying outside India or working in armed forces and services are found to have given their land on lease. This may be true for the state of Haryana also (Sawant, 1991).
The rural non-farm sector is widely looked upon as a source of momentum for rural growth and poverty reduction. Employment patterns in the non-farm sector have been widely scrutinized for evidence of economic dynamism in rural areas. Visaria and Basant (1993), who examined NSS and census data, have documented a clear increase in the share of non-agricultural employment. In addition, they also point to a more rapid expansion of tertiary sector employment rather than secondary sector employment, and the bulk of employment came in the form of casual nature, rather than permanent. Related evidence is the increase in the proportion of non-cultivating households in the rural areas. As of now, the NSS has conducted four rounds on the assets and liabilities of households. They are: 26th Round (1971), 37th Round (1981), 48th Round (1991), and 56th Round (2002). These surveys have showed that the number of rural non-cultivating households has been increasing over time — the percentage of non-cultivators has increased from 27 per cent to 40 per cent. In the sub-groups of non-cultivating households, one observes that the proportion of agricultural labor households is nearly the same in the four rounds, i.e., around 14 per cent, while in case of the artisans, there is an increase in the proportion of artisan households from 2 per cent to 5 per cent. The major increase in the non-cultivators is the ‘others’, category. In 1971, the ‘others’ formed 27 per cent of the households, which increased to 40 per cent by 2002. The rural economy is witnessing an increase in the proportion of non-cultivating households, and in the non-cultivating households, the proportion of ‘other’ households in the rural sector increased. According to Thorner (1976), about 70 per cent of the lands are owned by non-cultivating households. Such households garner an average of about 50 per cent of the gross product as rent by leasing-out to poor landless or marginal tenants who bear all costs of cultivation. This rental income represents a ‘return’ to land monopoly and has nothing to do with any investment of capital by non-cultivating households in the production process, nor creates labor demand in the labor market. It only leads to the generation of an inactive labor market in the rural economy.

Effects of Irrigation on the Supply Side of the Land Lease Market:
The provisions of irrigation can affect the supply side of the land lease market in two ways: (a) given the allocation of land-labor resources among the households, irrigation shifts the marginal product curve of labor outwards, leading to a potential for higher usage of land and
in turn a decrease in 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 to them. 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; Sen, 1974).

(b) The provision of irrigation can have 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 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 studies on the economics of farm management also show (West Godavari) the impact of irrigation on employment. Several crops grown in different parts of India are also found to improve their production and subsequently the employment measured at acreage level. Given the rise in the demand for labor, the wage rates in irrigated areas are significantly higher than those in the unirrigated areas, despite the large-scale migration of labor to the irrigated areas (Rao, 1975). The rise in employment and wages on account of irrigation leads to a relative stability in employment and income (Rao, 1994). Rao’s (1995) study reveals that the share of non-farm employment is increasing in the delta region.

As we observe the non-agricultural employment among the land owning households, we find that an increase in irrigation is collinear with the introduction of green revolution technology. There is a need for provision of inputs to farmers to use the green revolution technology. So there is a need for input traders, commission agents, and output traders, who were not there before. One segment who can convert to the providers of these services is that of land owning households that have some surplus. Thus, it is possible to have an occupation shift without sale of land. These segments may form the potential suppliers of land post irrigation. It is also important to note that there is some evidence that larger
farmers invest their surpluses into non-agricultural activities (Rutten, 1991; Harriss, 1991; Basant and Joshi, 1991).

(c) The provision of irrigation reduces the uncertainty introduced by nature. This would lead to decrease in the variability introduced by nature as well as the increase in the yield of the farmers. So if a household is diversifying from agriculture due to employment opportunities in the non-agriculture sector, it is assured of a more certain income in the form of rent from the land. This can strengthen the desire of the households to diversify from agriculture, but to hold on to their land.

2.2.2. Demand Side Factors

There are two different causations for the demand for leased-in land:

1. It is assumed that homogeneous farming households with differentiated ownership of inputs needed in the production process are among the potential demanders of land that can be generated, as hypothesized by the resource adjustment model. There could be some households that own less land when compared to the ownership of other non-market resources. Given the absence of related markets, these households become potential demanders of land in the land-lease market. The resource adjustment model is followed for the empirical exercise. The empirical exercise shows that the resource position is different between the leasing-in and leasing-out households and so these households enter the land-lease market. Many economists adhering to the neo-classical tradition broadly interpret tenancy as a resource adjustment mechanism under conditions of unequal resource endowments and imperfect markets (Marshall, 1961; Cheung, 1969; Bliss and Stern, 1982; Jodha, 1981; Sharam and Dreze, 1990). It is usually believed that the land deficit and labor surplus farmers lease-in land from land abundant and labor scarce households, in order to increase their operational holdings either to meet their subsistence requirements or to earn commercial profit.
2. Assuming that a non-homogeneous farming community conceives two different sources of demand for leased-in land, one segment can be labeled as subsistence-oriented peasants while the second can be called the market-oriented/capitalist farmers (Patnaik, 1976). Subsistence-based tenancy is generated by the demand for land by agricultural labor households and/or poor peasantry, while the market-oriented farmers have the second type of demand.

Considering an agricultural labor household holds broadly two options: to enter the labor market or to enter the land-lease market, the household entering the labor market needs to find employment to sustain. The wage earner enters the output market as a purchaser of goods needed for his household consumption. So these households enter into two markets to satisfy their food needs. The second option with a landless labor household is to enter the land lease market. These households in the Indian situation in general produce food grains, and are able to meet their food needs in addition to assured employment on their owned land. In the Indian conditions, the output market is said to be imperfect.

The literature identifies that there could be a hedge between the sale price and the purchase price. In such a situation, there could be a preference for an agricultural labor household to enter the land lease market rather than to enter the labor market. If this condition is true, one would expect an excess demand for land in the land lease market. This will necessitate a process of rationing in the land-lease market. In a study of the contractual options open to agricultural labor households in a village (in Andhra Pradesh), it was found that there was a demand for leased-in land by agricultural labor households, but only households that owned some non-marketed production-based inputs could access land in the lease market (Vijay and Sreenivasulu, 2005). Verma and Mishra (1984) pointed out that the institution of shared tenancy reflects the true conditions of subsistence tenancy in a backward agrarian setting like Bihar. The study emphasized that land is predominantly leased-in by marginal and small farmers out of necessity. As the very purpose of this class of tenants is subsistence, such tenancy may be termed as ‘subsistence tenancy’. In the case of subsistence tenancy, the terms and conditions are obviously unfavorable to the tenants, resulting in their exploitation, while the lessor-lessee relation is unhealthy and inimical to agricultural development.
The second important segment to lease in land is that of market-oriented farmers in the rural areas. Given the constraints to the expansion of land by these households either due to low turnover in the land market or state legislations (mainly land reforms measures), these households enter the land lease market to expand their scale of pertain. A necessary condition for the existence of demand for this segment of farmers is an expanding demand for the goods produced by them. Several studies have expressed an opposition to the idea of tenancy being necessarily a feudalistic or pre-capitalistic institution. The basis for their argument is the recently observed tendency in some parts of the country of big farmers who are leasing-in land with a view to improve their operational holding for large-scale capitalistic farming — this is indeed a ‘commercial tenancy’ or what Lenin called ‘entrepreneur renting’. Some studies also hold the same opinion that land lease market is now dominated by medium and large farmers as lessees, and that small and marginal farmers now make the multitudes of lessors (Vyas, 1970; Rao, 1974; Nadkarni, 1976; Jodha, 1981).

The reversal in the tenurial relations could be attributed to a number of factors: First, with the spread of new agricultural technology, medium and large farmers find it more profitable to lease-in additional land in order to make optional use of the capital inputs such as tractors, threshers, pump sets, and so on. Some studies in agriculturally developed states/regions, viz. Punjab, Haryana and Western Uttar Pradesh, appear to have brought out increasing incidence of self-cultivation, emergence 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). According to Murty (2004) the entry of large farmers into the lease market aggravates further capitalist development in the agricultural sector. However, numerous prospective tenants from the poorer sections can get distanced from the lease market in the process. In a rural economy, if the farmers have co-existence with these two segments, they would compete to get access to land. The amount of rent that is paid by these segments would define whether the scale helps the market-oriented farmers reap benefits or the intensive labor-using subsistence farmers to get access to the land.
The provision of irrigation can influence the demand for land lease in a number of ways: As specified earlier, the provision of irrigation reduces the uncertainty generated by nature. Simultaneously, the area irrigated would also have witnessed the uses of modern inputs leading to an increase in the yield of the land. Separating these two can be a difficult proposition. The changes in the demand for land lease can be due to the following reasons:

(a) In case of homogenous peasantry formulation, the provision of irrigation leads to a decrease in nature-based production uncertainty, while increasing land productivity. In this context Bardhan (1979) maintains that “The percentage of area under tenancy will be higher in areas where the land improvement factor is larger (i.e., soil fertility, rainfall, irrigation, etc., is better). This result holds even if the landlord and the tenant have unequal access (or incentive) to land improvement” (Bardhan, 1976, p. 1508). Further, “An increase in production uncertainty reduces the percentage of area under tenancy” (Bardhan, 1976, p. 1508). In such irrigation, we expect tenancy to increase when land improvement factor increases and uncertainty factor reduces.

(b) Production-based uncertainty with yield increases on conditions of a substantial increase in the employment opportunity. Krishna Rao (1996) has mentioned that with the introduction of green revolution technology, both labor employment and real wage rates have increased, as has the area under irrigation. About 45 per cent of the gross area under cultivation in the state is under irrigation. With the distribution of government wasteland, ceiling surplus land, and partly with the acquisition of small plots of land by SC and OBC families, the percentage of agricultural labor has declined and that of cultivating households has increased in AP. Further, the available evidence (Laxminarayana and Tyagi, 1982) indicates that there might have been some decline in tenancy in the green revolution areas of North India, where a large number of landowners have taken back their land from tenants for self cultivation in order to get better benefit from new technologies. Similarly, large and bigger land owners are not only leasing-out their land but also leasing-in land from others. The new technology has given ample scope to large land owners to lease-in land from smaller holdings with a view to enhance their income (Iqbal, 1989; Reddy,
1996). The agricultural labor households will want to enter the land lease market to meet their subsistence and so the demand by these segments will increase. If the corresponding demand for output is witnessing an increase, it would also witness an increase in the demand for land by the market-oriented segments. Irrigation can influence the demand for land by increasing the proportion of market-oriented rich peasantry.

According to Hayami (1993), shared tenancy exists when tenants are risk-averse under the condition of uncertainty. Such results are consistent with the positive association across regions between the adoption of shared tenancy and the degree of variations in yield. On the other hand, tenants are expected to pay higher rents for lower risk under the fixed-rent tenancy.

The overall impact of irrigation of the land lease market may be ambiguous depending on the total effect of the demand and supply factors and the extent of land leased; but the implication on the rent may be clearer. At the empirical level, there appears to be a shift towards fixed rental contract, which in terms of theory is a decline in nature-based uncertainty leading to a decline in the importance of land lease market and an increase in the land under fixed rental contract.

The types of irrigation can play an important role in rural economy weather it can be a choice change of demand and supply of lease-in extent that has been expressed by Parthasarathy (1967). The variations in tenancy are generally sought to be explained by the proportion of irrigated area. Some opinions have been expressed by Rao (1965) and Tara Shukla (1965). Their explanation appears plausible in view of the fact that areas with very high degree of tenancy are generally found to be those with high proportion of irrigation. More particularly, 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 reduces the variability in yield. The trend of decrease in variability due to sources of irrigation depends on whether the provision of irrigation is private or public. Basically, the study looks into the nature of irrigation and how it influences the
demand and supply choices of lease households. Parthasarathy (1967) 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 low proportion of irrigated area. According to Bardhan’s (1979) inter-regional cross-sectional study the agriculturally better-off regions have a larger proportion of area under tenancy. A few studies tried to examine the relationship between irrigation and land lease market. The tenancy institution is predominant only in highly irrigated areas (Bardhan, 1979; Subramanyam, 2000; Narayan and Nair, 1994).

An important aspect in tenancy system is about who leases and from whom. All the lessors may not be big landholders, nor are all the tenants marginal cultivators. As there are many claimants, the lessors may choose a particular lessee in preference to others. There are two arguments regarding the lease market: whether the large farmers or the small marginal and marginal farmers dominate the land lease market. Bardhan (1976), based on the NSS data for 1960-61 and 1970-71 states that the smaller tenants are treading into a concentration of tenancy — the lease market still continues to be dominated by the small and marginal farmers (Singh, 2001). The proportion of households leasing-in land was found to be much higher among households of lower size categories such as the landless and marginal households compared to higher land size categories (Sharma, 2007). Particularly, in canal irrigated areas, the number of pure tenants might be high in the land lease market (Parthasarathy, 1967). The study makes an attempt to analyze the conditions under which pure tenants enter into the land lease market in different study villages.

2.3. Conclusion:

In this chapter has presented the literature on these two factors and tried to analyze the impact of irrigation on the extent of land leased. In the post-colonial period, the Indian State has made a series of attempts to increase the levels of irrigation as well as to initiate a process of transformation. Irrigation was seen as the extent to decrease the level of nature-based uncertainty as well as to increase the yield of the crops cultivated. In this context, an
attempt is made to identify the factors influencing the demand and supply of leased-in land. The demand for leased-in land can be due to a mis-match between the land and other non-marketed resources owned by the household, or the presence of households in the rural areas who own land but do not cultivate the land. The supply of leased land was also generated due to mis-match of resources as well as the demand for land by agricultural labor households and market-oriented segments. The provision of irrigation can influence the demand and/or the supply behavior, and the total effect depends on the impact on the demand and the supply side of the land lease market. The relationship between irrigation and extent of lease-in land and forms of lease at state level analysis will be discussed in the next chapter.