CHAPTER II

REVIEW OF LITERATURE

Introduction

Any review of literature is bound to reflect the strong and weak areas of research already undertaken. The extent of research done on the topic and similar areas are the guiding factors for the review of literature. We did depend on the fast research broadly but the main lacunae is the available research material on the topic of rural capital market. The earlier studies available are mostly confined to capital formation in agriculture and not the capital formation in rural areas on one hand and on rural capital markets on the other. The second major problem faced while reviewing the literature is absence of any definite structure of rural capital market.

Raghar Nurkse is the first to deal systematically with the problems of capital formation in under developed countries. His treatise on capital formation suggested the utilisation of the surplus manpower found in rural areas in the form of disguised unemployment in capital formation. According to him in the process of modernisation of rural areas, the acute shortage of social overhead capital was always felt. Such social overhead capital has to be accumulated only through government activity on the investment side.
The Rural Credit Followup Survey (1958-59) has the following to say regarding the sources and uses of funds "the items on the uses side are the different constituents of capital formation including purchase of land, livestock and houses and other capital expenditures such as financial investments and purchase of bullion and ornaments, repayments of debt and increase in lendings. The components on the sources side are borrowings, sale of assets and decrease in lendings. The excess of the total uses over the total sources is of the same significance as indicative of the net position of cultivators on capital account. This balance, however, does not provide an accurate measure of savings mainly due to the fact that changes in inventories and changes in cash balances held by cultivators are excluded.

Tara Sukla (1965) studied capital formation in agriculture sector in detail. Her major conclusions are based on secondary data. The rate of gross investment in the durable physical capital as percentage to gross value of agricultural product (crops only) has varied between 10 and 15 during 1935-36 to 1960-61. The rate of net investment in durable physical capital as per cent to net agricultural income varied from less than 1.0 to above 4.0 per cent during the same period. The ranges of the rates of gross and net investment would not differ very much even if the data could be obtained for 1920-21 to 1935-36.
With regard to capital, Shukla commented that, Indian agriculture seems to have struck a long-term low level of equilibrium position. And she suggests that, if the rapid growth of output is desired, this equilibrium is to be disturbed manifestly. The only way for this seems to be that of technological change. Liberalization of credit, with a view to increasing the flow of resources into agriculture, unless accompanied by technological changes, would meet with resistance to borrowing by farmers (due to internal capital rationing). A concerted action to improve market conditions, production relationship and credit supply, with better tenural system and provision of adequate infrastructure for agriculture would improve output/input relationship which subsequently would raise the investment rate and generate dynamic conditions for equilibrium to move continuously upward.

Based on N.S.S. Data (1950-51), Dandekar (1953) attempted estimating the gross investments of rural families. The total investments per family was Rs.219.80. Of this, the investment on land improvement was Rs.17.40, new constructions Rs. 18.3, other real estate improvements Rs.40.8, net purchases of buildings Rs.4.7, farm implements Rs.12.5, other machinery Rs.16.3, bullion Rs.11.9, shares Rs.0.9, livestock Rs.76.2, land Rs.9.8 and other assets Rs.11.0.

Observing some methodological deficiencies in the data presented by Dandekar, Panikar attempts to estimate the gross
Savings per family in 1950-51 at Rs.147 which excluded the direct investments and purchase of land and livestock. This sum of Rs.147 comprises the following: land improvements Rs.17, new constructions Rs.18, other real estate improvements Rs.41, buildings Rs.5, farm implements Rs.13, other machinery Rs.16, bullion Rs.12, shares and other financial assets Rs.1, increase in cash holdings Rs.13, and other assets Rs.11. By arguing that the saving and investment decisions are made by the same persons and savings by the family are going to be equivalent to the family share in investment. He estimated that the average gross income per Indian rural family from all sources was approximately Rs.1309 and the share of savings was Rs.147 i.e., a little over 11 per cent.

All India Debt and Investment Survey (1971-72) is the third in the series of decennial exercises undertaken by Reserve Bank of India in collaboration with National Sample Survey and it has covered over one lakh rural households from 12,452 villages. In this monograph the data on capital expenditure in cash as well as in kind by the rural households during the year July 1971 to June 1972 are analysed to bring out the nature of investment, its magnitude and source of finance for meeting this expenditure and receipts from the sale or loss of capital assets and to give a rough idea of the gross capital formation during 1971-72.
The data analysed separately for four groups of households viz., cultivators, agriculture labours, artisans and other non-cultivator households. Broadly the term capital used in this monograph to cover all assets which are capable of further production and includes land, orchards, plantation, all irrigation sources, agricultural implements and machinery, transport equipment, farm houses, banks, cattle sheds, livestock, non-agricultural land, furniture and durable household goods.

In the year 1971-72 all rural households spent on the aggregate Rs.1,210 crores as capital expenditure in farm business. Of which, 96 per cent was accounted for by cultivators and 4 per cent by non-cultivators. Expenditure in farm business as proportion to total capital expenditure was as high as 61 per cent.

For cultivators, accounting for more than 88 per cent of the total expenditure was on livestock, agricultural implements, land purchase, bunding, wells, orchards and plantations, in the order of their importance. For non-cultivators three items viz., land purchase, livestock and agricultural implements accounted for slightly more than 89 per cent of the total capital expenditure per household.

Capital formation in all activities in the rural sector in India was estimated at Rs.472 crores in 1971-72, of which, 94 per cent was accounted for by cultivators and 6 per cent by non-cultivators. Capital
formation in non-cultivators was negligible at less than Rs.2 as against Rs.52 by cultivators. Nearly 45 per cent capital formation in farm houses was reported in agricultural implements followed by 31 per cent in wells and other irrigation sources.

Garg, J.S. and V.Prasad (1975) studied the impact of High Yielding Varieties (HYV) on capital formation between 1966-67 and 1973-74 in Kalyanpur block in Uttar Pradesh. The surplus income so generated is disposed of partly in meeting the farm and family needs and partly is ploughed back on their farms in the form of capital assets. In order to examine the extent and pattern of capital formation as a result of the high yielding varieties (HYV) programme and to examine the items on which the farmers preferred to invest.

The largest investment was on irrigation structures, followed by livestock and implements and machinery. The investment on land improvement and farm building was the lowest and nominal. The investment on irrigation structures showed a constant rising trend from Rs.55.22 per hectare in 1966-67 to Rs.116.36 per hectare in 1972-73. It stimulated the use of fertilizers, adoption of HYV and multiple cropping which had a cumulative effect on production. It was noted that, the peak years of investment on irrigation corresponded with the peak years of capital formation during 1969-70 to 1972-73. In the case of livestock, the investment varied from Rs.32.44 per hectare in 1966-67 to Rs.56.94 per hectare in 1973-74. So far as the investment on
implements and machinery is concerned, it abruptly increased from Rs.1.38 per hectare in 1966-67 to Rs.33.24 per hectare in 1969-70. It varied between Rs.33.54 and Rs.48.26 per hectare in 1970-71 and 1973-74 respectively. The rate of gross capital formation as a percentage of gross income showed an increase from 1969-70 onwards and varied between 6.9 per cent and 7.82 per cent in 1969-70 and 1972-73 respectively. The percentage increase in gross capital formation in gross income during these years was associated with the increase in the percentage area under irrigation and the area under the HYV. The percentage of net capital formation to net income varied between 12.51 in 1967-68 and 18.55 in 1973-74.

Yadava R.P. R.S.Tomar, J.P.Bhati, and R.N.Tewari, (1975) studied the investable and physical surpluses with a sample of 98 farmers drawn from 10 villages of 2 blocks of Kangra, agriculturally progressive district of Himachal Pradesh. The data for the year 1973-74 were collected by the survey method.

The savings were observed only on the farms with more than 4 hectares that too of a significant magnitude i.e., Rs.3,303. The quantum of dis-savings varied from Rs.462 to mere Rs.15 on farms between 3-4 hectares which mean substantial capacity to invest lies with the farmers holding more than 4 hectares in this progressive district of the State.
Ram Ikbal Singh, Daulat Singh and Janardhan Singh (1975) study embodies the results of an intensive enquiry conducted during 1966-67 to 1970-71 covering 140 farmers selected randomly according to the size groups of 0, 0-1.5, 1.5-3.0, 3.0-4.5, 4.5-6.0 and 6 hectares and above, from 5 villages of Dhanipur block in Aligarh district of Uttar Pradesh.

There was no saving or investible surplus on the lowest size group of farmers. In case of other groups the saving tended to rise with the increase in the farm size. It ranged between Rs.474.69 on the small size group and Rs.8,609.21 on the large size group. Out of this saving (or investible surplus), Rs.524.06 was ploughed back into agriculture and the rest Rs.283 remained as net saving or surplus from agriculture. In the case of very small and small groups, they invested Rs.97.53 through borrowed funds. In case of small size groups the investible surplus was only 11.30 per cent of the total family earnings of Rs.4,195.27 per annum. However they ploughed back a major part of their investible surplus into agriculture i.e., 71.30 per cent of investible surplus. The two middle size groups had an investible surplus of Rs.627.48 and Rs.894.01, which was 26.80 and 25.01 per cent of their total family income respectively. In the highest size-group the investible surplus constituted 38.84 per cent of the total earnings, but the farmers of this size group ploughed back only 20.71 per cent of their investible surpluses into agriculture.
Mishra, B.L., V.P.Shukla, and D.K.Morathia, (1975) have identified two types of surpluses from Tendukheda farms of Damoh district of Madhya Pradesh. The technological or production surplus on Tendukheda farms ranged from Rs.3,667 to Rs.8,640 in the lower size farms having traditional and advanced technology respectively. Similarly it varied between Rs.9,098 and Rs.26,344 on the upper size group of farms depending upon the level of farm technology. The investible surplus was negative by Rs.448 in case of traditional farms of lower size groups, while it was positive at Rs.3,120 on advanced farms. The upper size group of farms showed an investible surplus ranging from Rs.2,545 to Rs.19,458 on the traditional and advanced farms respectively.

Sarma, P.V. (1975) studied the type of investment in which the farmers of Coastal Andhra Pradesh are interested and the motive behind their investment in fertilizer companies. Thirty one per cent of the sample farmers reported that their motive behind their investment was to get fertilizer more cheaply as subscribers, 6.2 per cent stated the motive to get dividend and the remaining 62.8 per cent farmers have expressed both. In the lower income group 75 per cent of the farmers expressed the motive of their investment in terms of getting more fertilizer at reduced rates as a share holder, and in the very high income group 88.9 per cent of the sample farmers expressed the view that not only to get fertilizer more cheaply but also to get dividend.
The cultivators of Coastal Andhra Pradesh in all income groups appear to have realised the need for more fertilizer to increase farm incomes and showed preparedness to invest their surpluses to augment the fertiliser supply.

Jhingan, M.L. (1975) studied the extent of surpluses accrued to the farmers of the Punjab due to the adoption of the new agriculture strategy and the extent mobilisation of these surpluses for the purpose of industrialisation of the State. The agricultural surpluses were divided into real surpluses and financial surpluses. The former was expressed in physical terms having two components viz., food and raw materials, which are important as industry's working capital. The latter are expressed in money terms and represent a command over resources, which can be transferred to the industrial sector. Author concludes that agriculture failed to become net lender to industry in the Punjab.

Shukla, P.C. and B.K.Mishra (1975) studied the technological impact on saving potential of farm families of Rai Bareili district. They observed that, the new strategy in agriculture seems to have varying impact on income, production and savings. Authors have identified the problems of mobilization of saving and difficulties of developing suitable techniques for augmenting savings or in preventing unproductive use of savings. The savings are observed to be in the form of disguise and the question is mobilization of these savings into
effective saving. Authors observed that, the direct method of mobilising actual savings into effective savings from the majority of farmers by selective indirect taxes or by deficit financing may not be successful because their consumption being limited to house grown produce which generally escapes from such measures. They further pointed out that, in the present agricultural situation, when technological effect is visible on the farms, the scope for exploiting saving potential relating to a large number of small and medium farms is very limited.

Swarna Sadasivam (1975) examined the savings behaviour of small and big cultivators in Kota district of Rajasthan, Surat district of Gujarat and East Godavari district of Andhra Pradesh. The data are taken from the savings and investment reports of the Agro-Economic Research Centres at Vallabh Vidyanagar, Anand and Waltair (Andhra Pradesh) for the years 1969-70 and 1970-71. Except in the group of large farmers, negative savings appeared to be common, irrespective of the size of the operational area. The bulk of the positive savings came from the large farmers, showing a highly unequal distribution of savings. In Kota district, all the 100 per cent of the savings came from 11 per cent of the households, in East Godavari district, 89.23 per cent of the savings came from 3.3 per cent of the households, and in Surat district, the savings seemed to be more evenly distributed.
Authors also observed a positive relationship between institutional credit and the investment in physical assets. They concluded that provision of institutional credit leads to more investment in physical assets by the big cultivators.

Ramkumar, M.L. Sharma and G.S.Sisodia (1975) attempted to assess the savings in three agro-climatic zones of rural Hissar and to locate the social values associated with saving and banking habits and to suggest the ways for mobilising the savings. The study was based on primary data collected from sample households.

Authors found that, in all the three agro-climatic zones an increase in the size of land holding was associated with an increase in the quantum of savings and number of savers. Multiplicity of occupation and increasing educational level of the chief earners were closely related to saving and banking habits. The strongest incentive for saving was to buy or build a house, expenditure on weddings, dowries and other social ceremonies. Highest quantum of saving was found in the irrigated zone and no savings from small farmers. Households with agriculture as a single occupation were having least savings. Nuclear families were found more favourable to savings and banking habits. Saving and banking habits were also found related to educational level of the chief earner.
In Arup Chakrabarti's (1975) expression, investible surplus is the difference between income and expenditure at the family level and such surpluses generated in the rural areas need careful mobilisation for the promotion of development. This is particularly true in India where there is need for strengthening the resource mobilisation effort in the rural sectors. For a number of reasons, (1) gap is said to persist in the agricultural sector between capital requirements and its actual availability; (2) surveys conducted by Reserve Bank of India found that the growth of trade and small scale industries in many unbanked rural and semi-urban areas was retarding because of lack of institutional credit, and (3) substantial portion of potential saving of rural household sector is not mobilised at present and is simply used for unproductive or speculative investment in land and real estate, gold etc.

The author concludes that the present institutional arrangement is thus not sufficient to tap the full potential of rural investible surplus. He feels that agricultural prices led to substantial rise in farm income, but not to growth in rural indirect financial savings (for example through taxation). It is necessary, therefore, to stimulate indirect financial savings by taking several institutional and policy measures.

It is also essential to induce household sector in the rural area to have a dominant part of its saving in farm financial assets,
particularly through thrift deposits. Unless this is done, it would be difficult to step up the rate of deposit mobilisation in terms of reforms credit mechanism alone.

Jagannatha Rao, R. Pawar and B. Vijay Patil (1975) attempted to estimate the quantum of surpluses at the micro level in one of the agriculturally prosperous pockets of the Maharashtra State. The data for the study were obtained from member cultivators of the sugar factory through a sample survey in four villages. Authors concluded from this study that in rural Maharashtra sugar factory areas in general and member cultivators, with large farm size, in particular, could be considered as potentials for mobilisation of rural surpluses.

With the objectives to determine the extent of savings at the existing and optimum levels of technology in different farm situations, and to investigate the relative allocation of surplus income within agriculture, Sharma, R.K. and S.C. Tewari (1975) has undertaken a study in Ludhiana block of Ludhiana district. Two villages were randomly selected on the basis of probability proportional to the cultivated area. Twelve farmers from each village were selected randomly and stratified into small, medium and large farmers. The farm business analysis of all the farm situations indicated that through shifts in crop combinations and adoption of yield increasing technology, the returns of the fixed farm resources increased by 40.79, 59.58 and 42.48 per cent on the small, medium, large bullock operated
and large tractor operated farms over the existing plans respectively. The corresponding figures for gross savings were 21.89, 37.01, 21.68 and 17.40 per cent. The study revealed that there was a substantial potential for increasing farm incomes and savings of all the categories of farms through the application of improved methods of production, better resource use and better adjustments in the cropping patterns. The study showed that the farmers gave first preference for the purchase of land out of the anticipated additional income followed by the purchase of farm machinery and home consumption. The cultivators were interested in keeping their additional income with the banking institutions.

Rajagopalan V. and S.R.Subramanian (1975) undertook a study of the agricultural surplus and investment in the Chingleput district of Tamil Nadu. They defined agricultural surplus as the amount by which total agricultural output, valued at current prices exceeds the current consumption of agricultural population. The amount of agricultural surplus estimated is of the order of Rs.6,725.58 per farm in the case of irrigated and Rs.10,434 in the case of irrigated and, dry land farms. Out of this surplus, more than 20 per cent is spent for meeting the consumption expenditure of the dependent members of the family. Twenty-eight farms, out of the one hundred sample farms, have reported agricultural surplus and the rest have deficit.
Functional analysis was carried out to find the relationship between the amount of agricultural surplus and the total agricultural output, consumption expenditures and investment expenditures. Another model was specified to explain the investment behaviour with reference to the agricultural surplus and total agricultural output. The analysis revealed that most of the farms need additional investment to augment their resource base and to improve the techniques of production, to increase the size of agricultural surplus. Based on the results, authors suggested the need for national investment on research and development in agriculture, investment in human capital to build professional skills and labour productivity, and development of strategies to minimize the impact of risks and uncertainties.

A study by Singh, D.S. S.R. Yadav and R.I. Singh (1975) is based on a small survey of 80 landholders adopting modern technology in agriculture was conducted in 1973-74. The surplus income occurred and the pattern of investment of the disposable income was presented in the paper. The disposable income is estimated by taking the difference between gross income and production expenditure. The findings of the study revealed that the value of capital per hectare was Rs.2.296, Rs.2.269 and Rs.2.213 in the holdings of below 2 hectares, between 2 to 4 hectares and 4 hectares and above respectively.

About 69 per cent, 57 per cent and 53 per cent of the disposable income was spent on family consumption in holdings below 2 hectares,
2-4 hectares and 4 hectares and above respectively. The investment on non-farm capital was about 8 per cent in each of the three size groups of holdings. The repayment of institutional credit and of old debt was respectively about 7 per cent, 11 per cent and 10 per cent in the holdings of 0-2, 2-4 and 4 hectares and above. Investment in savings, life insurance, gold and ornament, etc., was between 6 and 7 per cent in the three size groups of holdings.

Subrataghatak (1976) studied rural money markets in India, and distinguished between the money and capital markets. The capital market deals with long term money capital and the money market with short term money capital but points out the difficulty in such distinguishing since there may be considerable overlap between the two.

Ghatak reaches an important conclusion that in most cases it was capital and not family expenditure which was the most significant variable affecting the demand side of borrowing. However Ghatak points out that at a higher level of borrowing, capital expenditure rather than family expenditure is more closely correlated with borrowing and/or debt and perhaps at lower level of borrowing and/or debt family expenditure is more closely correlated with indebtedness.

Regarding the supply side of the share of rural money markets Ghatak reached the conclusion that: (1) In both 1951-52 and 1961-62
agricultural money lenders remained important sources of credit to the cultivators in the supply side. (2) The relative significance of the role of the professional money lenders went down considerably in 1961-62 in comparison to 1951-52 as the proportion of loans borrowed from the professional money lenders declined from about 45 per cent to about 15 per cent. (3) Relatives seem to have gained in importance in 1961-62 in comparison to 1951-52 in supply side of borrowing. (4) Although the importance of co-operatives did not appear to be great in the supply side in either 1951-52 or 1961-62 it seems that they made some progress because while in 1951-52 the co-operatives accounted for only 3 per cent of the total borrowing of the cultivators in 1961-62 they accounted for about 13 per cent. (5) The supply side of rural credit was dominated by the unorganised sectors in both 1951-52 and 1961-62 as that sector provided about 93 per cent total borrowings in 1951-52 and 82 per cent of such borrowings in 1961-62.

A farm level survey was carried out in Punjab by Singh, et.al, (1978) to study the factors determining investment. Authors observed that, besides base year capital stock, income, operational size of holding and family size were the major factors determining investment. This study was based on data collected at a time (1967-68, 1968-69 and 1973-74) when tractorisation of Punjab agriculture was in its infancy.

The sample households were selected through a three stage stratified sample design - districts, villages and households. All districts in the country were grouped into 50 strata based on prosperity indices, constructed with the help of a number of socio-economic indicators. Two districts were selected in each stratum with a probability proportional to population. At the second stage, 237 villages were chosen from the 100 sample districts. At third stage, an effective sample of 3,015 rural households was used to provide data base for the study.

The study concluded that rural households invested Rs.5,396 crores in 1975-76. A major portion (76.2%) was direct investment on physical assets, about three-fourths of physical investment was in agriculture and livestock. The average household investment in agriculture was Rs.395. There was a wide variation in the average agriculture investment, and when households were classified on income; at the lowest income level of below Rs.3,600, the average investment was Rs.109. It rose rapidly to reach a level of Rs.14,196 when the household income was over Rs.30,000. The large cultivators had more than 90 per cent of physical investment on farm assets,
whereas the smaller farmers' investment was less than 80 per cent of their direct investment.

Changes in farm inventory accounted for 44 per cent of rural household investment in agriculture followed by investment in livestock 18.7 per cent, farm equipment 12.9 per cent and irrigation assets 11.5 per cent. Rural households invested Rs.20.6 crores in land improvement during 1975-76. Bunding was the most important improvement accounting for 55 per cent, followed by levelling 21.7 per cent and fencing 17.4 per cent. Investment in farm assets together was Rs.161 crores. Bullock carts had the largest share claiming 64.3 per cent of the investment in farm assets. Rural households invested Rs.45 crores in farm houses and godowns.

Bhupinder Singh, A.S. Kahlon and Karan Singh (1982) assessed the relative significance of different variables in affecting capital formation overtime using time series data from the studies of Economies of Farm Management in Ferozepur district (1967-68 to 1969-70 Period I; and from 1969-70 to 1973-74 Period II). Specific objectives of the study were to examine the factors affecting capital formation in the Punjab and to analyse the changes in the relative significance of different variables affecting capital formation overtime.

Authors concluded that the base year capital, farm size, lagged net income and family size were the important variables that affected
capital formation. Authors also observed that the change from bullocks to tractor made a substantial difference to capital formation and it was captured through a dummy variable, which was highly significant. The base year capital had negative impact on capital formation, which meant that the higher the base year capital, the lower would be the capital formation. The lagged net income presented a contrast between two periods. It had positive and more than unity elasticity in period one but negative and less than unity in period two.

In an empirical study conducted in Jind District by Gurudevsingh and Krishnakumar have assessed the role played by various agencies in the capital flow process on the farms. A sample of 74 farmers was chosen with various socio-economic backgrounds. They have concluded from the study that, the most important source of liquidity generation was sale of produce except on marginal farms where it was labour hiring out which generated a larger proportion of liquidity. Credit use was the second major source of liquidity.

The study considers farm investment on sample farms consisted of land, buildings, livestock and deadstock (machinery and equipment employed in farming). According to authors, various agencies involved in capital flows process were the supplier of inputs, buyers of output, financiers of supplies, extension services and others helping in the higher use of inputs for increasing productivity and marketed surpluses on farms. Based on these they have divided the agencies
involved in the capital flows on farms mainly into four groups i.e., financing agencies, output marketing agencies, input supply agencies and other agencies. Many a time, a single agency might take up more than one function.

G.S.Bhalla and G.K.Chadha (1983) carried out a state-wide survey of 1,663 cultivator households for the State of Punjab. Though the focus of their enquiry was on studying income and consumption effects of the new farm technology, they do briefly report data on farm investments during 1974-75. The investments averaged to Rs.631 per cultivator household. Inter-spatial comparison revealed that the average investment was higher (Rs.808) for south-western Punjab, a predominantly canal-irrigated region than in central Punjab (Rs.486), where private tubewell irrigation was the main source of irrigation, and in semi-hilly northern Punjab (Rs.624) where both canals and tube wells are in use. The evidence shows that public investments in canal irrigation enhanced farmers own farm investments.

Bhende, M.J. (1986) studied various aspects related to rural financial market in three villages of three agro-climatic zones of peninsular South-India. Data for the study come from ICRISAT (International Crop Research Institute for Semi Arid Tropies) village level studies being conducted since 1975 was the sample for the collection of data for the study.
The author concludes that, traditional money lending has some inequitable features and appears at least as effective in terms of volume of lending as the institutional sources. Money lenders serve a residual group of individuals who cannot obtain credit from institutional sources or from their friends and relatives. They are high risk clients paying correspondingly higher interest rates. The author observes that, institutional credit is concentrated in the richer households having the characteristics of higher education, older heads of households and larger family size and larger farm size.

The Reserve Bank of India (1988) carried out a nation-wide debt and investment survey of households and the survey pertains to 1981-82. The first striking fact to take note is that only a small fraction of Indian farmers annual capital outlay results in fixed capital formation in agriculture. During 1981-82 hardly one-sixth of the cultivator households capital expenditure was geared towards addition to fixed farm assets (excluding purchase of land). This fraction of capital outlay resulting in fixed capital formation in agriculture could be construed partially as a measure of Indian farmers preference for acquisition of fixed farm assets over others such as land, livestock, residential housing, financial assets and assets of non-farm business (e.g., transport vehicles). This preference varies greatly across states and is found to be very highly and positively correlated with fixed farm
capital per cultivator household \((r = 0.97)\) but negatively associated with normal rainfall \((r = 0.66)\).

Fixed investments in agriculture are classified under eight heads viz., (1) reclamation of land, (2) bunding and other land improvements; (3) orchards and plantations, (4) wells, (5) other irrigation sources, (6) agricultural implements, machinery and transport equipment, etc. (7) farm houses, farms and animal sheds, and (8) other capital expenditure.

The magnitude of fixed capital formation in agriculture on private account was low at Rs.138 per rural household during 1981-82. It was somewhat higher for cultivator households at Rs.176 (way above Rs.14 per non-cultivator household, Rs.51 per urban household and Rs.124 per self-employed urban household). The cultivator households accounted for the bulk of the private household fixed capital formation in farm business (Rs.12.7 billion out of total of Rs.14.5 billion in 1981-82). The investment in agricultural machinery, farm implements and farm transport equipment accounted for 47 per cent of total private fixed capital formation in agriculture during 1981-82. The share of this item was relatively high in the northern states of Punjab, Haryana and Uttar Pradesh (67-69 per cent), and very low in West Bengal and Assam (5 per cent). Next in order of importance are investments in land improvements with a share of 15 per cent, followed by farm buildings, and structures, orchards and plantations.
and other items of capital formation. These shares differed markedly from State to State, both in proportion and absolute magnitudes per cultivator household/unit sown area.

A study by Mander and Grewal (1988) based on a sample survey of Punjab farmers in 1985-86 concluded that there was over-investment in tractors and allied machinery across all sizes of operational holdings below 22 acres in Punjab.

In view of the excess stock, Mander and Grewal have called for rigorous scrutiny by lending institutions before advancing credit to make sure that farm size and custom work justify the acquisition of tractors.

Gandhi (1990) studied private investment behaviour by using a series of data put together from various sources on private fixed capital formation from 1950 to 1980. His econometric results of the elasticity of investment regarding the determinants of private investment behaviour are: the stock of private capital in agriculture (-5.29) in the preceding year, cooperative credit availability (+0.89), value of agricultural output (+0.58), rural savings (+0.56) and the stock of public capital in agriculture (+0.42) in the same year. The other determinants of almost equal but lower order of importance are: agricultural output prices (+0.31), commercial bank credit (+0.31) and agricultural wage rate (+0.30). The inference that could be drawn
based on the study are: income from agriculture, own savings and credit availability turn out to be the most important positive factors influencing farmers' behaviour towards investment. The single most important negative factor influencing private investment behaviour is the stock of accumulated capital in hand.


The author concludes that the proportion of rural households reporting fixed capital formation in farm business showed a decline from 15 to 13 per cent over the decade ending 1980-81. Considering the share of each component in the total fixed capital formation, it was observed that the share of residential buildings increased substantially from 40 to 54 per cent over the decade. The share of farm from 49 per cent to 35 per cent over the decade, the share of non-farm business remained constant at around 10 per cent over the decade. The residential plots, houses or buildings, emerged as the most significant items of investment in 1981-82, while farm business was relatively more important in 1971-72. Excluding the component of residential buildings, the share of farm business in the total investment (in farm and non-farm business) of rural households declined from 82 per cent in 1971-72 to 77 per cent in 1981-82.
The author further noted that, the deposits of rural branches of commercial banks increased from 6.4 per cent of aggregate deposits in 1972 to 14.1 per cent in December 1982, thereafter, it had remained at 14.9 per cent upto September 1989. Also, as per the Reserve Bank's ownership survey of bank deposits, the share of farmers' deposits in the total increased from 5.4 per cent in March 1976 to 7.2 per cent in March 1982.

Narayan, D. (1992) examined the performance of institutional credit programmes for rural development and the attempts to improve poor loan recoveries, especially the group lending programme and risk management. He concluded that in the face of mounting overdues, vitiated recovery atmosphere and the consequent poor health of the institutional credit structure, the attempts are being made to try out the group lending programme countering such actions. Author believes that it essentially amounts to leaving the population involved in agricultural and related activities to fend for themselves.

Arene, C.J. (1993) studied the credit delivery system of supervised agricultural credit scheme (SACS) in Anambra State of Nigeria with emphasis on loan repayment performance of small holder farmer recipients. Three hundred small-holder farmer borrowers of the scheme in the State comprising 95 maize farmers, 55 rice farmers and 150 poultry farmers, were randomly sampled using cluster sampling method.
The author concludes that, loan repayment rate among maize farmers is directly related to size of loan, farm size, income, age of farmers, number of years of experience, level of formal education and adoption of innovations and inversely related to distance between home and source of loan, household size and credit needs. Author observes that, cash credit, in itself is not a solution to agricultural production problems. However, for it to be meaningful, it is suggested that credit should be given in both cash and kind so that farmers can easily be advised on how best to adopt new farming innovations.

Ashok M.V. (1994) identified credit as the single most critical input that holds the key to the use of improved technologies that can result in the development of dry-land areas and assessed the credit requirements for the development.

Author suggests cyclical production credit to the dry-land agriculture. The author suggests that the financing of investment credit be undertaken on an area basis for a group of farmers, so that the impact of technology is effective and sustainable. In addition to financing of individual farmers, bank finance can be made available to group of farmers also for common facilities which will benefit a large number of farmers like common farm ponds and large check-dams.

Ashok also suggests the linkage of self help groups with banks. The self help groups are seen as a source of great assistance to
bankers to interact with farmers and even reduce servicing cost of banks. Author further suggests that banks can think of associating with voluntary agencies/non-governmental organisations which are known to have a good track record to conduct credit assessment surveys, supervision of end-use of credit, extension of technical know-how and in developing forward and backward linkages for major activities in the area. These are areas where banks may have difficulty to cope because of staff shortage, lack of familiarity with the area and large number of borrowers.

Pulak Chakravarthy (1994) studied role of Khadi and Village Industries Commission (KVIC) in rural financing basing on secondary data. Author points out that more than 700 institutions affiliated to KVIC could avail bank finance and at least 44 of them could tap more than Rs.50 lakhs individually and these institutions are prominently from Tamil Nadu, Maharashtra, Madhya Pradesh, Gujarat, Uttar Pradesh and Kerala. Keeping in view the increasing financial needs of the KVIC for its expansion work, author expresses the genuine need to set up a separate bank for Khadi and other rural industries.

Singh, O.N. (1995) studied the need of working capital finance in agriculture. He analysed the working capital needs segregating it into three categories; (1) investment credit needs (medium or long-term credit needs relating to the expenditure incurred on permanent additions or improvement of permanent assets on farms and on
agricultural farms); (2) working capital needs (farm expenses of recurring nature relating directly to the production process i.e., all short-term and seasonal production credit needs come within the purview of working capital in agriculture); and (3) consumption credit needs (personal, domestic and non-farm expenses which are mostly unproductive in nature such as redemption of old debts, purchase, additions, construction, repair and maintenance of houses, payment of land revenue or rent, family expenditure on acquisition of consumer durables, medical and educational expenses, expenditure on social customs etc).

Basing on this principle of segregation author supports that agriculture can also be financed on the lines of other industrial and commercial finance with a slight modification. Having a system of working capital finance in agriculture is, therefore, the need of the hour. This approach is said to have the desired features for augmenting the resource use efficiency in farming and allied activities by providing adequate, timely and easy availability of credit to the farmers and other entrepreneurs undertaking a variety of projects.

Author explains that the system also conforms to the new prudential norms laid down for ensuring greater quality in lending operations of the banks. The system is said to be equally equipped and appropriate to meet the needs of both the farmers and the bankers. The biggest advantage which this system is expected to yield is its
capability of augmenting the surplus available with the farmers in a gradual way which would enable them to meet their needs in the long run without requiring much support from outside. Thus, it is an attempt to take the farming community to a state of self-reliance by strengthening their capital base.

Mishra, S.N. Ramesh Chand (1995) attempted to provide an explanation of the behaviour of public and private capital formation in agriculture during the post-green revolution period.

Public sector real capital formation continued to decline through the decade starting during 1980-81. In contrast, private sector capital formation continued to rise through the decade with minor variation during 1980-81 to 1983-84. A marginal decline up to 1987-88 and then a rise by private sector more than compensated the fall in the public sector capital formation.

Latha Bastine, C. and K. Palariswami (1996) analysed private investment in irrigation in northern agro-climatic zone of Kerala by using data collected by way of household survey. The average capital investment for pumping units per farm worked out to be Rs.6,291. The capital cost per hectare for irrigation systems including structures worked out to be Rs.6,771 on an average. It ranged from Rs.13,086 in low land well category to Rs.5,236 in high land rivulets category. The average annualised capital cost per hectare was Rs.1,031.
Garg, B.R. K.K. Jain and Nirinder Kumar (1996) examined the behaviour of investments in agriculture in Punjab State by using both primary and secondary data. The growth in government expenditure on different sectors of agricultural economy was studied for three periods, namely 1970-71 to 1979-80, 1980-81 to 1989-90 and 1990-91 to 1996-97. The results of the study indicated that the highest expenditure in the budget was made on major and minor irrigation projects since 1970-71, followed by roads and bridges. Of late, rural development and minor irrigation received attention of the state government along with usual crop husbandry. Micro level investment behaviour indicated that marginal, small and semi-medium farms had increased their investments to the maximum on milch animals between 1981-82 and 1992-93, as these size groups of farms relied on the incomes from the dairy sector to supplement their incomes from the crop farming.

Prema A. and E.K. Thomas (1996) studied the extent and pattern of capital formation and the constraints to capital formation in farm households in Thrissur district, Kerala. The study generated through a sample survey of 120 farm households pertained to the year 1994-95. The average income of the sample farm households was Rs.39,019. The savings of the sample households amounted to Rs.9,512 per household, which was about 24.40 per cent of the total income. The asset structure showed that lands (92.72 per cent)
followed by residential buildings (3.24 per cent) and household durables were the major items of capital. Capital formation (gross) on per sample farm worked out to be Rs.2,993. Of which 30 per cent was accounted by irrigation appliances, followed by livestock (29.70 per cent) and land improvement (12.85 per cent). Capital formation formed 31.47 per cent of the total savings per farm and 24.25 per cent of the savings per hectare.

Kushwaha, R.K.S. et. al, (1996) studied the income, saving and investment pattern by the different farm categories in district Ethawah (Uttar Pradesh) based on an intensive enquiry of 100 farmers selected randomly during the year 1994-95. The study revealed that the average size of holding was 2.32 hectares. The area under irrigation was 75.36 per cent to the total cropped area and it varied from 85.55 per cent on large farms to 78.26 per cent on the medium and 69.19 per cent on the small farms. The intensity of cropping on an average was 198.23 per cent and it increased from 187.35 per cent on small size group to 218.26 per cent on the large ones.

Chahal T.S. (1996) studied the effect of a sugar mill on the investment of farms in Punjab. The study area was divided into two zones. Zone-I : within radius of 10 Kms and Zone II within the radius of 20-30 Kms around sugar mill. The data was collected from 60 holdings consisting of small (37), medium (16), and large (7) holdings.
The total investment per hectare on the small, medium and large farms in Zone I was higher by 104.35, 112.27 and 113.39 per cent respectively as compared to corresponding farms in Zone II. The investment on machinery per hectare on the small, medium and large farms in Zone I was also higher by 104, 117 and 120 respectively as compared to Zone II.

Patel, R.K. and G.S.Kang (1996) studied the trends in capital formation on tractor and bullock operated cotton areas of Haryana state. The study was based on a sample of 120 farmers (54 small, 36 medium and 30 large, half bullock and half tractor operated). The sample farmers were interviewed twice, once in the year 1986-87 and later in the year 1996-97. The results of the study showed that family income was estimated at Rs.21,316, Rs.33,431 and Rs.58,401 per household on bullock operated farms in 1984-85; on the small, medium and large holdings respectively. It was Rs.44,820, Rs.72,838 and 91,600 on these farms respectively in period II (1994-95). On tractor operated farms in period I, the total income per household worked out to be Rs.38,110, Rs.62,800, and Rs.89,650 on the small, medium and large farms respectively. It was higher at Rs.64,413, Rs.97,370 and Rs.2,34,370 on small, medium and large farms respectively under tractor cultivation in 1994-95. The study revealed that about 30.47 per cent of the total family income was spent on durable capital goods acquisition on bullock operated farms, and it was about 41 per cent on
tractor operated farms in period I. In period II the durable capital formation accounted for nearly 42 per cent on tractor operated farms.

Ashok Kumar and R.K. Pandey (1996) studied the role of institutional finance in capital formation in agriculture based on farm level data from Muzaffarnagar district of Uttar Pradesh. A sample of 320 farmers, comprising 80 from each of four blocks, were selected and the data pertained to the year 1993-94. The study revealed that the total value of assets on per hectare basis was the highest on small farms, followed by medium, marginal and large farms. The proportion of farm building investment to total assets per farm varied from 30.58 per cent on the small farms to 44.40 per cent on the large farms.

Kakde S.J. and M.R. Alishi (1996) studied the investment in capital assets and extent and pattern of capital formation on selected farms based on a sample of 180 cultivators in Akola district of Maharashtra. The data pertained to two points of time i.e., 1984-85 and 1993-94. The study revealed that at overall level the total land possessed by the farmers in 1983-84 was 4.54 hectares, which increased to 4.82 hectares in 1993-94. The number of working and milch animals in 1983-84 at the overall level was 1.66 and 0.70 respectively as against 1.25 and 0.81 in 1993-94. The number of major implements in 1983-84 was 4.68 as against 4.09 in the year 1993-94. The number of electric pumpsets per farm on an average in 1983-84
was 0.10 while in 1993-94 it was 0.22. At the overall level there was an increase of Rs.3.058 in the capital investment in 1993-94.

R.K.Khatkar and J.P.Singh (1996) attempted to study the growth of gross domestic product (GDP) and gross fixed capital formation (GFCF) both in the public and private sectors and their relationship over the period 1965-66 to 1992-93 by using secondary data. It was observed that GDP has increased at the annual growth rate of 2.31 per cent in period I (1965-66 to 1979-80) and 1.57 per cent in period II (1980-81 to 1992-93). While the corresponding figures for capital formation were 4.40 per cent and 0.66 per cent respectively. The decelerating growth rate of investment in the public sector (4.36 per cent) was higher than the positive growth rate in the private sector (3.25 per cent) in period II. The regression results of GDP over public and private sector investments turned from positive in both the sectors in period I to negative in the public sector in period II. The priority areas of investment of private sector in a majority of the states are agricultural implements (about 15 per cent). The per cultivator component of GFCF was Rs.176 during 1981-82. Of this, about Rs.82 was on agricultural implements and Rs.46 on irrigation.

Focus of the paper by Dhawan, B.D. (1996) was on the determinants of private fixed farm investments which predominate the overall capital formation in Indian agriculture. Author studied
investment behaviour of Indian farmers and price and non-price determinants of investments.

Author concluded that loan finances play a crucial role in fixed farm investments. The interest rate on term-loan finances is a critical price factor acquiring in fixed farm assets. Institutional credit, land and tenancy reforms, infrastructural investments on rural roads, rural electrification, regulated markets and yards etc., positively encourage investments in agriculture.

It is estimated that during 1981-82, investments in private irrigation amounted to about 42 per cent of total private fixed capital formation in Indian agriculture. However, this share varied greatly from State to State. It was about 50 per cent in five states of Tamilnadu, Gujarat, Maharashtra, Andhra Pradesh, and Haryana, but very low in Jammu and Kashmir, Himachal Pradesh and Assam.

At the all India level, out of Rs.177 absorbed in private fixed capital formation in agriculture per cultivator household, as much as Rs.102 went into non-irrigation related investments during 1981-82. The total fixed capital formation per cultivator household varied considerably across 17 States in non-irrigation investments (coefficient of variation = 111 per cent). Factor explaining this disparity in non-irrigation investments was availability of institutional credit, and the correlation coefficient between the two was around 0.93. The value
elasticity of private non-irrigation related investments in agriculture was about 0.89, much higher than the corresponding value of elasticity with reference to canal irrigation of about 0.22.

Smriti Mukherjee (1996) studied the trends in investment in agriculture. Gross capital formation at constant prices in agriculture reveals three distinct types of trends: (i) a rising trend between 1960-61 and 1978-79; (ii) falling trend between 1978-79; and (iii) an upward trend ending up to 1993-94.

Coming to relative share of agricultural investment, it is noted that during 1960-61 and 1978-79 the figures varied between 16 and 19 per cent. Straight from the year 1978-79 relative shares started declining in a systematic manner from 15 per cent in 1980-81 to 9.27 per cent in 1993-94. The lowest figure of 7.50 per cent was attained in 1990-91 after which date the investment showed slight improvement.

Bhuvaneswari, S. and T. Alagumani, (1996) studied determinants of capital formation in agriculture in Dindigul – Anna District in Tamil Nadu with a view to studying the nature and extent of capital formation and assess the rate of capital formation. The primary data were collected by personal interview method selecting 120 respondents. Out of that, 77 reported capital formation. The gross capital formation per farm was Rs.23,000 and net capital formation was Rs.20,513. The rate of capital formation was 7 per cent, which is
less than the minimum rate of 10 per cent required for sustainable agricultural development. Only 5 out of 77 farms (6.5 per cent) used own funds and 72 farms (93.5 per cent) depended on borrowed funds. The share of credit in total investment varied from 58.86 per cent in land improvement, 76.90 per cent in livestock, and 100 per cent in tractors.

Autkar, V.N. et. al, (1996) studied assets of rural households in Vidarbha region based on a sample of 150 cultivators, selected randomly from seven villages. The data pertained to the year 1990-91. The results of the study indicate that as the size of holding increases the assets position also increases correspondingly, the assets like land and buildings are mostly inherited and constituted about 95 per cent of the total capital assets. Capital investment per hectare worked out to be Rs.44,749 and per farm to be Rs.68,380.

Rekha et. al., (1996) studied the capital formation in agriculture made through the borrowings from the commercial banks. A sample of 180 beneficiaries are drawn from four villages of Goa for the study. Most important results of the study are: 56 borrowed for dairy, 37 for fishery, 31 for crop loans, 22 for pumpsets and sprinklers, 13 for land development, 7 to repay loans, 6 for poultry, 2 for wells, 4 for domestic consumption and 12 had misutilised.
Based on secondary data obtained from different published sources. Brahm Prakash and Sushila Srivastava (1996) studied trends, constrains and prospects of capital formation in Indian agriculture. The study revealed that gross domestic capital formation was 10.2 per cent of gross domestic product in 1950-51, and it increased to 22.7 per cent in 1980-81 and to 27.1 per cent in 1990-91. Since then it has been moving within the range of 20 to 24 per cent. Gross capital formation in agriculture was Rs.44 crores in 1987-88 and it increased slightly, in absolute terms, to about Rs.47 crores in 1993-94.

Inder Sain and V.K. Sharma, (1996) analysed private investment and capital formation in Punjab agriculture. The primary data was collected from 170 farm households for the year 1982-83 and 205 for 1992-93. The large farms continued to add more to farm machinery at a substantial growth rate over the period 1982-83 and 1992-93. On an average, farm family recorded an improvement in the capital output ratio by Rs.0.43 for 1992-93. A rupee spent in fixed capital yielded Rs.1.14 during 1992-93, whereas it yielded Rs.0.71 during 1982-83. The analysis highlighted that investment in livestock is the promising factor where all size categories of farms and particularly the small farms invested in a big way over the study period.
Sinha, R.P. and R.Kumar, (1996) examined the pattern of capital formation in the form of investments on fixed assets, based on the primary data collected from 60 households drawn from three villages of Bihar Sharif block of Nalanda District pertained to the agricultural year 1985-86. The study revealed that the average per household income was as high as Rs.29,929. The average per household saving was Rs.7,234. The marginal propensity to save was as high as 0.6380 for the sample as a whole. The average per farm and per hectare investments on fixed assets were high being Rs.19,650 and Rs.10,767 respectively. It was observed that nearly 40 per cent of the investment was on land development 33 per cent on building of cattle sheds, farm houses, etc., and the rest 27 per cent on implements, machinery, irrigation sources and dairy.

Namboodiri, N.V. (1996) studied the level and rate of capital formation in both private and public sector since 1950. There has been a significant decline in the share of capital formation in agriculture from about 26 per cent during the early 1950s to roughly 10 per cent during the early 1990s. Financial institutions played an important role in accelerating the process of capital formation during 1960s and 1970s. Both private and public capital formation swelled since the early 1980s. What is more disturbing is not only the low rate of growth in real private capital formation during 1980s, as compared to the previous two decades, but also the decline in the public capital
formation during 1980s. Institutional finance as a percentage of private capital formation has reached a level of 44 per cent during early eighties and declined to 35 per cent by early nineties.

Ashutash Shrivastava, et. al (1996) studied income, saving and investment behaviour of farmers in the Lalbarra block of Balaghat district in Madhya Pradesh. Three villages were selected for the study and from these villages 50 farmers belonging to small, medium and large groups were selected for the study. The average income from all the activities for the small, medium and large farms come to 22,617, Rs.50,214 and Rs.87,694 respectively. Agriculture and other allied activities like dairy, poultry, goat keeping were the major sources of income that contributed 85, 80 and 70 per cent of the income for the small, medium and large groups respectively. Large farmers (44.59 per cent) saved more money than the medium (29.68 per cent) and small farmers (14.70 per cent). As compared to the small farmers, the large farmers invested their surplus earnings largely in the non-agricultural sector e.g., on gold, motor cycles, bank deposits, luxurious articles etc., and very little amount was spent on agriculture or related items like purchase of land, wells, irrigation equipment etc.

Raj, K.N. et. al (1996) studied capital formation in Indian agriculture by studying the trends in investment based on secondary data collected from different published sources. The study pertained to the period 1960-61 to 1993-94. The study revealed that both the public
and private sector investments in agriculture after a modest start in the 1960, increased steadily during the 1970s but declined thereafter leading to an absolute fall in investment. However, the private sector investment remained stagnant during 1980-81 to 1991-92. The author attributed the decline in public investment to complementarity between public and private sector investments.

Basing on secondary data Dingar, S.M. (1996) analysed the trends and determinants of capital formation in Indian agriculture from 1960-61 to 1990-91. The share of capital formation in Gross Domestic Product (GDP) of agriculture increased from 5.55 per cent in 1960-61 to 10.43 per cent in 1980-81, thereafter it declined to 7.72 per cent in 1990-91. The per annum compound growth rates indicated a steady decline from 6.88 per cent (1960-65) to −0.93 per cent (1980-85), and thereafter improving slightly to 1.98 per cent (1985-90). Gross Capital Formation (GCF) increased from 15.09 per cent in 1960-61 to 18.86 per cent in 1980-81 and it showed a declining trend and reached 10.49 per cent in 1990-91. The percentage share of public sector in total investment in agriculture was 38.73 per cent in 1980-81 and it came down to 26.98 per cent in 1990-91. Against this, the percentage share of private investment increased from 61.27 per cent to 73.02 per cent during the corresponding period.

Janaiah, A. (1996) studied trends in capital formation, capital productivity, resource flow, gross value of output and incremental
capital-output ratio in Indian agriculture based on secondary data covering the period 1960-61 to 1994-95. The results showed that the ratio of capital formation in public sector to private sector was 1:3.75 during 1994-95 and 1:1.9 in 1965-66. However, gross capital formation increased in real terms from 2,306 crores during 1965-66 to Rs.4,895 crores in 1994-95. The resource flow at a faster rate vis-à-vis increased investment resulted in an increase in agricultural output from Rs.35,477 crores in 1965-66 to over Rs.80,000 crores during early 1990s (at 1980-81 prices). The estimated capital productivity (at 1980-81 prices) was Rs.16.67, Rs.17.47, Rs.10.91, Rs.14.60, Rs.18.58, and Rs.17.88 during 1965-66, 1975-76, 1980-81, 1985-86, 1990-91, and 1994-95 respectively. It was observed that the gross capital formation has increased but at a declining rate. But at the same time, gross output value in agriculture sector has increased significantly from 1.21 per cent during 1960-61 to 1970-71 to 3.57 per cent during 1981-82 to 1994-95. In addition to investment, rural electrification, education and agricultural terms of trade are found to be other important factors which contributed about 44, 12 and 1.40 per cent to growth in agricultural output respectively.

Singh, R.P. and S.K. Singh (1996) studied growth in agricultural capital in Bihar based on secondary data covering the period from 1955-56 to 1990-91. Results show that the growth rate was mere 0.014 per cent. The gross irrigated area increased to 4,157 million hectares
in 1970-71 from 1,735 million hectares in 1955-56 with an annual growth rate of about 4 per cent. The annual growth rate of livestock population was 2.11 per cent. The stock of non-traditional agricultural equipments, i.e., tractor, oil engine and electric pump has increased considerably and the average annual growth rate established to be 41.42 per cent, 290 per cent, and 475 per cent respectively between 1956-57 and 1987-88. The annual growth of agricultural and allied activities added value was 84 per cent between 1955-56 to 1990-91.

Tilekar, S.N. (1996) studied the situation of physical and productive capital investments on the sample farms in four regions of Maharashtra viz., Western Maharashtra, Marathwada, Vidarbha and Konkan. Primary data collected from 1,000 farmers selected randomly pertained to the agricultural year 1988-89. There was an increasing trend in total productive investment with the increase in the size of farms in all regions. Productive investments on farms was highest in Western Maharashtra, followed by Konkan region. The reasons for higher investments in Western Maharashtra and Konkan regions are better economic conditions due to canal irrigation and supplementing non-farm incomes received from urban areas (Mumbai) respectively.

Rachhpal Singh, Bant Singh and Jaswinder Kaur (1996) conducted a study to examine the growth in capital accumulation and farm productivity during the post-green revolution period with respect to the Punjab that experienced different technological innovations in
agriculture during the two decades ending with 1991-92. The specific objectives of the study are: (1) to examine the pattern and growth in capital accumulation on different size groups of farms in different agronomic regions of Punjab from 1971-72 through 1991-92; and (2) to bring out the incremental capital-output ratios on the small, medium and large-sized farms at different time intervals in the State.

Authors concluded that investment on fixed farm assets (except on draught animals) has continuously grown in almost all farm situations in the state both at current and constant price levels over the period 1971-72 through 1991-92. The relatively low increase in investment on farm machinery and equipments on the large farms indicated a stage in that these farms were already mechanised and there was little scope for making more investments on these items. The high per hectare investment on machinery and equipment and irrigation structures on medium farms indicated over-investment because of the indivisible nature of these assets in relation to the area under command. The study showed that, the investment on draught animals has decreased considerably on all the farm size categories in all the regions of the state during 1971-72 through 1991-92 because bullock labour has been substituted by tractors and other machines like threshers. The study has further brought out that incremental capital output ratios had decreased during the later period i.e., from
1981-82 to 1991-92 as compared to first decade of the study i.e., from 1971-72 to 1981-82.

Jairath, M.S., and Brijesh, C. Purohit (1996) conducted a study in arid India, known for distinguishing features such as persistently harsh climate, water scarcity and fast moving production system from traditional to modern and commercial agriculture. The study mainly draws information from various official documents. Looking at the time-series from 1980-81 to 1992-93, it was found that gross fixed capital formation in agriculture which was steadily rising during the period 1980-81 to 1986-87, reached a peak level in 1986-87, became subdued during 1987-88 and thereafter it fell sharply to the level of about Rs.12,000 crores but again picked up marginally after 1990-91. The composition in the agriculture sector revealed that the share of public and private capital formation accounted for nearly 42 and 58 per cent respectively during the triennium ending 1981-82. During the next decade share of the public sector increased and that of the private sector declined. The trend in capital formation revealed that public capital formation continued to decrease at a simple annual growth rate of 3.0 per cent upto 1986-87, and picked up at the rate of about 1.0 per cent during 1987-88 to 1991-92. Private capital formation, in contrast, continued to rise during the period 1981-82 to 1986-87 but fell at the rate of nearly 14 per cent during 1987-88 to 1991-92. The total agricultural capital formation growth at a simple annual rate of
about 2.5 per cent during 1981-82 to 1986-87 and a sharp decline by about 8 per cent during 1987-88 to 1991-92. Based on the high degree of complementarity between public and private investment author suggested that there is an urgent need to enhance public investment in the agriculture sector which in turn will influence private capital investment in the agriculture sector.

Varadarajan, S. and Sri Sankari (1996) studied the determinants of private fixed capital formation in agriculture in Tamilnadu. The primary data was collected from a randomly selected 200 investor-farmers in four districts and the data pertained to the year 1993-94. The data was analysed with the help of a system of three simultaneous equations with a recursive structure and estimations were made with two-stage least squares method. The results of the study showed that the past savings, asset holding, area irrigated, productivity of land and priorities among investment opportunities are the farm specific determinants of private fixed capital formation in agriculture. The availability of external finances and the user cost of capital are the policy variables. Authors observed that, the policy support for institutional credit, marketing and prices of farm inputs and output are effective instruments to promote private capital formation in agriculture.

Mani, K.P. P.Shaheeha, and P.Chacko Jose (1996) made an attempt to examine the level and composition of gross domestic capital
formation in agriculture sector at the national level with the help of secondary data for 40 years from 1950-51 to 1990-91. Data related broadly to seven variables viz., gross domestic saving, gross fixed capital formation, gross domestic capital formation, gross capital formation in agriculture, institutional flow of credit, gross cropped area and gross domestic product in agriculture.

Authors concluded that, there is a continuous fall in the savings of public sector which constitute an integral part of gross domestic capital formation. The share of gross capital formation in agriculture to gross domestic capital formation dangerously come down (around 10 per cent) in 1990-91 as compared to 1950s about (21 per cent).

It has also been observed that public sector investment on agriculture, which accounts for about one-third of the total investment, has been declining in the last few years and it is the private investment which is playing a major role. The private and co-operative sectors are emerging as a major source of capital formation. Authors suggested that unutilised resources pending with the co-operatives can be more effectively utilised, if right policy prescriptions are issued, particularly in the context of decentralised planning and panchayati raj.

Vasant P. Gandhi's (1996) study based on the theory of investment behaviour seeks to examine the nature of investment
behaviour from the early 1950s to the early 1990s based on secondary data available in official records and publications.

Author establishes that Government investment, which was almost continuously rising until the early eighties, shows a decline continuously even beyond the mid-eighties to 1992. Between 1980 and 1986, the private investment has fluctuated substantially and also shown some decline. However after 1986, private investment has started rising and continued to rise quite sharply. In the process it has compensated for the decline in government investment, making the growth of total investment positive. However, the level of total investment in constant prices in 1992-93 remained lower than that seen in the early eighties.

A theoretical model for investment behaviour in agriculture indicated that, rural savings and co-operative credit to agriculture are the strongest determinants, followed by high-yielding varieties, agricultural wages and commercial bank credit. Government capital stock has a positive sign for all the periods and is statistically significant during 1952-53 to 1980-81, indicating its continued fostering role in stimulating private investment. Wage rate has a negative sign in all the periods, indicating the importance of capital-labour substitution, though this is not statistically significant. Rural savings have emerged as a strong determinant in the recent period of 1980-81 to 1992-93 and commercial bank credit is also becoming more
important. The decline in private investment in the 1980 to 1986 may be associated with squeezing of rural savings as well as less net commercial bank and co-operative credit to agriculture in real terms. Relative improvement in the later as well as a growth in replacement investments may have fostered the rise in private investment in the subsequent period.

Shiyani, R.L. and S.B. Vekariya (1996) attempted to examine the impact of watershed on capital formation in agriculture in the command area of Madhuvanti watershed situated in Junagadh district of Saurashtra region. For the purpose of the study, four villages from the command area of watershed were selected. In all 50 beneficiaries of watershed and an equal number of non-beneficiary respondents were selected constituting the sample strength of 100 farmers. The input-output data of all the three crops grown by the farmers, viz., castor, wheat and garlic were collected by personal visit during the rabi season of 1996. The data were analysed separately for both the groups using farm management concepts.

The findings of the study revealed that the beneficiary farmers enjoyed relatively better position in respect of net income, family labour income, farm business income and input-output ratios. This suggests that the investment made by the beneficiary group was more remunerative as compared to their counterpart in the command area. This suggests the positive impact of watershed on the farmer's
Acknowledgement

Economy. Thus, it is concluded that the watershed is one of the most important determinants of capital formation in agriculture.

Amalsesh Banerjee (1996) examined the capital formation and redirection of public investment, nature of saving, surplus and terms of trade, importance of different financial institutions in agricultural capital formation, and financial reform in the rural sector in order to facilitate capital formation.

Author observed that agriculture is required to diversify the field of production for income generation, employment expansion, poverty alleviation and export promotion. In order to enable this diversified production both public and private investments have to be redirected and the financial institutions have to be redesigned to supply the growing need of capital and to reduce the legacy of overdues, inefficiency, corruption and undue administrative intervention.

Author says that public investments in agriculture are confined largely to high-tech irrigation projects, and infrastructure technology, energy, marketing and communication, sub-systems are the important areas which call for extensive public investment for diversified agriculture production. Similarly, housing and human settlement is another area for public investment.
Saving in agricultural sector is largely dissipated due to lack of opportunities of market facilities and unfavourable terms of trade. Author proposes to redesign the rural financial structure around the Regional Rural Banks (RRBs), rural branches of commercial banks and co-operative banks. And RRBs have to be combined together in order to strengthen the rural financial structure and to provide appropriate and adequate financial support to private capital formation in a diversified system of production.

Dhawan, B.D. (1996) studied canal irrigation in India which is wholly in the public sector domain and is also a dominant source of irrigation. Author concluded that both at macro and micro levels, it lends support to the proposition that public investments in canal irrigation in India stimulate private investments in agriculture, including investments in private means of irrigation. Since development of canal irrigation accounts for a major share of total public investments in Indian agriculture, the veracity of the proposition gives credence to the complementarity hypothesis according to which private fixed capital formation in Indian agriculture is generally positively induced by corresponding fixed capital formation on public account. The substantial decline in public fixed capital formation in agriculture since 1980-81 must be deemed as a major explanatory factor behind the marked slow down in the rate of
growth of private fixed capital formation in Indian agriculture during 1980s as compared to 1970 and 1960s.

Mishra, S.N. (1996) studied the capital accumulation in Indian agriculture since Independence in relation to factors of production, namely land and labour. Author observed that the capital formation in Indian agriculture grew at accelerated pace over the first three decades since Independence. However, its growth rate was drastically reduced during the eighties due to an absolute decline in public capital formation. Again, the ratio of fixed capital formation to agricultural GDP, however, continuously increased from 5 per cent in the 1950s to 9 per cent in the 1980s. Even though the share of agriculture in the GDP of the country declined over the period, the ratio of fixed capital formation in agriculture to the agriculture GDP was maintained around 3 per cent over the period. The net fixed capital stock per hectare of net sown area increased from Rs.2,433 in 1951 to Rs.5,543 in 1991 in real terms. Similarly, per agricultural worker it increased from Rs.2,847 in 1951 to Rs.4,122 in 1991.

Regarding efficiency of capital, author established a relation between Green Revolution and capital efficiency. Beginning with the Green Revolution, since when the area under cultivation came to remain constant, the marginal efficiency of capital increased from 0.28 during the Green Revolution period to 0.41 in the Post-Green Revolution period of 1980s. Author believed that, it would not be hard
to achieve 3.5 to 4.0 per cent annual growth rate of agricultural GDP in future, if the agriculture's own rate of investment of 9 per cent achieved during the 1980s is pushed upto 10 per cent and the efficiency of capital use is further improved.

Pal, D.P. and S.K. Mondal, (1996) studied the changes in the structure of rural assets held by different groups of rural households in India. Secondary data relating to the asset holding in rural areas of India and in West Bengal, Gujarat and Tamil Nadu states for the years 1961-62, 1971-72 and 1981-82 are obtained from All India Rural Debt and Investment Survey (1961-62) and All India Debt and Investment Survey; Assets and Liabilities of Rural Households (1971-72), both by Reserve Bank of India, and the NSS 37th Round (January-December 1982).

The authors concluded that during 1960-61 – 1981-82, the distribution of rural assets by types of households has changed in India and in the states of West Bengal, Gujarat and Tamil Nadu. The disaggregative analysis showed that the share of cultivator households in total rural assets has increased and undoubtedly at the cost of non-cultivator households, thereby resulting in changes in the overall distribution of rural assets.

The Lorenz and Theil inequality indices showed that concentration in the distribution of rural assets has in general
markedly decreased in India and in West Bengal, Gujarat and Tamil Nadu States. The rural assets have in general tended to be evenly distributed over time.

Investment and Capital formation in hill farming areas of Uttar Pradesh was studied by Tripathi, R.S. (1996). The study was based on an intensive enquiry of 60 farmers selected from 6 villages of Chamba block in Tehri Garhwal district. The data were collected through personal interviews with the respondents at first in 1984-85 and again in 1994-95. The same set of the sample was used at two points of time.

The author concludes that, the per farm capital investment of fixed assets excluding land was higher on high-hill farms as compared to valley farming systems due to the larger size of holdings in the higher elevation. But investment on per unit area indicated a reverse trend. The highest share of investment was on farm buildings followed by livestock and irrigation structures and it was the least on farm machinery and implements. On an average, per hectare fixed capital formation was highest in valleys during a decade from 1984-85 to 1994-95. The highest growth rate of fixed capital formation was in high hills and it tended to decrease with the decrease in the elevation of the farms. The highest growth rate was recorded on farm machine and implements under valley and high-hill farming situations and also on irrigation structures in mid-hill conditions during the reference period. Estimates of real capital formation indicated, on an average, a
remarkable disinvestment of fixed capital in all the farming situations and no capital was formed in real terms during the decade 1984-85 to 1994-95. Furthermore, farm implements provided positive capital formation growth in all the situations and irrigation structures under the mid-hill farming systems. The regression analysis indicated sufficient scope to increase fixed capital formation through increased investment on irrigation structures in valley and mid-hill and also on farm buildings under mid and high-hill subsistence farming system.

Kaladhar, K. (1996) studied the requirements of financial services for poor rural households that encompass consumption smoothening, human capital formation, production and investment credit and insurance in addition to savings facilities. Author observes that, while the informal sector provides most of the services, the formal rural financial institutions have inappropriate tools and perspectives in delivering the services. And, unless institutions retool themselves by focusing on a rural household's economy rather than limiting themselves to activity linked lending, they cannot be successful in delivery of financial services.

Kailas Sarap (1996) analysed the functioning of the land market (rural asset market to a large extent) as it operates in the rural areas of Haryana on the basis of field survey data collected from 90 households drawn from the villagers. The author discusses (1) the inactive nature of the land sale market; (2) the background of sellers
and buyers; (3) motive of selling land; and (4) variation in the price per unit and other factors affecting it.

The study analyses the sellers and buyers who have transacted land during the period 1960-61 to 1990-91. Even in a dynamic rural area like the study area, with diversified occupation and modern technology, the turnover of land sale is low. The same observation applies to land purchase transactions.

A variety of reasons have led to the sale of land once for all. In the case of poorer farmers, land sale was mostly involuntary in nature: given the inelastic demand for fund. These households had no choice but to sell their land. In such transactions they had to part away more than two-fifths of their land holdings. By contrast, the sale of transactions of the medium and large farmers were voluntary in nature and the demand for fund was elastic.

Many households that could manage funds from the informal credit market have supplemented this source for land purchase. Given the imperfections of the credit market, it was the collateral rich and therefore credit worthy households who could mobilise the funds. On the other hand, the collateral poor households were left out from getting informal credit and as such were not able to purchase land unless they had money from the service sector, clearly the credit market imperfections were reflected in the land market.
There was wide variation in the price per unit of land sold during the period. The impact of green revolution and diversification of the rural economy due to government intervention have been reflected in the rising price of land during 1970s and 1980s. The average price of land rose moderately during 1970 and later period. But there was a wide variation in the price of land during the period of study, especially during the early 1970s. The regression analysis clearly revealed that the variance of prices of land stemmed from differences in the characteristics such as site, relative location, and the time of the sale of land. About 70 per cent of the variation in the land price could be explained on that basis.

Kishor C. Samal (1997) analysed the paper by Kalandar (1996) on working of successful rural financial institutions (RFIs) and suggested that, directed credit should be timely and adequate at reasonable rate but not necessarily at concessional rate except of course at the time of natural calamities like harvest failure, so that informal credit agents like money lenders may be driven out from the 'rural credit market.' Author argues for the services of deposit mobilisation and loan advances at the door-step of small farmers and rural non-farm sector (RNFs) entrepreneurs. Co-ordination with post offices and self-help groups is desirable was also suggested for the purpose. Further, post offices in rural areas work for only 1 to 2 hours a day. The post office staff in rural areas is mostly recruited from the
local area. They have intimate knowledge of local people and local economic and social conditions. But they are under-utilised and underpaid. In these circumstances, they can be fully utilised with higher remuneration and incentive and thereby post offices can work as service banks without creating extra infrastructure in rural areas. That is besides deposit mobilisation, post offices can also advance loans for various activities and to various groups in their areas. Alternatively, a certain percentage of deposit mobilised by post offices may be earmarked to be diverted to RFIs for disbursement of loans in the area so that savings mobilised in rural areas are not diverted to urban centres.

Dhavan, B.D. & S.S.Yadav, (1996) made an explanatory effort in establishing a functional relationship for public capital formation in Indian agriculture. Authors observed that, bulk of the public investments in Indian agriculture are for the purpose of development of irrigation infrastructure. Since nearly three-fourths of irrigated area is devoted to foodgrains production by Indian farmers, public investments in irrigation are interalia determined by government concern on domestic food front.

Each additional rupee of net borrowing by the states resulted in about two-fifths of a rupee worth of fixed capital formation in agriculture on public account over the period 1960-92. And, if the borrowed funds are tied to agricultural projects like irrigation works
and watershed development programmes, these may then be wholly transformed into capital formation.

One rupee of additional savings in states revenue budgets gives rise to about a little under one-third of a rupee worth of public capital formation in agriculture.

Renu Kohli (1999) traces the bank branch licensing policy in India in the post-independence period and evaluates its performance and relates it to the restructuring of the banking industry under financial reform. Within this context, the focus of the article is on the future course of rural public sector banks. It offers the Indonesian bank Rakyat Indonesia as a model relevant for the rural branches of public sector banks in India. It argues for their transformation as an alternative to closure and/or gradual substitution by private sector banks.

The proposed solutions in Narasimham Committee (1998) for achieving financial viability emphasise flexibility, autonomy and accountability to restructure financial intermediaries at all levels. The details of these structural concepts however are discussed at macro level, basically with reference to the first and second tier banks for rural and small industrial credit.

Shankar Kumar Bhawnic and Abdur Rahim (1999) addresses some of the inter-linked credit transactions of issues with reference to
rural West Bengal. The objectives of the study were: (i) to understand the incidence and forms of inter-linked credit transactions, and (ii) to examine the characteristics of households involved in inter-linked credit contracts.

For the purpose of the study two districts Hooghly and Bankura were selected. The former is highly developed in terms of the level of agricultural development and the later is relatively backward. Four sample villages have been considered from each district and the total sample was 420 covering categories of agricultural labourers, marginal farmers, small farmers, medium farmers and large farmers.

Authors conclude that the probability of entering into linked credit transactions is higher for the households having smaller operated area. The regression equations showed that there are other statistically significant determinants of linkage as well. The households with higher area under tenancy cultivation are involved relatively more inter-linked credit contracts while borrowing. On the other hand the probability of entering into linked contracts become lower for households having higher ratio of male workers to total workers, higher value of non-land assets and higher ratio of non-farm to farm income. The probability of entering into inter-linked contracts have been greater for the economically disadvantaged households in West Bengal villages.
V. Puhazhendhi, B. Jayaraman (1999) studied development of the rural credit delivery system in the country and observed the metamorphosis from monopoly of cooperatives to the induction of commercial banks and establishment of regional rural banks for improving the outreach and ensuring access to credit in rural areas. The innovations in rural credit delivery had an impact on agricultural production and acceleration of the pace of capital formation in agriculture, infrastructure development with focus on transportation and marketing. Authors suggest that, focus should be on strategies that are required for tackling issues such as sustainability and viability, operational efficiency, recovery performance, small farmer coverage and balanced sectoral development.

Authors concluded that, for accelerating the pace of capital formation ensuring remunerative prices for agricultural produce, infrastructure development with focus on transportation, marketing and other post harvest facilities etc., are essential.

Bhatia, M.S. (1999) in his paper attempts to build a composite index of state-wise rural infrastructure and examines the relationship between infrastructure development and levels of production and growth in agriculture. The paper further aims at examining, the pattern of development of rural infrastructure in India over the years and regional variations in the availability of rural infrastructure facilities.
The estimated functional relationship revealed that index of infrastructure is significantly influencing the per hectare yield of foodgrains and value of output from agriculture in the States. Author identified Rajasthan, Bihar, Madhya Pradesh and Orissa as having poor infrastructure. The development of infrastructure in these States would require large scale step up in investment in these sectors, which may be constrained because of financial resources.

While reviewing trends in rural financial intermediaries and commercial banks, Tara S.Nair (2000) explains that the rural financial system, as it has evolved in India, operates through two sets of institutions in the formal and informal sectors. The formal sector has adopted a multi-agency approach and includes the co-operatives, public sector commercial banks and regional rural banks. The informal sector, which operates outside the formal system consists mainly of rotating savings and credit associations, traders, merchants, contractors, commission agents, local money lenders etc. The former is governed by the existing rules and regulations in the financial sector, whereas the later largely functions in an autonomous fashion with its own norms, rules and discipline.
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