Chapter – III

Review of Literature
I. Introduction

The second chapter dealt with the elaborate discussion of capital formation in agricultural sector and a few methodological issues. In addition to that the chapter also explained several concepts of capital formation such as meaning and definition, causes for low rate of capital formation, significance and chapter scheme of this study. The present chapter deals with the review of related studies. An attempt has been made to review some important works related to the present study. The study is a well conversant with relevant theories, raises a few researchable issues and finds some gaps with the concepts from the relevant literature. It is also done to find out what data and other materials, if any, are available for operational purpose.

Knowing what data are available often serves to narrow down the problem itself as well as the techniques that might be used. This would also help the study to know if there are certain gaps in the theories or whether the findings of the different studies do not follow a pattern consistent with the theoretical and conventional expectations. All these will enable to take up new studies in the field and for furtherance of knowledge. Accordingly the review of earlier studies is classified into five broad areas such as (i) capital formation and growth of agricultural sector, (ii) composition of capital formation in agricultural sector, (iii) capital formation and saving, (iv) capital formation and institutional credit and (v) capital formation and general issues.
A. Capital Formation and Growth of Agricultural Sector

The first classification of reviews deals with the various aspects of relationship between capital formation and growth of agricultural sector. The following studies clearly focus on the above issues.

Chand and Kumar\textsuperscript{1} (2004) estimate a simultaneous equation model to find out the determinants of private and public capital formation and their impact on agricultural GDP in India. The model provides some new insights to understand the behaviour of private investments, and quantifies the trade-offs between public investments and subsidies. The rate of return on private investments, which in turn depends on the terms of trade and technology, is found to be the most important determinant of private capital formation.

There is an asymmetry in the effect of public investment on private investment: an increase in public investment definitely induces a rise in private investment while a decline forces farmers to cope with its adverse impact again by increasing private investment. Public investments mainly depend upon fiscal resources. The increase in farm subsidies and decrease in revenue receipts from agriculture are causing an adverse impact on public sector capital formation. Agricultural GDP is affected by both capital formation as well as subsidies,

besides terms of trade. The instant return to one rupee spent on subsidy is much higher than the instant return to one rupee spent for public sector capital formation. However, long-term returns from capital formation are more than double the returns from subsidies. Diverting 1 per cent of resources from subsidies to public investment raises output by more than 2 per cent.

Gulathi and Bathla\textsuperscript{2} (2001) after redefining and re-estimating trends in capital formation in agriculture, conclude that the situation is definitely not good, but not as alarming as is sometimes made out to be. This is because of the increasing share and role of private sector investments in agriculture over time. And the trend in that has remained robust despite decline in public sector capital formation in agriculture, and the fact that public sector investment has an inducement effect on private sector capital formation. This only goes to suggest that private sector investment in agriculture has been increasingly influenced by other factors, especially the terms of trade. And this has implications for the structure of growth within agriculture.

The former Union Minister, Singh\textsuperscript{3} (2001) points out that the growth rate of Indian economy depends more on capital formation in agriculture,


industry and service sectors than only on wishful thinking. The government has set the target of GDP growth at 8 per cent per annum for the 10th plan period and within this over-all growth, the target of agriculture growth has been fixed at 4 per cent. It is not possible to achieve this target. But it would not materialize, unless capital formation in the farm sector increases up to about 15 per cent of its contribution to the GDP. In recent years, capital formation in the farm sector has not been even half of this.

Hirashima (2000) points out that during the 1980s public investment in agriculture has been declining. This trend has not been offset by an increase in private investment, thereby the overall level of investment in agriculture has continued to decline. The relationship between investment and growth in agriculture is important to note that difference between ICOR or marginal capital coefficient of public and private investment.

This argument denotes that increased efficiency of capital formation in agriculture, expressed in terms of declining public investment and increasing private investment during the reference periods. In addition to this few studies explain the estimation of capital formation. Finally this study concludes that the adverse effect of public and private investment in agriculture.

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Mishra (1996) analyses real capital formation in Indian agriculture since 1951, offers some explanation for the behaviour of public and private capital formation, examines changes in the rate of investment in agriculture and the pattern of capital accumulation in relation to land and labour and examines changes in the efficiency of capital use. The study shows that capital formation in Indian agriculture grew at an accelerated pace over the first three decades since independence. In the 1980s, agricultural GDP grew at a higher rate than that of capital accumulation. Accordingly, the efficiency of capital use, as indicated by the output to capital ratio, increased.

Jairath and Purohit (1996) illustrate how capital formation is influenced in Rajasthan state, India, during the period 1980/81-1992/93. In particular, the paper focuses on the trends in Public and Private capital formation and its composition in agriculture and the link between public and private sector capital formation in agriculture and assesses their relative importance in agricultural growth, the factors influencing public as well as private capital formation in agriculture and policy options for strengthening the process of capital formation in agriculture.


Mishra and Chand\(^7\) (1995) argue the behaviour of public and private capital formation in agriculture and also examine the efficiency of capital use in agriculture. They conclude that the efficiency of capital use in Indian agriculture shows continuous improvement since the 7\(^{th}\) plan. The incremental capital-output ratio fell from about 7 in the pre-green revolution to about 4 in the green revolution period of the 1980. Correspondingly the marginal efficiency of capital increased from 0.15 to 0.28 and further to 0.41 during the time. This improvement was due to comparatively high sectoral GDP grows than that of fixed capital formation in the successive periods.

Wagle\(^8\) (1994) says that during the decades of the 1970s and 1980s agricultural output in India has recorded encouraging growth. Credit for this growth goes both to technological factors and rise in government as well as private investment in agriculture. Overall investment in agriculture went up to Rs.9,120 crores in 1988-89. As higher government investment induces more private investment, the government should ensure reverse of the downward trend in investment in agriculture as reflected in its share in the GDP at factor cost.

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Bhatt (1959) examines the relationship between the trend of capital formation and growth of agricultural sector and finds that the average annual rate of growth of investment was about 2.9 per cent in agriculture from 1950-51 to 1957-58. This study focuses on the trend of annual average growth of agricultural investment in the previous period of 1940-50.

The above studies explain the behaviour of private and public investments in agriculture and determination of capital formation. In this, terms of trade and technology are the major determinant factors of capital formation in agriculture. The above studies concentrate on the impact of public investment on private investment. Subsidies in agricultural sector and its impact on the public investment also are clearly focused in the above studies.

Another group of studies shows the relationship between capital accumulation in relation to land and labour. A few more studies clearly point out public and private capital formation in agriculture, assess their relative importance in agriculture growth and efficiency of capital use. In this connection the following studies deal with the composition of capital formation in agriculture.

B. Composition of Capital Formation in Agricultural Sector

The second classification of the reviews deals with the composition of capital formation in agricultural sector. This classification explains various aspects such as investment on land, livestock and machineries. The following studies clearly explore the above fact.

Singh\textsuperscript{10} (1965) conducts a study of 30 families in Swar block of Rampur district (U.P) and observes that of the total increase in investment in agriculture between 1950-51 to 1962-63, 36.6 per cent was on farm housing and cattle shed, 30.8 per cent on improved implements, tools and machinery, 25.6 per cent on irrigation works, 4.8 per cent on traditional tillage implements and carts and 2.2 per cent on land improvements.

Sancheti\textsuperscript{11} (1965) in his study of 240 cultivators of 24 villages of Rajasthan has excluded land but included residential buildings. In certain studies both purchase of land and livestock have been excluded as items of capital formation. These studies identify the component of capital formation is different aspect.

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Datta\textsuperscript{12} (1964) shows that during the period from 1949-50 to 1960-61 the percentage increase in stock of agricultural capital was 49.65 per cent in 1949-50 of the total capital stock in the country, 29.4 per cent in 1960-61, indicating a relatively slower growth of capital formation in agriculture during the period. Within agriculture itself, the addition to capital stock in the form of improvements of land and irrigation works (public) was the highest, while it was the lowest for the livestock.

The All India Rural and Debt and Investment Survey\textsuperscript{13} (1965) states that purchase of farm equipments was the most important item accounting for 28.4 per cent of the total capital formed in farm business. Well and other irrigation resources were the next in importance accounting for 26.5 per cent of the total, followed by reclamation of land - 16.7 per cent, bunding and other land improvements - 15.5 per cent, farm houses - 9.3 per cent, new plantation and additions to existing orchards - 2.7 per cent and other items of fixed capital formation - 0.9 per cent. The survey finally concludes that the majority of the investment comes under the category of farm equipment; the next majority item is well and other irrigation sources and only low investment comes under the category of new plantation.

\textsuperscript{12} Datta U (1964), \textit{"The Capital Structure of the Economy Change over the Two Plan Periods"}, \textit{Economic and Political Weekly}, 16(5,6&7):301-310.

\textsuperscript{13} All India Rural and Debt and Investment Survey (1965), \textit{"Tangible Wealth, Capital Expenditure and Capital Formation of Rural Households"}, \textit{Reserve Bank of India Bulletin}, 19(6):865-872.
The National Sample Survey\textsuperscript{14} GOI, (1965) in its fifteenth round estimates of capital formation per reporting house - hold stood at about Rs.250. Expenditure on land and building was about 48 per cent of the total investment. The next most important item was livestock (39 per cent).

Patel\textsuperscript{15} (1965) from the study of 21 cultivators of Sijhora village (Manda) in Madhya Pradesh has concluded that nearly 50 per cent of capital is invested on land improvement alone. Perhaps the local farmers might have been keen in developing agriculture through land improvement measures.

The National Council for Applied Economic Research (NCAER)\textsuperscript{16} (1963) survey indicates that gross capital formation for rural sector was of the order of Rs.699 crores in 1962 for the nation as a whole, out of which 218 crores was in farm investment, constituting 26.15 per cent on land improvements, 27.98 per cent on irrigation sources, 25.69 per cent on farm equipment, 11.47 per cent on bullock carts and 8.71 per cent on farm structures. They also made a separate estimation of Rs.88 crores for the change in livestock (net births and net purchases).


According to All India Rural Credit Survey\(^{17}\) (1956) estimates, the capital formation is 294.6 crores of rupees which is composed of 7.91 per cent invested on reclamation of land, 14.05 per cent on building and other land improvements, 18.5 per cent on digging and repair of wells, 5.8 per cent on laying of new orchards and plantations, 19.18 per cent on purchase of implements and machinery and transport equipment, 8.72 per cent on construction of farm houses, cattle shed and 17.01 per cent on miscellaneous capital expenditure in agriculture.

Hate\(^{18}\) (1951) carries an enquiry covering 227 families in Kodinar taluk to know the extent of net capital formation. He observes that net capital formation was the highest in machinery and implements followed by digging of wells, i.e., 37.4 and 28.1 per cent of the total investment.

The above studies deal with the trend of investment on farm household, cattle shed, irrigation works and agricultural machineries. A group of studies states that land and livestock do not come under the category of capital formation. Another study explains the trend of agricultural capital and its use of land and irrigation works. In this regard lowest capital in livestock

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\(^{17}\) Reserve Bank of India (1956), *All India Rural Credit Survey Vol.I, Part I (Rural Families)*, Reserve Bank of India, Bombay.

compared on land and irrigation works. A couple of studies points out that majority of the capital are invested on land. Additionally one more studies focus that highest investment on come under the category agricultural machineries. The following classification deals with capital formation and saving.

C. Capital Formation and Saving

The third classification of reviews shows the relationship between capital formation and saving. This classification tries to explain the role of saving in capital formation in agricultural sector. The following studies have focused in this theme.

Joshi19 (2007) states that the capital account of the balance of payments (BoP) is not separately represented in the national account identity, its contribution to capital formation remains generally unexamined. Taking various components of domestic savings and the capital account, the existence of a long-term steady state relationship between capital formation and various savings components and capital account balance to GDP. A notable result is that the short-term dynamics of capital formation are guided significantly by

the capital account such that disturbances in the steady state equilibrium are
corrected over time by means of changes in the desired amounts of capital
flows in the balance of payments. The implication of this finding is that a
calibrated approach to easing external capital constraints would serve to
smoothen and foster the capital acquisition cycle for productive activities and
help in achieving higher levels of capital formation and economic growth.

Pahlavani and Others\(^{20}\) (2006) in their paper investigate how capital
formation and saving promote economic growth in Iran. This is a challenging
task given the unresolved debate about the roles of investment and saving (both
empirically and theoretically) in models of growth and the difficulty of
specifying and estimating the relationships for an economy which has
experienced profound changes over the past four decades.

The study believes that it is necessary to briefly consider each of these
important factors in turn. In addition to this paper estimates the
interdependencies between real capital formation, saving and output for Iran in
the turbulent years 1960 to 2003 and the changes faced in the country during
the study period.

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\(^{20}\) Pahlavani M and Others (2006), "The Role of Capital Formation and
Saving in Promoting Economic Growth in Iran", 35\(^{th}\) Australian Conference
of Economists, Perth.
Dhawan\textsuperscript{21} (1998) explains that the decade of the 1990s has witnessed a renewed interest in the area of capital formation in Indian agriculture. This study began with the observation of a decline in public investment, that set in during the early 1980s, and has been followed by a series of studies and debates on related issues like relationship between public and private investment, determinants of private investment in agriculture and the trend of rural saving.

Zivot and Andrews\textsuperscript{22} (1992) analyze that the procedure to endogenously determine the structural breaks occurred in 1984 for real output, in 1980 for saving and in 1979 for investment. These dates coincide with the effect of the Islamic revolution in 1979 and Iran-Iraq war from 1980 to 1988. This study clearly focuses on the impact of saving and investment on output during the reference period. Additionally the authors explain that the procedures of output and determination factor also are discussed.

Another study by Rakshit\textsuperscript{23} (1982) points out that the remarkable rise in the net domestic saving and investment ratios in the seventies has not been


accompanied by any increase in the average growth rate of Net Domestic Product during this period. In this connection the author also points out that the study establishes a relationship between saving and capital formation in India.

According to Rajkrishna and Raychaudhuri$^{24}$ (1982) the trend of rural household saving and net capital formation in agricultural sector during the period from 1950-51 to 1973-74. During these periods the trend of rural household savings were compared with previous periods of 1940-50. But there has been acceleration of saving and capital formation in more recent years. The authors estimate that the saving propensity is higher during the study period.

Modigliani$^{25}$ (1970) and many others provide empirical evidence of the positive correlation between saving and output for a large number of countries. This direct relationship is often argued as supporting the Solow style model of growth in which a higher saving rate causes transitory growth to a higher steady state level of output. However there is growing evidence that causation may run in the other direction, from growth to saving, called the Carroll-Weil

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hypothesis. There is further disagreement about the subsequent effect of saving on investment.

The above studies show that the determinants of private investment and trend of rural saving. In addition to this study explores the ratio between saving and investment. Another group of studies shows that the trend of rural household saving and capital formation in agriculture. The main reason is that saving is the major determinant factor of capital formation.

D. Capital Formation and Institutional Credit

An institutional source plays an active role in farm sector. Farm lending has been influenced by various activities in agriculture. While short term loan is given for crop cultivation long term loan is given for procuring assets like machineries. These kinds of loans are used for the development of crop cultivation among the farmers in the country. In this view the following few studies explain the institutional credit and its role on agriculture sector.

Sivakkumar and Tholkappian26 (2009) in their study on “Interaction between Capital Formation in Agriculture and Banking Sector Reforms in

India" explain the relationship between capital formation in agriculture and trend of institutional credit for the study period (1980-2005). Macro level analysis in capital formation has been done for about a decade and a half. During the study period the trend of public investment is decreased when compared to private investment in agriculture. The case of institutional credit increased 36 times; but the case of capital formation only increased only 18 times during the study period. Various factors like the LPG have been attributed for such trend in institutional credit for agriculture sector. Albeit the fact that it is a macro level study, it did not offer any concrete solution for accelerating institutional credit.

As reported by Sivakkumar and Rajendran27 (2008) the trend of institutional credit declined during the study period (1995-2005). In addition to this the study finds that the inverse relationship between the cooperative and commercial bank credit during the study period. The study concludes that the cooperative credit declined in the study period. Various factors like the LPG have been attributed for such trend in institutional credit for agriculture sector. Albeit the fact that it is a macro level study, it did not offer any concrete solution for accelerating institutional credit.

In their study Awasthi and Arvind (2007) explain that the importance of credit for raising agricultural production and productivity can be understood by the functional relationship between output and basic factors of production which is often written as: \( Y = f (L, K) \), where, \( Y \) is output, \( L \) is labour and \( K \) is capital. The term capital strictly implies building up of capital assets like pumpsets, tractors etc. The procurement of these assets by the farmers depends on the credit availability and credit policy of term lending institutions. In this context the role of 'Investment Credit' becomes significant for capital formation in the agricultural sector in order to reap the benefits of capital formation for enhancing agricultural production. Perhaps this would also have a chain effect in the primary sector.

Sidhu and Others (2006) in their findings observe that the capital accumulation depends on the rate of investment, which in turn depends on the rate of savings. The financial institutions play a dominant role in mobilizing savings and then channelising those savings for investments into productive economic activities. Therefore, the role of financial institutions is crucial in the development of any sector and agriculture is no exception to it. Rather the development of agriculture sector is more dependent on banking sector because

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80 per cent of the farmers are small and marginal. Such marginalized farmers need to be helped by institutional sources.

Golait and Others\(^3\) (2005) explain the important institutional aspects of agricultural credit post-liberalisation in 1991 with the aim of drawing some lessons and delineating prospects for the future. A comparative analysis of direct institutional credit to agriculture and allied activities in the eighties and nineties revealed that the growth of long-term credit had decelerated, while the short-term credit flow had either stagnated or marginally increased. This phenomenon has even continued in the later years and has reached an alarming proportion in 2000-01 and 2001-02, which has a dampening effect on the agricultural investment for future growth process.

According to Gandhi\(^3\) (1996) investment behaviour in Indian agriculture is examined over the period from the early 1950s to the early 1990s. Substantial changes are observed in the post-1980 period. Government investment which rose almost continuously until the early 1980s shows a decline in 1992. Between 1980 and 1986 private investment has fluctuated substantially and also shown some decline.


However, after 1986, private investment 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. Results of a model of investment behaviour for the whole period indicates that rural savings and cooperative credit are the strongest determinants of investment, followed by high yielding varieties, agricultural wages, and commercial bank credit. Whereas government capital stock has a positive effect.

Rajendran and Prabhuswamy\textsuperscript{32} (1994) illustrate that a lion’s share of rural credit goes to crop cultivation followed by industry and consumption purpose. This is a micro level study on the dimensions of a rural investment in a backward district - Pudukottai of Tamil Nadu. Perhaps the economic status of households has a direct bearing in the institutional credit for offering collateral security. Though it is a micro level indepth study, it fails to integrate the influence of capital formation with agriculture development.

In a useful micro level exploration on resources use Rajendran\textsuperscript{33} (1993) states that to reduce the drudgery of farm operations, farmers invest more on agricultural machineries. His study covered 120 households in two districts of Tamil Nadu. Liberal credit policy of the formal lending institutions has resulted in investing more on farm machineries. Of late, farmers, to increase their social status, started applying for loans for procuring machineries like tractors. Subsequently such machineries have been used an custom hiring to repay loan.

The above studies clearly show that the role of institutional credit in agricultural sector. Additionally these studies sum up the trend of institutional credit in agricultural sector. In addition to this, a group of studies explains the impact of LPG on institutional credit. Another group of studies deals with the beneficiary of institutional credit and the problems faced by the farmers during receiving the agricultural loan. A couple of studies points out the major determinant factors of investment like public investment, rural saving and cooperative credit. The following studies deal with the capital formation and general issues of the present study.

E. Capital Formation and General Issues

The fifth classification of reviews states the capital formation and general issues of the present study. Capital formation has a wide gamut of domain of agriculture. Hence, it is intended to have a separate section for reviewing the issues, falling under general category. The following studies clearly explain the above fact.

Ray\textsuperscript{34} (2007) explains the capital formation in the Indian Economy over a 34 year period between 1970 and 2004. Three measures of capital formation GFCF, GDCF, and NDCF are studied. Special attention is paid to the potential impact of economic liberalization on capital formation in India. All the measures of capital formation have strongly positive time trends. Economic liberalization is found to have no statistically significant impact on any measure of capital formation.

Ramanjaneyulu\textsuperscript{35} (2006) estimates the growth rate of agricultural GDP that is based on factors such as capital formation, institutional credit and fertilizer consumption. Since these variables have a positive effect on GDP the


null hypothesis is rejected. Further, this study also estimates the export performance of agriculture on agriculture GDP and tests whether the increasing expenditure on subsidies results in reduction of agriculture capital formation. For this purpose, this study uses log linear regression models at various levels. The author concludes that in order to strengthen trade promotion of agro-products, central and state governments have to involve practically rather than making policies.

According to the annual report of RBI\textsuperscript{36} (2001) the ratio of public sector capital formation in agriculture to GDP has fallen to 0.4 per cent in 1998-99 from 1.7 per cent in 1980-81. Moreover the rate of GCF in agriculture has declined to 7.4 per cent in 1999-2000 from 8.9 per cent in 1980-81. The share of capital formation in agriculture and allied activities in GCF in the country has also declined substantially from 20.4 per cent in 1951-52 to 6.2 per cent in 1995-96. The inadequacy of new capital formation has slowed down the pace and pattern of technological change in agriculture with adverse effects on productivity. Expectedly this kind of situation warrants the attention of policy makers to take forward the agriculture sector in India.

In a systematic macro examination Chandakavate and Biradar\textsuperscript{37} (2001) argue that the basic policy instruments of economic reforms showed a dismissal picture in agriculture sector. The overall performance of Indian agriculture during the post-reform period has been very poor. The most serious effect of fiscal compression is deceleration of public investment in irrigation, power and other rural infrastructure like roads, communication and godowns. The planning commission document reveals that the planned public sector investment in agriculture during 1992-97 was much below that of secondary and tertiary sectors. A further disquieting trend is that the actual investment in agriculture during the period was only 59 per cent of the targeted investment. This was much below the secondary and tertiary sectors.

Kumar\textsuperscript{38} (1999) analyzes the behaviour of private investment in agriculture. The author points out that the stagnation in investment during the eighties has become quite notorious. The role of public investment in encouraging private investment in agriculture has come under scrutiny. The stagnation in investment is largely attributed to falling public investment in agriculture. The decline in public investment led to sluggish private investment. It is stressed that private investment in agriculture is partly autonomous and partly induced.


Rao (1993) explains that agriculture seems to have taken a back seat on the policy agenda of the nation. It is time that the gains made in this sector over the last two decades are not frittered away by default. Preferably sooner than later need to articulate the kind of policy initiatives that need to be taken in the context of the ongoing economic reforms. It is argued here that deregulation in case of agriculture is unlikely to be effective in ensuring sustained agricultural growth. Nor is it to a large extent even relevant in view of its existing structure.

It appears that the agenda of policy should emphasize public and private capital formation in this sector. Promotion of biotechnology, soil and moisture conservation, improvement of rural credit schemes, better farm infrastructure management and removal of restrictions on trade in agricultural commodities are some of the issues need to be addressed forthwith.

Agarwal (1966) in his field survey observes from the study of 318 holdings from 10 villages in Lucknow district (U.P.) that there was an increase of 19.82 per cent in capital assets on consolidated holdings and 2.52 per cent on un-consolidated holdings after the consolidated programme started in the area.

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This obviously reveals that large holdings have propensity to acquire more assets.

Sen\textsuperscript{41} (1965) observes that 78.2 per cent of the farmers in Bihar have the holdings below the average size and there is hardly any marginal surplus of farm receipts left for further investment towards capital formation. Basically the above study is based on only on Bihar farmers and particularly majority of the farmers coming under the classification of below the average size.

In a micro level exploration Bhanja\textsuperscript{42} (1965) explains a study of 179 cultivating families in three villages of Eastern India during the year 1956-61 to know the impact of source of finance on capital formation. The author observes that the total investment of 75.18 per cent was financed from own sources, about 9.02 per cent from money lenders, 2.89 per cent from sale of assets, 4.07 per cent from government sources and 8.84 per cent from other sources.


Patel (1965) opines that borrowing for investment in case of smaller cultivators will also help to improve their condition. Such foresighted observation needs to be considered seriously. This study focuses also on the role of borrowing in small farmers at various level in the field of rural farming system.

Shastri (1965) reports that borrowings have helped only a few cultivators in capital formation. This study points out that the only limited cultivators benefited in the agricultural credit system particularly big farmers. In addition to this study states that marginal and small farmers are benefited only at the lowest level. Interestingly the author observes in the study that agricultural borrowing is used for various purposes such as festival and family expenses.

Khatkhate and Deshpande (1965) work out investment income ratio for the plan periods (first, second and third) of India. The average investment income ratio which was 7.2 per cent during the First Plan, increased to 11.7 per


cent during the Second Plan period and touched 12.3 per cent in first two years of the Third Plan. The study explores the relationship between investment and income ratio in the above periods.

Misra and Others\(^{46}\) (1965) conclude from the study of 20 holdings in Jagatsinghpur of Cuttack district (Orissa) that on irrigated holdings 14.77 per cent of income was being utilized for capital formation, while the corresponding figure for unirrigated holdings was 8.1 per cent during the period 1961-62.

Hoselitz\(^{47}\) (1964) estimates that the amount invested in agriculture was 11.46 per cent of the gross income in the Indian agricultural society during the period 1950-51. This study also criticize that the investment of agriculture is low compared to other sectors like industrial and service sectors in the above study period.


Hicks\textsuperscript{48} (1961) views capital formation as the growth of inputs not merely to maintain, in the future, the previous rate of outputs and inputs but in order to make it possible to produce larger outputs. This is applicable to agriculture sector too.

Benham\textsuperscript{49} (1960) says the amount which a community adds to its investment of capital formation during a period is known as the amount of its investment of capital formation during that period. In this context Nurkse\textsuperscript{50} (1960) opines that society does not apply the whole of its current productive activity to the needs and desires of immediate consumption but directs a part of it to the making of capital goods, tools and instruments, machines and transport facilities, plant and equipments - all the various forms of real capital that can go greatly to increase the efficiency of productive effort. Thus capital formation explains addition to the stock of productive equipment.

Rangnekar\textsuperscript{51} (1958) views that the rate of investment as a percentage of the national income was about 9.5 per cent per annum during the period from

\begin{footnotesize}
\textsuperscript{48} Hicks J R (1961), \textit{"Value and Capital"}, Oxford Press, London.
\textsuperscript{49} Benham F (1960), \textit{"Economics, its General Introduction"}, Sir Isaac Pitman & Sons Ltd., London.
\textsuperscript{50} Nurkse R (1960), \textit{"Problems of Capital Formation in Underdeveloped Countries"}, Oxford Basil, Blackwell.
\textsuperscript{51} Rangnekar D K (1958), \textit{"Poverty and Capital Development in India"}, Oxford University Press, London.
\end{footnotesize}
1948-49 to 1951-52. This study points out the relationship between the investment ratio and national income level during the above study period.

According to Tostlebe\(^52\) (1957) capital formation is not an automatic process but a response to investment of money, effort and time in new resources or facilities of production. Pain\(^53\) (1954) reports that the farmers are eager for investment, particularly in irrigation sources, but could not invest due to the scattered and fragmented nature of holdings. This observation is optly relevant for India.

Rao\(^54\) (1953) says that capital formation involves investment, whether public or private investment involving the purchase of factors of production and their utilization for the creation of non-consumption output. The author talks of the component of capital formation and its function of the agricultural productivity.

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The United Nations\textsuperscript{55} (1953) explains that net capital formation is measured after allowances are made for depreciation, obsolescence and accidental damage to fixed capital. Conceptually net capital formation represents the addition to fixed capital (building, other construction works, equipment and machinery) available for further production. Thus net capital formation is like net profits which are derived on this basis, gross profit minus allowances allowed for depreciation, obsolescence and accidental damage to fixed capital.

The above studies illustrate the trend of capital formation such as GCF, GDFC and NDC. A group of studies deals with the import and export performance of agricultural sector. This group of studies outlines the tendency of agricultural growth in the pre and post - reform period and further clearly states the trend of various aspects such as rural infrastructure, power, roads and communication facilities. Another group of studies sum up the impact of finance of capital formation. Besides the ratio of investment, income are also explains in this classification of reviews. Finally various notable authors explain selected concepts of the capital formation.

The present chapter clearly explains the various previous studies related to capital formation. Past studies are classified into five sections and it explains the various issues like capital formation and agricultural growth, composition of capital formation, association between saving and capital formation, capital formation and institutional credit and general issues of capital formation. The following chapter deals with the profile of the study area.