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CAPITAL FORMATION IN HARYANA AGRICULTURE

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SUMMARY

The gross capital formation (GCF) is obtained on the basis of net additions of assets plus replacement during the particular quinquennium. Net capital formation (NCF) refers to the additions of assets minus depreciation. For GCF, zero rate of depreciation is used so long as an asset is in use and 100 per cent depreciation when it is scrapped. For NCF, straight line depreciation method is used.

GROSS CAPITAL IN AGRICULTURE IN HARYANA: 1950-51 TO 1965-66
(IN 1950-51 YEAR CONSTANT PRICES)

(*in Rs.*)

Assets	GCF between 1950-51 to 1955-56	GCF between 1955-56 to 1960-61	GCF between 1960-61 to 1965-66
Land	14,02,50,000	13,33,75,000	14,55,00,000
Irrigation	44,53,92,000	22,68,20,000	45,15,78,000
Bullocks	22,74,49,456	25,80,52,542	27,51,45,320
Wooden ploughs	90,85,680	97,01,328	92,56,560
Iron ploughs	2,54,376	18,62,640	42,41,448
Carts	1,41,46,380	2,09,06,480	2,09,08,515
Sugarcane crushers			
(*i*) Power-drawn	32,422	2,92,946	8,27,320
(*ii*) Bullock-drawn	36,46,942	40,50,930	52,156
Oil engines	26,16,000	11,40,000	84,00,000
Electric pumps	5,94,700	22,43,550	1,10,08,000
Tractors	55,37,000	1,69,61,000	2,58,65,000
Rural housing	17,96,54,640	19,12,48,640	3,00,24,86,960
Total	1,02,86,59,796	86,66,55,056	3,95,52,69,879

NET CAPITAL IN AGRICULTURE IN HARYANA: 1950-51 to 1965-66

(IN 1950-51 YEAR CONSTANT PRICES)

(*in Rs.*)

Assets	NCF between 1950-51 to 1955-56	NCF between 1955-56 to 1960-61	NCF between 1960-61 to 1965-66
Land	14,02,50,000	13,33,75,000	14,55,00,000
Irrigation	44,53,92,000	22,68,20,000	45,15,78,000
Bullocks	22,84,14,892	26,54,09,750	27,90,48,538
Wooden ploughs	11,72,568	3,07,824	—2,22,384
Iron ploughs	1,58,871	12,93,442	24,12,124
Carts	90,38,387	2,13,31,749	33,14,825
Sugarcane crushers			
(*i*) Power-drawn	2,651	1,87,756	5,36,295
(*ii*) Bullock-drawn	2,04,328	1,21,052	—10,93,744
Oil engines	23,61,400	—43,000	60,52,800
Electric pumps	1,82,297	3,47,115	45,55,976
Tractors	30,86,592	96,03,048	89,93,309
Dwellings	13,03,82,032	8,72,91,830	2,81,17,66,400
Total	96,06,40,716	74,60,45,466	3,71,26,64,523

THE MARKET-MIX IN CAPITAL FORMATION IN INDIAN AGRICULTURE

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SUMMARY

Farmers respond to their markets more in terms of crop acreages than in terms of crop yields. This pattern of response acts as a serious damper on capital formation in the agricultural sector. This response pattern, in turn, arises from the uncertainty of the markets. The peculiar response pattern of the producers is at once both the cause and the consequence of uncertain market behaviour. Capital formation in agriculture is, therefore, as important as capital formation in the agricultural marketing sector. The measures of capital formation being currently debated are subject to serious limitation in that their success is dependent upon the success of agriculture. Measures have, therefore, to be devised which prove of help to the agricultural sector irrespective of its performance in different years and in different areas.

TECHNOLOGICAL CHANGE, CAPITAL ACCUMULATION AND CAPITAL REQUIREMENTS IN AGRICULTURE IN MADHYA PRADESH

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SUMMARY

An attempt has been made in this paper to estimate the rate of private capital accumulation in agriculture in Madhya Pradesh over the last three Plans. During that period some significant growth was recorded, if we ignore the precipitous fall during the two subsequent years. Between 1951-52 and 1967-68, crops yields have increased by over 60 per cent and the output by 100 per cent. It has been estimated that during the three Plan periods, the value of the farm capital (at constant prices) has increased by Rs. 68 crores. Investment in agriculture, community development, irrigation and power, has totalled up to Rs. 327 crores during the same period. State income from agriculture and animal husbandry (at constant prices) increased by Rs. 226 crores between 1951 and 1965. The capital-output ratio, according to these calculations, has fluctuated around 1, though if we ignore the last year as abnormal the ratio had all through been falling. The corresponding output-capital ratio had been rising though only slightly. That is suggestive of some small capital-saving technological development. Incremental capital-output ratio works out to be 1.75. With this ratio, capital requirement for a 5 per cent growth per annum is estimated to be 8.75 per cent of the income. Taking the income to be Rs. 700 crores at the begining, total capital requirements for the Fourth Plan work out to be Rs. 326 crores. The proposed Plan outlay on agriculture, irrigation and power is Rs. 223 crores. That leaves roughly Rs. 73 crores. Taking the rate of capital accumulation in the private sector to be Rs. 10 crores (Rs. 4.5 crores at constant 1952-53 prices), unaided private capital accumulation over the period is likely to be Rs. 50 crores. Add another Rs. 10 crores for liberal credit policies enunciated in the Plan. There is thus a likelihood of a deficit of Rs. 13 crores. Two steps can be taken in this regard. First, the Plan outlay can be revised to Rs. 250 crores, to provide for the deficit and other contingencies. Secondly, vigorous efforts should be made to provide sufficient investment credit to the farmers. According to the All-India Rural Credit Review Committee, total investment credit requirements for the country are likely to be Rs. 1,500 crores. The requirements for Madhya Pradesh can be put around Rs. 60 crores. These requirements can be adequately met if the nationalised banks show the desired interest in agriculture.

LAND TENURE SYSTEM AND CAPITAL FORMATION IN AGRICULTURE

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SUMMARY

It is felt that amongst many factors land tenure system prevalent in an area has considerable influence on the volume and pattern of capital formation in agriculture. It is generally believed that owner cultivators and secure tenants will have greater incentive in making permanent investments in agriculture than insecure tenants. Tenure relationship of cultivator with the land also affects his opportunities for securing funds for investment in agriculture. Abolition of the zamindari system in permanently settled areas such as Bihar is believed to have altered the land tenure system in a positive manner conducive to greater investment in agriculture than when the zamindari system was prevalent. The conclusions in this study are based on a survey conducted by the authors of 1161 households from all the districts of Bihar in 1962. Indeed legally there are only two kinds of cultivation from the point of view of tenure, *i.e.*, owner cultivators and tenants. For the sake of precision we have divided the cultivation into (1) owner cultivation, (2) part-owners and part-tenants, (3) share croppers, (4) fixed kind rent paying tenant, (5) fixed cash rent paying tenant, (6) non-cultivating owners of land, (7) others. In fact, the owner cultivators and part-owners and part-tenants together constitute 97 per cent of the total number of cultivators in this State—71 per cent owner cultivators and 26 per cent part-owners and part-tenants. Information was obtained on various types of investments for land improvement and improved farm technology in 1952 pre-land reforms period and 1962 post-land reforms period by different tenure groups of cultivators.

The study has shown that there has been considerable shift in the pattern of farm investment between 1952 and 1962. The number of farmers buying land increased from 79 in 1952 to 239 in 1962. Investment in buying land constituted only 6.49 per cent of total farm investment in 1952 but 44.65 per cent in 1962. Farmers not only invested more of their resources in buying land but also in reclaiming land. Investment per farmer for reclamation increased from Rs. 124 in 1952 to Rs. 594 in 1962. Whereas there has been considerable spurt in investment in buying and reclaiming land, investment of farmers in irrigation has actually declined from 10.73 per cent in 1952 to 6.80 per cent in 1962. All farm households made investment in construction of buildings including farm buildings both in 1952 and in 1962 but the percentage of total investment in buildings declined from 64.58 per cent in 1952 to 32.67 per cent in 1962.

There has been considerable spurt in farm investment after a decade of land reforms in Bihar. Farm investment for land improvement was Rs. 441 per household in 1962. The major form of investment is in buying and reclaiming land. All tenure groups of farmers invested in buying and reclaiming land. Owner cultivators invested 7 per cent of their resources in buying land in 1952 and 40.54 per cent in 1962. Similarly, part-owners and part-tenants invested 53.57 per cent of their resources for this purpose as against 5.89 per cent in 1952. Even more remarkale than owner cultivators and part-owner-part-tenant farmers buying land is non-cultivators purchasing land. They did not invest anything in purchasing land in 1952 but invested 18.18 per cent of their resources for this purpose in 1962.

Investment by all tenure groups in creating irrigation facility and in bunding, levelling, etc., has relatively declined during the decade 1952-62. The decline is from 8.07 to 5.03 per cent for owner farmers and from 7.54 to 3.34 for part-owners and part-tenants. Almost all the farmers of all tenure groups invested a large proportion of their resources in construction and repair of building including farm building in 1952. Investment in this field considerably diminished in 1962 and there has, as if, been diversion of resources from construction and repair of buildings to purchase and reclamation of land. In 1962 too all farm households indicated some investment in buildings but its proportion in total investment had considerably declined. The investment of owner cultivators in building declined from 66.39 per cent in 1952 to 35.64 per cent in 1962. Part-owner and part-tenants' investment in building was 59.72 per cent in 1952 and 27.21 per cent in 1962. There has been similar decline in the case of non-cultivating owners and share croppers also. Farmers' investment in orchard, garden and plantation of trees also declined in post-land reform period.

A major portion of investment of farmers is made on the acquisition of more land, gold and silver, moneylending, etc. Relatively much less resources are invested in superior technology whereas aggregate investment per farm household in land improvement was Rs. 441 and Rs. 1,241 in 1952 and 1962 respectively. It was only Rs. 49 and Rs. 128 in superior technology. There is not much difference between different tenure groups investing in superior technology. It was Rs. 50 and Rs. 133 per household for owner cultivators and Rs. 45 and Rs. 119 for part-owners and part-tenants

in 1952 and 1962 respectively. Among the items of superior technology such as farm implements, seeds, fertilizers and improved breed of bullock the last was the most predominant form of investment. The study has shown that land tenure did not have much impact on stimulating investment in superior technology. Investment in superior technology is associated with the skill of the farmer, extension effort, availability of social overheads and engineering services, supplies, availability of finance and the level of technological development itself. In the absence of opportunities for investment in technological improvement *farm investment* in Bihar still continues to be on traditional forms of investment.

PROBLEMS OF CAPITAL FORMATION IN SUBSISTENCE AGRICULTURE OF TRIBAL INDIA

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SUMMARY

Capital formation should mean "not as an automatic process but a response to investment of money, effort and time in new resources or facilities of production." Capital formation in the agricultural sector comprises of investment in irrigation, land improvement, soil conservation, rural roads, etc. However, from a point of view broader than that of economics, capital can be described as a social heritage dependent upon the institution and habit patterns of thought and action of the individual in society and that is why "capital cannot be transferred from one situation to another, without the individuals who will readopt and refashion it in a new pattern of activity." Part one of the paper deals with the peculiar conditions which determine the scope of capital formation in the subsistence sector and the commercial sector of agriculture. Capital formation in the former sector is more influenced by the expenditure incurred in the public sector, because individual farmers have little or no saving to invest in agriculture. The reverse is true in the commercial sector where there is the will to do, farmers create large inventories of agricultural inputs by their individual efforts. "With the advent of the Five-Year Plan, creation of tangible wealth has been added largely under the public sector in gross capital formation," which was quite insignificant up to 1950-51, according to one study. To create capital in agriculture, comprised of the subsistence tribal farmers, considerable efforts have been made by the State Government. However, the total expenditure incurred under agricultural development schemes during the three Five-Year Plans was Rs. 602.71, crores, out of which about Rs. 10.87 crores (or 1.79 per cent) were spent among the scheduled tribe cultivators. Since the subsistence sector of Indian agriculture contributes 17 per cent of the total agricultural output, the reinvestment of only 1.79 per cent of resources spent to develop agricultural schemes in this sector (mostly comprised of the scheduled tribe farmers) is quite inadequate.

ROLE OF LAND MORTGAGE BANKS IN CAPITAL FORMATION

(A Brief Study in Assam)

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SUMMARY

The main purpose of this paper was to examine the role of land mortgage banks in capital formation. Ninety borrowers of land mortgage banks from Kamrup and Nowgong districts of Assam were studied. Investment patterns of the selected borrowers for 1965-66, 1966-67 and 1967-68 were studied and capital formation on the basis of average investment of the years was calculated. The land mortgage banks in Assam are in very poor financial condition and the working capital at the close of 1967-68 was only about Rs. 30 lakhs. Loans advanced by these banks to 452 farmers

amounted to Rs. 13.34 lakhs during 1965-66 to 1967-68. During this period, the selected borrowers received only Rs. 2,79,260. Only 30.60 per cent of this loan was invested by farmers in capital assets. An analysis of the investment pattern reveals that the land mortgage banks have provided new dimensions to the traditional investment pattern where purchase of land and bullocks takes the major part. The rate of capital formation per farm, per annum was calculated at Rs. 500 which is the average of the years under study. To this the land mortgage banks have contributed 69.2 per cent, capital formation from farmers' own fund being Rs. 154 only. The higher rate of capital formation was found to have occurred in the higher size-groups of ownership holding. It was concluded that the credit institutions like the land mortgage banks can play a vital role in capital formation in the farm sector. Necessary investment guidance must be made available to farmers. Along with better co-ordination between the extension agency and the land mortgage banks, the lending policies should be tuned to the needs of the farmers adopting improved technology. Given proper financial assistance, these co-operative institutions can render better services.

IMPACT OF MODERN TECHNOLOGY ON PATTERN OF CAPITAL FORMATION IN AGRICULTURE.

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SUMMARY

The present study on capital formation is of crucial importance in depicting the dynamic changes that have taken place as a result of the Green Revolution. The results of this investigation are based on a continuous study of 100 cultivators, selected in 1966-67, to find out the changes in the capital formation from year to year. Fifty cultivators growing high-yielding varieties on some of their plots and 50 adopting traditional varieties were selected purposively from 10 villages of the Development Block Kalyanpur, Kanpur. The per hectare average value of gross capital formation on the cultivator's holding using high-yielding varieties came to Rs. 116.67 which is about 48 per cent more than those cultivators using traditional varieties. The irrigation structure contributed the largest share of 48.49 per cent to gross capital formation on the cultivator's holding using high-yielding varieties, while livestock (67.41 per cent) contributed the highest share to gross capital formation on the cultivator's holding using traditional varieties. A similar trend was found in net capital formation. The study shows that there is a progressive increase in capital formation. The gross capital formation rose from 28.26 per cent in 1966-67 to about 40 per cent in 1968-69 while the net capital formation rose from 24.53 per cent in 1966-67 to 36.08 per cent in 1968-69 and the trend is towards a further rise in capital formation with the adoption of improved technology.

CHANGING PATTERN OF MATERIAL CAPITAL FORMATION IN ANDHRA PRADESH AGRICULTURE

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SUMMARY

In Andhra Pradesh in recent years, there is sufficient proof of a gradually rising investment in material capital formation in agriculture both in public and private sectors. Water pumps for irrigational purposes by oil engines are replaced by electric power and bullock laboue is giving place to improved mechanical devices. It is a common observation in Andhra Pradesh that several farmers now use either hired bullocks or hired tractors for their tillage operations as this method

is more economical than the annual expense of Rs. 1,000 to Rs. 2,000 on maintenance of an average pair of owned bullocks per year. However, the rise in agricultural production does not seem to be commensurate with the rising investment. What seems to be needed is first a sufficiently steep rise in capital formation which will then produce the desired impact on output. As the bulk of Andhra Pradesh farmers are poor, tiny holders, they are not in a position to contribute in any significant manner to material capital formation. It is in this context that the nationalisation of banks and channelisation of institutional means to provide production credit to poor farmers has to be considered.

CAPITAL FORMATION IN FARMING SECTOR OF UDAIPUR DISTRICT (RAJASTHAN)

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SUMMARY

In Udaipur district the rate of capital growth is 1.11 per cent when land value is included in capital and 3.20 per cent when land value is excluded. The latter implies that capital is growing approximately with the same rate as population in the district. It means that only capital is growing while the land-man ratio is decreasing.

For achieving higher income higher capital formation is very essential. In our study, the estimated rate of capital formation is 6.3 per cent. This figure is very low as compared to more advanced economies, where it ranges between 15 to 18 per cent. Capital formation in this study is compared with net disposable income of the year 1967-68 which was a better year from the climatic point of view. It means that if average income for the three years is taken with the assumption that the average income might be 10 per cent less of the present incomes, the rate of capital formation does not exceed 7 per cent. However, if capital formation is measured by the expenditure method, the estimated rate is higher as compared to various other estimates, which do not take into account non-monetized investment which account for 1.5 per cent of our national income, according to an estimate made by Coale and Hoover. If this allowance is made for comparison, our rate of capital formation comes down to only 5.5 per cent.

As regards the relative expenditure on various assets, the major expenditure is on the development of irrigation facilities. Out of the total agricultural investment, external finance accounts for 26.1 per cent of the total agricultural investment. Heavy dependence on external finance to the extent of one-fourth of capital expenditure implies far less capital formation from one's own savings. In our study, the average saving is 17 per cent. Family expenditure accounts for 53.4 per cent of the total expenditure. Social expenditure accounts for a very high percentage (26.2 per cent) of total expenditure. Heavy expenditure on social ceremonies, purchase of ornaments and money-lending affect investment in agriculture. Of the total investment, 20 per cent of the amount is required for assets transferred within the economy which does not increase the capital stock of the agricultural economy. Another factor which hinders capital formation is topographical features of the district. The propensity of the farmers to consume rises because of their contact with the urban living standards. Nurkse explained the situation of failure of saving-ratio to rise in terms of "demonstration effect." It means that it will put another obstacle to propensity to save.

CHANGING PATTERN OF CAPITAL FORMATION IN INDIAN VILLAGES

(A Case Study of Six Villages in West Bengal)

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SUMMARY

In the context of the 'Green Revolution' in Indian agriculture, capital formation is of prime necessity for its rapid development. How far and in what direction capital formation is taking place in the Indian villages is the subject-matter of this paper. This is a case study of six villages

in West Bengal. The rate of capital formation differs in different regions of India depending upon the forces like irrigation facilities, road communication, tenancy rights, etc. The conclusions drawn at the end of the paper may not or should not be of general type but suitable only in West Bengal. Nine items on which the cultivators in the villages are more or less inclined to invest their surplus money have been included in the analysis. Capital formation on all these heads has been studied firstly by occupation and then by operational size of holdings.

Occupationwise distribution shows that all the six villages have increased their total investment by percentage over the first point in the case of cultivators of land wholly or mainly owned. This percentage increase was more than hundred in the case of Sahajapur and Kanrsar and in some cases like Dakhinsija and Binanoi it was as low as 5.79 and 20.63 respectively. Sahajapur enjoys irrigation facility and is served by government agency like national extension service. The cultivators' class here is comparatively more enterprising than in the other villages. All these factors count for Sahajapur's improvement on per farm total investment over time. Kanrsar does not have similar characteristics as Sahajapur. Kanrsar's proximity to an industrial town like Durgapur made it indifferent to agricultural pursuit. Many workers from the farmer's family rushed for job to the plant. The surplus income thus gained was invested more on items like education, consumer goods than on irrigation, input, land improvement.

Dakhinsija's Muslim cultivators lacked in agricultural enterprise. In spite of the natural advantage of canal irrigation and N.E.S. in this village, the cultivators failed to adopt better methods of cultivation and thereby raise the income to invest on different items. Whatever small surplus income they invested, preference was shown to social overheads rather than on farming items.

Binanoi is one of the backward villages in North Bengal. The cultivators in this region spend their major time and money on tobacco and jute cultivation at the cost of pady cultivation. The profit of the agricultural produce like tobacco and jute goes to the moneylenders who are the chief financiers to the cultivators. The farmers of Binanoi could not raise their standard as they did not invest a small part of their income on any items.

The direct bearing of tenancy over capital formation is observed in this study. Here the cultivators of land wholly or mainly unowned showed a lower tendency of capital formation per farm than the owner cultivators.

Operationwise distribution of capital formation reveals that in most of the villages investment increased in the lowest size-group than in the upper size-groups. Cultivators in the higher holdings started earlier to invest on inputs, land improvement, etc. Their increase compared to the first point is not noticeable. In the lowest size-groups, however, the cultivators in the second count had proportionately used more inputs, and other items which apparently showed their investment greater than in former years. In all the items Jungul's incentive to invest on the lowest size-group was striking. The additional benefit received from the second canal passing through the field inspired the cultivators of this group to invest more and more. Except Sahajapur, the other villages had improved a lot to their investment on social overhead particularly in the size-group 0—5 acres.

From the above analysis the following conclusions emerge. Capital formation in West Bengal in general is low. The pattern of capital formation largely depends on the various inherent characteristics of villages. The nature of tenancy right has its direct bearing on the extent of capital formation. The effect of operational size on capital formation is not so perceptible except that higher holding groups started using improved input and technique earlier than the lower size-groups.

A NOTE ON SOME ASPECTS OF CAPITAL FORMATION IN AGRICULTURE IN ORISSA

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SUMMARY

There is already a distinct evidence of the process of initiation of technological transformation in agriculture in this State of Orissa. An attempt has been made in this paper to analyse this problem of capital formation from certain relevant aspects. It is seen that the investment in productive lines in agriculture in Orissa has generally gathered momentum since 1967-68. The land mortgage banks in Orissa constitute the main institutional agency for this orientation in capital forma-

tion. The commercial banks have entered the field only in 1969-70. The State Bank of India has indirectly participated by subscribing to the debentures of the Orissa State Co-operative Land Mortgage Bank to the tune of 10 per cent of its debenture capital. The Agricultural Refinance Corporation has a proposal for contribution to capital formation. The commercial banks now nationalised have started their agricultural financing programmes from this current year. It is further shown that the pattern of investment has been biased in favour of certain specific fields. The installation of pump sets, digging up of wells and tanks have made better progress. The introduction of tractors and power-tillers has not yet made appreciable stride. One peculiarity in Orissa has been the declining demand for pump sets in 1968-69. The reasons have been ascribed to be (*a*) fall in enthusiasm, (*b*) withdrawal of 20 per cent subsidy by the State Government, (*c*) absence of persuasion and demonstration and (*d*) harassment of the cultivators.

It has been observed that there has been regional imbalance in the State in the growth of this investment in agriculture. The district of Ganjam has been a leading pioneer in this field. The factors responsible for this are (*a*) sound system of land tenure and absence of widespread tenancy and share cropping, (*b*) facility for getting encumbrance certificate without trouble, (*c*) the role of the process of induction from the neighbouring State of Andhra Pradesh. Lastly, a comprehensive discussion has been made on the problems facing this task of capital formation in agriculture. A few issues that deserve mention are (*a*) absence of an agency to link up the source of finance and the loanee, (*b*) examination of the question of revival of subsidy scheme, (*c*) absence of an integrated approach. A few suggestions are given for accelerating the rate of growth of capital formation. A strong case is made out in favour of reorientation of lending policies,strengthening the administrative set-up of institutions and introducing fundamental reforms in the land tenure system. Importance has also been attached to the action of the Government which should play a dynamic role. Finally, a plea is made for a well co-ordinated and integrated approach for increasing the tempo of this capital formation.

CAPITAL FORMATION IN INDIAN AGRICULTURE

(A Case Study of 100 Farm Families in West Bengal)

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SUMMARY

The problem of capital formation in the context of agricultural development is of vital importance. In this paper an attempt has been made to study (*i*) the gross capital formation on certain specific items according to the size-group of holdings, (*ii*) the changes of investment pattern, if any, and (*iii*) the reasons for changes thereof. Data were collected from 100 households which covered 10 villages of West Bengal. Almost all the farmers are using indigenous implements but side by side a few progressive farmers have changed their investment pattern and are using improved implements. A closer relationship is observed between the adoption of high-yielding crops and purchase of oil pumps and sinking of shallow tube-wells because shallow tube-wells and pumping sets can guarantee the supply of water to the field throughout the year. In recent times short-term investments on fertilizer, seed, etc., are being made by the farmers. New changes in the investment pattern are gradually taking place. The farmers are making long-term investment on oil pumps, shallow tube-well, etc., along with the short-term one. But this change is not so spectacular but this new trend in investment pattern is a recent phenomenon.

This study shows three significant changes in the pattern of investment, *viz.*, (*i*) the percentage investment per farm on bullock and traditional implements is inversely related with the size of holding; (*ii*) by and large, aggregate investment per farm in percentage terms on modern equipments, oil pumps, shallow tube-wells increases with the increase in the size of holding, and (*iii*) expenditure per farm on land improvement in percentage terms decreases with the increase in the size of holding.

The study revealed that investment per farm increased more than three fold on irrigational work and sixteen fold on improved tools and implements. Due to the adoption of high-yielding crops, the pattern of investment has changed. High-yielding crops need frequent application of water, insecticides, weeding, etc. Therefore, the farmers need pumping sets, sprayer, paddy weeder, etc. This changing pattern of investment is mainly restricted to relatively few progressive farmers of the higher size-group. In West Bengal a large number of farmers are small farmers and most of them are outside the purview of this new agricultural strategy.

CO-OPERATIVE FINANCE AND CAPITAL FORMATION IN AGRICULTURE—A SAMPLE STUDY

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SUMMARY

An attempt is made in the present study to throw light on co-operative finance and capital formation in agriculture with special reference to the Co-operative Sugarcane Development Unions in the Deoria district of Uttar Pradesh. The present study is based on the data collected during the course of an enquiry of a sample of 5 Co-operative Sugarcane Development Unions and their 40 members selected on the basis of stratified random sampling design. Capital formation in agriculture may be measured as the value of the change in farm stocks such as grain, fodder and livestock, addition to machinery and implements, etc., and other construction work related to the farm business. In the present study fixed capital formation in agriculture has been measured by the estimates of expenditure on assets formation in the farm business. Co-operative Sugarcane Development Unions during recent years have considerably increased the volume of credit to their members. The co-operative loans are utilized by the members for different purposes such as current farm expenditure, capital farm expenditure, family consumption expenditure, etc. The medium-term loans advanced by the Cane Unions have contributed to assets formation. The present study indicates that the share of co-operatives in borrowings of the members ranges from 31 per cent in small farmers to 45 per cent in big farmers. Capital expenditure per family ranges from Rs. 75 to Rs. 382 whereas capital formation has been estimated to be Rs. 25 per family among small farmers and Rs. 133 among big farmers. The share of co-operative finance in capital formation in agriculture among the sample farmers is still not quite significant except in the case of bigger farmers.

CHANGING MAGNITUDE AND PATTERN OF FARM INVESTMENTS IN SRI GANGANAGAR DISTRICT OF RAJASTHAN

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SUMMARY

The present study was undertaken with a view to examine the effects of the changed situation created by the new economic environment in villages—the high prices of agricultural commodities, shifting incomes and the new agricultural technology on the economic activity of the farmers. The main objective of this study was to see whether and in what ways this new environment has affected the amount and pattern of capital formation in agriculture. The magnitude and pattern of capital investments and their relationship with factors like size of farms, rights in land, age of the head of the family and the size of the family were studied. The study was conducted in Sri Ganganagar district of Rajasthan and covers a period of 8 years from 1961-62 to 1968-69. Sri Ganganagar Panchayat Samiti was purposively selected from which three villages were selected at random. The farm families were divided into three size-groups. Two *khatedar* (owner cultivator) and one non-*khatedar* (tenant cultivator) farm families were selected at random from each size-group from each village. The study reveals that in the case of *khatedars*, the annual net investment per farm family has varied from Rs. 418 in 1961-62 to Rs. 2,114 in 1968-69 with an average of Rs. 978. On the whole, it comes to about 8 per cent of the average gross annual income of the *khatedar* farm families. The average net investment per farm family by non-*khatedars* was only Rs. 148. The net investment per hectare of cultivated land in the case of *khatedars* has ranged from Rs. 49.82 to Rs. 251.52, being highest in 1968-69 with an average of Rs. 116.22. In the case of non-*khatedars*, however, it came to only Rs. 27.12 per annum. The pattern of investment shows that *khatedar* farmers who have most secured rights in land have invested largely on irrigation (33.28 per cent), improved farm machinery and equipment (28.54 per cent) and land improvement (9.76 per cent) which have really enhanced

the productive capacity of land. The non-*khatedar* farmers who cultivate land as share-croppers and on lease, however, have invested mostly on milch cattle (48.89 per cent), draft animals (17.35 per cent) and farm buildings (22.40 per cent). This leads us to conclude that in the case of farmers who have no secured rights in land, there has been little investment in the farm so as to enhance the productive capacity in agriculture. It is, therefore, imperative that if capital formation is to be encouraged the rights in land have to be made secured. It was found in the course of the study that since 1965-66, the investment on installation of tube-wells and purchase of improved machinery has been rapidly increasing. In 1968-69 as much as 91.33 per cent the total net investment was made in irrigation and farm machinery. The study further reveals that as the size of cultivated holding increases, net investment per farm family increases. The average net investment per hectare, however, has been highest in large size *khatedar* farmers (Rs. 136.81), followed by small size-group (Rs. 101.93) and medium size-group (Rs. 82.26). In the case of non-*khatedar* farmers, it was maximum in small size-group (Rs. 58), followed by large and medium size-groups respectively. The pattern of investment in relation to the size of farms reveals that as the size of the farm increases the net investment on farm machinery, irrigation and land improvement increases. It leads to the conclusion that a major portion of the investment by small size farmers is on items which have not increased the productive power in agriculture correspondingly.

Regression analysis was tried to find out the relationship of net investment per farm family with factors like the age of the head of the family, size of the family and the size of operational holding. The regression equation for the capital investment was found to be

$$Y = -2672.63 + \underset{(23.55)}{49.05}\ X_1 + \underset{(115.29)}{1.52}\ X_2 + \underset{(45.14)}{165.27}\ X_3$$

The coefficient of determination (R^2) was calculated to be 0.62.

COMPARATIVE STUDY ON CAPITAL FORMATION AT FARM LEVEL IN TWO VILLAGES IN LUDHIANA DISTRICT

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SUMMARY

To examine the existing and planned farm inventory and the coefficient of capital utilization a study was undertaken in two villages, *viz.*, Otalon and Manjalian in Samrala block of Ludhiana district, one having approach to modern infra-structure in the form of banking facilities, road transport, technical farm facilities, nearness to market and canal irrigation while the other having none. The holdings were classified into small, medium and large, with the size-group of 0-10, 10-20, 20 and above acres respectively. The existing pattern of farm inventory showed that the small farmers possessed one pumping set in both the villages whereas the percentage of these farmers who were planning to instal one more was greater in Otalon than in Manjalian. The farm machinery such as *toka*, canecrusher, drumy were either owned or planned to be owned by these farmers. As Otalon was directly linked by *pucca* road, therefore, cart/*rehri* was less favourite to the small farmers in this village. Items like two ploughs and threshers were not owned while the percentage who were planning to own them was also meagre in the case of small farmers. Further farm house and tractor were found to be a remote cry for these farmers in both the villages.

Though the medium farmers desired to possess two pumping sets, a majority of them owned only one. Their existing farm inventory pattern revealed that items of daily use were owned by them while they were planning to own thresher and tractor. None of the medium sized farmers in both the villages owned farm house while 20 per cent of them were planning to construct it in the village having access to external economies. Cart/*rehri* was owned by all the farmers in both the villages. It was found that 80 per cent of the large farmers owned two pumping sets in both the villages, while 20 per cent of them in village Manjalian owned even three pumping sets. Besides owning farm inventory of daily requirements, 20 per cent of these farmers also owned their farm house while the same percentage was planning to construct it. Since 80 and 60 per cent of the large farmers respectively in Otalon and Manjalian owned tractors, therefore, cart/*rehri* was less favourite to the farmers of this category.

To examine the potentialities of the existing farm inventory, the existing cropping pattern was reorganized and it was found that the potentialities for increasing gross and net income were greater in Manjalian except for the large farmers. This was due to intensive cultivation already practised by these farmers. In the reorganized cropping pattern, even the fall in variable costs was noted in the case of medium and large farmers in Otalon and Manjalian. Lastly, the coefficient of capital utilization was greater in the case of the farmers having access to external economies. In this case the only exception was large farmers of Manjalian village which was due to intensive cultivation adopted by these farmers.

A STUDY OF THE PATTERN AND SOURCES OF CAPITAL FORMATION IN AGRICULTURE IN MAJHAWA BLOCK OF MIRZAPUR DISTRICT (U.P.)

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SUMMARY

An attempt has been made in the present paper to study the pattern and sources of agricultural investment and the effect of the size of holding, the intensity of irrigation (irrigated area as percentage of cultivated area) and the intensity of cropping on per hectare investment. For the purpose of the study, a sample of 50 farms in two villages of Majhawa Block of Mirzapur district was selected. The study relates to the year 1968-69. The study reveals that the per hectare investment shows a declining trend with the increase in the size of farm, except for the holdings in the size-group above six hectares. This shows that generally the size of farm exerts a negative influence on per hectare investment. Further the investment trend to increase with an increase in the intensity of cropping as well as the intensity of irrigation, thereby indicating that these two factors affect the per hectare investment favourably. The owned funds account for hardly one-fourth of the total investment. The per hectare investment from owned funds shows a declining trend with the increase in the size of farm. Borrowings, specially from Government and co-operatives are responsible for a major portion of the investment. Government loans as a source of investment in agriculture assume greater importance with the increase in the size of farm possibly due to asset-oriented nature of such loans and the personal influence that bigger farmers are able to exert in obtaining them. The reverse trend is observed in case of loans from co-operatives. The per hectare investment from different sources does not show any definite relationship with the intensity of irrigation and intensity of cropping. This indicates that although these two factors exert an important influence on investment, they have no bearing on the sources of its supply.

CHANGE IN THE PATTERN OF CAPITAL FORMATION IN AGRICULTURE

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SUMMARY

The objective of the paper is to examine the changing pattern of capital formation among the cultivating families in the context of the infra-structure created by the development programme. As the general level of economic development is generally influenced and conditioned by the pace and pattern of capital formation in agriculture, the paper not only seeks to find out the nature and extent of capital investment at farm level but also tries to identify the forces affecting capital formation. The basic data for the present study have been obtained from the two points of village surveys conducted by the Agro-Economic Research Centre, Visva-Bharati in the three villages of Bihar

during 1957-59 and 1962-64. The villages covered are Sahpurpanapur in the district of Muzaffarpur, Samahuta in the district of Sahabad and Sihorwa in the district of Champaran. Investment at farm level has been broadly classified as real farm investment; investment in durable consumer goods and other investments. Real farm investment includes those items which are directly related with the growth of reproducible tangible wealth of the farm over time and covered items of investment on land improvement, irrigation, purchase of improved tools and implements, livestock, land and construction and major repair of farm houses. The preponderance of small holding below 5 acres was evident in all the three villages. The volume of real farm investment has significantly increased on all the size-group of farms in the villages under study. The increase in real farm investment is more pronounced on small and medium farms than on larger ones. Irrespective of farm size, the percentage of real farm investment to total investment is high in the two villages (Samahuta and Sihorwa where the new technology has been adopted.

The significance of investment in land purchase decreases with the increase in farm size. Unless the creation of infra-structure like drainage and irrigation schemes are simultaneously supplemented by a well-planned efforts to provide technological help to the cultivators, the pace of capital formation will be retarded. Absence of such effort has actually arrested the growth of capital formation in Sahpurpanapur by way of diversion of investment from farm to non-farm items. Low average farm size appears to be one of the major bottlenecks in creating surplus on small farmers. In village Sihorwa where intensity of cropping was 219 per cent the volume of increase in real farm investment was lowest. The finding further shows that the largest increase in the per farm and per acre investment was concentrated on owner-operator farms followed by partly owned farms. Excepting Sahpurpanapur, investment per farm as well as per acre has decreased on share cropper farms. Protection against cattle epidemic should be an inseparable programme of rural development as otherwise the capital invested in livestock is totally lost and further capital formation in other items is retarded. Village Samahuta seems to have suffered very badly year after on this account.

CAPITAL FORMATION IN INDIAN AGRICULTURE

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SUMMARY

Capital formation gains momentum in such areas where conditions for transforming traditional agriculture into modern one exist. This purpose of this paper is to study the capital formation in the tract where almost all incentives to commercialize farming have been in existence. Sangli district has rivers like Krishna and Warna which offer perennial water supply for irrigation. The co-operative sugar factory has given a great boost to expansion of sugarcane cultivation. The co-operative institutional structure is well-developed to meet the long, medium and short-term credit requirements. The dynamic leadership mobilizing the cultivator's business outlook has been able to set in the process of transformation of traditional agriculture into a modern one. The study has been based on a sample of 63 cultivators randomly selected from six villages situated in talukas served by the co-operative sugar factory. There has been rapid increase in capital formation on the cultivators' holdings. During 1961-62, the cultivator on an average possessed only Rs. 827.56 worth of capital assets (excluding land), the value of capital assets indicates how poorly he was equipped with the wherewithals of production. His capital assets included livestock and some traditional implements. The increase in the value of capital assets is as large as 300 per cent in the very first year, *i.e.*, 1962-63 when the sugar factory commenced working in full swing. Thereafter, there has been a sustained increase in capital formation. The value of capital assets has increased over 17 times, over a period of six years. The cultivator on an average possessed Rs. 14,818.08 worth of capital assets during 1967-68. The rate of increase in the value of capital assets is highest in the case of large size-group, *i.e.*, 1935 per cent followed by the small size-group, *i.e.*, 1709 per cent and the medium size-group, *i.e.*, 1121 per cent respectively. It indicates that given favourable situation Indian agriculture readily

responds and spectacular increase in capital formation results irrespective of the size of holding almost in a few years. The study revealed that a major proportion of the total investment ranging from 50 to 70 per cent has been for harnessing irrigation resources and the remaining for augmenting other capital assets like implements, machinery, livestock as well as land improvement and machinery, livestock as well as land improvement and to a very small extent for purchase of land.

The land mortgage bank played a dynamic role and offered sustained financial assistance in capital formation. It is observed that the bank equally came to the assistance of small farmers and long-term loan trickled to the lowest rung of the cultivating class. The share of the bank in capital formation has been to the extent of 42.53 per cent of the total investment. The cultivators were also in a position to plough back a part of their farm earning for building up required capital assets. The cultivators invested a substantial proportion of the farm earnings every year. On an average, 57 per cent of the value of capital assets built up during the period of six years have been on account of allocation of part of farm earnings to capital formation every year. The necessity of investment of a part of profits has been well realized by all the cultivators. Even the small size-group has built up capital assets wherein 45 per cent of the value of capital assets is accountable to investment of a part of profits every year. The share of own investment to capital built up in the case of medium size-group is 59.98 per cent and in the case of large size-group it is 57.92 per cent. Thus ploughing back increased farm earning has a substantial share in capital formation. The study indicates that given favourable situation the structure of Indian agriculture readily responds and spectacular rate of capital formation can be achieved.

FACTORS INFLUENCING PATTERN OF FARM LEVEL CAPITAL FORMATION IN ASSAM
(A Case Study of Nowgong District)

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SUMMARY

The process of agricultural development in Assam even after 18 years of planning has been slow and tardy. Assam has the lowest growth rate in agriculture among the States of Indian Union. This may be due to many and varied causes, but the slow rate of capital formation in agriculture is one of the contributing factors. No study has yet been made on the pace and pattern of capital formation and the factors influencing such capital formation in Assam. In this paper, an attempt has been made to estimate the 'gross' capital formation in an average farm and the relation of such capital formation with tenancy, farm size and level of income from a sample survey of 150 farms in the district of Nowgong selected on the basis of stratified random sampling. Data on farm size, tenancy and income for one agricultural year (1968-69) are collected from the records of the Farm Management study, while investment patterns for five years from 1964-65 to 1968-69 are collected from the farmers. A broad hypothesis has been formulated to the effect that as the farm size and income increase capital formation per farm also increases, but at less than proportionate rate under the existing level of technology and land-man ratio prevailing in the agricultural economy of Assam.

The results of the survey indicate that the above hypothesis is, by and large, correct. Without a change in the size of farms leading to a change in techniques of production, the rate of capital formation will continue to lag behind the rise in the level of farm income. Under the existing level of technology, there is not much scope for capital formation and any surplus generated in agriculture is being invested in properties which have status symbol attached to them. The incentive for higher production through the price mechanism may change such an attitude and accelerate the process of consolidation of farms (through transfer from less viable farms), technological change and capital formation. The supply of input at subsidized rates and cheap credit may go a long way in breaking the vicious circle of poverty, low investment, low level of population and income. Once such a vicious circle is broken, the process will gather momentum and help in ushering in a 'green revolution' already initiated through the high-yielding varieties programme.

POSSIBILITIES OF CAPITAL FORMATION IN AGRICULTURE IN SALIPUR P. S.

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SUMMARY

The main objective of presenting the results of this study is to find out the possibilities of capital formation in agriculture in the four sample villages of Salipur Police Station. An attempt has been made to study the effect of (*i*) urbanisation, (*ii*) irrigation and (*iii*) the size of holdings on capital formation. The main conclusions of the study are summarized below.

The study has not shown the existence of significant difference between the urban and the rural village in total income. The inter-holding difference in total income due to size of farms is significant. But irrigation has got little effect in increasing the total income of the farming families. But the effect of irrigation is significant with regard to farm business income from crop husbandry. The effect of urbanisation is not significant on the farm business income. The inter-holding difference due to size is significant.

In the case of total family living expenses there is significant difference between the urban and the rural village and between the different sizes of holdings. The effect of irrigation is also found to be significant. It is also noticed that as the size of holding is increasing the total family living expenses are increasing. It may, therefore, be said that the levels of consumption are the function of the levels of income.

No significant difference in the amount of total fund available for capital formation is observed between the urban and rural village. But there is significant difference in this regard between the irrigated and unirrigated holdings. There is an increase in the amount available for capital formation with increase in the size of holdings.

The quantum and rate of capital formation is greater in the rural village and in irrigated holdings. Moreover, per farm capital formation is greater in larger holdings. It is also noticed that the rate of capital formation per farm is greater in the size-group of 5-10 acres.

The analysis of investment pattern showed that in absolute terms the investment is greater in the rural village. Investment on livestock, equipment, land and house is greater in each case. Investment in livestock varied from 29 to 35 per cent of total investment in all the four types of farms. Investment on irrigational structures in urban unirrigated village is 13.44 per cent and in rural unirrigated village, the figure is 19.21 per cent. But in irrigated farms both in rural and urban, the figures are 8.64 and 4.39 per cent respectively. As unirrigated farmers have to depend for irrigation on tank and wells, etc., they spent a considerably larger amount than the irrigated farmers.

INCOME, SAVING AND INVESTMENT OF PROGRESSIVE AND LESS PROGRESSIVE FARMERS IN NORTH-WESTERN U.P.

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SUMMARY

A study was made in North-Western Uttar Pradesh to find out the income, saving and investment of progressive and less progressive farmers by size-group of boldings. A random sample of 242 progressive and 161 less progressive farmers according to size-groups of holdings was randomly selected. It was found that all the types of farmers, progressive and less progressive are taking to new technology and using their increased income, borrowings and credit for creating capital assets like tube-wells and pump sets, tractors and power threshers and also in meeting their working expenditure on high-yielding varieties seed, fertilizers, irrigation, running expenditures, expenditures for pesticides and fuel and lubrication for machinery and vehicles. The disposable income of farmers was found and from it the consumption expenditures were deducted. The balance constituted the saving of the farmers. A regression was run with saving as dependent variable and disposable

income as independent variable. The relationship was significant for all the size-groups and types of farmers showing thereby the accelerating change in the level of agricultural technology in this region. Another regression was run with capital investment as the dependent variable and disposable income as the independent variable. A significant relationship was found for the medium and large farmers of Tarai and large farmers of north-western plains. There was no significant relationship for less progressive farmers and progressive small farmers. The relationship was significant for the progressive medium farmer of Tarai but not so for medium farmers of the north-western region plains. It is concluded that capital formation depends upon the size of holding, the level of technology and geographical region.

CAPITAL FORMATION ON SUBURBAN VEGETABLE FARMS IN LUDHIANA DISTRICT

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SUMMARY

This study was undertaken to examine the present level of capital formation and to estimate its potentials with available resources on suburban vegetable farms in the Ludhiana district of the Punjab State. The random sample for this study comprised 10 per cent of the small, medium and large vegetable farms of the population. The field data were collected from 17 small, 8 medium and 4 large sample holdings by the interview method. The potentials of capital formation on these farms were estimated by reorganizing the synthetic farm situations in each size-group assuming existing resource limitations. The study showed that gross returns from the small, medium and large vegetable farms were Rs. 12,142, Rs. 14,907 and Rs. 55,207 and that these returns could be raised to Rs. 14,600, Rs. 18,508 and Rs. 95,658, respectively by reorganizing them for optium utilization of existing resources. Capital formation on small, medium and large vegetable holdings in the suburban areas of Ludhiana district was to the extent of Rs. 438.30, Rs. 971·52 and Rs. 15,099.68 respectively. Capital formation on these farms could be increased to Rs. 904.23, Rs. 2,031.21 and Rs. 33,044.71 respectively through increased income based on scientific production planning. The potentials of capital formation on small and medium farms could be raised further by cutting down expenditure on social and religious family obligations, because these expenditures at present cover an unduly large percentage of gross income. The coefficients of capital utilization indicated that small and medium farms were exploiting around 80 per cent of their potential gross income whereas large farms were exploiting only 58 per cent of it. The indexes of potential capital formation based on reorganized small, medium and large holdings over the existing level of capital investments worked out to 206.30, 208.86 and 218.85 respectively.

AGRICULTURAL INVESTMENT AND CAPITAL FORMATION IN KANJHAWALA BLOCK, DELHI

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SUMMARY

The present study is an attempt to inquire into the magnitude and pattern of capital formation on farms and to examine as to what extent it differs between size-groups. The study has drawn on the data collected by the Division of Agricultural Economics of the Indian Agricultural Research

Institute, New Delhi and relates to the period 1965 to 1968. For the purpose of this study, the farms were classified into three groups according to the size of their holdings, *viz.*, 0.1 to 5 acres; 5.1 to 10 acres and 10.1 acres and above. The pattern of farm investment on the six major types of physical assets was examined. These included farm housing and cattle shed, draft cattle, milch cattle, irrigation works, improved implements and machinery and traditional tools, etc. The valuation of these assets was at constant prices. Depreciation by straight line method was accounted for. The data revealed that farm buildings constituted the largest single item of capital stock. During the period 1965-68, the percentage increase in the value of farm buildings was of the order of 209, 37·9 and 45.6 on small, medium and large farms, respectively. Except for the medium farms, the increase in the value of farm buildings was mainly due to the contribution of farm produce and farm family labour. In 1965, the draft cattle constituted the second largest item of capital stock on small and medium farms, whereas on large farms it occupied the third position. However, in 1968, draft cattle occupied second position on large farms and third position on medium farms. The data further revealed that during the period 1965-68, there was decline in the share of outlay on milch cattle. In 1965, the small farms had the highest share in irrigation but in 1968, the medium farms claimed the highest share in this item. Improved implements and machinery was the sole monopoly of large farms indicating inability of the small and medium farms to invest in this item. The traditional tools accounted for a very small share of the total outlay. In the case of small farms, the percentage share of farm buildings increased whereas that of all other items showed a decline. On medium farms, there was increase in the share of irrigation followed by draft cattle, whereas a decline in the share of all other items was noted. On large farms the share on improved implements and machinery was the only item which recorded increase during the period under review. The data revealed that the small farms had the highest per acre outlay on these assets. During the period under review, the total per acre value of these assets was almost doubled. Though, the major portion of the increase was due to contribution of family and farm products, the per acre cash expenditure of Rs. 207.60 was very close to that of Rs. 212.25 on medium farms and was much higher than that of Rs. 133.1 on the large farms. Thus the data revealed a positive relationship of capital formation with farm size.

Since the data relate to the period of three years only, no trends could be established. However, a close examination of the data revealed some interesting facts. The priority for investment on farm buildings could be due to the expected high yields in view of the introduction of high-yielding varieties. It is expected that in the coming years, this item will not enjoy the same priority. Farm family labour combined with appropriate amounts of capital can lead to meaningful growth of capital formation. Therefore, its is suggested that credit should be advanced for providing new farm technology which can utilize the available farm labour without replacing it. It was observed that the tractors were the monopoly of the large farms. Therefore, effort should be made to provide tractor facilities to small and medium farms through certain agencies or institutions specially evolved for the purpose. This emphasizes that there is great need for more equitable sharing of new resources and technology so that the advantages are not confined mainly to a small number of large farmers.

INVESTMENT PATTERN AND CAPITAL FORMATION IN AGRICULTURE IN HIMACHAL PRADESH

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SUMMARY

Modernization and improvement of agriculture necessitate large doses of capital investment per agricultural unit. The larger the quantity, the greater will be the increase in productivity and the rate of economic development. Himachal Pradesh presents typical picture of a subsistence agriculture with low levels of capital formation. The present study analyses the investment pattern and capital formation in agriculture among the farmers of Panchrukhi block in Himachal Pradesh. It was found that capital investment in agriculture increased directly with the increase in the size of farms. However, investment per acre was inversely related to the size. The latter was mainly due to the more intensive use of family labour on farm buildings and their repairs. The most predominant type of investment among sample holdings was in the form of purchase of land and laying out of orchards and plantations, which accounted for more than 45 per cent of total investment.

Among the sources of finance, owned capital accounted for the major share, most of which was from current income. Savings accounted for nearly 25 per cent of all capital investment and it varied inversely with the size of holdings. Borrowing for capital investment was not favoured because of the difficulties of obtaining loans, which was more true in the case of small and medium size holdings. Provision of adequate infra-structure for productive use of surplus labour, popularisation of modern technology, improved facilities for medium and long-term credit are recommended for increasing agricultural production and capital formation in the study area.

CAPITAL FORMATION IN ARID AGRICULTURE: NEED FOR STRUCTURAL CHANGE

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SUMMARY

The new strategy of agricultural development which has initiated the Green Revolution in 145 well watered areas has nothing to offer to dry areas which cover 3,17,090 sq. km. of the area of the country. The arid zone of Rajasthan covers nearly 62 per cent of the total dry region. The problem of the arid zone of Rajasthan is not only the non-applicability of High-Yielding Varieties programme, but recurrence of droughts and low and unstable production. The accentuated deficiency of moisture is the main reason for low and unstable production. The modern conservation technology has evolved certain measures against the factors which accentuate the moisture scarcity. Some of these measures (like bunding, shelterbelts, micro-wind-braker, etc.) when adopted result in the creation of physical assets. To improve the production possibilities in arid agriculture these permanent land improvements should get top priority in capital formation at the farm level. In the absence of irrigation facility, the conservation measures like bunding, shelterbelts, micro-wind brakers, etc., are the only hope of dry areas for higher and stable production. But as indicated by the Reserve Bank of India surveys and other investigations, these permanent land improvements get negligible share in the capital expenditure made at the farm level. Livestock and farm implements dominate the capital structure of desert farmers. But as revealed by certain studies, any attempt to increase capital formation (with its present structure) may prove self-defeating and no result in terms of growth of arid agriculture may be achieved. Increased capital formation (with its present structure) would mean increased extent of physical under-utilization of the farm implements, reduced animal production, continuation of instability and low production in spite of increased investment in arid agriculture and finally reduced physical availability of usable resources due to resource depletion. All these problems may be remedied if the conservation measures are made an integral part of capital structure at the farm level.