Summary of Studies Conducted by AERC since 1957

2. Name of the Study: Outlook on Production and Prices of Rice in Bihar, Orissa and West Bengal

Year of Publication: 1957

Main Findings:

Out of the eight villages in Bihar, 3 villages with irrigation facilities reported no change in the yield of paddy in the current year as compared to the previous year. 4 villages with no irrigation reported a heavy fall while the last village which had received irrigation recently experienced a substantial increase in the yield.

In Orissa all the villages reported a fall in the yield of paddy. The fall ranged from 60 to 67 per cent in four villages and from 9 to 33 per cent in two villages. The latter two villages had some irrigation facilities which could withstand the drought to some extent.

In West Bengal three villages representing the rice producing districts and having irrigation facilities reported a higher yield of paddy in the current year than in the previous year. A substantial fall in the yield of both aus and aman paddy reported from the two villages in the North Zone which is deficit in food production. In the village in 24 Parganas the yield of aus paddy increased while that of aman declined. The village in Midnapur representing the coastal villages reported a complete failure of the paddy crop in the current year.

The following facts came out of the above analysis. First, there had been a general fall in yield and production of paddy in Bihar, Orissa and in the North Zone of West Bengal due to drought. Secondly, the irrigated lands had successfully withstood the adverse effects of drought.

3. Name of the Study: Trends of Consumption of Food and Foodgrains in India: 1900-1957

Year of Publication: 1958

Main Findings:

Part-I: Two separate estimates have been prepared for the study; one series relates to undivided India for the period 1900-45, and the second series relates to Indian Union for the period 1939-57. Four crops, namely, rice, wheat, jowar and bajra were considered. The analysis shows that per capita consumption of foodgrains increased slightly from 18.9 ozs in 1901-05 to 19.7 ozs in 1916-20 in Undivided India. Thereafter it declined gradually to the level of 14.7 ozs in 1940-45. In Indian Union, for which data were available from 1939, there had been a steady decline from 17.3 ozs in the pre-war period to 13.6 ozs in 1951-52. After 1951-52, some improvement was noticed and the per capita consumption reached the level of 16.0 ozs in 1957. The reasons for such changes are: The production of foodgrains increased at a slightly higher rate than population in the first two decades of the century. The production declined sharply after 1920 and had remained almost steady up to 1951-52 at the level prevailing in the first decade. As a result, the progressive rise in population depressed the level of per capita consumption of foodgrains and that with even an increasing reliance on imports the deterioration could not be halted. After 1951-52, the production of foodgrains started increasing and the rate of increase being slightly higher than the growth rate of population, some improvement in the consumption level was noticed.

Part-II: Food consumption in Indian Union:- The findings are: (i) Food consumption in respect of both protective (animal protein) and the energy giving (cereals) items of food had deteriorated since the pre-war period. The deterioration was very much marked in the case of milk and milk products. (ii) Some improvement was noticed in the case of cereals and pulses after 1951-52, which was largely due to the success of foodgrains development programmes in the Five Year Plans. (iii) The average intake of calories per capita in India was 1740 (av. of 1951-52 to 53-54) as compared to the average level of 3090 calories in the advanced western countries in the same period. (iv) The proportion of calories obtained from cereals and pulses in India was 79.3% as against 26.4% in U.S.A. and 6.24% in Italy.

Other important findings which have been revealed from the analysis of data from some regions in India are: (i) Extreme dependence on cereals was observed in all the regions, although there were wide variations in diet as among the wheat-eating people of Punjab, the millet-eating sections of Hyderabad and the rice-eaters of West Bengal. (ii) Analysis of data on West Bengal shows that among the different socio-economic groups in a rural community, the diet of the agricultural labourers was poorest in all aspects.

Part-III: The crucial issue in connection with the forecasting of consumption of foodgrains relates to the use of expenditure elasticity. The problem arises mainly because of the data calculated from the N.S.S. showed variations from year to year since 1951-52. Another problem relates to the choice between the use of „value elasticity‟ and „quantity elasticity‟. The quantity elasticity is, however, "more stable and reliable" and appropriate in Indian conditions.

6. Name of the Study: Food Administration in East India 1939-1954
Year of Publication: 1959
Main Findings:

The study is divided in two parts. The first part traces the evolution of Food Administration in East India between 1939 and 1954 and attempts an assessment of the same. The second part analyses the effects of food administration on the Rural Economy of East India. The appendices include a note on the nature and source of statistics, a chronological statement of the administrative measures and a number of statistical tables.

Of the four of the states covered under the study, West Bengal and also Bihar were heavily deficit in foodgrains. Assam was more or less self-sufficient in the whole of the period covered by the study. Orissa was the only state enjoying a comfortable position throughout the period. West Bengal had the largest measure of direct control during the period of reference and Orissa had the least. One of the major findings of the study was that the "degree of success of the food administration during and after the war, as judged from the consumers‟ end was a function of the thoroughness, on the one hand, and of their administrative efficiency and consistency, on the other."

Analysing the effects of food administration on food production the study concludes, "so far as East India is concerned, food controls did not lead to any significant diversion of acreages under rice and cereals to other crops or vice versa. In other words, the effect of controls on the crop pattern was more or less neutral in East India." It was, however, observed that since control prices fixed by the government did not make allowance for nice

difference in qualities there were tendencies of a shift, however small, towards medium and coarse varieties in preference to the finer ones.

Analysing the effects of food administration on marketable surplus and consumption the study concludes that compared to the pre-war period, the post-war period was characterised by a fairly large drop in the size of the marketable surplus of rice as well as in its percentage share in the total production in Bihar, Orissa and West Bengal.

About per capita consumption of cereals there were no evidences of its increase in any of the states of East India.

The main cause of the fall in the size of the marketable surplus during the period is attributed to "failure of production to keep pace with population increase" and "the control measures as such did not make any direct contribution to the fall."

And another interesting finding of the study was that in East India "hand pounding industry did not suffer any set-back during the control period. If anything it perhaps gained a little in popularity".

Referring to disparity in prices, between control markets and open markets which was maintained during the entire period of control the study concludes, "given the available supplies, the disparity could to some extent have been remedied by extending the orbit of controls both in respect of the marketable samples as well in that of the population to be fed from the samples…." The need of the situation was one of a more extensive rationing and a more intensive procurement.

9. Name of the Study: Experiments in Co-operative Farming – A Study in East India (1958-60).

Year of Publication: 1961

Main Findings:

Co-operative Farming in East India was found to be in its infancy; social and economic homogeneity were found to be congenial to the growth of co-operative farming. Sufficient scope for the formation of co-operative farming among agricultural labourers was found to exist for reclamation and settlement of new lands. Co-operative farming had shown development centering round cultivation with tractors and installation of pumping machine for irrigation.

The greatest problem encountered in the organisation of co-operative farming was the distrust of the people in co-operative enterprise and their apprehension that the pooling of land might result in the loss of ownership rights of land. Another major problem in the smooth operation was the absence of harmonious relationship between supervisory interests and the interest of the field worker members.

The imposition of tax upon co-operative farming amounted to a penalty payable by its members for joining co-operative. At the initial stage of development this tax should be exempted. The conclusion is by observing that "whatever may be the extent of importance of co-operative farming in East India, hindrances to its growth were quite formidable".

16. Name of the Study: A Study of the Behaviour of Agricultural Prices in East India 1953-61

Year of Publication: 1965

Main Findings:

The phase 1953-55 was a period of declining price trend. The phase 1956-58 was characterized by a sharply rising trend of prices and the third phase of 1959-61 recorded stability in comparison with the earlier phase. This was more or less true for all the commodities under study excepting jute, in respect of which the price trends were much more erratic over the three phases. Rising Trend (1956-58) was sharpest in the case of rice. The falling price trends for jute and raw-sugar were sharper than the rising ones. This was also true for maize, wheat and gram.

A regular pattern of seasonal variation characterised by lower price at the time of harvest and higher price later was observed in the case of rice and raw-sugar. This pattern was not so regular in the case of wheat, maize, gram and jute.

The inter-market variation in prices within the state in the case of rice and wheat was greater in the year of higher price level of the commodity compared to the year of lower price level.

The relationship between production and price trends was not very marked though at certain points a higher price level was succeeded by a higher level of production leading to a subsequent fall in price. This was true of rice, wheat, maize and gram but raw-sugar and jute remained outside of this trend.

In general, rice enjoyed a better stability of prices compared to other commodities during 1956-61 in all the three states.

17. Name of the Study: An Evaluation of the Intensive Agricultural District Programme in Sambalpur, Orissa and Sahabad, Bihar 1964

Year of Publication: 1965

Main Findings:

IADP in Sambalpur was in its third year and in Sahabad in its fourth year when they were being evaluated.

In pursuance of the strategy of concentrating in the most endowed areas of the country in terms of irrigation and other infrastructure for a crash production programme particularly in foodgrains Sambalpur from Orissa and Sahabad from Bihar were selected both of which enjoyed largest irrigation facilities in their respective states. Nearly 74% of the net areas sown in Sahabad were served by irrigation of different types and 40.5% of the net cropped areas were irrigated in Sambalpur in addition to the district having a good rainfall. Sambalpur was additionally favoured with well-developed institutions of co-operatives and panchayats.

The programme which was in the form of package facilities brought to the farmer had its instant effect of augmenting production for the package areas. Production of paddy per acre was 16.82 mds in package areas as against 10.17 mds in non-package areas of one block of Sambalpur. Such differences occurred in all the major crops in both the blocks of Sambalpur. Use of chemical fertilizers or improved seeds widely varied between package and non-package areas. Where as in one of the blocks of Sambalpur expenditure per acre on chemical fertilizers was Rs.19.5 for package farms it was Rs.2.5 for non-package farms. In Sahabad also the differences in use of fertilizers were equally wide. Output for the package and non-package plots widely differed sometimes to the extent of more than 50%. In Sahabad it was noted that such inputs as pesticides or improved tools and implements had not attained

popularity at the time of the study in contrast to chemical fertilizers and improved seeds. The arrangements for the supplies of the production requisites were far from satisfactory. A lack of co-ordination was found between the two vital agencies as IADP and Irrigation Department.

In Sahabad also "programme for the introduction and popularization of improved tools and implements remains practically untouched" and "arrangements for the supplies of production requisites to the package farms suffer from various defects and loopholes". Progress in improved methods of cultivation was also far from satisfactory. Chemical fertilizers and improved seeds had attained popularity and lop-sided nature of the programme was noted.

What was further revealed from both the studies was very significant in terms of social implications of the IADP. From the caste and also size composition of the participants and also non-participants the class-bias of the programme was quite apparent. In both Sahabad and Sambalpur participants in package programme consisted of relatively large farmers. In Sambalpur, Atabira Block, of the 30 farms only 12 were small and marginal farms though in the non-package farms they were 19 out of 30. More than 70% of the area of package farms belonged to farms above 7.50 acre holdings. This was true of the other block also. In social terms Brahmin landowners of Atabira had a very high level of participation and there were no tribal or scheduled caste participants in either of the two blocks though their proportion was quite high in the two areas of Atabira and Jharsuguda. Such a bias was more prominent in Sahabad. Rajputs, Brahmin and Kayastha landlords were the main participants. In some villages of Sahabad participants were presented by only farmers above 10 acres. In four of the six villages small and marginal farmer had no place in the programme and in the other two their representation was marginal.

That the strategy of IADP would lead to further inequalities was quite apparent from the very beginning.

19. Name of the Study: An Evaluation of Pilot Co-operative Farming Societies in Orissa (Secon Round Survey, 1966).

Year of Publication: 1966

Main Findings:

All the four farming societies had recorded some improvement in the level of yield over previous years. But in comparison to the self-operated members‟ farms the level of output was much lower in the society farms. This clearly corroborated our findings of the first round of study (1964), that these societies were organized with motives of tapping external finances and Govt. help, along with replacing the practice of share-cropping on the lands pooled in the farming society.

But in the farming society, which was a product of the „Gram-dan‟ movement the performances of the society farm was much better than the Members‟ Own farm. Absence of any clandestine motives, as it was observed in the earlier set of Farming Societies, behind organizing this society, surely, contributed to this agricultural improvement.

20. Name of the Study: A Study into the Working of Pilot Project Farming Societies in East India (West Bengal, Bihar and Orissa)

Year of Publication: 1967

Main Findings:

The common feature for all the societies was that the farming societies were not association of any homogeneous group of cultivators but appeared to be formed as a device for obtaining external finance and government help. The co-operatives gave the members an opportunity to replace share-cropping and to utilize hitherto unutilized area. The step improved the production potential of the Farm but it was brought about not through pulling of the members‟ own resource but through securing of public fund. Leadership of the society mainly came from persons of better economic status having good access to government officials.

In West Bengal it was observed that institution of share-cropping presented the biggest stumbling block in the way of organizing the poor farmers as many of them had some land taken on lease which could not be pooled. On the other hand, some of those leasing out land tried to avail of officially sponsored co-operative farms to get rid of traditional share-cropping.

Rather than bringing in a group of farmers suffering from size disincentive in a co-operative organization the official interest was in certain cases found to be more in bringing in a block of land requiring reclamation or some ameliorative programme under a co-operative. Programmes were more land-oriented than farmer-oriented. This often led to a combination of a heterogeneous group of co-operators. On the whole, the pilot projects that were evaluated either in terms of motivation of the co-operators, composition of the membership or of their relative performance vis-à-vis the individual forms showed little prospect of their turning into path-setters for a wide co-operative farm movement.

21. Name of the Study: A Survey of Socio-Economic Condition of Agricultural Labour in East Indian Villages.

Year of Publication: 1967

Main Findings:

The findings did not unequivocally indicate any significant improvement in the condition of agricultural labour households. In 7 out of 12 villages the number of agricultural labour households increased. In some cases it was due to higher demand for labourer while in others it was simply due to drying up of alternative sources of employment that caused influx into this category.

Per capita income increased in 7 villages but in majority of villages real income of agricultural labourers had decreased considerably.

Per capita consumption expenditure recorded increase in 8 villages but villages recording increased expenditure were not always the same as those registering rise in per capita income. Wage rates for agricultural labourers had increased only in those areas where scope of non-agricultural occupations increased and where intensity of cultivation had improved. It was suggested that the condition of agricultural labourer could be improved mainly through programmes for development of rural crafts, buildings of small-sized industries and labour-intensive socially beneficial projects.

22. Name of the Study: Capital Formation in Agriculture at the Farm Level (a case study of three villages in Eastern India)

Year of Publication: 1967

Main Findings:

Capital formation in the majority of the households was in the form of either house construction or purchase of land.

In Hussainabad (Bihar), the most backward of the 3 villages a large investment was made on the purchase of new ornaments.

Due to epidemic cattle diseases taking heavy toll of cattle in Chadiapalli (Orissa) heavy investment were made in the purchase of cattle.

The growth of market, urbanization and developmental efforts around Chadiapalli (Orissa) induced some new investment in the form of introduction of new crops, introduction of improved variety of sugarcane and application of chemical fertilizer.

Self-finance constituted the most important source of finance for capital formation, the credit system being too underdeveloped in the villages under study.

Name of the Studies:

23. A Study of Hyv. Programme in the district of Cuttack, Orissa with special reference to credit (Kharif) 1966-67

24. A Study of Hyv. Programme in the district of Cuttack, Orissa with special reference to credit (Rabi) 1966-67

25. A Study of Hyv. Programme in the district of Birbhum, West Bengal with reference to Kharif Paddy 1967-68

29. A Study of Hyv. Programme in the district of Birbhum, West Bengal with reference to Kharif Paddy 1968-69

32. A Study of Hyv. Programme in the district of Saran, Bihar with reference to hybrid maize (Kharif) 1968-69

42. Social and Economic Implications of large-scale introduction of HYV of foodgrains in the Eastern Region of India (UNDP Global Project) 1972-73

56. Operational Research Project on Rice in the district of Burdwan, West Bengal 1974-75

62. Performance of HYV Wheat in West Bengal 1977-78

Year of Publication: 1967, 1968, 1968, 1969, 1969, 1973, 1976 and 1978.

Main Findings:

The above studies relating to the High Yielding varieties Programme reveal that in the early years of introduction (1966-67) the response of farmers in the *kharif* dominated regions of the Eastern States to the new varieties of rice was not satisfactory. Both technological and institutional constraints were found to be in operation and in the initial phase Green Revolution was found to be mostly confined to the wheat regions. It was not till the introduction of the I. R. varieties of rice that farmers started responding.

Studies undertaken subsequently (1967-68) revealed quite satisfactory increase in farmers‟ response to the programme. In Birbhum the level of participation of farmers had gone up from 59 per cent in 1967-68 to 81 per cent in 1968-69. The UNDP study in 1972-73 also revealed a high participation of farmers. Although the new technology required larger investments, there were no significant differences in the extent and intensity of participation

between the owner farmers and tenants and among the different size classes of farmers. The percentage of Hyv. Area to total area under the crop in respect of different size group of holdings indicated insignificant differences in the extent of adoption of Hyv. paddy. However, in the propagation of Hyv. paddy a switch over from the *kharif* to *rabi* season was definitely perceptible.

The studies brought out clearly that the rate of participation in Hyv. Rice was considerably higher in the summer season than in the *kharif* season and that the high yielding varieties of rice introduced so far did not fare well in the *kharif* which constituted the major rice growing season. The brake-through in this respect had mainly been possible in the *rabi* season indicating that controlled irrigation is a must for the success of the new technology.

The level of inputs of seed, manure, fertilizers, pesticides, irrigation and hired human and bullock labour were analysed according to different size groups of farms and by tenurial groups in all the studies which revealed that the per hectare use of all inputs was much higher for the high yielding varieties than for the local varieties of paddy. The difference in the average expenditure was much more pronounced in the case of chemical fertilizers, pesticides and hired labour. Analysis of relative importance of different items of inputs revealed significant changes in the input structure with the advent of high yielding varieties. In the cultivation of traditional varieties of paddy inputs supplied from within the farm or village economy were more pronounced than inputs purchased from outside and hired labour was the most important item of input. With the introduction of high yielding paddy the relative importance of manufactured inputs like chemical fertilizers and pesticides had gone up significantly. The relative importance of hired labour in the input structure declined slightly despite the new technology remaining labour intensive.

A positive correlation between size of holdings and the per hectare use of inputs, particularly in respect of hired labour and chemical fertilizers was discernible in the villages of Birbhum, Burdwan and Sambalpur. On the other hand, an inverse co-relation was observed in the villages of Sahabad while no definite relationship could be found in the villages of Cuttack.

As between the different tenurial groups, the per hectare use of inputs was higher among owner farmers in Burdwan while in Sambalpur it was slightly higher among mainly non-owner farmers. Interestingly enough, the introduction of high yielding varieties brought about an active involvement of the land owners by way of sharing the farm inputs like chemical fertilizers, pesticides and irrigation with the tenants. In the sphere of share-cropping a new socio-economic relationship between land owners and tenants was found to take roots centering the new production process.

Turning to sources of finance of current farm expenses it was observed that since 1968-69 facilities of institutional credit were expanding for the small farmers. The credit requirements of each farmer were worked out and disbursed through the co-operative societies. This led to inflated statements of area under Hyv. rice by some farmers in Birbhum and excess amount of loan over the actual expenses was supplied. However, self-finance was found to be increasing in larger farms. The availability of institutional finance was not equal for different tenurial groups of farms in Burdwan as the owner farmers were found to derive a higher percentage of the total loan from government and co-operatives than that derived by

tenant farmers. In Sambalpur, however, both large and small owner operators and tenants received loans from co-operative societies.

The average yield of Hyv. paddy, though exceeded that of the local varieties in all the districts taken up for study, was much less than the maximum that could be attained because the package of practices recommended for the Hyv. seeds were not fully implemented. Chemical fertilizers were used much below the recommended doses. Pesticides were not used in sufficient quantity in spite of attack of pests and diseases. Moreover, a number of farmers used home-produced seeds which were not properly treated against diseases and pests. Absence of controlled and timely irrigation and excessive rainfall also reduced the yield rate through crop damage. As regards profitability of Hyv. rice, the studies undertaken in the districts of Cuttack and Birbhum during 1967-68 and 1968-69 revealed very little surplus of output over current cash expenses and the local varieties appeared to be more profitable. This was mainly due to the fact that the Formosan varieties of high yielding seeds introduced in the early stages were highly susceptible to attacks of diseases and pests and were not suitable for the local agro-climatic conditions. However, after the introduction of the IR-8, and other varieties developed at the Indian Research Stations the profitability of Hyv. rice increased substantially. The latter studies undertaken in Burdwan, Sambalpur and Sahabad under the UNDP revealed that surplus of output over current cash expenses was much higher in the case of high yielding varieties than for the local varieties.

Thus, the studies reflected that in West Bengal and Orissa the contribution of Hyv. rice to the green revolution had been in the nature of a second crop grown during the rabi or summer season which increased the intensity of cropping in these states. This, however, did not so much occur in Bihar, where Hyv. rice was mainly grown in *kharif* even though limitedly. The limited success of Hyv. rice in the *kharif* season did not allow the realization of the full potential of the new technology for the Eastern States.

Experiments were, however, continuing to find out varieties of seeds suitable for the *kharif* season. The study of the working of the „Operational Research Project on Rice" in the district of Burdwan revealed that *Pankaj* was the best variety in respect of its adaptability under water logged conditions. But it performance in respect of yield and net return was not upto expectations. The surplus of output over costs was lower than in the local varieties. Thus the widespread adoption of Hyv. rice in *kharif* season would depend upon the introduction of more productive seeds suiting the agro-climatic conditions of the *kharif* season.

The study of Hyv. programme relating to hybrid maize in the district of Saran in Bihar where dearth of irrigation facilities inhibited concentration of efforts on Hyv. rice and wheat revealed that the smaller farmers were not lagging behind the big farmers in regard to their response to the programme for maize. Percentage of land devoted to hybrid maize was higher in the lower size group of farms. But the input and yield level of the small farms was lower than those of the bigger farms.

All these studies conducted in different parts of West Bengal, Bihar and Orissa from the initial phase of „Green Revolution" (1966-67) till 1977-78 reveal among others the following features:

The technological constraints that faced the *kharif*-dominated region were sought to be got over by switching to summer rice and wheat during the *rabi* season. In West Bengal and also in parts of Bihar extension of wheat cultivation was remarkable and in Orissa

summer rice extended in certain parts – both depending on the availability of water during the *rabi* & summer season. One of the chief weakness that continues to face the areas where *kharif* rice dominates (West Bengal, Orissa and certain parts of Bihar) is as yet absence of any break-through variety of *kharif* rice. Farmers‟ efforts to make up for this lag by concentrating wherever possible on wheat and summer rice are only increasing the domination of cereals in the cropping pattern of the region and hindering the much required processes of diversification. The institutional constraints particularly arising out of the problems of holding size and land tenure do not seem to have prevented the small or tenant-farmers from participating in the new enterprise. Large-scale participation of land-owners in input purchase with the share croppers even though perhaps intensifying the rate of exploitation has to an extent obviated the credit problem of a tenant farmer. Institutional credit for the tenant farmer continues to be limited. But the area where the constraints of a marginal or a small farmer are bound to be operative is long-term capital-forming investments. The SFDA or MFAL with their programmes of dug-well or well-irrigation do not seem to have been able to provide so far the smaller categories of farmers with the necessary infra-structure. Further, our studies of dry-land areas of Bihar, Orissa or West Bengal show that in the absence of any suitable dry-land farming technology development efforts even in such areas are remaining confined to Hyv. wheat, maize or rice which in the very nature of thing are bound to remain extremely limited.

26. Name of the Study: A Comparative Study of Food Consumption in Four Villages in Orissa.

Year of Publication: 1968

Main Findings:

Proportion of expenditure on cereals to total consumption expenditure was lower in the advanced villages than that in the backward villages. Such expenditure was found rather constant among the different income-groups in backward villages while in the advanced ones the proportion varied inversely with the variation in incomes. The average expenditures on pulses and vegetables were proportionately higher in the advanced villages. Similar trend was observed in respect of gur, sugar and protective food items. In the backward villages all the occupation groups showed a lower level of consumption as compared to the respective occupation groups in the advanced ones.

27. Name of the Study: Fertilizer Application and Yield according to Varieties of Paddy and their duration in the district of Burdwan, West Bengal.

Year of Publication: 1968

Main Findings:

Loamy and clay-loamy lands were found to be most suitable for high yielding varieties of paddy while sandy soil was the least productive. Fields of medium levels yielded higher returns than those of low and high levels because controlled irrigation was found easier in medium level lands. The increase of single chemical fertilizers keeping the others constant resulted in significant increase in yield but if the doses of all the fertilizers were increased simultaneously the yield rates would show considerable increase. The impact of

manure particularly when the dose was small on production was not always clear. But the application of high doses of manure showed significant increase in yield.

Delayed harvest beyond the recommended days resulted in sharp fall in production. With favourable weather and irrigation condition and timely access to seeds and fertilizers, a rotation of three crops a year was feasible in the region through the adoption of hyv paddy.

28. Name of the Study: Food Consumption in 3 Villages in Eastern Region – Study in Change

Year of Publication: 1969

Main Findings:

During the period the level of agricultural yield and prices of food items increased in all the villages. Among the lower income groups, consumption level of cereals and protective food decreased over the years. In Gobindpur, an improvement in respect of vegetables consumption was noticed mainly due to substantial increase in vegetable production within the village.

In the higher income groups consumption of cereals showed a rising trend with the increase in income but the improvement in respect of protective foods appeared marginal. Cereal consumption among producing households belonging to all the operational size groups showed increasing trend while in the non-producing section the trend was that of decreased consumption excepting those households having substantial non-farm income.

The consumption decreased more sharply in case of landless agricultural labour earning only cash wages than the labourers having some land or earning kind wages.

In all sections of the communities a fall in the level of cereal consumption was found to be accompanied by a fall in the level of protective foods where as an increase in cereal consumption was not necessarily followed by an improvement in the level of protective food consumption.

30. Name of the Study: Economics of Potato Cultivation in West Bengal (1967-68)

Year of Publication: 1969

Main Findings:

Potato was found to be more profitable than hyv paddy. As potato was highly capital-intensive, it was not given to share-cropping. Irrigation appeared to be the major obstacle to the expansion of potato cultivation. Small farmers could not grow much potato due to the lack of institutional credit. As regards marketing the cold stores helped to raise floor level of prices and reduced wastage to a considerable extent.

31. Name of the Study: A Study of Loans Advanced by Land Mortgage Banks for Agricultural Development and their Utilization in Orissa (1967-68)

Year of Publication: 1969

Main Findings:

A change in emphasis in the loaning policy from advancing loans for such purposes like leveling and building, redemption of old debts etc. difficult to verify to more specified and verifiable purposes like sinking of irrigation wells purchase of tractors, pump sets and

agricultural machinery in the year 1967-68 had caused considerable improvement and visible impact both on the pattern and utilization of loans and in creating an infrastructure for development in the rural economy. The stipulation of productive credit to the tune of 90 per cent was a significant policy decision. A revision of the very lengthy procedure followed in the grant of loans to borrowers was also effective in reducing the period extending from six months to forty-five days. Similarly, maximum loan amount and land value per acre were raised substantially. The rate of interest charged was 9.25% with an additional 1.50% for default.

The volume of transactions and outstanding loans was on the increase alongside membership of these banks which indicated their expanding activities. In Ganjam, development of irrigation sources with pump sets and wells was predominant accounting for a lion‟s share of the loans in 1967-68 while in Koraput features of such development were not noticed. In spite of it, the average borrowing in Koraput in 1967-68 was Rs.4853/- against Rs.4169/- in Ganjam. Overdues were much larger in Koraput than in Ganjam. Overdues were much larger in Koraput than in Ganjam. Owner-cultivators predominated in both the districts.

Land Mortgage Bank – SL. No.17

Land Mortgage Banks were by far the most important source of long-term credit extending from 10 to 15 years. Such loans accounted for 53% and 71% respectively in Koraput and Ganjam districts and borrowers‟ own funds for investment in farm development accounted for 45% and 27%.

Diversion of loans advanced by the banks ranged from 17% to 28% in Ganjam and 8% to 16% in Koraput. It was found that the extent of diversion declined with the increase in the size of borrowing. Despite changes in the lending policies, land improvement was still the most important purpose accounting for 41 per cent to 45 per cent of the total capital investment in the districts.

Regarding utilization of loans and the benefits derived from them, it was found that in 1966-67, 78 to 79 per cent of borrowed funds were utilized in land improvement. In 1967-68 purchased of pump sets gained tremendously in the two districts. Admittedly, the major benefit derived out of loans from Land Mortgage Banks was reclamation and improvement of lands. While the small borrowers concentrated their investment on reclamation and land improvement the large borrowers directed their investment in improving the irrigation resources. An additional area of 16 % was brought under irrigation among the simple borrowers. Though signs of improvement were noticed recently, still much more remains to be done at the functional level of these banks in order that they serve the purpose of rural uplift in more useful and effective manners.

33. Name of the Study: Economics of Tube-well Irrigation in West Bengal (1970-71)
Year of Publication: 1971
Main Findings:

All the deep tube-wells were run by electricity but the progress of rural electrification being poor in the state, energisation of tube-wells had to wait for 3 or 4 years. The cost involved in installing a deep tube-well was Rs.1,05,700/- and that of shallow tube-well Rs.5,824/- only in 1970. The water tax was charged according to season. The water was distributed according to the list of priority drawn up by the local Irrigation Committee.

The tube-wells in Krishnanagar-I fared much better than those in Santipur. Irrigated area under *rabi* crops was much higher than that under *kharif* for all the tube-wells. Hyv. paddy and wheat had been introduced in both the blocks. Use of chemical fertilizers was mostly confined to five major crops aus, aman, jute, wheat and hyv. paddy. In Santipur, the yields of aus, aman, jute and mesta had been much higher in the irrigated area than in areas remaining un-irrigated. The cropping pattern of the user cultivators had undergone a significant change after the installation of tube-wells. Hyv. wheat accounted for about 25% of the total gross cropped area had extended at the cost of gram and *kalai*. The intensity of cultivation had gone up in both the blocks. High cost involved in the installation of deep-tube-wells and excessive fragmentation of land compelled medium and large farmers to turn towards shallow tube-well.

Problems of deep tube-wells were both operational and administrative. Operational problems included water distribution system, disrupted electric supply, theft of transformer motor and spare parts, mechanical troubles and break downs etc. from administrative view point inadequate staff, water rate structure and grievances of staff were the major obstacles.

34. Name of the Study: Study on the Problems of Marginal Farmers and Landless Agricultural Labourers in the District of Hooghly, West Bengal (1970-71)

Year of Publication: 1971

Main Findings:

Hooghly district is predominantly a small and marginal farmers‟ area. Marginal farmers had 1.55 acres while small farmers operated 3.91 acres. The proportion of leased-in land is greater in the case of small farmers. Small farmers also had bigger families (7.87 per household) in comparison to the marginal farmers and agricultural labourers. Level of literacy (adults) and school attendance (children) was higher among small farmers. The dependency load was also heavy among the small farmers. Resorting to secondary occupations other than cultivation, both as primary and secondary, was higher among marginal farmers as the farm under their command was not enough to offer full employment for all the working force. Resorting to agriculture labour was least preferred by both small and marginal farmers.

Both marginal and small farmers had similar cropping pattern. Both raised hyv. paddy on a limited scale. Average yield of crops like potato and jute, which required higher investment, was higher in case of small farmers. Total cost of cultivation per acre was nearly 60% higher among the small farmers. Jute and potato were important cash crops, most of which was marketed after harvest.

Only traditional tools and implements were in use of the small and marginal farmers while pump sets and sprayers were commonly used by meddle and big farmers in the villages.

The small farmers derived 80% of their income from agriculture. The same among the marginal farmers was 54% . 45% small farmer households were indebted while it was 70% among marginal farmers. Main purpose of the debt was productive among small farmers, while among marginal farmers it was both for production and consumption.

The condition of landless agricultural labour was worse than that of the marginal farmers. They had work for 280 days in a year. About 65% of the households were indebted, debt being entirely incurred for consumption needs.

Rural work programmes, dairying, poultry might offer good employment opportunities to alleviate suffering of the landless agricultural labour and marginal farmers.

35. Name of the Study: Agricultural Enterprise in West Bengal – A Study in Farm Economy in Burdwan (1969-70)

Year of Publication: 1971

Main Findings:

Structure of the agricultural economy of Burdwan revealed that 70% of the operating households had holdings below 5 acres of which 42% had holdings below 2.50 acres. Secondly 20% of all holdings represented leased-in area and in the holdings below 2.5 acres 51% to 55% of the area constituted leased-in holdings. Thus both size and tennurial constraints were quite strong in the economy.

In the two zones of old and new irrigation use of fertilizers, land-use intensity per acre yield, marketing of crops were found to be high by West Bengal standard and there were evidences of steady improvement over the years. "What is significant, however, is that situation as observed in Burdwan though indicating progress in agriculture could by no means be equated with any measure break-through." New technology commonly associated with hyv. of crops, pesticides, improved tools and implements had entered the economy in Burdwan in a very feeble way. Failure of hyv. seeds to enter in any substantial way was ascribed to absence of perennial as also controlled forms of irrigation. One of the significant findings of the study was that going by the usual indicators of enterprise as yield levels, use of chemical fertilizers the small farmer of Burdwan could not be treated as any less efficient than a medium or big farmer. But small farmers‟ drive and medium or big farmers‟ drive being different – one being for subsistence and the other for maximization of returns – the two could not be compared in terms of relative rates of return. Moreover, a small farmer was absent in the process of any major capital-forming investment. But performance of a medium or a big farmer was not very significant in this field either.

In terms of yield levels or use of current inputs even a tenant farmers‟ level of performance was not any significantly inferior to that of owner-farmer. "In recent years the land owners are showing a tendency to advancing the fertilizer inputs to the share-cropper to be ultimately deducted from the share-cropper‟s share.

Marginal or sub-marginal farmers, though showing all signs of "efficiency", for the sheer size of their farms, were left with an income that kept them steeped in poverty.

"This makes the case for effective land reforms, including stricter enforcement of ceilings at a level lower than the existing 25 acres quite strong". This could place bulk of farmers at any place between 1.25 – 2.50 acres thereby improving the household income. "The key to taking Burdwan agriculture on a path of new technologies lies in the hands of the medium and substantial farmers. That would depend on several factors, the most important one being setting up of a network of perennial irrigation and drainage facilities. And creation of off-farm employment opportunities on a wide scale including in industries, could

ultimately create new compulsions for modernizing agriculture in Burdwan. Meanwhile, maximizing income will be sought broadly within the traditional framework".

36. Name of the Study: Santal Rural Economy – a study based on village survey in Santal Parganas (1970-71)

Year of Publication: 1972

Main Findings:

The Santals though regarded as tribals belonged to an economy of settled cultivation, survivals of tribal economy among them being hardly recognizable. Dependence on forests had become marginal, the forests having become government reserves. Hunting, a way of life of the tribal people had now turned into a one-day ritual. From the villages studied the following features were revealed which had a bearing on the problems of development of this community.

Occupationwsie, there was overwhelming dependence on agriculture; in sectors outside agriculture manual labour in unorganized sectors predominated. Studies in migration behavior revealed that mining and plantation drew lesser number of Santals than before. Entry into organized industries requiring a particular level of skill was very limited. Agricultural labour was the main area in seasonal migration.

Within the sphere of agriculture ownership cultivation predominated; tenant-cultivation marginally existed. One of the characteristic features of the farm economy was its overwhelming dependence on the family labour. There were no farms depending entirely on hired labour. Another feature was the relative evenness in distribution of land.

Land in particularly the interior regions was least endowed with infra-structure facilities. Quality of land was very poor. Use of chemical fertilizers was extremely limited and use of improved seeds was almost unknown in 1970-71 a period making the peak of "Green Revolution". Paddy and maize were the major crops with extremely low yield levels. Depending on such agriculture more than 80% of the families had to live below the line of poverty.

From this economy no group of cultivators could be identified as "progressive" or "surplus generating". Reasons for such a feature were not any particular lack of production enterprise on the part of the Santals but absence of exploitative production relations within the community in an overall poor base of agriculture. From within such a state of agricultural economy Santals could not move to tertiary sectors, particularly to trade. Literacy level was very low, and rate of skill formation was still lower.

37. Name of the Study: Study Relating to the Crash Scheme for Rural Employment in the District of Bankura, West Bengal (1972)

Year of Publication: 1972

Main Findings:

Nearly 85% of the agricultural labourers were employed on casual basis. On an average an adult male worker worked for 153 days, an adult women for 85 days on wage during the period between July 1971 and April 1972. Agricultural activities, largely centering round *kharif* paddy cultivation accounted for nearly 80% of their total number of days worked.

The project provided employment to only 1000 labourers in the district. This seemed to be trifling attempt where more than 40% of the workers were agricultural labourers.

The scheme of afforestation had undoubtedly a great relevance to the development of an important resource of the district. However, it seemed that the scheme would not be able to sustain employment at the initial rate, because labour requirement for the maintenance of the grown up forests might not be labour absorbing. It would have been worth-while to consider the "crash scheme" as complementary to the existing efforts for the expansion of irrigation facilities and multiple cropping. This would have gone a long way toward boosting employment which could be sustained in the subsequent periods by systematic cultivation of *rabi* and summer crops.

38. Name of the Study: Agricultural Enterprise in West Bengal - A Study in Farm Economy in Jalpaiguri (1969)

Year of Publication: 1973

Main Findings:

The district was overwhelmingly dominated by small farms, which formed nearly 80% of total farms. About 36% of farmers cultivated leased-in land and this land constituted nearly 28% of total operated land.

The salient features of the agricultural enterprise was that farming was still being carried out on traditional methods. Farmers primarily depended on traditional inputs, such as, ordinary seeds, farm-yard, manure and labour. The use of Hyv. seeds was conspicuously absent; only a small amount of chemical fertilizers and pesticides were found to be used for some crops. The intensity of land use was very low; barely 19% of the cultivated area were double-cropped. Inadequacy of irrigation facilities, particularly during the *rabi* season limited the scope of increasing intensity of cropping. *Kharif* paddy was the main crop, forming as such as 82.3% of total cropped area. The yield level of crops was also very poor.

In such a low level of enterprise, the performance was slightly better among the smaller owners and tenant farmers than along the bigger farmers. This was observed in respect of land use intensity which was highest among the tenant farmers. This was also found to be higher among the small owners than the large owners. Jute and tobacco, being more labour intensive crops, were found to occupy an important place in the crop structure of the small and tenant farmers.

However, with regard to chemical fertilizers and pesticides, although used on a limited scale, significant differences were observed among the different groups and classes of farmers. These two inputs were mainly used by the owner-farmers, particularly by the large farmers. The response of the differential use of these inputs to the yield of crops, particularly of tobacco was observed. The average yield of this crop was 13 mds per acre among the large farmers as compared to 8 mds and 6 mds among the small owners and tenant farmers respectively. The investment on land improvement was also quite high among the large owners. This was Rs.134/- per acre among the large farmers as against Rs.36/- among the small owners and Rs.1.31/- among the tenant farmers. Only two households, which belonged to the largest size class of owner-farmers, had possessed machinery. These were one tractor, one sprayer, one seed drill and 8 weeders.

39. Name of the Study: Land Reforms and the Changing Economic Structure in Cooch Behar (West Bengal: 1972) (Two parts)

Year of Publication: 1973 & 1974

Main Findings:

Part I of the Study mainly dealt on the basis of official data with the extend of land reforms carried out in the district. Part II was based on farm-level study of the impact of land reforms on the economy.

From official figures it was observed that the vesting of surplus land with the government was wider in the district than in the state as a whole. Vested land represented 12% of all agricultural land in the district as against state‟s 7%. But it was observed that land distribution programme under government initiative had progressed very tardily which was due largely to the de-facto redistribution that had taken place at the initiative of the land owners themselves in a sort of a pre-emptive bid. Such a redistribution at the initiative of the land-owners had created a number of complication major of which had been transfer and retransfer of land. This made the problem of officially settling the vested lands with the ryots further complicated. At the time of the study not more than 42% of the vested land could be redistributed under official seal. Another aspect of the problem was the uneven way the distributable land remained spread over different areas of the districts and this did not correspond to the distribution of landless or land poor over these areas.

In the village-level studies it was observed that marginal farmers or erstwhile share-croppers were mostly the beneficiaries but such lands lay precariously in their hands. Quite often partial sales of such otherwise non-saleable lands took place for purchase of bullocks or some basic wherewithals of cultivation. The land that were distributed to the local poor peasants, quite often belonging to Rajbansi community, sometimes passed into the hands of the community that had crossed the border and settled over there. The latter had some cash in hand and were more adept in such deals than the local Rajbansis.

Even with these limitations land distribution so far effected had a distinct impact on the agrarian structure with lessening of the extent of share-cropping. But the study suggests that such a lessening in the incidence of share-cropping had not always come alone the intended lines. In the overall climate of land reforms and also with the extension of infra-structures there had been provided the motivation of self-cultivation by evicting the share-croppers. Apart from quantitative change in the extent of share-cropping, there had also come about significant changes in the form of share-cropping this getting more formalized with share-croppers having to provide for their own bullocks and homesteads. Census estimates as well as the present studies suggested that Cooch-Bihar land economy was transiting from a share-cropping dominated economy to a family labour based small peasant economy on the one hand and agricultural labour-based farm economy on the other. Whether the last mentioned mode would be in a position to assume a commanding position in the economy paving the way for capitalist agriculture remained problematic.

40. Name of the Study: Income, Saving and Investment in a Progressive Agricultural Area (A study in Cuttack district, Orissa: 1970-71

Year of Publication: 1973

Main Findings:

It was strange that in an agriculturally progressive area the highest income of the cultivating farms came from service accounting for 37% of the total income. Income from cultivation accounted for only 27% of the total. The average total net income per household was only Rs.1539.

Out of 100 farms only 5 farms could save, on the average, Rs.980 per household and the rest of the households incurred loss amounting to Rs.3484 per household after meeting all the expenditure of the households. In regard to consumption expenditure it was observed that the expenditure on cereals was the highest in percentage term in lowest income group and it tended to decrease with the increase in income of the household; but the cereal consumption was the highest (911gms) in the lowest income group as compared to the lowest (379gms) in the highest income group.

The asset position appeared to be lopsided as three-fourth of the total assets were locked in land. Of the assets newly acquired were land, drought cattle and residential houses. Modern tools and implement were seldom acquired. Sale of assets was mostly confined to land.

Casual labour was the most prevalent type of labour as 39 households out of 40 had supplied 106 persons as compared to 10 attached labour from 5 households. The casual labour was employed on an average for 188 days in a year and its average earning per day was Rs.2.77 only including kind payments. The level of living was, in general, very low spending 87% of their income on food.

41, 44 & 51. Name of the Study: Study on the Marginal Farmers and Agricultural Labourers‟ Development Programmes in the District of Bankura, West Bengal (Three Studies)

Year of Publication: 1973, 1974 & 1975

Main Findings:

The M.F.A.L Bankura had the unavoidable problem of identifying marginal farmers (holding 2.5 acres) and agricultural labourers simply basing upon individual holding and ignoring off-farm income. Besides this each project had its own difficulties, e.g., in case of dairy development project indicate vet. services essential for launching the project.

In spite of these limitations there was perceptible impact on the cropping pattern of the dug-well irrigated area. Highlights of the impact are (1) area under Hyv. paddy increased from 5.3% to 41% of the gross cropped area, (2) wheat cultivation spurt from 5.2% to 22% and vegetables from 2.2% to 8% of the gross cropped area. But all these improvements were restricted to the area under the command of the dug-well which was a very small portion of the total holdings of the beneficiaries.

The new cropping pattern, particularly the vegetable cultivation which was perishable in nature was exposed to market hazards in the absence of any protective system for the perishable agricultural produce.

The dairy development scheme was mostly adopted by the milkmen community. Their know-how was extremely inadequate, in spite of a seven days training. Moreover, there were a lot of malpractices in selection of animals, its transport, supply of feeds and associated issues which vitiated the success of the programme. All the participants of the scheme were defaulting in repayment of their loans. Programme of supplying exotic breeds of cattle to

poor farmers was ill-conceived as such cattle could hardly be adjusted to the entire living pattern of a poor farmer.

43. Name of the Study: Economics of Rural Changes – A study in East India
Year of Publication: 1974
Main Findings:

The rural economy of East India was characterised by a high degree of stagnation during 1956-65. However, some rudimentary changes took place during this period in the form of enhanced supply of irrigation, fertilizers and transportation etc.

The Community Development Programme failed to create productive and social overhead capital by utilization of under-utilized physical and human resources. However, it might have influenced the development of increased linkage between villages and market centres. This was reflected in increase in marketed surplus of farm products surpassing the rate of increase in output itself.

During this period, a tendency towards owner-operation in farming was perceptible. This led to the swelling of proportion of workers in the rank of agricultural labourers. There was also a tendency toward diminution in the size of holding under the pressure of population and consequent break-up of families. This might be a drag on the future progress of agriculture in East India.

The period after 1965 was characterised by the official pursuit of HYV programme. in general, the progress of HYV was limited to areas where perennial irrigation facilities were available and where organizational efforts were concentrated. This gave rise to zonal disparity in the distribution of the benefit of the HYV programme. The progress was also arrested due to the limited risk bearing capacity of the small and marginal farmers who lacked funds to risk investments.

Progress of new technology in agriculture would depend in large measure upon the extent to which practical technological inventions are adapted to the variety of local or ecological situations within the national or regional economy.

What were necessary in the specific context of the Eastern states were (1) funding out of appropriate technology for small farmers in the given agro-economic conditions, (2) appropriate institutional arrangements for better facilities of credit and material inputs and (3) setting up of an effective extension service. Experiences of the Eastern states highlighted the need for expansion of state and institutional role in agriculture.

45. Name of the Study: Income and Savings and Investment in a Progressive Agricultural Area (A study in Sambalpur District, Orissa for the years 1971-72 to 1973-74)
Year of Publication: 1974
Main Findings:

Nearly 47% of the cultivating households coming from different operational holding size-groups and income groups were running on deficit.

The investment did not depend on the assets already held rather it tended to increase with the increase in income though the trend was not well pronounced. Cases of deficit households investing on assets were observed.

Preference in acquisition of assets in upper income groups was for residential houses, consumer durables and financial assets while the emphasis of lower income groups was more on land.

Besides cost on routine replacement, maintenance and repair of household and agricultural assets purchase of land had next priority. Investment in assets other than purchase was in favour of agricultural assets.

Nearly 80% of the households were indebted and indebtedness tended to increase. Loans for cultivation and acquiring livestock accounted for 90% of the total debts incurred.

Two types of agricultural labourers were studied: (1) attached labour and (2) casual labour. The former had rate of annual employment at 314 days. Average employment period for casual labour was about six and half months. Average annual income per labour (both types) was Rs.424/- out of which Rs. 422/- was spent on consumption leaving hardly any savings.

46. Name of the Study: Study of Big Farmers in Purnea District (Bihar: 1971-72)
Year of Publication: 1974
Main Findings:

Purnea which had received the benefits of Kosi canal had an agricultural economy dominated by big landlords. Evading the land reform legislation these landlords had tried to take advantage of the infrastructure facilities that resulted from state investments and also of bank finance.

One of the notable features in the late sixties and early seventy was resort to extensive cultivation for which tractors were found to be essential. In this period use of tractors proliferated in the area.

The big landlords who were selected for the study were all well-above 20 acres of ownership holdings and alongside employing permanent hired labour for cultivation they leased-out land on share-cropping extensively.

Comparing the relative performances of the big landlord farmers with those below 20 acres (who had been selected as a control group) it was found that the letter by different indicators of agricultural enterprise showed a distinctly higher level of performance than the former. Among the non-big category those using tractors on hire basis showed the best level of performance. Tractor utilization by the tractor-owning big landlords was at a lower level.

Practice of advancing bank credit to the big landlords for purchase of tractors some of whom owned highly valuable consumer durables including motor cars and refrigerators was questioned in the report. At least two policy implications emerged from the study viz. relative performances of big.

48. Name of the Study: Study on Small Farmers' Development Programmes (Ganjam, Orissa)
Year of Publication: 1974
Main Findings:

A small or marginal farmer is not difficult to indentify. They belong to a stratum of the peasantry with large-degree of tenurial obstacles, vast illiteracy and such other handicaps which have prevented their development. The defective identifications of the target

beneficiaries due to ambiguity in its definition was evident from the fact that 82 out of 106 small farmers studied belonged to the caste Hindu group and the level of literacy among the adult population of the small households was as high as 80 per cent. While the corresponding district literacy position was 24.41 per cent as per 1971 Census. The asset structure of the beneficiaries under study was better than what was expected.

Therefore, it was evident that more enlightened sections of the society first grabbed the benefits offered by the Agency. It was observed that the Agency made positive contribution in the development of small farmers. This was reflected in the higher per farm investments, input-output patterns as well as in income and indebtedness of the small farmers. Whether newly created development potential among the small farmers could be sustained remained to be seen.

49. Name of the Study: An analytical study of income distribution in East Indian Villages.
Year of Publication: 1974
Main Findings:

Per capita income had been found to increase with the increase in the size of holdings. The owner-cultivators as a class were getting larger share of the village income compared to their share in the total number of rural households. More than 80% of the agricultural labour households were getting per capita income equal to or less than Rs. 240 in 9 out of 14 villages. 50% of the households cultivating mainly or wholly owned lands were having a per capita income not exceeding Rs. 240/- showing that ownership of land could not guarantee a reasonable level of livings.

In many villages, households with their heads as literate were getting more per capita income than households with illiterate heads. With higher standard of education the per capita income tended to increase. No clear-cut relationship between per capita income and share of secondary income had been observed.

50. Name of the Study: Economics of Tractor Cultivation- A Study in the District of Sahabad, Bihar
Year of Publication: 1975
Main Findings:

Extensive adoption of high yielding varieties of crop was found in the case of farmers owning and operating tractors. Farmers using tractors on customs service appeared second in this respect. Yield rates of HYV crops were found to be higher in the case of tractor operated farmers than animal-operated farms due to timely operation and better field- preparations. Animal power was completely replaced by tractor-power by farmers owning and operating tractors. The performance of the farmers using tractors on customs service was socially desirable because of the high surplus generated by them with minimum displacement of human labour. Under utilization of tractors was solved to a great extent by hiring them out to other cultivators who needed customs service. In Sahabad use of tractors led to intensive cultivation and thus had met labour-replacing effect.

52. Name of the Study: Socio-Economic Survey towards a Plan for Increasing Village Income and Its Rational Distribution under the Sriniketan Rural Reconstruction Program

Year of Publication: 1975

Main Findings:

(1) Daronda: The main problem for improving agriculture in this villages is lack of irrigation. Except a few tanks there was no other source of irrigation. Kharif paddy was the most important crop with very little area under HYV. Cultivation of rabi crop was negligible. The approximate cost for re-excavation of 14 tanks at Daronda was estimated to be about Rs. 4 lacks, which would irrigate about 318 acres in kharif and 178 acres in rabi seasons. The multiple ownership of the tanks had become the main obstacle. Besides, the owners of tanks and the owners of lands to be benefited were not the same persons and consequently the interests differed. It was suggested that;

   i) Government should acquire all such tanks and re-excavate those.
   ii) To form a cooperative society which would excavate the tanks with Government and helps to realizes irrigation tax from the beneficiaries.

(2) Sarbanandapur: Kharif paddy was the most important crop with very little area under HYV paddy and also wheat. Irrigation covered 74 per cent of the cultivated area in kharif season only. Cooperative and nationalized banks provided adequate credit but the loans were misused. Provision should be made for irrigation for rabi crops. Steps should be taken to extend financial help to the pottery workers in the village.

(3) Sarpukur-Bandlodanga: it was a typical tribal village. Agricultural labour and cultivation were the important occupations in the village. More than 81 per cent farmers belonged to small and marginal farmers' category. Average yield of paddy was low due to lack of irrigation facilities and low rate of inputs. Occupations like weaving, basket making, carpentry etc. might be introduced for increasing the village income.

(4) Mahula: Agriculture was the major occupation. Pottery was an important subsidiary source of income. The low yield of HYV and other crops was mainly due to low doses of manure and fertilizers and to some extent due to pests and diseases. The village had good irrigation facilities and there was enough scope for improving the level of agricultural output through the adoption of improved methods of cultivation.

54. Name of the Study: Agriculture in Ajoy Command Area

Year of Publication: 1976

Main Findings:

Birbhum district has emerged as a surplus district in paddy in recent days, yet there were some villages not very far from Bolpur, where agriculture was in a very back-ward stage.

Tagore Society for Rural Development, a philanthropic organization made arrangements to construct a dam on the river Ajoy to check floods and also undertook a scheme to bring the village under a cluster of shallow tube-wells with a view to modernize agriculture.

55. Name of the Study: An Evaluation of Tribal Development Agency in Singhbhum, Bihar
Year of Publication: 1976
Main Findings:

The intensity of cropping in the case of participant farmers was much higher than the non-participants. HYV crop were raised by the participant farmers due to improved irrigation facilities. The yields also in their fields were much higher. Use of fertilizers and pesticides was confined among the participant farmers. The farmers were also benefited from land development and soil conservation works. Creation of new irrigation facilities received the highest priority. But proper steps should have been taken to impound the surface water instead of dug wells. Most of the wells could not be used for irrigation because of inadequate depth and low water holding capacity. This is one of the most important reasons for the low acreage under the HYV crops and vegetables. The inputs were not supplied in time. Poultry enterprise was nothing but a total failure. Lack of coordination in the working of T.D.A. and the blocks were observed.

58, 63. Name of the Study: Agricultural Development in West Bengal Part-I and Part-II
Year of Publication: 1976, 1979
Main Findings:

Part-I of the study deals generally with the crops while the Part-II deals with animal husbandry, fisheries and forestry in West Bengal.

Part-I includes a time –series analysis of growth in different crops, growth of inputs, input-coefficients, price-movement etc. Growth of income and employment in the agricultural sector is also sought to be analyzed through the available data. The extent and role of land reforms and development of the institutions including the cooperatives are discussed in a separate to finding out the extent of state intervention in the sphere of agriculture. In Part-II, apart from bringing forth relevant and available data on animal husbandry, fishery and forestry a note is added on agricultural research, education, training and extension.

The coverage in terms of area and also the period being quite wide, the two studies throw a lot of information arranged in a systematic manner on the state of development in agriculture in West Bengal.

60. Name of the Study: Command Area Development Agency, Bihar-A Study on Sone and Kosi Command Area.
Year of Publication: 1976
Main Findings:

Large concentration of land in a few households was more pronounced in Raghopur than in Dehri Block. Irrigation was available to all farms in both the blocks. Paddy was far the most important crop in both the blocks and wheat came next. In both the areas HYV of paddy was grown and ordinary wheat was completely replaced by HYV. The extent of marketing of crops was higher in Delhi Villages.

Of the total income of the cultivating households as much as 70 per cent and 82 per cent were earned from farming in Dehri and Raglupue Blocks respectively. The infrastructure for agricultural development was more favourable in the Sone Commend area than in Kosi

Command are since the farmer was enjoying the benefits of irrigation for a much longer. The industrial complex of Dalmianagar was at an easy reach for Dehri villages providing a nearby market for their products and opportunities of factory employment. The cultivators of Dehri could invest more money in agriculture earned from other sources. Institutional credit was also more readily available in Dehri than in Raghopur.

61. Name of the Study: Study on Change in off-take of Fertilizers (A micro-study) in W.B.
Year of Publication: 1977
Main Findings:

A growing response in fertilizer rise in West Bengal was due to a spurt in demand that marked the period. This period in West Bengal was a silent wheat revolution and also a sudden increase in summer rice cultivation. This was particularly true of districts like Burdwan. States of the eastern region as late entrant in green revolution had been deprived of the benefits of a subsidized price in fertilizers.

Farm level studies in Burdwan showed that small and marginal farmers if provided equally with credit and water facility would respond equally with other categories of farmers in respect of fertilizer use. Tenant farmers showed slower rates of use which was due to their lower access to institutional credit. Burdwan villages received canal water and unless they were reinforced by more controlled form of irrigation, cropping pattern was likely to remain dominated by cereals-this setting a constraint in the rate and extent of fertilizer use.

Fertilizer consumption trends in Purulia suggested that in a largely arid region fertilizer use tended to remain confined to certain pockets to high yielding cereals. A wide use of fertilizers in districts like Purulia dependent on adoption of a suitable dryland farming technology.

Coochbehar, an area of heavy rainfall and study to sandy loam soil, provided a different type of problem where such commercial crops as tobacoo and jute were extensively grown. A peasantry that continued to be exploited by traders and jotedars were unable to make the best of their commercial crops. Tenurial and market disincentives were drags on higher productivity of such crops. Extension of fertilizer consumption in areas like Coochbehar very much depended on how quickly institutional constraints were removed.

64. Name of the Study: Economics of Cocoon Rearing –A Study in the Districts of Malda and Birbhum, W.B.
Year of Publication: 1979
Main Findings:

What seemed important both for traditional and newly set-up areas was the problem of protection of producers from so-called market forces. Both in the input market or in the product market private traders operated on a large scale especially in the traditional commercial areas.

At Malda, despite a high return in terms of physical output, actual financial returns on Cocoon rearing were much lower in comparison to Birbhum farmers because of a low market price. Practically all the Cocoon rearers in Malda most of whom came under the small farmers category were indebted to money-lenders-cum-traders who gave much lower price than the prevailing market price.

To start a cocoon rearing enterprise by small farmers, major difficulty faced was in respect of initial investments on rearing houses, land reclamation and purchase of equipment's. Otherwise, even a landless family could augment its income through this occupation if leaves could be purchased and financial help could be extended on easy terms.

In new areas, the adoptions had mostly come from sections having some capital and land and by virtue of their education and assets. The level of skill necessary for Cocoon rearing was not difficult to acquire but maintenance of a minimum hygienic conditions for rearing of worms would require continuous care and supervision.

West Bengal with her favorable agro climate conditions for Cocoon rearing much more favorable than Karnataka which accounted for nearly 80% of the produced Cocoons, could successfully engage a large number of under-utilized rural labour force in this enterprise.

65. Name of the Study: Economics Minor Irrigation in Nadia, W.B.
Year of Publication: 1979
Main Findings:

The intensity of cropping at Krishnagar I was much higher than that at Nakashipara because of assured irrigation facilities in the former. The yield rates of all the crops, in both the blocks were found to have improved over those in 1970-71, when a similar study was conducted. Most of the beneficiaries of shallow tubewells were medium and big farms. The intensity of cropping in the case of shallow tubewells due to better control of water in case of the former. Ordinary kharif paddy was the most important crop in Nakshipara but hyv and boro paddy were found to be the most important crops in Krishnanagar –I. There had been a perceptible change in the use of fertilizer.

The preponderance of small and marginal farms under the command of river lifts was most pronounced. Despite better irrigation facilities the area under rabi remained low under all types of minor irrigation. It was found that river lift yielded the best results when the comparative efficiencies of the three types of irrigation had been assessed by benefit cost ratio and internal rates of returns.

66. Name of the Study: Economics of Minor Irrigation in Dhenkanal, Orissa,
Year of Publication: 1979
Main Findings:

The cropping pattern of the beneficiary farm had undergone a through change in their irrigated lands. HYV wheat and sugarcane seemed to have replaced aus paddy, ground nut and rabi pulses. The pigeon pea had attained the status of second important crop. The use of modern inputs had not been extensive. The Diversion Weir Project as a source of irrigation had never effective during rabi season. Minor irrigation projects, depending on the rivers for water supply, were effective only during kharif because rivers of Dhenkanal were rainfed the only MIP utilizing the ground water was dug well project which became popular for financial assistance offered by SFDA. Of the three types of minor irrigation projects lift irrigation appeared to have the best impact on yield as well as cropping pattern, intensity of land use and use of modern inputs.

67. Name of the Study: Dryland Farming Projects in Palaman (Bihar)-An Evaluation
Year of Publication: 1980
Main Findings:

Short-term programmes of supplying subsidized inputs like seeds, fertilizers and pesticides were widely availed of by the farmers but in long-term programmes like soil conservation, soil treatment, water harvesting, irrigation etc. participation rate was small. Long-term programmes were mostly availed of by non-tribals whereas in short-term programmes tribals had equal opportunities. Newly introduces crops consisted mostly of hyv maize and wheat.

Dry land farming programmes had definitely made some impact on local agriculture. But such a programme seemed to have been more in the nature of a crash programme and lack of proper coordination with other extension agencies was quite apparent. The improvements so far effected under the programme had been based mainly on irrigation rather than on Dry land farming technology. Irrigation being a constraint, success of farm enterprise on a wide scale would depend on trying out short-duration drought resistant crops. High-yielding varieties of wheat, paddy or maize which depended on high doses of fertilizer and controlled irrigation had little possibility of success in the area, on any mentionable scale. For enabling tribals to avail of the long-term investment programme special care needed to be taken by the project authorities.

68. Name of the Study: Study on 'Food for Work Programme in West Bengal: A Casestudy in two Panchayet Areas in Birbhum District.
Year of Publication: 1980
Main Findings:

The study revealed a remarkable change in the debt position of the beneficiaries. A study of the opinion of the beneficiaries, on the whole, suggested that such a programme was considered beneficial by the respondents. Whatever might have been the individual attitude towards the programme, it had surely helped the rural poor to get employment opportunities for some period and in this way to provide some economic relief without which they would have to starve particularly in the context of devasting flood ever experienced in this area. Although some constructive programmes of durable nature could have been taken up which would also benefit the local community. Another counter argument was that any constructive scheme of durable nature could not be taken up because of the very nature of the scheme which continued for a very limited period.

69. Name of the Study: Utilization of Vested Land in West Bengal, Bihar and Orissa
Year of Publication: 1980
Main Findings:

While land distribution measures had been extremely tardy in most parts of the Country Jammu & Kashmir and West Bengal were the only two states where there had been relatively better performances in regard to land distribution. In West Bengal by far the major share (92%) of the surplus land acquired originated in the ceiling provision under Estate Acquisition Act, 1951. Only a small portion of the surplus land was acquired from the West Bengal Land Reforms Act which provided for Ceiling on all agricultural holdings. Through

Estates Acquisition Act had provided for radical Ceiling on the Khas land of the hitherto landlords the pace of its implementation was extremely show evasion through benami transfers. There had been three categories of beneficiaries under land distribution programme in West Bengal. First Category was represented by refugee population. The second category of beneficiaries were represented by a section of the share croppers and the third category was represented by a section of landless agricultural labourers or marginal farmers. The last two categories were quite often organized by different Left political Parties.

The working group on Land Reforms of National Commission on Agriculture reported in 1973 that land reforms in Bihar were a sour joke. Taking advantage of the several conciliatory measures contained in the act, Bihar landlords were able to retain a large amount of land in their own possession. The present study which tries to find out the impact of land distribution on a group of beneficiaries in the district of Bhojpur, revealed that the land had been distributed belonged to very inferior in terms of soil type. There were two positive impact of this land distribution. Firstly, the land that was distributed was fallow land where no crops would be grown. Secondly, from the standpoint of the individual beneficiaries whatever little income these crops fetched for them were not additions of income of these households.

Although ceilings on land in Orissa had been provided for in 1960 in the Orissa Land Reforms Act in 1960, there distribution had any progress till 1975. The areas which were selected for the study of the beneficiaries were in the district of Koraput where distributed land constituted nearly 25 per cent of the distributed land in the whole of the State. Like in Bihar the institutional agencies for credit provided loans to the beneficiary households both in Laxmipur and Padampur, more or less as routine measure.

From the total land distribution account in Bihar and Orissa it may be instantly said that vast masses of the landless and landpoor in the two state have remained untouched by the programme. In West Bengal, however, the possibility of retaining the lands by the beneficiaries seems to be at least for the time being large not so much due to economic gains from these lands as due to the general bargaining power of the rural poor which has enhanced following relatively large redistribution.

70. Name of the Study: An Evaluation of Minikit Seeds Distribution Programme (Birbhum, West Bengal

Year of Publication: 1981

Main Findings:

The progress of the programme in West Bengal revealed that number of kits distributed had increased from 2 lacks in 1975-76 to more than 18 lacks in 1978-79. Data collected from the sample cultivators revealed that the benefits of the programme went largely to the small and marginal farmers. From the point of view of tenancy the benefits accrued largely to tenants of either pure or mixed category.

Of the different seeds distributed through minikit, wheat featured most prominently, other seeds distributed were mustard, potato, pulses, winter vegetables and hyv paddy. The composition and the value of kit per beneficiary varied from village to village and from year to year. The study revealed that on an average more than 30 per cent of the seeds remains unutilized at the beneficiary level. In two villages kharif seeds were not utilized at all.

Untimely supply of seeds, non-availability of water and suitable land supply of damaged seeds were the reasons adduced for this under utilization of seeds.

The impact of the programme on the cropping pattern of the beneficiaries shows that the intensity of cropping had increased during the period under reference. In the process of utilization of minikit seeds some new had also been introduced in the beneficiary farms and as such some diversification of the cropping pattern had been there. However, the increase in the intensity of cropping was not attributed to availability of minikit alone, but also to the availability of additional irrigation facility during this period.

Yield level of crops on minikit seeds compared favorably with the corresponding crops grown on non- minikit seeds. But in cases of pulses and H.Y.V. summer paddy yield levels of non-minikit seeds were generally higher than those of minikit seeds.

71. Name of the Study: Economics of Potato Production and Marketing in West Bengal (Hooghly & Birbhum)

Year of Publication: 1981

Main Findings:

West Bengal whose share in potato production in the country has been quite large improved its position further both by extension in acreage and increase in yield (1) A higher profitability of the crop which was due both to a higher yield and a higher price; (2) A larger availability of the area which was due to introduction of the quick-yielding paddy; (3) A larger access to irrigation particularly to tube-well or other controlled process of irrigation-these were some of the factors contributing to a potato spurt-particularly in the decade of seventies in West Bengal. In the process of growth in potato, cold storage's have increased perceptibly in West Bengal, but such cold storages have tended to remain further concentrated in two or three districts. Extension of potato areas where cold storages are entirely absent has perhaps increased the grip of tenders on the potato-growing farmers. Ownership of cold storages in private hands has increased the problem further.

Fram-level study showing relatively a much higher return on potato compared to such substitutable crops as wheat and mustard underlines at the sometime the limits to the extension of the crop. Apart from some ultimate agronomic constraints for such an extension which includes high perishability of potato in contrast with mustard and wheat, there seem to be some other factors setting limit to potato areas despite its much higher profit potential. Risks attendant on potato cultivation are larger. Infrastructures particularly controlled irrigation and cold storages provide another constraint.

72. Name of the Study: A Study in Bhery Fisheries, 24 Parganas, West Bengal

Year of Publication: 1981

Main Findings:

The present study is based on two sets of information. The first set consists of general information regarding area, ownership, management etc. procured from secondary sources and past studies. The second set of data is based on only 15 Bheries selected purposively to represent qualitatively different size classes and zones of the bheries.

Bheries are important in West Bengal not only as the bulk producer of fish but also as producer of certain rare and valuable species not available in other fisheries. Some of the main findings of the present study are summarized below

1) Among different categories of fisheries Bhery stands in between the inland fisheries and coastal fisheries as a unique category.
2) Bheries in recent years (at the time of survey) have been subjected to various natural and institutional problems for which their production is rather declining instead of rising in response to rising prices.
3) So far as the distribution is concerned 60 per cent of the Bheries, belong to size class below 50 acres accounting for only 15 per cent of water area whereas 85 per cent of the total area belong to size class above 30 acres. Regarding forms of management a little less than two thirds of the Bheries are operated under direct ownership and the rest are operated by lease holders and share holders under different terms.
4) Operation of the Bheries involves a good amount of technical appliances and know-how and as such a high capital investment. But in the operational phase labour requirements are also quite high.

This study provides us with some idea as to the present condition of the Bheries, their operational details, cost of production, varieties of the species produced, range of production, gross profitability and the problems faced by different types of the Bheries in the recent years.

73. Name of the Study: Economics of Mustard in West Bengal (Murshidabad & Birbhum)
Year of Publication: 1981
Main Findings:

At the farm level the following observations were being noted.

1) The differences in the extent of mustard cultivated area noted between the two sets of farm are attributable to differences in the extent of irrigation available. Mustard cultivation was found closely related to availability of irrigation.
2) Mustard being a competitively low –cost crop no significant difference was noted as among different size-groups in respect of restore to this crop.
3) Per acre value of output varied significantly between potato and mustard value of the farmer being much higher than that of mustard. As between wheat and mustard value of the latter was noted to be a little higher.
4) In the two villages area under mustard was growing; where irrigation was available on a wide scale in the rabi season mustard's growth in acreage was alongside the growth in acreage under wheat and potato.
5) In the two villages area under mustard was growing; where irrigation was available on a wide scale in the rabi season mustard's growth in acreage was alongside the growth in acreage under wheat and potao.
6) In terms of disposal behavior in the villages which has a wide resort to mustard and which was growing for a long time – the crop was largely marketed. Farmers in some villages had taken to mustard cultivation mainly to protect themselves from the scaring prices of edible mustard oil.

74. Name of the Study: A Study in Wheat Decline in West Bengal (Birbhum and Murshidabad)

Year of Publication: 1982

Main Findings:

Two districts of Murshidabad and Birbhum taken together accounted for 18.3 thousand hectares under wheat when total wheat acreage in the state was as low as 34.6 thousand hectares in 1960-61. That is to say these were the two major wheat growing districts when wheat was a very minor crop in the state. In Birbhum, as far as the official figures for the district reveal, the phenomenal rise in acreage was effected between 1968-69 and 1971-72. But the wheat boom seemed to have been very short-lived in the district. Murshidabad the major wheat producing district provided a different picture. For the whole of West Bengal wheat acreage had reached its peak in 1975-76. Since then the acreage had started declining till in 1980-81 the acreage reached its lowest point.

Wheat was becoming less attractive in regions where cultivation has higher technology base and hence a higher cost base and was becoming more attractive in regions where cultivation was more indifferent and less costly.

The study of ten farmers showed that maximum acreage was reached around 1975-76 since when decline started. Mustard became the competitive crop. Per acre costs and returns for wheat and mustarded showed the following:-

With regard to all items of cost-seeds, labour, irrigation, fertilizers-per acre for wheat was larger than that of mustard. Firstly, owing to larger requirements of these inputs for wheat compared to mustard the rise in cost of wheat cultivation has been larger; secondly rise in prices of wheat has far lagged behind the rise in prices of the inputs during the period. Going by 1980-81 data net surplus from an acre of mustard was Rs. 1338 compared to Rs. 205 from wheat. This may give a clue to the phenomenon of fall in wheat acreage and partial substitution of it by mustard.

75. Name of the Study: A Study in Drought in Birbhum (West Bengal)

Year of Publication: 1982

Main Findings:

The study in view of the enormity of drought in this part of West Bengal between the month of May and July was proposed by the AERC and members of staff including heads of Palli Siksha Sadan, Palli Samgathan Vibhaga, Palli Charcha Kendra all situated in Sriniketan and department of Economics responded favourablly to such a proposal. The study of drought in this particular district of Birbhum derives significance from the following feathers about the district. Firstly, Birbhum is a food-surplus district of a deficit state. Secondly, area under kharif cereals constitutes more than 85 per cent of the area under cereals in the district. Thirdly, the district which is within the Rarrh region of West Bengal used to be highly drought-prone till Mayurakshi Canal Irrigation was commissioned in 1951-52. Fourthly, the district which is overwhelmingly rural has an agrarian structure. So while, on the one hand irrigation endowment in the district during the kharif season was one of the highest in the state the agrarian structure of the district revealed the extent of vulnerability in the event of any calamity. The present study is done on the basis of field studies on the one hand and official estimates and data supplied at different levels on the other.

The catchment areas in Santal Parganas for the Mor Irrigation system were suffereing from severe drought during this period. As a result the inflow position was precarious. Despite a very precarious position at the source, decision was taken to release at the rate of 2000 acre ft. a day from July 9 when seed-beds for Aus were getting destroyed on a large scale and farmers totally failed to prepare the seed-beds for Aman Paddy, Meanwhile reports of acute distress particularly of the landless labourers for lack of employment ina season which is the busiest in the year started pouring. The acute drought in the months of May to July had brought severe erosion in the condition of agricultural labourers. The pattern is almost the same for all the areas in the district.

76. Name of the Study: Impact of Mass Media on Agriculture in Two Villages in Orissa
Year of Publication: 1982
Main Findings:

The present study took up mainly the extent of diffusion of new ideas on agricultural technology through mass media as would be evident their adoption or rejection. Role of the promotional agency was not taken up in the present study. A comparison of the level of agricultural enterprise in the selected two villages had been done from the performances of the sample households. It was observed that cropping pattern was much diversified in the better exposed village. Further, it was observed that with the improvement in the quality of exposer to mass media the diversification of crops and substitution of traditional crops by more profitable are also improved. This was true for both the villages. Cultivators in better exposed village had been observed to use comparatively more fertilizers. Use of modern input-plant protection chemicals was also found to better among the cultivators of better exposed village. With regard to improved agricultural implements sample households in the better exposed village found to be owning more such implements than poorly exposed village.

Thus it was obvious that with respect to agricultural enterprise the better exposed village had been able to make use of different agricultural programs launched by CADA and have made appreciable progress on the path of modernization of agriculture while the poorly exposed village are still stagnating at the traditional level and have failed to take advantages of developmental programmes of CADA. Accordingly the relative importance of various sources of information which comprised of both mass media and personal media was examined on different items of innovations found to be adopted in the better exposed village. Another significant point emerging from the present study was that quite a large section of the respondent listened to agricultural programmes broadcast through radio, read information literatures on various crops and witnessed instructional movies on agriculture.

77. Name of the Study: Agricultural Development in Bihar
Year of Publication: 1982
Main Findings:

Bihar has one of the highest densities of population in the country coming only next to Kerala and West Bengal. This high density for Bihar unlike West Bengal or Kerala is accompanied by a rate of urbanization which is one of the lowest in the country. Bihar has vast stretches of fertile land rich with alluvial deposits. The region of Chotanagpur not rich in

terms of requirement of agriculture is one of the richest in mineral deposits and forest resources in the country. Alongside river potential, Bihar plants have one of the richest sub-soil water potential where water level is as high 10 feet to 60 feet below surface. Under the circumstances, both river irrigation and tube well irrigations are less costly for Bihar.

But lack of effective utilization of Bihar's resources either in the sphere of agriculture or industry has rendered the state one of the poorest in the country.

The second chapter of the present study shows for Bihar a moderate growth rate in agriculture marked by wide fluctuations over the years. Under-utilization of resources or of the newly –created infrastructural facilities is brought into sharp properly utilized. Additional irrigation potential created during the plan period had not been properly utilized. Utilization of one of the scarcest resources viz. energy for agricultural purpose is woefully small and has been declining over years. Increase in the use of chemical fertilizers has been very limited. Institutional credit as indicated by the financial position of primary Agricultural Credit Societies showed a static picture.

Bihar like West Bengal has an economy dominated to overwhelmingly by small and marginal farmers. On top of it proportion of agricultural labours in the rural work force is very high in Bihar. Concentration in ownership of land is quite high in Bihar.

Level of living in Bihar marked by acute poverty typically conformed to Engels' law with a very high proportion of food expenditure to total consumption expenditure and with a very high proportion of expenditure on cereals to total food expenditure.

78. Name of the Study: Ragi in Orissa- A Probe into a 'Growing Crop'
Year of Publication: 1983
Main Findings:

The present study is mainly devoted to probing into the phenomenon of a galloping increase in Orissa under millets in general and 'ragi' in particular. 'Ragi' has been chiefly a kharif crop in the state, the substitutable crop being paddy. A district wise study in the growth in ragi showed that through 'ragi' was chiefly confined to the inland districts and the coastal district of Ganjam where 'ragi' was an important crop showed very clearly that over the years in seventies rice area had declined while ragi area had increased. A village-level study did not provide any direct answer about the reasons or significance of such a movement. But certain aspects of 'ragi' cultivation were brought out from the study which would throw some light on this a typical nature of development for the state of Orissa.

Firstly, it was found that 'ragi', was grown by all size-group of holdings inputs their concentration was larger among the small cultivators than among the middle or big cultivators.

Secondly, in the cultivation of 'ragi', labour inputs dominated, modern inputs like chemical fertilizers or improved seeds being very seldom used. Labour inputs chiefly consisted of family labour.

Thirdly, what seemed interesting was that in the village through area under summer ragi with irrigation facilities exceeded considerably the area under kharif 'ragi' the difference in yield of the crop in the two seasons was very small.

Fourthly, a comparison in per hectare yield and per hectare returns between paddy and 'ragi' or HYV paddy and ragi showed very clearly a far lower yield or returns for 'ragi'.

What could be concluded from the above findings was that 'ragi' continued to be cultivated on a sizeable area as there was no scope for substitution of the low return 'ragi' by any other crop.

79. Name of the Study: Malnutrition of Rural Indian Children and the Sex Bias
Year of Publication: 1983
Main Findings:

The empirical studies of the nutritional conditions of children below 5 years of age in the two villages of Sahajapur and Kuchli have provided firm evidence of: (1) remarkably high incidence of undernourishment, and (2) systematic sex bias reflected in higher deprivation of girls vis-à-vis boys. The sex bias is reflected both in (i) the greater prevalence of undernourishment of various degrees among girls than among boys, and also (ii) in the lower growth dynamics of girls vis-à-vis boys.

Another finding is an important contrast in nutritional standards of children as well as in sex bias of nutritional deprivation between the two villages studied. Interestingly enough the village with the better over –all nutritional record has much sharper sex discrimination. In the two villages of Kuchli and Sahajapur, the performance of girls in terms of nutritional criteria are broadly similar, and it is the better position of boys in Kuchli that seems to make both the average nutritional record of Kuchli noticeably higher and also the extent of sex bias clearly greater. In this regard some policy issues related to the respective roles of reform and direct nutritional intervention have also discussed.

80. Name of the Study: Marketing of Rice and Paddy in West Bengal
Year of Publication: 1983
Main Findings:

Processing of rice had come overwhelmingly under the control of husking machines located mostly in the village or in the periphery of the agro-urban Centres. In the process, role of rice mills in the processing of rice had remarkably declined in the state. Two factors which prevented such an emergence were (a) a system of levy imposed on the rice mills from which husking machines, was exempted and (b) huge growth of husking machines all over the country side.

Flowing from this mushrooming of husking machines in the country side and a relative disadvantage which the rice mills faced on account of levy, small trading in rice started assuming a very important position in the process of distribution. The main feature of the trade centering round the husking machines was that it generated more employment than the rice mills. This system involved a vast number of people mostly belonging to the rural poor peasantry into different operations. The next feature which needs underlying was the continued reduction of state-level procurement with rice mills being made the only source of procurement. Thus the public distribution system became more dependent on central released of food grains. Following from such a course of development, the policy makers at the state level were confronted with a dilemma. The State Government was unable to put a cheek on the mushroom growth of husking machines and petty trade, these were done illegally on a large scale.

A feasible way-out of such a situation appears to be to induce the modernized rice mills to go in for diversification of production with the bye-products. State Government's internal procurement policy should be reoriented accordingly.

The failure of Government in procurement and distribution of rice need not be looked upon as a signal of alarm. Husking mills sprang up as a fresh outlet for decentralized rural investment favoured by a type of intermediate technology, bringing in its train by way of forward and backward linkage a host of opportunities of employment.

81. Name of the Study: Problems of Growth of Oilseeds. A study of Mustard in West Bengal.

Year of Publication: 1983

Main Findings:

Oilseeds occupied about 10 per cent of the gross cropped area 1978-79. Steep increased in the population resulting in the increased demand of edible oil had precipated the scarcity of edible oil, wheat, potato and summer rice is the competing crop of mustard.

In the districts mustard was found to have taken firm root in Birbhum. In Murshidabad area under mustard had suffered a marginal decline through its productivity had gone up. In West Dinajpur, the traditional mustard growing district of West Bengal, is marked with positive growth rate in area and negative growth in respect of productivity. Productivity of mustard is found to be comparatively higher in Murshidabad, but in comparison to its competing crops productivity from mustard is lower. In consideration of net return it stands next to potato. Net return per hectare from mustard is nearly double of wheat in West Dinajpur. The small farmers in Birbhum used their mustard harvest to meet their domestic consumption needs, scale of mustard harvest is mostly observed among the bigger farms. The production of mustard in West Dinajpur was mostly market oriented. On the whole mustard appears to be most profitable crop in all the three districts. In view of high cost of inputs and also the involved risk associated with potato cultivation and comparative low yield from rabi pulses, wheat remain as the only competing crop of mustard. Thus the scope for expansion of area under mustard is immense. The level of yield of mustard can be improved upon through popularization of improved variety of seed, plant protection measures and upgrading the technology of its cultivation.

82. Name of the Study: Gobar Gas Plants- Their Economics & Problems of Extension (A Casestudy in Birbhum & Nadia Districts, West Bengal)

Year of Publication: 1984

Main Findings:

In both the areas the user-households were found to have an average family size far above the general average of either the villages or of the rural areas in the state generally. In both the areas the heads of households had an education level well above the village averages. Thirdly, scheduled caste and scheduled tribe families featured quite prominently among the user households. Fourthly, average size of land holdings of the user households in both the areas were well above the villages.

From the report it reveals the so-called economics of gas plants in terms of the fuel and lighting expenses saved through the installation of plants. Despite the limitations of the

data, they reveal that the savings affected through the installation of gas-plants have been quite substantial. Saving on account cash savings in the family budget but more as social savings. As for Coal and Kerosene –both non-renewable their physical savings are extremely important and data reveal significant out in consumption of both the items. The non-tangible benefits by their nature are difficult to quantity but that does not minimize the importance of such benefits. The intangible benefits which are manifold accrue mostly to woman-flok-who are spread the usual hazards of the kitchen. And it has been observed that a village woman with a gas-over at her command is a happier, cleaner and a smarter person.

Another category of benefits that accrue to the user of gas-plants is in the sphere of manuring. Generally, in West Bengal villages avoid constructing separate sanitary latrines. Such constructions became easier when they come in combination with gas-plants.

Technical guidance and financial assistance for construction of gober gas plants are available from KEVIN, Govt. of India. Capital assistance in the form of grant from the Govt. and loan from banks are being arranged for different sizes. Apart from these, certain objective difficulties that seemed to face the intending users were (1) delay in bank financing (2) lack of timeliness in supply of cement and (3) lack of co-ordination from government. There seems to exist a lack of appreciation on the part of the development agencies including banks about the importance of the bio-gas programme. This is a socio-economic programme in contrast with purely economic programmes.

83. Name of the Study: Socio-Economic Study on Benefits of Minor Irrigation Project of Small and Marginal Farmers in Bihar

Year of Publication: 1984

Main Findings:

All the respondents in the two villages belong to a cultivating class who are hardy and are willing to pay proper care and attention to augment their yield rates and the gross levels of production. They are striving to switch over to not only high yielding crops but also high –valued crops. The difference to the cropping intensity and crop pattern in the case of marginal and small farms across the two villages studies may be explained by the nature of ownership of irrigation sources. The small and marginal farmers who have ownership, are in a position to more easily synchronize the use of surface well irrigation facilities with their needs than their counterpart who do not own these facilities; they are at the mercy of big farmers. Needless to say, the bigger farms sell out water meeting their own requirements. It has been revealed from the study, a government subsidy on surface well or on other sources of minor irrigation involving low or modest investments is likely to be a better alternative than direct government ownership of the means of irrigation.

A rather distinguishing feather of this area noticed in course of this study is that the farmers, irrespective of size, do not critically depend on the local extension agencies for supply of complementary inputs. As a result of the minor irrigation facilities, the farmers of both the villages are found to have held a more balances port-folio of crops which has enabled them to achieve substantial reduction in production risk.

A rather unfortunate feature about the surface wells, in spite of their benefits, is that because of the unplanned growth of surface wells and because of intensive cultivation, water is being over pumped.

84. Name of the Study: Social Forestry in Bihar
Year of Publication: 1984
Main Findings:

Social Forestry is a very comprehensive subject which encompasses not merely forestry on farmers' private land but also forestry on community and government waste lands and even rehabilitation of degraded forests. In both areas of Bihar under the study, the non-participant households have been found to have a smaller family size, a smaller amount of land area, lower literacy rates than the participant ones. These factors seem to have acted as barriers to their prompt response and active participation in the Social Forestry Programme. These households seem to be more interested in selling their labour.

Even in the presence of the government policy of 100 per cent financial support to the scheme during the demonstration phase, families which are relatively weaker seem to have stayed away from this scheme for a number of reasons. This is ironic in view of the fact that these families considering their greater ownership of cattle and other households animals as well as their poor background, seem to be more in need of Social Forestry for mooting their large demands for animal feed and fuel –wood.

Although this project seem to have the potential for making all the concerned parties better off in terms of absolute benefits, its wider acceptance by the society will be contingent upon two things. First the return on Social Forestry has to be stable and high. Secondly, Department and even non- Government Organizations must continuously design appropriate incentive schemes which will be able to adjust the total gains from this project in one way or the other in order to suit the aspiration of the various groups of people in the society.

85. Name of the Study: Mung Cultivation in Orissa
Year of Publication: 1984
Main Findings:

Mung is a relatively hardy crop with low coefficient of variation in its yield level when it is grown during the rabi season or when it is grown in the inland districts of Orissa during the kharif season. On unirrigated high lands it is grown during the kharif season. On irrigated high land it can be a sand witched crop between an early maturing kharif crop and rabi crop. During 1966-67, the area under Mung was about 351 thousand hectares and by 1980-81about 690 thousand hectares area is put under Mung. Nearly three quarters of the total Mung area and its production in Orissa is concentrated in only 4 (out of 13) districts of the State. However, one must not feel over- enthusiastic about the growth of Mung, for the growth of Mung has also posed several serious problems in recent years. First, the methods of cultivation, especially the nature and pattern of inputs used in its cultivation remain essentially primitive. Secondly, a severe pest problem which has been seriously affecting its production over the last three or four years also requires an urgent solution. Although examination of the marketing system of Mung has been one of the objectives of the study, this could not be seriously pursued. The failure of this crop over the last few years in succession has virtually choked off the trade in Mung. The cultivators have had hardly any Mung to market after meeting their consumption needs.

86. Name of the Study: Marketed Supply of Milk in Bihar
Year of Publication: 1984
Main Findings:

Patna has been renowned as an important centre of dairy enterprise since very old days. But strongly enough, no serious efforts were made to augment the existing scale of enterprise. If dairy enterprise has to be succeed, an unit should comprise of both types of milch animals. Moreover, the strong public antipathy towards improved breed of animals should own over through appropriate policy measures. Suitable vetenary facilities should be provided so that adoption of such animals does not pose any serious problem of risk to the households. This study reveals that hardly has there been any use of institutional credit for dairy development. Although the role of private traders is on the decline, their preponderance even at this point in spite of the higher prices offered by the milk co-operatives, seems to suggest that the co-operative societies have not yet been successful to completely replicate the various types of functions that were provided by the private traders. Although it could not be properly explained through the response of the sample households in the present study, it seems that the co-operatives have failed to link credit with the marketing of milk, which still constitutes a strong point of the private traders.

87. Name of the Study: An Evaluation of the Programme of Barga Operation in West Bengal
Year of Publication: 1984
Main Findings:

'Operation Barga' is a device in which the landlords are expected to participate more in the cost-sharing of inputs, while on the other, the tenants are expected to be proved with a greater share of output. The input application rate has increased in nominal terms, but the increase in real terms is at most marginal. The inter-temporal analysis reveals that the yield rate has witnessed hardly any increase over time, through in certain cases where the tenants have better access to formal sector credit, local level organization, or better educational standard the input and output rates are found to be better than those who do not enjoy such facilities. The income levels of not only tenants but also landlords have increased in nominal terms and in all probability also in real terms. Tenants are now found to be holding a much more diversified portfolio of income-earning sources than before. Unfortunately, investments in agriculture and human resources have not reached any significant proportions. A large part of this increased investment is seen to have switched on to residential units and non-agricultural activities.

Even though the objectives of 'Operation Barga' to formalize the relations between the tenants on the one hand and the landlords on the other in order to establish a fair exchange between the two parties is yet to be fully realized. It must, however, be remembered that the traditional dependence of the poor tenets on the land –lords, given the imperfections and incompleteness of markets and other non-market organizations in our society, cannot be overcome one fine morning.

88. Name of the Study: Economics of Groundnut Cultivation in Orissa
Year of Publication: 1985

Main Findings:

1) In case of kharif groundnut, unbounded high lands which were normally left fallow are found to be profitably substituted with kharif groundnut since early fifteen.
2) Rabi groundnut was a rescue crop in the flood-prone land in coastal districts, which could be raised with the residual moisture after the flood water receeds. The study shows that out of about 80 per cent coverage under rabi crops nearly 4 per cent was devoted to groundnut.
3) Recently, groundnut is being cultivated during summer season where some irrigation could be available. The requirement of water for the crop is not so high as of the cereals.
4) Some of agronomical needs of groundnut e.g. intensive and timely labour requirements and short duration of its maturing found favour among the small/marginal cultivators.
5) The level of productivity could be achieved by using appropriate inputs.
6) It was observed that the existing channel of trade and the processing units was grossly inadequate. Micro –level data reveals that major part of the groundnut harvest is sold out. There is a significant difference in net return from groundnut cultivation for different size of holdings.
7) Proportion of purchased inputs is comparatively higher for groundnut cultivation in comparison to other traditionally grown other crops. In the absence of adequate institutional credit it became difficult for all the size of farmers it was observed that sometimes the farmers drawing loans for other crops during kharif season diverted a part of it to groundnut cultivation.

89. Name of the Study: Santal Rural Economy

Year of Publication: 1985

Main Findings:

In the village studies the following points were noted:

(i) Avery weak infrastructure in agriculture.

(ii) A very low level of agricultural enterprise and more importantly, failure of new technology to make an entry in agriculture managed by the tribals.

(iii) A correspondingly low of living as indicated by housing, clothing and use of durable consumer goods.

(iv) A very low entry of children in schools.

(v) In terms of mode of production what was chiefly noted was the overwhelming preponderance of family farming with a noticeable small incidence of agricultural labour and share cropping.

(vi) What was underlined in this context was that in an overall low level of enterprise the process of differentiation among pleasantry was very feeble and what wasmore remarkable was the high degree of homogeneity that continued to mark the tribal agriculture.

(vii) Endogenous process of change in differentiated society which is boosted by further differentiation and such exogenous factors as laying of insfractures were both remarkably lacking for Santal Parganas at the first point of the study.

It is interesting to see how things changed in this district among the tribals during a decade's time.

90. Name of the Study: Problems of Under-Utilization of Irrigation Potentials Created in Bihar

Year of Publication: 1985

Main Findings:

Irrigation and especially canal irrigation is the most crucial input in modern scientific agriculture. Bihar has reaped significant benefits from development in this field. Unfortunately allegations regarding underutilization of created irrigation potential in Bihar are quite severe. The present study tries to study the problem at the farm level. Although the term 'underutilization' generally gives the impression that it is a demand side problem, the relevant study, however, allows for the fact that it may be influenced by both supply side and demand side factors.

The rate of utilization was found to be higher in case of alternative sources of irrigation. In regard to canals, upper reach and head end villages were found to be much better off than the others. Coming to the demand side factors, the study lands, the ownership status of the farmers, the role of complementary resources in the form of access to market for credit, use of fertilizers and other purchase inputs, commercial motivation of farms, access to local level organizations and also the extent of consolidation of land holdings captured by fragmentations of land. The following observations were being found from the study:

(1) Water is not so important an input during kharif as it is during rabi or summer.
(2) The capacity of the Sone Canal system seems to have become inadequate for meeting the ever increasing demand for water.
(3) Absence of field channels is the biggest single factor affecting utilization of irrigation potentials.
(4) Apparently, the cultivators of the upper reach and head end positions are getting more water than they need.
(5) With the adoption of hyv seeds, the timing of water deliveries is becoming more and more crucial. But the farmers are not getting prior assurance regarding supply of water. The present system of field to field irrigation cannot ensure efficiency in distribution of irrigation facilities.
(6) The farm structure of the selected region is characterized by predominance of marginal and small farms. The adoption of modern irrigated agriculture is a highly capital intensive proposition. These poor farmers often lack complementary resources in spite of their better utilization rates of available irrigation potentials.
(7) In canal irrigation there may be economics of scale but all available evidence indicates that these are also accompanied by diseconomies of management.
(8) Larger land holding have been found to display greater tendency of underutilization.
(9) Since fragmentation of land holdings posses a rather serious problem during rabi.

91. Name of the Study: Evaluation or Special Rice Production Programmes

Year of Publication: 1986

Main Findings:

West Bengal is one of the most important rice growing states in the country, accounting for about 13 per cent of the country's rice acreage and contributing more than 11

per cent of the total rice production in the country. Under the SRPP it was planned to increase rice production in West Bengal by about 37 per cent in a period of 5 years mainly through increasing the productivity of rice in the kharif season. The programme aimed at increasing the productivity of rice through popularization of high yielding varieties of seeds along with inputs required for adopting improved practices. However, in the first year (1985-86) of the introduction of this project, only two schemes, namely, distribution of minikits containing hyv seeds of rice and chemical fertilizers and rasing of community nurseries received priority. SRPP was launched in three blocks in the district of West Dinajpur and seven blocks in the district of Birbhum from the crop year 1985-86. One of the primary objectives of the SRPP was increase intensity of cropping through the adoption of short duration varieties of rice. The analysis of the cropping was higher among the beneficiary farmers than the non-beneficiary farmers. Among the beneficiary farmers the performance in this regard was better in the SRPP year than in the previous year. The irrigated plots and the SRPP plots had recorded a higher level of cropping intensity than the un-irrigated and non- SRPP plots. Muslim farmers had brought a larger proportion of their cultivated area under multiple cropping than their Hindu counterparts. Educational level also had a positive role in this regard. Again the mainly owner-operated farmers achieved a higher level of intensity of cropping than the mainly tenant farmers.

With regard to the adoption of hyv seeds a different pattern was observed. The non-beneficiary farmers, particularly those belonging to non-beneficiary villages, had devoted a larger proportion of their rice area under hyv seeds than the beneficiary farmers. No significant impact of SRPP on productivity of rice was observed from the analysis of field level data. The non-beneficiary farmers had obtained a higher level of productivity of rice compared to beneficiary farmers. The impact of the SRPP on the level of fertilizer application in rice cultivation was not clear. The analysis revealed here, that there existed no difference in the rate of fertilizer dose between the beneficiary and non-beneficiary farmers. The foregoing analysis leads to the conclusion that the Special Rice Production Programme achieved only a limited success.

92. Name of the Study: Constraints to the Use of Fertilizer in West Bengal Agriculture
Year of Publication: 1986
Main Findings:
The available secondary source data on fertilizer consumption provides the following findings:

(1) The pace of increase in fertilizer application falls short of the increase in area devoted to HYV crops and extension of irrigated area.
(2) Fertilizer intake is lowest in Eastern India.
(3) The rate of fertilizer application bears an inverse correlation with the size of farms.
(4) Crop-wise consumption as revealed from the cost of cultivation data shows that fertilizer application in the cultivation of rice in East India comprising Bihar, West Bengal, and Orissa is much lower than that in Punjab and Tamil Nadu.

(5) A comparison of the price rises in fertilizers and procurement price of rice and wheat indicates that rise in case of the former is comparatively low, thereby creating a climate for higher intake of fertilizer, which, however, has not come true in reality.
(6) It is observed that availability of irrigation facilities has always been positively associated with the growing of HYV crops.
(7) A break up of the total fertilizer consumption reveals that when the dose is high all the three components are used.
(8) Manures are used mostly as supplementary input along with the fertilizers.
(9) The fertilizer application rate is found to be usually higher than among literate cultivators in comparison to counterparts in the illiterate category.
(10) Crop productivity among small and marginal farmers are usually higher than those for other size of operational holding.

93. Name of the Study: Use of Tanks for Minor Irrigation and Pisiculture in West Bengal
Year of Publication: 1986
Main Findings:

The main findings of the study are that the scope of using tanks for irrigation is rather limited while potentialities of pisciculture are quite huge. Some institutional and legal reforms are urgently needed to overcome the existing constrains. Improvement of the technical characteristics of tanks like depth, siltage, weeds etc. are of crucial importance for long term improvement of tanks. The importance of extending social forestry in the embankments of tanks has also been high-lighted in this study.

The study of the effects of ownership status reveals that tanks held by the lease holders are hardly used for irrigation purposes. Multiple ownership is a barrier to pisiculture. The multiple ownership sometimes allows the tank to pass on to a derelict situation of the various government measures, F.P.G. and F.F.D.A. are found to be superior to others but the degree of improvement is not very significant. The tanks which are located near market places have been also able to avail of the benefits of market. The affluent people have been able to retain fish in water for a longer duration. This helps them to agument productivity and income.

94. Name of the Study: A Reflection on the Price Behaviour of the Major Crops in the Eastern States of India (During the last three decades 1951-1980)
Year of Publication: 1986
Main Findings:

It is evident from the foregoing analysis of facts obtained from Government publications that in spite of continuous assurance of the policy makers in favour of stable prices, the real situation is very much different from what are wished or claimed. The continuous fall in real income is becoming more disastrous for the small cultivators who are victims of both the rising price tends as buyers and unchecked fluctuations of seasonal prices for their products as sellers. Inspite of Government efforts, the seasonal prices of the main crops has remained almost same as before. In fact, the rapid increase in money supply which is closely related with the present rise in Government expenditure constitutes one of the basic reasons for the present inflation.

The second important reason to aggravate inflation is the repeated rise in the administered prices and particularly those of the basic commodities, which readily enter, as input cost, into hundreds of other products to raise immediately their cost of production and output prices. The officials reasoning for these frequent price rises differ from time to time as well as from one commodity to other. During practice of the Central Government to raise prices before budget so that budget can be places free from large price rise proposals. Accordingly, Agricultural Price Commission is raising the prices of agricultural commodities every year on the same ground of rising cost of production.

95. Name of the Study: Employment Conditions and Modes of Wage Payments of Agricultural Labour in Birbhum

Year of Publication: 1988

Main Findings:

The study has identified three types of labour employment:

(1) Non-wage labourers, namely sharecroppers and Krishans,
(2) Non-interlinked wage labourers and
(3) Interlinked wage labourer.

The incidence of non-wage labourers is found to be higher in relatively backward areas where production uncertainty is gender. Interlinking of labour contracts have been found to be higher in relatively advanced areas where both size and number of pick seasons are larger. However, most of the wage labourers are non-interlinked type.

As regards the wage rate, it is found to be comparatively higher in advanced areas. Seasonal variations in the wage rate are sharper in backward areas. Regarding modes of wage payment, it is found that in most cases wages are paid partly in cash and partly in kind. The incidence of cash wage payment is relatively greater during the lean season. Kind wage payment in the form of meal is generally provided in the advanced areas while the same in the form of clean rice is provided in the backward areas.

96. Name of the Study: Economics of Pineapple Cultivation and Its Marketing in West Bengal

Year of Publication: 1988

Main Findings:

Density of planting per acre was very low which resulted in low production. It is widely agreed that by dense planting, production can be increased without affecting quality.

Size distribution of operational holdings revealed that per acre production cost and rate of return increased by 83 per cent and 56 per cent respectively in the new area against an increase of production cost. There was a correlation of cost increase with size distribution in the traditional area, but a reverse trend was noticed in the new block. Cost of production, yield rate and rate of return was seen to be the highest for these planters who had non-agricultural sources of income. It being a highly capital intensive crop, return from it was more for those who could afford to invest more and who had extra sources of income.

97. Name of the Study: Cropping Pattern under the Irrigational Technology of Shallow Tube-well in the District of Nadia, West Bengal

Year of Publication: 1988

Main Findings:

The performance of the farming enterprise in respect of cultivation of commercial crops, adoption of hyv seeds, application of fertilizers and pesticides and yield rate of crops was better among the farmers who purchased water from private owned shallow tube-wells than among the owner-users and those who received water from government owned shallow tube-wells.

An inter-temporal analysis of the crop enterprise among the owner-users showed that the cultivation of hyv seeds, intensity of cropping, rate of application of different kinds of inputs and yield rate of most of the crops had increased significantly over time.

98. Name of the Study: Evaluation of Benefits Flowing from Central Sector Scheme of Minikit Programmes in Millets (Maize) in Bihar

Year of Publication: 1988

Main Findings:

The study reveals the programme of minikit distribution has achieved only a limited success. The extent of coverage under this programme has been found to be rather small. Even among the receipients the extent of coverage under hyv seed is poor. Very little differences in yield rates is observed among beneficiary and non-beneficiary households, extension activities seem to be confind only to the distribution of seeds. Follow-up measures have hardly been taken. Demonstration of the new production technology is done only on a limited scale. The farmers often do not get varieties of their choices. Non-availability of credit poses a serious problem. Lack of storage facility is another constraint to the growth of maize.

99. Name of the Study: Prospects of Changing Cropping Pattern in Favour of Oilseeds and Pulses production in West Bengal.

Year of Publication: 1988

Main Findings:

Notwithstanding sharp rise in prices of oilseeds and pulses the production of these crops was not augmented because:

a) People's expectations and predictability power was profusely blurred by sharp fluctuations price.

b) For structural reasons the market for these two crops tended to be comparatively impact. Consequently, wide variations of price available for the produces of these crops were noted and the traders –processors of these crops enjoyed the greater share of the price rise at the expenses of the producers of these crop.

c) Technological breakthrough in evolving superior yielding varieties and /or crop production technology was marginal in case of oilseeds and negligible incase of pulses; which resulted in assigning residual status to these crops by the farmers. Thus these crops were grown on marginal/ inferior lands and input structure of these crops in comparison to cereals and other cash crops were far interior.

Growth of oilseeds and pulses are found to be different groups of cultivation. Thus separate policy recommendations need to be evolved for these crops through state interventions and encouraging the cooperative sector to oversee the marketing of these crops.

100. Name of the Study: The Impact of Recent Drought on the Economic Life of the People in Rural Bihar

Year of Publication: 1988

Main Findings:

The overall agricultural production of the sample villages suffered a setback as a result of the drought of 1987. The main kharif crop paddy become worst sufferer where fall in production ranged from 24 to 48 per cent across the sample villages in comparison with last year's production. Among kharif crops, only maize suffered a very nominal loss of 10 per cent in production and 5 per cent in productivity. Farmers attempted to compensate the loss of kharif production through devoting area under rabi crops. However, rabi crops also suffered a loss in production due to fall in productivity causing from drought. Fall in agricultural production and agricultural income was not compensated by other incomes from non-agricultural pursuits. The result was that the level of consumption falls below the subsistence level leading to starvation where all relief programmes proved virtually infratuous in the real sense of relief.

101. Name of the Study: Problems and Prospect of Hill Area Development- A Case Study of Sikkim

Year of Publication: 1990

Main Findings:

Sikkim falls within the Eastern Himalayan Zone. Being a part of inner ranges of motivation of Himalayas, it is wholly a hill state of the total reporting areas, 36 per cent is under forest and only 11 per cent under cultivation.

The state is pre-dominated by marginal and small farmers. The average size of holdings is 2.00 hectares. Spring water is the only source of irrigation which provides 14 per cent of the cultivated land with water. The supply of water is not supported by reservoir and therefore it is restricted to the cultivation of kharif paddy.

Food-grain crops, particularly, maize dominates the crop structure. Due to low level of technology, the average yield of food-grain crops is very low. Important non-foodgrain crops are cardamom, oilseeds, soyabean and ginger. Horticultural crops are also grown on a significant scale.

The use of manures, fertilizers and pesticides is very low even in irrigated rice crop. The average yield of crops is much lower than the country average.

Rearing of livestock and poultry birds is widely prevalent. Agro-based industries are also important both in terms of the number of enterprises and providing employment and income to the people of the state. However, the state lacks in basic infrastructural facilities and amenities, such as, road transport services, power, banking, services, technical educational institutions, hospitals etc.

The density of population is 45 persons per sq. km. The state records a marked increase in population between 1961 and 1981 which is due to heavy influx of population

from the neighboring countries. The state had an average literacy rate of 34 per cent in 1981. More than 63 per cent of the total workers are engaged in agricultural occupations.

102. Name of the Study: Evaluation of Centrally Sponsored Scheme for Assisting Small and Marginal Farmers in Bihar

Year of Publication: 1990

Main Findings:

The present study revealed that so far the scheme had received only a limited success. A proper identification of beneficiaries was not done at the farm level as was evident from the fact that only one fourth of the beneficiaries belonged to the categories of small and marginal farmers. The study highlighted that most of the selected beneficiaries were caste Hindus. The lower sizes of holdings were found to be associated with higher cropping intensity. The study observed that one of the major drawbacks regarding the distribution of minikits was that it did not cater to the felt needs of the farmers. Minikits were to be distributed exclusively to small and marginal farmers, but in practice big and medium farms also received the same. The study also observed that the beneficiaries who were assisted in the sinking of tube-wells were found to have been deriving higher income through rasing the level of productivity of some crops as well as through hiring out of water.

103. Name of the Study: An Evaluation of the National Watershed Development programme for Rain-fed Agriculture in West Bengal

Year of Publication: 1990

Main Findings:

In order to assess the progress overtime, the relevant information were recorded for the year 1986-87 and 1988-89.

The programme works undertaken in National Watershed are have made a significant contribution in the cropping pattern and crop intensity. It has also created an infrastructure through which the farmers have been able to adopt improved technology and cultivate a larger number of crops which are economically profitable to them. There has been a significant increase in total production per farm and per acre. Productivity per acre of farm is highly positive during this period. The impact of NWDP on the generation of employment man days is positive.

Within the National Watershed area NWD programme have been able to reduce the risk and uncertainties in cultivating the crops. The farmers are investing larger volume of resources than those farmers who operate outside NWD area.

From the calculation of the Benefit-Cost ratio it is found that life span of the project should be at least 28 years. If the project operates in a proper manner, soil and water conservation measures, afforestation and other programme works will bring improvement on the ecology and environment of the area.

104. Name of the Study: A Model of Micro-Level Planning for Rural Development:- Bolpur-Sriniketan Block Area

Year of Publication: 1990

Main Findings:

The economy of the block is primarily dependent on agriculture. Thus the key to the development of the block is the development of infrastructural facilities like irrigation, roads and electrifications as the study suggests. There exists good scope for raising the level of multiple cropping and for raising productivity of crops through increasing irrigational facility. The study reveals that a considerable amount of land could be brought under irrigation through reclamation of tanks which would also encourage the development of fisheries. Proportion of workers engaged in activities like fishing, forestry and livestock is abnormally low, the percentages being varied a great seal across the Panchayats between 0.03 and 1.37 per cent. The block is industrially backward although there exists good scope for expanding artisan-based household industries.

105. Name of the Study: An Evaluation of the Training and Visit Programme in West Bengal

Year of Publication: 1990

Main Findings:

The findings of the study revealed that average holdings and proportion of irrigated area were generally higher for the 'contact' farmers in all the blocks. Sixty per cent of the sample farmers although know the Krishi Projukti Sahayak, most of the 80 farmers were not familiar with the 'T&V Programme'. The visit of the KPS was not according to scheduled and very few of the farmers attended any agricultural training programme, seminars, krishimele or anything like that.

The incidence of full adoption of different agricultural practices for various crops was nil although 'Contact' farmers generally adopted fully some practices for some crops in the different blocks. Educational status of the farmers were seen to have no impact on adoption of recommended practices in general average productivity of different crops was fairly high for the cultivators of the 'advanced' district. Some, new crops which were not grown earlier were introduced in the 'advanced' district by the Agricultural Department.

Regular personal contact by the extension personals with the cultivators will have some positive impact in the agricultural development. It was noticed that there remains some lacuna in the enforcement of the scheme in the strict sense. In spite of some constraints, it may be said that the T&V system has helped to introduce new crops and increase the production of crops by providing recommendations of improved agricultural practice to the cultivators.

106. Name of the Study: Evaluation of National pulses Development Project in West Bengal and Bihar

Year of Publication: 1990

Main Findings:

The study reveals that although the National Pulses Development Projects has made a drive towards increasing area and productivity of pulses, so far, it has not been able to significantly improve the status of the crop in the cropping pattern. Pulses are still relegated to the status of inferior crops, the cultivation being mostly confined to non-irrigated conditions. In area where irrigation facilities are available, farmers are generally in favour of growing cereals or high values crops at cost of pulses. Given the fact that there are large areas

which are lacking in terms of irrigational attributes, there seems to be considerable scopes for augmenting acreage under pulses in non-irrigated areas particularly where pulses are grown on the basis of residual moisture condition.

107. Name of the Study: Role of Non-Governmental Agencies in Agricultural Development (Bihar)

Year of Publication: 1992

Main Findings:

The study reveals that about 80 per cent of the beneficiaries belonged to the category of small and marginal farmers and most of them were either scheduled caste or scheduled tribes. Minor irrigation schemes received the top priority under the command area of N.G.O.s. The average yield of all the crops cultivated in these two areas showed marked increase due to greater availability of irrigation water. Both these organizations made arrangement to supply superior quality seeds, chemical fertilizer, credit etc. to the farmers in farmers in their command areas. Extension services were also provided to introduce new crops in the cropping pattern particularly, during the rabi season. There is no doubt that the N.G.O.s with their grassroot level organizing and carrying out government policies and programmes in the rural areas more effectively than the government organizations.

108. Name of the Study: Study of Emerging Problems of Agricultural Marketing with Special Focus on processing and Input Supplies (West Bengal)

Year of Publication: 1992

Main Findings:

It was revealed from the study that marketed surplus of paddy had increased over the years and there had been developed a tendency for an even pattern of sales among the different quarters of the year. This had resulted in narrowing down the spatial and seasonal prices of rice. This phenomenon was due to widespread cultivation of summer paddy. It was also observed that following form of mushrooming of husking machines, small trading in paddy and rice had assumed a very significant place in respect of both in processing and distribution of rice. The processing of rice had come overwhelmingly under the control of husking machines, and in the process, the role of the rice mills in the processing had remarkably declined in the state. This development had caused a loss of grains since the recovery rate in the husking machines is lower than rice mills and also a loss of bran oil-a by-product extracted from rice bran supplied by rice mills. The state had also lost control over the marketable surplus. The trading in rape and mustard seeds was at the hands of itinerary traders at the village level. These traders mostly acted as commission agents of aratdars and oil miller. Thus the latter group of trader enjoyed the benefit of price rise in the lean period.

109. Name of the Study: Economic Viability of Small and Marginal Farms: Potentialities for Increasing Income and Employment on Marginal Farms, W.B.

Year of Publication: 1992

Main Findings:

The study reveals that imbalance in factor-combination is the crucial feature of small and marginal farms. Firstly, small and marginal farms with a narrow land those support

relatively larger size of worker. Secondly, investment in fixed capital like draught cattle and plough is rather heavy on small and marginal holdings in relation to their size of farms. However, with regard to implements and machineries, small and marginal farms are found to have adjusted their investment to their size of holding by making lower investment per acre as the study shows that small-marginal farms are mostly users of traditional tools and implements.

The use pattern of resources reveals that small and marginal farms use land more intensively as compared to larger ones. Such farms, however, turn out to be inefficient in the use of resources. Inefficiency in resource use arises out of the lower intensity of labour use on such farms. That does not imply that small and marginal farms are irrational in allocating labour resource. In fact, they make adjustments in labour use by combing farm activity with supplementary enterprises. The study reveals that in the region representing advanced agriculture like Burdwan farmers have resorted to agro-based activities of which agro-processing has turned out to be the most promising one both in terms of capital-output ratio and return per rupee investment.

110. Name of the Study: Impact of Increase in Fertilizer Prices on Consumption/Demand of Fertilizer – A Study in Bihar (Rabi & Kharif)

Year of Publication: 1992

Main Findings:

The study reveals that in areas where rabi crops were cultivated both under irrigated and un-irrigated conditions, crops requiring intensive fertilizer use were replaced by less fertilizer consuming crops. No significant change was, however, noticed in the areas where rabi crops were cultivated only in irrigated fields, excepting minor allocation of crops acreage among different competing crops. In the former areas, the total consumption of fertilizers particularly, nitrogenous and phosphate fertilizer, recorded a declined between 16 per cent and 46 per cent. In the latter areas, the total consumption of fertilizers had remained unchanged. The study also appears to have shown that the performance of Dual fertilizer pricing system is far from satisfactory.

112. Name of the Study: Decentralized Planning in Agricultural and Rural Development-A Study in West Bengal

Year of Publication: 1993

Main Findings:

Various government development agencies are undertaking different development programs or schemes in Birbhum district mainly with a view to increase the standard of living of rural, down trodden masses and to develop the district's infrastructure. The on-going programs launched within last few years are like I.R.D.P., Minor Irrigation, F.F.D.A., Sericulture, Bio-gas, New 20 points programme-1986, I.T.D.P., Self-Employment Programme for Educated Unemployed Youths, Self-Employment Programme for Urban Poor etc.

i) Bio-gas: Under National Energy programme bio-gas plays a vital role to produce energy at a cheaper rate in rural sector. From the report it is being observed that from 1982-83 upto 1989-90 the progress in installation of such plants in most of the block

expecting Labhpur, Nanoor, Rampurhat II, Nalhati I and Muraroi have shown satisfactory progress.

ii) I.R.D.P.: The various governmental development agencies are undertaking development programmes in the district of Birbhum with a view to increase the standard of living of rural down-trodden masses and to develop district infrastructure. From 1984-85 to 1988-89 per head subsidy of IRDP for the district as a whole increased more or less steadily excepting the year 1986-87.

iii) TRYSEM: Training for the rural youths for self-employment is a vital aspect of IRD programme. Under this programme rural youths are trained in vocational training to acquire minimum expertise to make themselves self employed. During 6^{th} and 7^{th} Five Year Plan Birbhum and achieved only 28.94 and 39.52 per cent respectively of its target under this programme. DRDA, Birbhum earnestly endeavors to make TRYSEM a success for augmenting rural production.

iv) Minor Irrigation: Generally it includes all ground water schemes like dugwells, tubewells and surface water flow and lift irrigation schemes.

v) Self-Employment Programmes for Urban Poor: in Birbhum SEPUP loan are sanctioned from five centres at 5 towns of Birbhum, covering the whole district. Loan are finally disbursed through bank in those five towns. The financial help given through this scheme is for generating trades and business. Maximum amount of loan given for a single case is Rs. 5000.00 out of which 25 per cent is given as subsidy by the govt. of India and 75 per cent is given as bank loan of the project cost.

vi) F.F.D.A: In Birbhum this scheme has been operating since 1982. The rate of subsidy in case of scheduled tribe and scheduled caste is 50 per cent of the estimated cost and it is 25 per cent for general caste.

vii) Sericulture: The sericulture department of Birbhum is now putting stress upon those blocks which are comparatively new and less developed in sericulture practice. It is being observed from the report that mulberry cultivation have decreased in traditional regions.

113. Name of the Study: Concurrent Evaluation of Jawahar Rozgar Yojana
Year of Publication: 1993
Main Findings:

Macro level data revealed that JRY was introduced in the selected panchayats during 1989-90. It is pertinent to note here that the low allocation of funds over the years might have affected the creation of economic assets as well as generation of employment in the study area. A review of the projects undertaken in these village panchayats revealed that nearly half of the fund was deployed on non-productive works. Whereas the share of expenditure on other works likes social forestry, renovation of ponds, other irrigation works were very low. The survey found that the item wise expenditure was not based on the priorities laid down in the guidelines prescribed by the govt. of India, proper arrangement were not made for maintenance of assets created.

Micro data collected under this study revealed that during the year 1992-93, exceeding 85 per cent of the total working force of the selected area was from the families below the poverty line. By occupational classification they were either cultivators or

agricultural labourers. While the extent of unemployment was about 61 per cent of the available mandays, on an average, absorption through JRY was almost negligible during that reference year.

Thus it can be summarized that JRY had not been an effective program in view of both of its objectives – (a) creation of economic assets and (b) in providing employment to the poor in order to supplement their meager income.

114. Name of the Study: Glimpses of the Literacy profile – An Evaluation Study of Mass Literacy Programme

Year of Publication: 1993

Main Findings:

The mass literacy programme had its primary objectives to impart functional literacy through acquainting the beneficiaries with 'three Rs.' alongwith improving some general awareness among them, Birbhum is the third district in West Bengal declared to have attained the status of 'total literacy' (in July 1992) in consonance with the standard set-up by the National Literacy Mission. Efforts of the officers as well as grass-root workers of the State Government, quite frequently beyond their normal activities, were involved in this remarkable achievement.

According to the official statistics, participation in the Mass Literacy Programme in Birbhum was not uniform across the villages. Participation from both sex groups was almost similar. Adult participation from either sex was comparatively higher. But at the time of evaluating the achievement of the programme (July, 1990), it was found that exceeding one-third of the participants had dropped out in the meanwhile. Proportion of drop-out was comparatively higher among the males. Among the beneficiaries of the Mass Literacy Programme distributed over four sample village indicated that only 11.5 per cent of the beneficiaries could achieve the literacy level specified by the programme. Mal-functioning or non-functioning of the literacy centres run by the programme and /or heavy work-load causing disenchantment on the part of the target group of the programme as well as some insincerity and disappointment among the voluntary training might have contributed to this failure of the programme.

During the intervening period between these two estimates (July 1990 and February – March 1993) the new literate beneficiaries of the MLP might have lapsed into illiteracy in the absence of essentially required 'post literacy measures'. Another reason may be that the success of programme on eradication of illiteracy depend very strongly on (a) the attitude of the beneficiaries towards the program as well as (b) the attitude of the officials/workers involved in implementing the programme. It was observed in connection with the former that the beneficiaries were mostly from among the economically and socially backward group/communities. Owing to their poverty, they anticipated some immediate 'material gain' which could contribute towards their day to day requirements. The long run benefits to accrue to beneficiaries, from attainment of functional literacy were not clear before these people for obvious reasons. Besides these, an apathy towards formal education in view of the ever mounting unemployment among the educated youth, is bound to have its tall on this programme.

115. Name of the Study: Impact of Subsidies of Agricultural Development in West Bengal
Year of Publication: 1994
Main Findings:

a) Subsidy on agricultural implements: Purchase of agricultural implements were offered subsidy under this programme. The district Burdwan is fairly advanced in agriculture and enjoys a very congenial infrastructure since long. Naturally, these minor agricultural implements are unlikely to influence the agricultural productivity of the beneficiaries. This fact is borne out through the findings of this study.

b) Subsidy on irrigation equipments: Subsidies granted for purchase and /or installation of pump-sets was covered under this programme in the district of Nadia. Benefits accruing from this programme in terms of raising production and productivities of important crops were clearly discernible in Nadia. Difficulties or problems associated with this type of subsidy were many.

c) Subsidy of seeds in West Dinajpur: A border district of the state, was covered under this programme. Beneficiaries of subsidy on seeds were restricted to the cultivators who are selected for such benefits by the Panchayat. Main purpose behind sanction of this subsidy was to reduce the monetary burden on the small and marginal farmers.

d) Subsidies on Allied Activities: One of the activities allied to agriculture is livestock breeding. The govt. of West Bengal had provided for development the allied activities in this district. It was revealed from this study that subsidy on rearing milch cattles did not have any positive impact so far as the asset formation and income generation concerned.

116. Name of the Study: Role of Price Policy in Raising Oilseeds Production: Instance of Mustard in West Bengal.
Year of Publication: 1994
Main Findings:

The growth performance of various oilseeds in West Bengal is not uniform obviously this has affected the overall production performance of oilseeds depending upon the weight age of various oilseeds.

The cross-sectional data from selected farm households reveals that:

i) Favorable price movement has made a dent in the crop adjustment in favour of mustard. The degree of such crop adjustment varied according to the available irrigation facilities. This establishes the fact that in the absence of the provision of basic infrastructure price incentives, alone, may deliver the desired result.

ii) An yield response analysis at the farm level among the mustard growers indicate that farmers do not display necessary dynamism to upgrade the technology of growing the crop. This is true with respect to pre-sowing seed treatment and application of balanced fertilizer etc. However, hyv seed has been used by mustard growers. Thus the achieved average yields hardly 48.67 per cent of the improving the productivity of mustard in West Bengal through appropriate use of seed –fertilizer technology and assured irrigation.

117. Name of the Study: Evaluation of Implementation of Central Sector Scheme on Promotion of Agricultural Mechanization Through Small tractors

Year of Publication: 1995

Main Findings:

- Under the scheme, it has not been found any single beneficiary who is either small or marginal. However, small and marginal farmers derived the benefit of tractor through hiring tractor services.
- With regard to the impact of tractorisation, the study reveals that tractorisation has produced positive effect on farm output where the mechanical conditions of the tractors were in order.
- The increase in cropping intensity due to tractor use is found to be insufficient to neutralize its labour-displacement effect emanating from tractor use.

118. Name of the Study: Evaluation of Engineering Structure Constructed under soil Conservation in DVC (Bihar)

Year of Publication: 1995

Main Findings:

- Materials used for construction of the structure were good.
- The structure enables the farmers to raise production, productivity, farm income and employment through supplementary irrigation and land treatment.
- The cross section accountability of the benefits indicates that the efficiency of engineering structures is higher in comparison to those of the other structures.

119. Name of the Study: Fallow Lands: Their Potential for Increasing Agricultural Production

Year of Publication: 1995

Main Findings:

- Area of current fallow is directly proportional to size of operational holding of the farming households while area put as old fallow has an inverse relation.
- Major cause for current fallow appears to be fertility rejuvenation.
- Old fallow depend primarily on the geo-morphology of the respective area.
- There exists lack of institutional assistance and farmer's motivation towards suitable alternative crops.

120. Name of the Study: Agro-Economic Evaluation of Micro Watershed Development Programme for Rainfed Area (NWDPRA)

Year of Publication: 1995

Main Findings:

- The fund released to different districts of West Bengal was inadequate in terms of actual requirements.
- The inadequate funds were not fully utilized for the stipulated purposes. This had resulted almost no development in the essential fronts like land development, irrigational infrastructure, training of contact farmers etc.

- The adoption of modern technologies in the study area was found to be very poor which had resulted low productivity and thus low income of the farmers.
- The study emphasizes the urgent need for coordination between the agencies involved in this programme which is at present lacking, for efficient and fruitful implementation of this programme.

121. Name of the Study: Factors involving development of Pisiculture in West Bengal with Special Reference to Inland Fisheries in Birbhum district

Year of Publication: 1995

Main Findings:

- Pisiculture has immense potentialities in generating employment opportunities to the rural masses in WB.
- The essence of development of this sector entirely depends upon effective utilization of water resources through various means.
- Farmers are yet to accept and treat this sector as important as agriculture.

122. Name of the Study: Socio-Economic Implications of Farm Mechanisation in Burdwan district (West Bengal)

Year of Publication: 1995

Main Findings:

- The pace of mechanization in Indian agriculture has been quite spectacular. The number of tractors has increased from 0.31 lakhs in 1961 to 10.54 lakhs in 1988. The density of tractors per lakhs hectares of GCA has increased from 20 to as high as 595 in 1988.
- Farm mechanization in the study area had benefited all sections of farmers. The non-tractor farmers received the benefit of mechanization power in lieu of draught on human labour by hiring the tractor services.
- In both of the sample blocks the cropping intensity and the gross return per acre of GCA was higher than that of the non-tractor owner farms.
- Although mechanization has displaced bullock labour substantially, yet there was no fall in demand for human labour on tractor ploughing farms which might be due to the increase in cropping intensity.
- The benefit-cost ratio on the investment in tractor in the study area was worked out to be 1.20 considering the life span as 10 years only.

124. Name of the Study: Non-Conventional Energy Sources in West Bengal: Prospects and problems

Year of Publication: 1996

Main Findings:

- The chief advantage of this plant is providing electricity to the families.
- Most of the families in the sample villages have been benefited from electricity generated by solar energy.
- The project has also provision for improved chullhas and bio-gas plant.

- Although the investment on the installation of such project is high, the running cost is very low.
- It does not pollute the environment to any great extent.

125. Name of the Study: Growing Non-Conventional Export Commodities in Agricultural Land in West Bengal- An Exploratory Study
Year of Publication: 1996
Main Findings:
- There exists high cost of inputs and low prices of out puts
- There is lack of availability of cold-storage and warehouse facility.
- Lack of irrigation facility persists.
- Less cropping intensity as compared to both Rabi and Kharif crops is found in the production of non-conventional export commodities.
- If hurdles be removed floriculture can play an important role in the economy of West Bengal.

126. Name of the Study: Analysis of trend in Operational Holdings (West Bengal and Bihar)
Year of Publication: 1996
Main Findings:
- Growth of holdings in West Bengal and Bihar is accompanied by the proliferation of marginal holdings.
- In west Bengal, apart from sub-division of holdings following from the law of inheritance, the process of growth of holdings is the result of repeasantisation of the landless holdings made possible partly by the re-distributive efforts of land reforms and partly by the market forces along with changes in the lease market.
- In Bihar the process of growth of holdings is the consequence of parcellisation of land holdings occurring through land partitioning among heirs of family members.

127. Name of the Study: Causes of Shrinkages of Areas Covered by Tank Irrigation
Year of Publication: 1996
Main Findings:
- Field level data suggest that there has been marginal shrinkage in respect of area under tank irrigation over last ten years.
- In the village economy most of the tanks (90%) serve twin purpose of irrigation and pisciculture.
- As most of the tanks have a large number of owners the operation is governed by system of joint management.

128. Name of the Study: Floriculture in west Bengal- its problems and potentials
Year of Publication: 1998
Main Findings:
- Macro-level analysis revealed that initially commercial cultivation of flowers lacked momentum; but production registered steady increase since 1990 in all major flower producing states of India.

- From micro-level data it was found that the average size of the selected flower growing farmers was 2.45 acres, out of which 1.35 acres was irrigated.
- The broad cropping pattern of the selected farmers depicts that the flowers accounted for 16.5 per cent of the total cropped area, out of which two-third was in Kharif and one-third in Rabi seasons.
- It was observed that 67.18 per cent of total area under flower was occupied by Rose, followed by 7.38 per cent by Rajanigandha, 7.34 per cent by Marigold, 5.94 per cent by Jasmine, 5.89 per cent by Bel and 0.48 per cent by Gladious.
- So long as farmer's objective is to maximize net income per unit of land, flowers have advantages over traditional crops like paddy and potato.
- The field-level constraints of flower farming depict that high cost of inputs and low prices of output were the major socio-economic constraints in the study area.

129. Name of the Study: Potential of Diversification towards high value crops (Collaborative Project with NCAP)

Year of Publication: 1998

Main Findings:

- The production of fruits and vegetables are quite economical in terms of their net return based on different cost estimates.
- With regard to the impact of horticultural based diversification on equity and ecological sustainability, it has been found that in general the degree of income inequality is relatively less in high value crops than the traditional crops.
- In spite of high profitability of high value crops the constraints like unsuitable land situation, lack of working capital, non-availability of proper marketing facilities, lack of cold storage, warehouse facilities etc. are very crucial and played significant role in hindering the desired momentum in the cultivation of horticultural crops in the state.

130. Name of the Study: Economics of Export Oriented Horticulture Crops in Darjeeling (West Bengal)

Year of Publication: 1998

Main Findings:

- Orchid growers consisted of 32 per cent marginal farmers and 40 per cent small farmers.
- Orchid growers are habituated in selling their produce within the village itself.
- The net annual income from horticultural crops is more or less steady than that from cereal crops.
- Horticultural crops more especially orchids are more wage employment generating than other field crops.
- Lack of working capital, low prices of output, non-availability of proper marketing facilities are the main problems of orchid and other horticultural crops cultivation.

132. Name of the Study: Production and Utilisation pattern of Milk at the Rural Milk producers' Level in West Bengal

Year of Publication: 1998

Main Findings:

- The average milk production (per day) of cross-breed milch cattle is 4.36 liters in Midinapore and 4.90 liters in Murshidabad districts. In case of local cows it varies from 2.13 to 2.39 liters per day.
- Milk producers kept 80 per cent of milk for domestic purpose in area where co-operative society does not exist and they encounter the problems of marketing in flush seasons.
- Many of the problems related to the marketing of milk have been solved by the co-operative milk union.
- Average price paid by the co-operative society to the producer is less than the price paid by the private traders.
- The profit from private trading is apparently greater, but if we add the average bonus given by the milk union, the producers get higher prices than the private traders.

133. Name of the Study: Economics of Poultry development and Role of Decentralised Poultry in West Bengal

Year of Publication: 1998

Main Findings:

- The poultry enterprises are being taken up as an occupation by the educated unemployed persons with better resource endowment.
- Poultry contributes about 30 % of the aggregate income of the sample households.
- The rate of return from the poultry farms is directly related to the size of farm in the decentralized sector.
- Given the infrastructural facilities, the farms around 500 birds per cycle are found to be viable.

134. Name of the Study: Economics of Pulses Production and Identification of Constraints in Raising their Production in West Bengal

Year of Publication: 1998

Main Findings:

- Pulses are still relegated to the status of inferior crop.
- Most of the pulses have indeed been grown under rainfed conditions whether they are grown in marginal land or on rich field.
- Superior cereals like paddy and wheat enjoy economic dominance over pulse crops in that net return per acre from cereals crops is higher than those of pulses.
- Yield of pulses are much lower than those of superior cereals which are grown under favourable conditions.
- Pulses have not responded to the new HYV technology and the available HYVs of pulses are unable to compete with HYVs of major cereals, rather the existing varieties of HYV seeds of pulses are not capable of yielding much higher yield rate as compared to the traditional varieties of pulses under the prevailing agro-ecological conditions in West Bengal.

136. Name of the Study: Interlinkage between Agricultural Production and Village Level Marketing Channels in West Bengal- Changing Scenario

Year of Publication: 1998

Main Findings:

- There is significant extent of heterogeneity among the agricultural producers.
- Lack of transportation or communication.
- Credit crunch.
- Presence of intermediaries in rural trading.
- Presence and influence of merchants and traders operating in the primary market.

137. Name of the Study: Economic Appraisal of Village Goat Rearing in West Bengal

Year of Publication: 1999

Main Findings:

- Goat enterprise is a side-line activity, raising goats at the subsistence level.
- As an enterprising unit consists of 3-4 goats, it does contribute much to the regular income flow of the rearers.
- Goats contribute some ad-hoc income which the rearers use for urgent family needs, and thus are considered as 'living liquid assets'.

138. Name of the Study: Socio-Economic Evaluation of National Integrated Pest Management Programme in West Bengal

Year of Publication: 1999

Main Findings:

- Considerable demotion in the demand for chemical control of pests in West Bengal due to several programmes adopted and the sensible approach suggested for judicious use of pesticides.
- The inherent constraints to agriculture of South 24-Paraganas are soil salinity, saline water, water logging and drainage congestion.
- With respect to cropping intensity the FFS farmers are better than that of its counterparts, non-FFS farmers, except marginal ones in South 24-Paraganas.
- The farmers' perception about significant impact on threshold pest level population for pesticide application, mechanical control, biological control and decreasing need for pesticides is relatively better in FFS farms than that in non-FFS farms.

140. Name of the Study: Study on Price Spread of Major Agricultural Commodities in West Bengal

Year of Publication: 1999

Main Findings:

- Squandering of crops due to improper storage facilities.
- Improper regulated marketing.
- Presence of intermediaries.

141. Name of the Study: An Economic Appraisal of Sheep Husbandry in West Bengal
Year of Publication: 2000
Main Findings:

- The relative importance of sheep in the livestock population had been on the decrease.
- The region with higher density of sheep population is comprised of three districts namely Purulia, Bankura and Birbhum. Sheep husbandry plays an important role in the livelihood of a large percentage of small and marginal farmers and land less labourers in this region.
- Sheep suffer from various diseases.
- Over stoking, grazing on low lands and poor feed are some of the main causes of disease.
- The market for live animal is not very developed and most of the sheep are consumed locally.

143. Name of the Study: Evaluation of Establishment of an Agency Reporting of Agricultural Statistics (EARAS) in West Bengal
Year of Publication: 2001
Main Findings:

There are four cropping seasons in this state. These are pre-kharif, kharif, rabi and summer. There are twenty major crops in West Bengal. Sometimes it was seen that there are two crops on a same plot under a particular cropping season. In that case it is counted as a mixed crop. Similarly, turmeric is cultivated in the mango orchard. In that case it is counted as subsidiary crop. In this way, the area under mango, guava and other important fruits is considered as the orchard under this survey. Similarly, forest area cover is considered as forest area. The area under non-agricultural uses, barren and un-cultivable waste land, permanent pastures & other grazing land, land under miscellaneous tree crops & groves, culturable waste, fallow land other than current fallow, current fallow, net area sown, gross cropped area and cropping intensity are estimated under these surveys.

In West Bengal, three departments viz. Directorate of Agriculture, Directorate of Land Records and Survey and Bureau of Applied Economics and Statistics of West Bengal are actively associated with EARAS for collection, tabulation and publication of agricultural statistics.

The Evaluation Wing, Directorate of Agriculture, Government of West Bengal is responsible for overall co-ordination of these surveys. At the same time, this Directorate is also responsible for printing and publication of statistics in regard to area, production and productivity of different principal crops of the state.

The Directorate of Land Records and Survey, Government of West Bengal is mainly engaged in EARAS in collection of data on area under different crops from the selected blocks and mouzas for the above mentioned seasons. Ultimately, they send this raw data sheets to the office of the evaluation wing located at district head quarter.

The Bureau of Applied Economics and Statistics, Government of West Bengal is solely responsible for collection of data in relation to production of twelve crops which are not covered by the extension workers of the directorate of agriculture.

At the inception of the EARAS scheme, it was proposed to collect data from at least 20 per cent of mouzas of a particular development block in each cropping season (July – June). This system was basically proposed to cover the whole mouzas of a particular development block after the completion of 5-years round. However, in reality 15 per cent of the mouzas of a particular development block are included each and every year for collection of data.

The category of posts in this directorate under EARAS are Technical Supervisor, Inspector, Assistant Investigator, Assistant Computer and other official staff like Typist cum Clerk and Messenger Peon.

The EARAS scheme is still funded on the basis of 50:50 shares by the central and state governments. The existing staff pattern of EARAS is much lower than the sanctioned staffing pattern.

144. Name of the Study: Consolidated Report on Evaluation of Establishment of an Agency Reporting of Agricultural Statistics (EARAS) in India

Year of Publication: 2001

Main Findings:

In West Bengal, for successful implementation of the survey under EARAS, the job is technically monitored and supervised by the two apex committees, viz. Standing Technical Committee (STC) at the State level and District Level Monitoring and Co-ordination Committee (DLMCC) at the district level. In Kerala, the whole process of data collection, i.e., enumeration, compilation and analysis is done under the supervision and monitoring of the Department of Economics and Statistics, Government of Kerala. In Orissa, the EARAS scheme was implemented under the technical and administrative guidance of the Directorate of Economics and Statistics, Government of Orissa.

The nature of duties of various posts under EARAS in West Bengal is very much specified. In Kerala, the nature of duties of various posts under EARAS is earmarked. In Orissa, the nature of duties of various posts under EARAS scheme is very much specified.

In West Bengal, three departments, viz. Directorate of Agriculture, Directorate of Land Records and Survey and Bureau of Applied Economics and Statistics of West Bengal are actively associated with EARAS for collection, tabulation and publication of agricultural statistics.

It is almost clear from this study that the nature of duties of the various posts under EARAS in different states of India are very much different as well as very much specified and earmarked in terms of their nature of works.

In view of the above all these facts indicate that the EARAS scheme has been operating on a close supervision and monitoring of different categories of committees and staff at various levels at different states of India.

The EARAS scheme is still funded on the basis of 50:50 shares by the central and state government.

In fact, on examining the methodologies adopted by EARAS and the department of agriculture and food production, Government of India, has decided to use only the estimates of Directorate of Economics and Statistics for all official purposes.

145. Name of the Study: Assessing the Existing Training and Testing Facilities for Farm Machinery in West Bengal

Year of Publication: 2002

Main Findings:

- In the field of agricultural extension, KPS training has been organized in six agricultural training centres (ATC) in the state. Presently, ATC is managed by non-government organization. Narendrapur Ram Krishna Mission has been organizing training on farm machinery and equipments.
- It is evident that about 300 trainees (pre-service KPS and in service KPS) have been obtaining training per year from these ATCs since 1984.
- The frequencies of organizing training for either category of trainees had reduced gradually during nineties as compared to eighties.

146. Name of the Study: Fruits and Vegetable Mandies Located in Urban and Semi-urban areas of West Bengal with special focus on Kolkata market-Their Problems and Suggestions

Year of Publication: 2002

Main Findings:

- Sole commodity-wise market is almost non-existent.
- Unauthorized deduction for charity and fraudulent marketing practices lead to regulated marketing less vulnerable.
- Improper infrastructure and delayed disposal and inadequate spacing for storage.
- Absence of processing units.

147. Name of the Study: Flow of Credit to Small and Marginal Farmers in West Bengal

Year of Publication: 2002

Main Findings:

- The dependence on informal sources of credit is still quite high and this feature does not vary across the sample villages whether it is micro-finance village or non-micro finance village.
- With regard to comport levels, all the credit agencies except SHGs are considered least conformable by the borrowers.
- Borrowers' side transaction cost is comparatively higher for formal sector loan. The issues involved in getting former sector loan are legal hurdles, complicated procedure, delays in loan delivery, collateral-based lending procedure followed by formal sector institutions.

At the institutional level, the build-up of overdue has severely restricted the capability of the rural financial institutions to recycle the funds.

148. Name of the Study: Impact of Minimum Support Prices on Agricultural Economy in West Bengal

Year of Publication: 2002

Main Findings:

- Minimum support price has positively influenced market price.

- Implementation of price support measures has resulted in narrowing down of seasonal variation in prices.
- Sharper increase in support prices of cereal crops viz. rice and wheat in relation to non-cereal crops have resulted in sharper increase in market prices of cereal crops leading to shift in area from non-cereals to cereals.
- Price support measures have provided incentives to the producers for increasing use of technology and contributed to the growth of agricultural production.
- The state's contribution in purchases of food grains is meagre in the absence of adequate storage facilities.

149. Name of the Study: Agricultural Input Subsidies in India: Quantum of Subsidies to SC/ST Farmers

Year of Publication: 2003

Main Findings:

- The total consumption of chemical fertilizers (N, P and K) in West Bengal increased from 89729 tonnes in the 4^{th} Plan period to 1109675 tonnes in 9^{th} Plan period.
- In terms of per hectare of GCA it increased from 13kg in 4^{th} Plan to 120kg in 9^{th} Plan period i.e. an increase by 8 times.
- Among the different factors explaining fertilizer consumption, the important one is the spread of HYVs technology.
- Consumption of fertilizers is negatively related to price ratio of fertilizer.
- Consumption of fertilizer decreases too with the rise in ratio of price of fertilizer nutrient to crop price.
- It is fairly evident that a preponderant majority of farmers are operating at poor level of fertilizer use in spite of increase in consumption of fertilizer over the years at the macro-level.

150. Name of the Study: Building up of an Efficient Marketing System to Obviate the Need for Large Scale State Intervention

Year of Publication: 2003

Main Findings:

Various inter connections between agricultural production and village level marketing channels found that there exists a large number of marketing channels and market functionaries which significantly differ from one another in respect of their size, economic power, mode of operation and roles in rural society and in economy. There are also significant inter-village variation as regards the types of channels that are present in a village and their relative importance in the market process. Moreover, the economic role of a particular channel is not the same in all villages.

i) Different classes of producers use different types of channels.
ii) Different classes of traders or marketing channels depend mainly exclusive on different classes of producers.
iii) Different classes of traders pay different prices to different classes of producers.

In case of sugarcane, the extent of marketing is higher in case of medium farmers than other category. Extent of marketing by this category in block-1 is 41% and 43% in block-2.

On the other hand, Government agencies play a very important role. Almost 90% of the total crops are marketed through this agency.

151. Name of the Study: Agricultural Policy in West Bengal: A Policy Matrix (Part I & Part II)

Year of Publication: 2004

Main Findings:

- In different phases series of agricultural development programmes were adopted the major ones being Community Development Programme (CDP), Intensive Agricultural District Programme (IADP), Intensive Agricultural Area Programme (IAAP), High Yielding Variety Programme (HYVP), Minikit Programme, Multiple Cropping Programme, Special Rice Production Programme (SRPP), Special Food Production Programme (SFPP), National Oilseeds Development Project (NODP), National Pulses Development Project (NPDP), Special Jute Development Programme (SJDP), and National Watershed Development Programme for Rainfed Areas (NWDPRA). As a part of institutional reform, land reforms programmes were adopted rigorously in the state.
- The weakness of West Bengal on the front of agricultural and allied agricultural sectors are listed as (i) agriculture in West Bengal is primarily rainfed (ii) soils are having poor fertility, low water holding capacity and high infiltration rate. (iii) majority of the cultivators are either marginal and small farmers. (iv) the State was rather late to adopt the new technology including irrigation and hyv seeds and chemical fertilizers. (v) inadequate network of retail outlets for agricultural inputs. (vi) very poor banking facilities.
- The policy initiatives needed for agricultural development in West Bengal are presented in the form of matrix.

152. Name of the Study: Co-operative Marketing Societies in West Bengal: Reasons for Success and Failure

Year of Publication: 2004

Main Findings:

- A good net work exits in co-operative marketing for the crops paddy and jute.
- The main reasons for success are an increase in the volume of business by manifolds since inception, increase in gross as well as net profits, diversification of business, etc.
- The main reasons for failure are excess amount of expenditure over the net profit on account of reserve fund, co-operative education, share dividend, bonus fund for workers, bonus for members and co-operative propaganda, failure in diversification of business, lack of dedication and business oriented motive and strong competition with private traders.

153. Name of the Study: Rural Non-Farm Employment in West Bengal

Year of Publication: 2004

Main Findings:

- The share of agriculture in rural employment has declined accompanied by the corresponding increase in the share of non-agricultural employment.
- The share of non-agricultural employment has gone up sharply for females as compared to males.
- With regard to the incidence of rural non-farm workers, the study reveals wide variation across the districts of West Bengal. Developmental and distress factors operated in a mutually re-inforcing way for such variation.
- Being constrained by the situation of non-availability of regular self-employment opportunities, female workers usually undertake activities of casual nature which are presumably lower cadre jobs.

154. Name of the Study: Role of Water Markets in Groundwater Management in West Bengal

Year of Publication: 2005

Main Findings:

- Small and marginal farmers having the WED installation of their own are selling a substantial quantum of water and reaping maximum benefit.
- The weaker sections in most of the cases don't even think of having their own WED.
- Operation of existing water market is crop dependent where Paddy plays the key-role.
- Through the water market operations an equitable distribution of ground water between different groups of farmers across various regions is found.
- Similarity in input use, production, productivity and crop pattern between the WED owners and non-owners in both the districts is observed.

155. Name of the Study: Cultivation of Medicinal & Aromatic Crops as Means of Diversification in Agriculture (A study in West Bengal

Year of Publication: 2006

Main Findings:

- Research in medicinal and aromatic crop economics has not received the support it deserves.
- It has been observed that motivations in cultivation of medicinal or aromatic plants are connected directly or in-directly with money return.
- Medicinal and aromatic plants have higher return than traditional crops.
- Both medicinal/aromatic plant produce has its own distinct trading mechanism with a given set of intermediaries involved in the movement of the commodities. Procurement, disposal and transportation of fresh produces are the critical factors for determining the efficiency of the markets.
- As far as the marketing of ashwagandha in West Bengal is concerned, it is ridden with a number of customs and conventions which are not economically beneficial to the growers.

156. Name of the Study: Factors Affecting Fertilisers Consumption in West Bengal

Year of Publication: 2006

Main Findings:

- The total consumption of chemical fertilizers (N, P and K) in West Bengal increased from 89729 tonnes in the 4th Plan period to 1109675 tonnes in 9th Plan period.
- In terms of per hectare of GCA it increased from 13kg in 4th Plan to 120kg in 9th Plan period i.e. an increase by 8 times.
- Among the different factors explaining fertilizer consumption, the important one is the spread of HYVs technology.
- Consumption of fertilizers is negatively related to price ratio of fertilizer.
- Consumption of fertilizer decreases too with the rise in ratio of price of fertilizer nutrient to crop price.
- It is fairly evident that a preponderant majority of farmers are operating at poor level of fertilizer use in spite of increase in consumption of fertilizer over the years at the macro-level.

157. Name of the Study: Estimation of total Production and Cost of Broiler Meat: A Study in West Bengal

Year of Publication: 2006

Main Findings:

- Average net return per bird and per kg. of live bird of all the sample broiler farms taken together are Rs.5.22 and Rs.3.05 respectively.
- Since the farming in the state is controlled by the big hatcheries (mostly on a contract basis), the major portion of profit from poultry farming is drained off to them.
- The actual rearers, mainly small and medium farms, are getting minimal profit at the subsistence level.

158. Name of the Study: Evaluation of Integrated Dairy Development Project (IDDP) in Non-operation Flood, Hilly and Backward areas: A Study in Sikkim

Year of Publication: 2007

Main Findings:

Status of Animal Husbandry and Dairying in Sikkim

In the State of Sikkim, the livestock production is the endeavor of small and marginal farmers (17th Indian Livestock Census, Sikkim, 2003). The rearing of cattle is an age old and integral component of the agricultural activities in Sikkim.

Allocation of State Budgetary Resources in Dairy Development

The expenditure on dairy development however varied over the years. Data pertaining to the period 2000-2001 to 2006-2007 revealed that expenditure on dairy development increased consistently from Rs.34.44 lakhs in 2000-2001 to Rs.65.00 lakhs in 2006-2007 accompanied by big jump (Rs.175 lakhs) during the year 2002-2003.

Growth and Composition of Livestock in the State of Sikkim

Livestock population in the state of Sikkim increased from 5.13 lakhs in 1997 to about 6.87 lakhs in 2003 recording a compound growth rate of about 6 per cent per annum. Bovine (cattle and buffaloes) population constituted 23.47 per cent of the total livestock in 2003. The cattle population shared the major in bovine population which accounted for 98.69 per cent of total bovine population. The fact is that by and large, the number of crossbred cattle has tended to increase over the period.

The bovine constituted 23.47 per cent, while ovine population (Sheep and goats) accounted for 18.88 per cent of the total livestock population. Population of in-milk bovine which includes lactating buffaloes and cows shared 25.53 per cent in total bovine population. Cattle constitute the major (98.69 per cent) in total bovine. Cows are preferred more than buffaloes and are the main source of milk production in the state of Sikkim.

Growth in Milk Production

It can be seen that during the Fifth Five Year Plan period average annual milk production was 10.95 thousand metric tonnes and it increased to 37 thousand metric tonnes annually during the 9^{th} Five Year Plan period registering an increase of 8.81 per cent per annum. During the 8^{th} Five Year Plan period (1992-97), annual milk production was of the order of 34 thousand metric tonnes when the scheme of IDDP was launched. It increased to 48 thousand tonnes in the year 2005-2006 and thus increased at the rate of 3.17 per cent per annum since the launching of IDDP programme in the state.

Integrated Dairy Development Project in Sikkim

In the year 1993-94, the Government of Sikkim received a grant of Rs. 217 lakhs from the Government of India for undertaking Integrated Dairy Development Programme in the north district.

The project is implemented in the state by the State Animal Husbandry, Livestock, Fisheries and Veterinary Services Department, Government of Sikkim. For implementation of IDDP in Sikkim, a Technical Management Committee (TMC) was constituted at the state level for monitoring the progress of the project. In addition to the state level TMC there is an implementing committee at district level to work out the modalities for implementation of the project in the concerned district.

Physical and Financial Performance of the Project

As of January 31, 2005(by the end of phase-II) 30 village-level dairy co-operative societies have been established with the total membership of 1000 village milk producers. Two milk chilling plants with the capacity of 500 LPD each and one milk processing plant with the capacity of 2000 LPD were established. The average liquid milk procurement and marketing was of the order of 1500 LPD respectively.

The total investment of the 2^{nd}.phase of the project as of January,2005 was 266 lakhs. In the allocation of funds among various activities, 112.22 lakhs i.e. about 42.19 per cent was given for building up milk processing and marketing capacity. Milk production enhancement

programme got 96.74 lakhs i.e. 36.37 per cent of the allocation. A sum of Rs.46.62 lakhs i.e. 17.53 per cent was spent on milk procurement. Manpower development received 2.25 lakhs i.e. 0.85 per cent of the allocation and the remaining was spent on working capital like purchase of cattle feed, purchase of heifers etc.

Performance of Dairy Co-operative Societies

In the present study, milk producers' co-operative societies receiving benefits only under IDDP form the sample frame for judging the performance of dairy Co-operative Societies. In all, three dairy co-operative societies are covered in the study namely Nampatam MPCS, Ringhim DUSS and Chandey MCS hereafter referred to as Society No.1, 2 and 3 respectively in north district of Sikkim.

At the time of survey, total members of the societies numbered 33, 50 and 49 in societies 1, 2 and 3 respectively while the corresponding figures at the time of inception of the societies were 19, 25 and 40 and thus recorded annual growth rate of 7.36, 10.00 and 2.25 per cent respectively.

Implementation of IDDP Scheme at the Farmers' Level: Its Economy and Impact

A total of 19 milch animals (cows) were provided to 19 beneficiaries out of a total of 36 who accounted for 52.78 per cent of the total sample beneficiaries. Inducted cows were in 1st lactation order. The lactation cycle of milch cattle provided under the scheme was reported to be duration of 415 days of which 230 days represented in-milk period and the dry period was duration of 185 days.

Out of a total of 19 animals assisted under IDDP project, 15 (78.94 per cent) were provided to small and marginal farmers. Again, as noted above, among the sample beneficiary households small and marginal landholders constituted the major.

Unit cost of investment under the scheme of IDDP included (a) cost of one crossbred cow (b) cost of construction of shed and (c) cost of equipments. The survey data revealed that the average actual unit cost of investment was Rs.10,755 covering cost of one milch animal (Rs.7105), cowshed (Rs.3500) and cost of equipment (Rs.150).

Out of the total sample beneficiary farmers selected for the study, 86.11 per cent are small and marginal who owned 82.67 per cent of total milch cattle. According to breeds, majority of milch animals kept by the sample beneficiary farmers are indigenous type having low milk yield potential. Out of 75 milch cattle possessed by the beneficiary households, only 32.00 per cent are crossbreed cows and 68.00 per cent are indigenous cows.

The overall average investment per household in dairy enterprise worked out at Rs.15100. Noticeably, investment per household increased with the increase in the size of milch animal from Rs. 14251 with less than 5 numbers of milch animals to Rs. 29525 when the size of milch animal herd increased up to 10 numbers. Average investment per unit of cattle population stood at Rs. 4150 being declined consistently with the increase in the size of milch animal.

IDDP programme has provided a dependable alternative channel for disposal of marketable surplus of milk at prices, which are considered fair for the producers. The benefits

comprised of two components of income viz. annual milk production and the estimated value of young stock. The overall BCR worked out at 1.14 with the estimated figure of 0.94 for local cows and 1.41 for crossbreed cows. Thus investment in dairy activity is found to be economically viable in the study area.

The financial soundness of dairy units is examined by working out the Financial Rate of Return (FRR). The financial rate of return on investment in the acquisition of a crossbred cow works out to 19.62 per cent. The figure stood at 12.96 per cent while reckoned on total investment. This substantiates the financial viability of investment in dairy units.

The dairy sector provided employment opportunities to the beneficiary farmers ranging from 55.98 percent to 71.84 per cent of the total working man days depending on the size of milch animals with an overall average of 58 per cent for all the dairy farms together.

As a source of income, the dairy farming contributed the least for the non-beneficiary farmers. As evidenced by the overall estimate of benefit cost ratio, dairying did not turn out to be a sound economic alternative for non-beneficiary farmers.

159. Name of the Study: Estimation of Seed, Feed and Wastage Ratios for Major Food grains in West Bengal

Year of Publication: 2008

Main Findings:

- Seed, feed and wastage ratios in case of cereals (rice) were estimated to be 13.07 per cent whereas in terms of pulses (lentil) the ratio was estimated at 11.84 per cent.
- It is observed that the significant percentage of produce is lost during different operations at farmers' level stretching from harvesting to the market for sale.
- It is clearly revealed that the post harvest losses of cereal crop (rice) increased with the non-availability of storage facility.
- Threshing losses were higher when the produce is threshed by threshing machine as compared to manual threshing.

160. Name of the Study: State Budgetary Resource and Agricultural Development (West Bengal)

Year of Publication: 2009

Main Findings:

- The real public expenditure on agricultural development in West Bengal indicated periodic ups and downs. In real terms, it had increased at higher rate in 1950's, 1960's and 1970's. After 1970's, particularly during 1980's and during mid 1990's and again during 2001-02 onwards it tended to decline sharply.
- Sector-wise composition of GSDP and workforce points to a significant transformation in West Bengal economy. The share of primary sector in GSDP after 1998-99 shows a steady decline. Accordingly, there was corresponding decline in the dependence on agriculture too. Though, the share of secondary sector in GSDP has reduced from 29 per cent to 19 per cent in 2005-06, the dependence of workforce on this sector increased from 3.67% to 9.37% in 2005-06. The share of tertiary sector both in GSDP as well as workforce dependence has increased throughout.

- Deceleration in the real government expenditure on agriculture is associated with decline in the growth rate in the agricultural output particularly the foodgrain output and slowing down the poverty reduction.

161. Name of the Study: Market Access and Constraints in Marketing of Goats and Their Products in West Bengal

Year of Publication: 2009

Main Findings:

- Goats are the main contributor of meat production of the state. The share of goat meat in total meat production of the state was highest (45.28 percent) in 2006. Maximum goat population is concentrated in Burdwan and Murshidabad in the state.
- Economic support can play an important role to intensify goat keeping. They cannot afford to maintain bigger flock & better management.
- At village level, there is acute crisis of pasture and grazing land.
- Marketing infrastructure for goat & skin and product is quite essential.

162. Name of the Study: Understanding the Growth and Prospects of Agro-Processing Industries in West Bengal

Year of Publication: 2009

Main Findings:

- Within the group of food-processing industries, paddy-processing activity gave maximum return. Within the group of non-food processing industries, paper-based manufacturing unit gave highest net return.
- The state of West Bengal being blessed with largest production of paddy has the potentials for investing in paddy processing industry. However, this would be possible if the units have access to information network to keep track of raw materials prices and availability.
- Within the group of non-food industries, textile and leather units yielded lower net income but have shown relatively better performance in terms of growth in number of units. They could enhance their earning capacity if they are provided with better infrastructure purveying market information for their processed products.
- The paper-based units yielding highest net return amongst the non-food processing units offers scope for investment in such units.

163. Name of the Study: Study on Impact Evaluation of National Watershed Development for Rainfed Areas Envisaged as WARASA JAN SAHBHAGITA during Tenth Plan (2002-07) in West Bengal

Year of Publication: 2009

Main Findings:

- Size of holdings was lower in watershed area.
- Irrigated area was 37.05 per cent and 26.66 per cent in watershed and non-watershed area, respectively.
- No difference was observed in adoption of recommended technologies in both areas.

- Most of the soil and water conservation measures serve the purpose of conserving rain or runoff water.
- Copping intensity decreases with the increase in size of holding due to less irrigated area for higher holdings.
- Net income increased to the extent of decreasing cost of irrigation.
- Livestock number increased due to availability of fodder and common lands.
- Fairly equitable distribution of income in watershed area is observed.
- Watershed Development Programme (WDP) has been able to regenerate natural resources including land, forest and water to a large extent and it is playing a crucial role in augmenting agricultural growth, productivity and cropping pattern in West Bengal.

164. Name of the Study: Impact of Macro Management of Agriculture Scheme
Year of Publication: 2009
Main Findings:

- The impact of interventions under the sub-schemes Sustainable Development of Sugarcane Based Cropping System, Special Jute Development Programme, ICDP-Coarse Cereals have manifested itself primarily through a marked increase in the area under sugarcane, jute and wheat cultivation respectively for the beneficiary farmers, especially through demonstration programmes.
- The sub-schemes ICDP- Wheat, though subsequently modified as Dissemination of New Technology through Diversification of Suitable Crops, has resulted into an increase in the production of wheat.
- Under the sub-scheme Balanced Integrated Use of Fertilizers, termed as Soil Health Management in West Bengal, has found to have played a significant role regarding positive changes in attaining a balance in fertilizer application among the beneficiary farmers and reviving soil health.

165. Name of the Study: Determinants of Stagnation in Productivity of Important Crops in West Bengal
Year of Publication: 2010
Main Findings:

It was firstly a bivariate and then a multivariate exercise.

Apart from total area under rice and annual rainfall, the other independent variables have a significant impact on changes in productivity of rice though each of the variables explaining partially the variability in productivity.

We carried out multiple regression exercise to assess the impact of the independent variables on productivity of rice.

The results express that independently all the variables have significant impact on productivity but taken together they show some differentiated impact. Nonetheless, these independent variables taken together explain 92.5 per cent of variability of the dependent variable.

There may be two reasons for such behaviour of the explanatory variables. Firstly, as the number of observation is rather small and the degrees of freedom goes

down as we go on adding independent variables. Secondly, there exists some degree of multi co-linearity among the explanatory variables.

166. Name of the Study: Study on Impact Evaluation of National Watershed Development for Rainfed Areas Envisaged as WARSA JAN SAHBHAGITA during Tenth Plan (2002-2007)(Consolidated Report)

Year of Publication: 2010

Main Findings:

West Bengal:

It has been observed that there is no difference in adoption of other recommended technologies in between WP and NWP farmers. It has been worked out that the overall adoption ratio of recommended watershed/agronomic technologies by WP and NWP farmers are 32.95 per cent and 27.68, respectively. It is evident that the quality of land available in WP area is suitable for agro-forestry and perennials and farmers are relatively more responsive to adoption agro-forestry and perennials.

The contribution of watershed as reflected in gross returns from rainfed crops was considered as the dependent variables, since the watershed impact is direct and implicit. Accordingly, gross returns from rainfed field crops in 2007 was regressed on dry land cropped area in hectares (X_1), human labour (X_2), bullock labour (X_3), seeds in Rs. (X_4) and fertiliser in Rs. (X_5). The adjusted R^2 for the watershed and non-watershed area was 87 per cent and 94 per cent which indicate adequacy of fit of the model.

The regression coefficients are the estimates of the elasticity of production with respect to the independent variables. In WP, elasticity coefficient for human labour, bullock labour and fertiliser are 0.02, -0.01 and -0.03, respectively, and are statistically significant at 5 per cent. For land, the elasticity coefficient is 1.01 and significant at 5 per cent. The coefficient for seed is -0.03 and is not significant.

In NWP, variables land and seed are significant and their elasticities are 0.93and 0.07. For human labour, bullock labour and fertiliser, the elasticity coefficients are 0.06, -0.03 and 0.01, respectively and significant at 5 per cent. The returns to scale are 1.01 and 1.04 in WP and NWP areas, implying constant returns to scale. This shows that the production technology used in watershed and non-watershed is scale neutral.

The geometric mean levels of gross returns for WP and NWP sample farms are Rs. 11500.83/- and Rs. 11764.65/-, respectively. The geometric level of inputs land, human labour and bullock, seed, fertilisers are computed both watershed and non-watershed sample farms as 0.49, Rs. 2300.87/-, Rs. 413.75/-, Rs. 172.43/- Rs. 612.60 and 0.48, Rs. 2302.69/-, Rs. 418.49/-, Rs. 163.07/- and Rs. 617.26/-, respectively in that order.

In watershed area, the major source of irrigation is groundwater from tank/ponds. All tanks were excavated before watershed development programme. The impact of WDP is assessed based on number of irrigation ponds. Another measure of impact of WDP is the increased water yield in the ponds. However, the average yield of ponds is not available. Out of the 65 total ponds in the selected watersheds, only 4 ponds are non-functional, whereas in NWP area 3 ponds are non-functional out of the 29 ponds. Average water area of the pond in WP area is 0.12 hectare, whereas it is 0.17 hectare in NWP area. The average command area and average depth of the tank in WP area is higher than that of NWP area.

Most of the soil and water conservation measures serve the purpose of conserving rain or runoff water and it is difficult to separate them and analyse their contribution to groundwater recharge. However, we can broadly divided them into (1) measures that increase in-situ water availability and (2) measures that increase availability of applied water stored off-farm or below the ground. The ubiquitous check dams and nala bunds, diversion channels and all their variants store water on surface or enhance subsurface storage. However, the use of farm ponds is for protective irrigation. The total investment on soil and water conservation structures in the selected watersheds is Rs. 35,52,403/- . The increased availability of groundwater due to WDP manifests in decreased irrigation cost. The net returns per farm has been observed to be Rs. 189.68/-, Rs. 518.48/- and Rs. 1057.91/- for marginal, small and medium farms, respectively. It has been observed that the cropping intensity decreases with the increase in size of holdings. This may be due to less irrigated area in higher holdings. It has been observed that the decrease in cost of irrigation and corresponding increase in net returns in WP is due to impact of WDP.

A large number of farmers in WP are rearing livestock on a small scale after the WDP. Farmers expressed during the discussion that due to availability of fodder on farm and common lands, the number of bullocks, cows, buffaloes, sheep, goat has increased. The net return from livestock per farm and per acre are Rs. 24.12/- and Rs. 38.22/-, respectively in WP area and Rs. 21.42/- and Rs. 5.15/- in NWP area.

The equity in the distribution of income among different categories of farmers due to WDP has been analysed using Gini coefficients. Gini coefficients are computed for marginal, small and medium farms. Gini coefficients for WP and NWP areas are 0.44 and 0.41 for all farms, respectively. This indicates a fairly equitable distribution of income in WP area than that of NWP area.

Rajasthan:

As compared to pre-project year, beneficiary households increased area under rabi crops by 5.26 ha. in 2006-07 as against 1.51 ha. by non-beneficiary households in Dhar watershed. A similar trend was witnessed in respect of GCA. In 2006-07, 20.13 percent of Kharif crop area was irrigated by beneficiary households as against only 3.03 percent by non-beneficiary households. This indicates positive impact of NWDPRA intervention on irrigation and cropped area.

In all 4 watersheds, compared to base year 2001-02, cropping intensity recorded notable increase in 2006-07 for beneficiary as well as non-beneficiary households. However, this increase in percentage and absolute term was much higher for beneficiary households. The NWDPRA intervention improved the ground water aquifers and soil-moisture which subsequently helped beneficiary households to increase double cropped areas and supplemental irrigation. This helped beneficiary households in enhancing cropping intensity.

As compared to 2001-02, the overall average cost of cultivation per hectare in 2006-07 for beneficiary shows an increase of 58.80 percent in Kirap, 43.56 percent in Sakariya, 48.29 percent in Modak-VI and 81.97 percent in Dhar watershed. For non-beneficiary, it ranged between 43.25 percent for Kirap and 86.10 percent for Dhar. The increase in cost of cultivation was mainly due to higher use of costly inputs such as HYV seeds, fertilizers, higher rate of application of inputs and increase in input prices. Thus, watershed treatments

brought changes in use pattern of inputs and also enhanced cost of cultivation. In total cost of cultivation, most important items were human labour, bullock labour and machine labour.

In all the 4 watersheds, compared to base year, beneficiary and non-beneficiary farmers achieved higher yield for all crops (barring few cases) in 2006-07. In Sakariya, the incremental yields achieved by beneficiary farmers varied from 35.96 percent for gram to 188.46 percent for Isabgul. And for non-beneficiary, it varied from 3.98 percent for gram to 100 percent for Isabgul. In Kirap, for beneficiary farmers, it varied from 23.07 percent for Bajra to 58.18 percent for Udad. And for non-beneficiary, it varied from -22.50 percent for gram to 38.74 percent for Jowar. In Modak-VI, yield increment for beneficiary households varied from 15.01 percent for Soyabean to 90.02 percent for Jowar. In Dhar also, increment in yields of different crops (except gram) obtained by beneficiary households were far superior as compared to same for non-beneficiary. Thus, in all 4 watersheds, NWDPRA had noticeable positive impact on crop-yields. However, scale of impact varied across watersheds due to variation in soil-climatic conditions, soil-moisture level, terrain, rainfall, inputs of pattern etc.

In all 4 selected watersheds, as compared to base year, value of gross produce per hectare of cropped area shoot up sharply for both, beneficiary and non-beneficiary households. Overall, for beneficiary farmers, it went up by 73.45 percent in Kirap, 111.21 percent in Sakariya, 175.62 percent in Modak-VI and 63.92 percent in Dhar watershed. For non-beneficiary households, it ranged from 51.92 percent in Kirap to 117.76 percent in Modak-VI. The significant upsurge in the value of gross produce was mainly due to higher farm harvest prices and higher yield achievement.

In all 4 sample watersheds, net farm income per hectare of GCA and output-input ratio (except Dhar) for beneficiary and non-beneficiary households in 2006-07 were found much higher than those in 2001-02. Further, net farm income and output input ratio for beneficiary households was found substantially higher than those for non-beneficiary households. This suggests quite positive impact of NWDPRA on net return from farm enterprise.

In selected watersheds, as compared to 2001-02, the average annual net income per household from various sources recorded impressive upsurge in 2006-07, for both, beneficiary and non-beneficiary households. For beneficiary, increase was Rs. 25427 in Kirap, Rs. 16068 in Sakariya, Rs. 37270 in Modak-VI and Rs. 13819 in Dhar. The corresponding numbers for non-beneficiary were Rs. 14489, Rs. 11144, Rs. 25745 and Rs. 10196 respectively. The sharp increase in the net annual income per beneficiary households shows positive impact of NWDPRA on livelihood security of different stakeholders of the watersheds.

As compared to non-beneficiary, assets investment per beneficiary household during 2001-02 to 2006-07 was found higher by Rs. 27260 in Kirap, Rs. 12638 in Sakariya, Rs. 18281 in Modak-VI and Rs. 20035 in Dhar watershed.

As compared to base year 2001-02, the average rise in water level in wells during Kharif-2006-07 recorded by beneficiary households ranged from 7.03 feet in Dhar watershed to 8.55 feet in Kirap watershed. During summer, it ranged from 1.88 feet in Dhar to 2.66 feet in Sakariya watershed. As compared to non-beneficiary, net increase in water table for beneficiary households was more than 4.43 feet in Kharif, 1.88 feet in rabi and 0.62 feet in

summer season. This clearly indicates that water conservation technology adopted under NWDPRA is effective. This improvement in water table situation eased the drinking water problems of watershed community to some extent.

As expected, in all selected watersheds, number of milch animals and total number of livestock increased moderately in 2006-07.

In selected watersheds, requirement of human labour for farming sector shows noticeable upsurge in 2006-07. Compared to 2001-02, beneficiary households in 2006-07 generated per ha./annum additional farm employment of 42 mandays in Kirap and Sakariya, 36 mandays in Modak-VI and 56 mandays in Dhar watershed. Additional farm employment generation was observed relatively very low for non-beneficiary households.

In majority cases, the out-migration was of short duration. In selected watersheds, average period of out-migration in 2006-07 was somewhat lower for beneficiary as compared to non-beneficiary households.

Using 10 percent discount rate, BCR, IRR and NPV have been worked out for 10 and 20 years time horizon. For 10 years horizon, Benefit Cost Ratio (BCR) was 3.50 for Kirap, 3.82 for Sakariya, 9.02 for Modak-VI and 1.17 for Dhar watershed. And the Net Present Value (NPV) was Rs. 51.78 lakhs for Kirap, 60.05 lakhs for Sakariya, 83.11 lakhs for Modak-VI and 16.17 lakhs for Dhar watershed. The Internal Rate of Return (IRR) was 9 % for Kirap, 62% for Sakariya, 144% for Modak-VI and 23 % for Dhar. BCR, IRR and NPV worked out for 20 years horizon are higher than 10 years time horizon. For each selected watershed, IRR are greater than opportunity cost of capital and BCR are greater than one which clearly indicates that investment on NWDPRA is economically very attractive and viable. A positive and high NPV for each sample watershed implies positive worth of project in generating returns in excess of all costs.

Bihar:

The change in irrigational status of agricultural land in 2006-07 over 2001-02 of the watershed indicate marginal increase in irrigated area in all the selected watersheds and almost in all the crop seasons, which may be due to increase in number of water harvesting structures (tanks, check dams, ponds, etc.). The increase was mainly found to big farms, which showed that perceived benefits are concentrated on large farms.

The land development and creation of new water harvesting structures in all the watershed areas have not much effectively brought some additional areas under the important crops both in kharif and rabi. The data indicate that there is increase in the area under paddy crops from 0.64 per cent to 4.37 per cent, maize 0.65 per cent to 3.37 per cent, pulses 0.99 per cent to 2.08 per cent and oilseeds up to 1.85 per cent. Of course, there is increase in area of important crops but it is not much appreciable. It is worth to mention here that almost similar increase has been indicated by the non-beneficiary respondents.

The findings indicate that the production increase is higher in rabi season for wheat, pulses and oilseeds across all the watersheds and this indicates the overall effectiveness of the watershed activities. Similarly change was also indicated in case of non-beneficiary respondents, which related that benefits were not centered on the beneficiaries rather shared with non-beneficiaries also.

It is generally presumed that if the facilities are extended to farmers, the cost of the production of the crops will come down provided the prices of the inputs are constant. But things are different. Neither the cost fallen nor is the prices of any inputs constant. Among the beneficiary farmers, it rose at the overall level to 8.16 per cent in WS-I, 5.54 per cent in WS-II, 4.38 per cent in WS-III and 13.08 per cent in WS-IV. Among the non-beneficiary farmers, it increased to 8.53 per cent in WS-I, 12.36 per cent in WS-II, 12.39 per cent in WS-III and 5.16 per cent in WS-IV.

The disposal for all the crops level in WS-I is lower among the beneficiary households. However it is a bit higher among the non- beneficiary households. The reason behind low disposal may be lower production. Among the beneficiary households, the percentage of disposal is comparatively higher across all the three watersheds viz., 34.47 per cent in WS-II, 18.82 per cent in WS-III and 19.86 per cent in WS-IV. It is by 0.39 per cent in WS-I, 6.46 per cent in WS-II, 17.15 in WS-III and 21.93 per cent in WS-IV among the non-beneficiaries households.

The total average income of beneficiary group has increased in all the sample watersheds but it recorded higher in WS-III (25.24 per cent) followed by WS-II (19.22 per cent), WS-IV (11.30 per cent) and WS-I (0.31 per cent). Almost similar is the case of non-beneficiary group. It increased by 23.18 per cent in WS-IV followed by 14.72 per cent in WS-I, 5.13 per cent in WS-II and 2.56 per cent in WS-III.

In all the selected watersheds the total number of livestock increased. It increased as much as 73.00 per cent in WS-I, 30.74 per cent in WS-IV, 21.32 per cent in WS-III and 10.78 per cent in WS-II. It reveals that the project has facilitated in keeping larger number of livestock. But in absence of clear and agreed livestock holding and grazing practices there cannot be favourable long term impact on conservation of common land resources.

Irrigation, afforestation and availability of irrigation have changed positively to the tune of 17.50 per cent, absorption of women in various activities (7.50 to 15.00%), production (10.00 to 15.00%), cropping intensity (7.50 to 10.00%) etc. Non- beneficiary farmers also indicated positive change of the programme on improvement in groundwater conditions (7.50 to 15.00%), qualitative aspect of livelihood (5.00 to 12.50%), production (2.50 to 7.50), availability of irrigation (5.00 to 15.00%).

In the initial years of the programme no UGs/SHGs could be formed in any of the sample districts, which may be due to delay in launching of the programme. These could be formed after 2003-04.

It is noteworthy that the cost per hectare is helpful in assessing their cost effectiveness. It is calculated at Rs. 8213/ha in WS-I, Rs. 8144/ha in WS-II, Rs. 7103/ha in WS-IV and Rs. 6561/ha in WS-III. The programme has significant positive impact on creation of employment opportunities.

Maharashtra:

With regard to percentage change in the annual income in the ‘before’ the operation of watershed and ‘after’ its operation, it is reveled that the highest percentage of (146.92%) increased in the annual income has occurred during the period 2001-02 to 2006-07 in the watershed–IV (Nanded) followed by the watershed-II (Nagpur) with 139.48%. the watershed-

III (Raigarh) demonstrates a record increase of 192.06% in the annual income during the period 2001-02 to 2006-07, followed by the watershed-II (Nagpur) with 67.24%.

As per the performance indicator of the selected watershed in Maharashtra, it reveals that the highest area has been developed in the watershed-II (Nagpur) (91.01%), followed by the watershed-IV (Nanded) (77.44%). In all the watersheds there has been encouraging number of man days employment generated, the highest position in occupies by the watershed-I (Kolhapur) with 46765 man days, followed by the watershed-IV (Nanded) with 36907 man days. The additional area brought under cultivation also indicates a growing trend the highest position occupied by the watershed-IV (Nanded) with 65 ha., followed by the watershed-III (Raigarh) with 49 ha.

The analysis in assessing the impact of NWDPRA on the rural agricultural economy of Maharashtra has concluded that watershed developments have greater potential to generate employment opportunities to the rural people. This is due to the increased availability of water resources, diversified cropping pattern including cultivation of labor-intensive vegetable crops and other horticultural crops. This additional employment generation from a watershed program varies across regions depending on the cropping intensity, and the labor-intensity crops grown in that region. This additional employment generation in the villages led to minimizing migration of landless and other labour.

167. Name of the Study: Understanding the Growth and Prospects of Agro-Processing Industries (Consolidated Report for West Bengal, Bihar and Maharashtra)

Year of Publication: 2010

Main Findings:

Status of Agro-based Industry

West Bengal:

As evidenced by Annual Survey of Industries data, the strength of agro-based industry is comparatively less than those of non-agro-based industries in the organised sector of manufacturing enterprises of the state. In the un-organised segment of manufacturing enterprises, the dominance of agro-based industry is clearly noticed. The un-organised segment of agro-industrial sector had as many as 86.30 per cent of total manufacturing enterprises, 81.54 per cent of employment of workers and 69.09 per cent of gross value added. During the reference period, agro-based enterprises (both food and non-food) witnessed increase in the number of units leading to an increase in their share in units from 80.51 per cent in 1994-95 to 86.30 per cent in 2000-01.

Bihar:

In Bihar, the unorganized manufacturing sector is characterized by the dominance of agro-based industries (including agro food and agro non-food) sharing 53.00 per cent in the number of total working units in 1994-95. Among the agro-based industries, the share of agro food processing industries was estimated to be higher (28.45 percent) than agro non-food processing industries (24.55 percent).

Data for the year 2000-01 be taken significant decline in the number of working units under the groups of ‘agro food,’ ‘agro non-food’ and ‘non-agro based industries’ as compared

to that of 1994-95. Decline in the number of working units based on agro-food and agro non-food based processing activities, suggest a state of uncertainty in the field of unorganized manufacturing industries based on processing of agro food and agro non-food commodities (particularly OAMEs) during the period 1994-95 to 2000-01.

Maharashtra:

In Maharashtra, the unorganised sector clearly dominates the organised sector as far as the number of the units is concerned in both the years viz. 1994-95 and 2000-01. In the organized sector, non agro-based industries are dominating with their share being around 70 percent. However, in the unorganised sector, the agro-based industries are seen to be dominating the non agro-based industries and their number has greatly increased (92.87 percent) over the concerned period whereas that of non agro-based industries has fallen (the percentage change being –19.98 over the period). Further, in the organised sector, the share of food processing industries in total agro-based enterprises has increased in the reference period while in the un-organised sector their share has declined.

Profile of Sample Entrepreneurs of Agro-Processing Activities

West Bengal:

In case of fish processing units, entrepreneurs are mostly from the SC and ST category. Educationally, majority of the entrepreneurs have their education attainment up to 10^{th} standard. However, entrepreneurs engaged in textile units which need technical know-how are better educated beyond the level of 10^{th} standard. Entrepreneurs of food processing units are found to have learnt and followed the activity traditionally while majority of the entrepreneurs of non-food processing units received institutional training and gained working experience in carrying out the activity. Previous experience in the business emerged as the important motivating factor behind choosing the activity in the case of food processing units. In contrast, the units engaged in non-food processing activities, reported higher profit margin as the major factor that has induced the entrepreneurs to take up the business activity.

Bihar:

As far as education is concerned, it is observed that majority of entrepreneurs are literates. Many of them have taken education above 10^{th} standard in case of food processing units while majority of entrepreneurs have been educated upto the 10^{th} standard in case of non-food processing units. As far as land holding is concerned, it can be observed that entrepreneurs engaged in non-food processing agro-based activities possess relatively smaller amount of land between 1-2ha as compared to those of households engaged in food processing activities. Non-food processing units are relatively new units although there are some instances of learning business activity traditionally.

Maharashtra:

As far as education is concerned, it can be observed that majority of the entrepreneurs are educated. Majority of them have been educated upto the 10^{th} standard. It can also be observed that the entrepreneurs possessing cashew-processing units, rice mills and paper-based (binding) units have taken education above 10^{th} standard. It is also observed that

majority of the units are existing units and have experience of more than 5 to 10 years back. This is specifically true in case of fish and leather units as the business is carried on traditionally and hence the household members have learnt the business traditionally. It can be noted that the cashew units are the newly established units and all the entrepreneurs have been trained as running the business needs technical training and knowledge about the machinery.

Cost of Investment and Its Financing

Status of the Sample Units

West Bengal:

Status of the units were ascertained in terms of year of existence, average age of the units and registration status. In West Bengal, all the sample-processing units were existing ones, the average age of the unit being varied from 10 to 20 years in case of food processing units and from 3 to 22 years in case of non-food processing units.

Bihar:

In Bihar, most of the units are existing ones. Further, most of the surveyed processing units have been working in the unorganized sector tiny, small and artisan based enterprises and so they are mostly unregistered. Average age of the sample processing units ranged between 08 to 35 years.

Maharashtra:

In Maharashtra, majority of the units are the existing ones. It is the cashew processing units and the rice mills which are seen to be the new units. In the state, most of the units are registered. Four fish processing units and one OAME each from leather, textile and wood category are the unregistered units.

Cost of Investment

West Bengal:

The size of investment in units varies across the food and non-food processing segments of manufacturing enterprises. It is relatively higher in non-food processing segment as compared to its counterpart.

Bihar:

In Bihar, generally within a particular group of processing activity, investment increased with the size of the unit. OAMEs showed lower size of investments in comparison to those of NDMEs and DMEs.

Maharashtra:

In Maharashtra, within a category, investment is increasing with the size of the unit. The size of the working capital is seen to be lower for the OAME units as these units do not have to incur expenditure on wages/ salaries.

Financing of the Investment

West Bengal:

In West Bengal, food-processing industries with only exception of paddy processing enterprises met their investment requirement from own fund. For paddy processing unit, institutional loan contributed the major in financing their investment. For the units engaged in non-food processing activity, majority of the units are found to have financed the activity using their own funds. Only the paper-based industrial units have resorted to outside borrowing both from institutional and non-institutional sources in financing their investment.

Bihar:

In Bihar, the NDME and DME under cereal based processing activity and DMEs of horticultural crop based, wood based and leather based processing activities were found to have taken institutional loans in varying degrees.

Maharashtra:

In Maharashtra, all the units engaged in cashew processing, rice milling and one (DME) each in book binding and leather have taken loan to finance their own investments.

Economics of Investment in Agro-Processing Units

Production and Operation Cycle of the Activities

West Bengal:

For all the activities, it is seen that monthly working days ranged between 26 to 30 days. The difference is noted in the case of per year working days. The levels of working days per year for food processing units are observed to be relatively less than those of non-food processing units.

Bihar:

In Bihar, number of working days per month as well as working hours per day were seen uniform in most of the cases, except in horticultural crop (litchi) based, dairy products' based and textile products' based processing activities.

Maharashtra:

In Maharashtra, the number of working days per month as well as working hours per day is seen to be uniform for all the units. The difference is noted as far as working days per year are concerned.

Sources of Raw Materials and Marketing Linkages of the Processed Product

West Bengal:

In West Bengal, sample food-processing units being relatively smaller units have the limited capacity to reach out to various markets. They do not have strong linkages with input-market, rather they have obtained raw materials from the producers directly (72.22 per cent). Non-food processing units however directly came in contact with the input-market through established trade/ market channel for procuring raw materials.

Bihar:

In Bihar, livestock based activity procured raw materials mainly from farmers directly (05). Other two types of agro-food based processing activities' used all the three channels for purchasing raw materials although in the major, the units are found to have purchased the same from farmers directly. Among non-food agro processing activities, raw materials, were wholly purchased through established trade channels and market channels.

Maharashtra:

Units like rice mills, leather units, textile mills and furniture units which process only the raw material provided to them by the customers at their doorstep do not have strong linkages with either input or output markets. All the units except the cashew units have reported that they have only one source (market) for procuring raw material as well as selling their product.

Cost of Production

West Bengal:

In general for all the processing units, proportion of cost on raw material is found to have declined with the increase in the size of the unit in the category.

Bihar:

In Bihar, within each category, the quantum of fixed costs is seen to be increasing with the size of the unit. As far as recurring variable cost is concerned, it is seen that cost on raw materials is the major component of the variable cost for most of the activities, except DME of horticultural products (36.89 per cent) and NDME, (31.90 per cent), DMEs of textile (29.91 per cent) and NDMEs and DMEs of wood and leather based processing activities (18.61 per cent, 43.50 per cent, 21.52 per cent and 20.04 per cent) respectively. In all these cases, share of wages dominated the variable cost component.

Maharashtra:

In Maharashtra, within each category, the quantum of the fixed cost is seen to be increasing with the size of the unit. On an average, only 13 to 14 percent of the total costs have been contributed by own fund in case of food as well as non-food processing units.

Net Income from Investments

West Bengal:

In West Bengal, all the activities gave positive net income being varied among the activities depending upon the size of the investment. This is uniformly observable in the case of food processing units.

Bihar:

In Bihar, all the activities and units yielded positive net returns. Data reveal that except DME category of livestock based processing activity, in all other cases under agro food processing activities net returns increased with the size of the unit.

Maharashtra:

In Maharashtra, all the activities and units show a positive net return. For the food processing activities, the net return increases with the size of the unit.

Employment Generation

West Bengal:

In the food-processing category of enterprises, maximum employment generation from the investment was observed in the case of fish-processing unit. Among the non-food processing units, maximum employment generation by the activity was observed in the case of wood-based product manufacturing unit.

Bihar:

The highest number of total man days employed was seen in case of DME of horticultural products based activity. It could also be observed that only OAMEs of cereal based, horticulture and textile based processing activities engaged female family labourers.

Maharashtra:

The highest number of workers (9) is found in cashew processing DME unit. It is also observable that all the categories in the food-processing sector except one have engaged female family labourers.

Problems Faced by Manufacturing Enterprises

West Bengal:

Reportedly the problem of non-availability of raw materials throughout the year, variability of prices of raw materials and absence of information network to keep track of raw materials prices and availability came to be featured prominently in the array of problems faced by the entrepreneurs of sample processing units in West Bengal.

In the field of marketing of processed products, reportedly for food-processing units, the main problem was lack of proper domestic market of processed products (72.22 per cent) followed by absence of good network purveying market information (66.67 per cent) and dependence on middleman for marketing the processed products (66.67 per cent).

Bihar:

In Bihar, problems of non-availability of adequate raw materials due to lack of capital, supporting machines/equipments, and absence of required infrastructural facilities were reported by majority of the food processing units. Fluctuations in prices of raw materials, absence of information network and circumstantial purchase of raw materials from middlemen at higher rates were also prominently reported by the sample food processing units. Non-availability of skilled labourers, availability of raw materials (litchi) for a very short period and difficulty in determining prices of value added products were specifically felt by DMEs of agro-food processing activities.

Maharashtra:

In Maharashtra, within the food-processing segment, majority of the cashew and fish units have reported non-availability of raw materials throughout the year. As far as the

cashew units are concerned, non-availability of good quality cashews is mainly due to inability of the small units to find agents or seller supplying good quality raw material. In the absence of information/ resources to find the same, these units are often at a disadvantage if the cashews supplied are not of good quality. The units have also reported non-availability of labourers during the peak season and variability of prices. The fish units also face this problem, as during the months of monsoon, fishing does not take place

Prospects of the Units

West Bengal:

The state of West Bengal being blessed with largest production of paddy has the potentials for investing in paddy processing industry.

Within the group of non-food processing industries, textile and leather units yielded lower net income, although, they have shown relatively better performance in terms of growth in number of units.

Bihar:

In Bihar, significantly large areas are under different top qualities of fruits viz. mango, banana, litchi, guava, lemon and pineapple. Quantum of production of these fruits is quite larger. Hence, there is great potential for installation of agro processing industries based on these fruits in areas/regions with their production in abundance. Among cereal based processing activities, apart from paddy and wheat, there is high prospect for agro-processing industries based on maize in Bihar. With regard to livestock based processing activity, dairy industry in the co-operative sector under the brand name Sudha has achieved marked success in Bihar. In unorganized sector, also there is great potential and bright prospect for processing of milk into khowa, ghee, butter, cream, paneer, lassi, etc.

Maharashtra:

The analysis of the data collected from the sample processing units in Maharashtra shows that cashew unit (DME) has earned highest net income followed by fish unit (DME). The cashew units are newly established units under DIC/KVIC schemes. Due to the increasing demand for the cashew nuts in the domestic as well as international markets and due to the existence of huge untapped potential for processing of the fruit, the units can in future also, take advantage of the expanding markets.

169. Title of the study: Impact Study of the National Horticulture Mission
Year of publication: 2011
Main findings:

- It has been observed that during the period 2004-05 to 2009-10, both area and yield rate of mandarin oranges have increased significantly, though there has been a marginal increase in area and yield rate of pineapple.
- There has been a gradual increase in the coverage under certified inputs, which indicates a gradual shift of production technology with certified inputs in place of traditional inputs.

- The positive impact of the National Horticulture Mission can also be witnessed in case of area expansion by rejuvenation and protection.
- In case of sources of procurement of resources for pineapple and mandarin orange cultivation, informal sources like private nurseries and fellow farmers continue to play an important role.
- The extension activities provided by the district horticulture and agriculture officials under NHM make only a sorry figure, as very little has been done in case of dissemination of technologies through training and capacity building activities.
- There has been a complete absence post-harvest management facilities like packhouse, storage units, and mobile processing units formed under the NHM in the study regions of both of the districts.
- Nevertheless, it can be said that the NHM performed well by providing financial assistance to the farmers to boost up and motivate them towards diversification of cropping pattern in favour of horticultural crops.

170. Name of the Study: Impacts and Constraints Evaluation of Organic Farming in West Bengal

Year of Publication: 2011

Main Findings:

- **Status of organic farming in West Bengal**

The overall increase in area under organic farming has been found to be 6.57 per cent and 6.14 per cent in North 24 Parganas district and 2.12 per cent and 3.77 per cent in Jalpaiguri district for NGO (in more than 10 years) and Government (in 5 years) activity area respectively.

- **Comparative economics of crop production under organic and inorganic farming**

The cost of cultivation was higher and production was lower in organic than inorganic farms for lady's finger, potato and chilli, but price of the organic product was higher than inorganic in the study area. The return / cost ratio of organic cowpea was higher than inorganic cowpea in NGO area. In case of brinjal, though production was lower and cost of cultivation was higher in organic system, but as the price of organic product was higher than inorganic product, return/cost ratio for both organic and inorganic farming system was more or less same. The same fact was replicated for cauliflower in NGO area, but in Government area organic cauliflower exhibited lower production and same price with inorganic product and lower but favourable return / cost ratio.

- **Impact of organic farming in relation to quality of produces and price premium**

In organic farming system, market price for organic produce is one of the most effective tools for reducing the disparity of income between organic and inorganic farming. As compared to market area, the impact level of price has been found lower for Government activity area than NGO activity area. Perhaps it was the result of more intensive campaigning regarding consumers' awareness and the quality of organic farm products by the NGOs.

- **Farmers' awareness regarding organic farm practices**

Organic farmers in both NGOs and Government area were not motivated like a layman to adopt organic technology in their farm. But it was observed in the study that the

organic farmers were much aware regarding good quality of organic product, beneficial role of organic crops in human health, high profitability of organic farming than other system, etc.

- **Constraints in adoption of organic farming**

The constraints like high cost of organic inputs, no market for organic product, unavailability of organic inputs , less yield and no price advantage for organic product are found to be the major constraints according to their ranking as first, second, third, fourth and fifth. The next important constraints are found to be no consumers demand for organic product. According to the ranking, the seventh position is obtained by less or equal profitability. Small holding size, inconvenience of organic techniques, unavailability of the scope, higher production risk, no suitable land for organic farming are the next important constraints by obtaining the rank eighth, ninth, tenth, eleventh and twelfth, respectively. Lack of training of organic practices, more recurring cost for input are found to be the next important constraints by obtaining the rank thirteenth and fourteenth. The other constraints in order to importance are lack of awareness, low employment potentiality and lack of experience of organic farming as these constraints obtained the rank by fifteenth, sixteenth and seventeenth.

171. Name of the Study: Impact of emerging marketing channels in agricultural marketing: Benefit to producer-seller and marketing costs and margins of agricultural commodities – A study in West Bengal

Year of Publication: 2011

Main Findings:

Crops considered for for EMC and TMC are Arum and M ustard respectively. Per hectare cost of cultivations of arum of the sample farmers as a whole is Rs. 60071.98 which varies marginally across marginal, small and medium farmers. On the other hand, per hectare cost of cultivation, on and average, for mustard is Rs. 37913.80. Out of the total cost, the share of paid out costs are 74.09 per cent in case of arum and 60.03 per cent in case of mustard.

Production and productivity of Arum is 4792.32 (qt.) and 242.04 (qt./ha.) respectively, while production and productivity of Mustard is 227.10 (qt.) and 14.34 (qt./ha) respectively. **N**et returns with and without the cost of labour / ha are Rs. 72568.00 and Rs. 88149.80 respectively for arum. Similarly, the net return with paid out cost and paid out plus labour cost results to Rs. 18613.27 and Rs. 3459.51 respectively for mustard.

Price spread and market efficiency of Arum in EMC

It is observed that by selling Arum in EMC, the sample farmers received an average price of arum at Rs. 548 per quintal from the contract traders, who purchase entire amount of Arum at post matured stage at field. In this process of transaction, no cost involves to farmer for harvesting and marketing of their cultivated crop. Hence, net profit (Rs. /Qtl.) incurs to the cultivators after ducting paid out cost is Rs. 364.20 per quintal.

The selling price per quintal of arum of the whole-seller is Rs. 973.35 in which their shares of market cost and market margin are Rs. 21.89 and Rs. 136.38 respectively.

The retailer's selling price of Arum is Rs. 1079.90 per quintal. In which market cost is Rs. 16.88. By selling Arum to the consumers, the retailer is able retain market margin of Rs. 89.67 per quintal.

The farmers' shares, market cost and market margin of different trading agents to consumer price are as follows:

- The share of farmer to the consumer price is 50.75 per cent.
- Market cost turns out to 8.64 per cent
- Market margins of different trading agents as a whole are 40.61 per cent and
- Ratio of market efficiency is 1.03

Price speed and Market Efficiency of Mustard in TMC

The selling price (Rs. /Qtl.) of mustard of the sample farmers a whole is Rs. 2876.28 and the marketing cost is Rs. 26.37 i.e. (20.53%) of total market costs. Hence, the net price realised by the farmer is Rs. 2876.29 and profit (net price minus paid up cost) is Rs. 1288.59.

The shares of farmers to processor's price, markets cost and market margin are as follows:

- The share farmers to the processor's price are 82.87 per cent.
- Market cost is 3.00 per cent
- Market margin of trader and whole-seller is 14.13 per cent and
- The ratio of market efficiency is 4.88

Benefit cost ratio for Arum & Mustard

The BCR is almost same for both the EMC and TMC crop.

- Cost of production/ha of Arum for EMC with paid out cost = 2.387
- Cost of production/ha of onion for TMC only with paid out cost = 1.24
- Cost of production/ha of Arum for EMC with family labour = 2.21
- Cost of production/ha of mustard for TMC with family labour = 1.09

Wastage of Crops

The extent of loss/wastage of Arum and Mustard during harvest threshing storage and transport etc. is 2.86 per cent and 0.55 per cent respectively. Wastage occurs for Arum during harvesting (2.61%), storage (0.20%) and retail marketing level (0.05%) while wastage occurs for Mustard during threshing (0.30%) and storage (0.25%).

Reasons of Preferring Existing Marketing Channel

The sample farmers of both the EMC and TMC inform the following reasons to word preferring marketing channels, which are habit (18.89% for EMC and 17.69 % for TMC) followed by higher/fair price (16.36 % for EMC and 15.44% for TMC), low cost of marketing (12.89% for EMC and 11.27% for TMC) and time taking in other channel (12.22% for EMC and 11.56% for TMC). Apart from these, other reasons for preferring this channels are less physical hazards in marketing commodities, proximity, absence hidden cost etc. supervising service and better infrastructure.

172. Name of the study: Impact of NREGA on wage rates, food security and rural-urban migration in West Bengal

Year of Publication: 2011

Main Findings:

Primarily the implementation of NREGA can be evaluated in terms of jobs demanded and provided. The official data in this connection shows that during the financial year 2010-11 (till December 2010) a cumulative total of 44.21 lakh households demanded employment and among them 43.80 lakh households (99.1 percent), were provided wage employment under the scheme in the state. In terms of person days of employment generated under the scheme, the state of West Bengal generated a cumulative total of 910.65 lakh person days during the financial year 2010-11 (till Dec' 2010) under NREGA out of which 328.35 lakh person days (36.1 percent) has been for scheduled caste, 98.85 lakh days (10.9 percent) for schedule tribe and the rest 910.65 lakh days (53.1 percent) for people belonging to other castes.

Across the districts, in terms of average person days generated per household, Bankura stood first (29 days) and Coochbehar stood last (11 days) among all the 18 districts in west Bengal during the year 2010-11.

The act mandates that at least one-third of the workers should be women. Notably, in the state, 284.08 lakh days of employment were generated for women which imply that women obtained 31.2 percent of the wage opportunities with their male counterpart getting the remaining 68.8 percent.

The works undertaken and completed during the financial year 2010-11 indicated that agricultural development related activities accorded top priority which accounted for the maximum share in total number works completed during the year.

As far as quality of assets is concerned, the majority of households reported that the quality assets created under NREGA is good.

In all the sample districts, wages received under NREGA were found to be less than the stipulated minimum wage of Rs. 96.00.

Manual works provided under NREGA are expected to bring down the level of out-migration. Evidently, however it is seen that among the five surveyed districts, out-migration has taken place mainly in three districts viz. Jalpaiguri, Malda and Nadia and marginally in Purulia district. Of course such migration has been the result of lack of employment opportunities within the village.

NREGA through generating incremental income is expected to bring about changes in the food security situation. Evidently, 70.50 per cent of households reported that they got full two meals throughout the year 2009 while the rest 29.50 per cent of households did not get full two meals throughout the same year. Out of the households who are not having full two meals, 11.86 per cent did not get sufficient food for one month, 62.71 per cent for two months and the rest 25.43 percent for period of more than two months. However, although

some of the households reported worsening situation of food security even after the introduction of NREGA, the overall impact NREGA on food security is positive as it has improved the food security for majority of households.

Due to the implementation of NREGA there has been sharp increase in the wage rates during our reference periods pertaining to the years 2005 and 2009. The present study finds that both male and female wages have gone up after the implementation of NREGA.

NREGA is expected to bring about changes in the standard of living of village people. In this regard, all respondents feel that living standard in general improved after the introduction of NREGA. The responses show that due to incremental income obtained from NREGA activities, households were able to spend more on food, clothing, housing and education and thus improvement in the living standard since the introduction of NREGA is noticed specifically in terms of these aspects. After introduction of NREGA, household daily consumption is increased as reported by 11.93 per cent of households. About 8.91 per cent of households reported improvement in health treatment condition. Households able to spend more on consumer goods and social ceremony are also noticed.

In the education front, all households reported that they are investing more money on children's education due to extra income earned from NREGA. Reportedly, awareness about education is also improved after the introduction of NREGA (6.08 per cent).

Overall, the scheme of NREGA has the great potential in enhancing income and livelihood security of the rural poor. The present study, in an attempt to evaluate the impact of NREGA has identified the key areas of progress as well as the shortcomings of the programme. Notably, NREGA has not been able to provide the employment that one would have expected. Despite making provision of 100 days of employment in a year, actual employment generation has been much below than 100 days in a year. In the matter of wage payment, in many cases, delay in wage payment is noticed. Procedural irregularities are also noticed at the stage of implementation of the scheme such as irregularities in conducting social audits and gram sabhas. True that NREGA addressed many of the weaknesses of the earlier wage employment programmes through introducing several features in its design. However, as evidenced by the present study, NREGA is also not free from limitations despite having its positive impact on income generation, asset creation and above all improving standard of living. Obviously, if the remedial measures are taken to address the limitations, the effectiveness of NREGA would increase with experience and would go a long way in ensuring livelihood security to the rural poor in a sustainable manner and in altering the balance of power in rural society. The key lies in proper implementation and planning of the scheme as per the guidelines laid down in the Act.

173. Name of the study: Impact of NREGA on Wage Rates, Food Security and Rural Urban Migration in Sikkim

Year of Publication: 2012

Main Findings:

Since Independence the country's strength is derived from the achievements of planning. The policies and programmes have been designed with the aim of alleviation of

rural poverty which has been one of the primary objectives of planned development in India. But employment programmes were not perceived as major instrument of poverty alleviation until the beginning of the 1980s in most states of the country. For the first time, the National Rural Employment Guarantee Act, 2005 provides employment opportunities of rural labourers as a matter of right. The act was enacted to enhance livelihood security in rural areas by providing 100 days of guaranteed wage employment in a financial year to every household whose adult members volunteer to do unskilled manual work.

In the state of Sikkim, NREGA became operational from February 2006. The scheme had been introduced in phases. Initially, in the first phase, the scheme was introduced in north Sikkim. In the second phase, from 1st April 2007 two more districts namely, East and South Sikkim districts were brought under its coverage. One more district viz. West Sikkim was added in the third phase from 1st April 2008. Thus the scheme is operational in all districts of the state of Sikkim w.e.f. 1st April 2008.

The present study, in an attempt to evaluate the impact of NREGA has identified the key areas of progress as well as the shortcomings of the programme. NREGA had a positive impact on income generation, asset creation and above all improving standard of living However, NREGA is not free from limitations and has not been able to provide the employment that one would have expected. Despite making provision of 100 days of employment in a year, actual employment generation has been below than 100 days in a year. In the matter of wage payment, in many cases, delay in wage payment is noticed. Procedural irregularities are also noticed at the stage of implementation of the scheme such as irregularities in conducting Village Monitoring Committee meetings which needs to be conducted for the participation of affected persons in the process of decision making and validation. It is true that NREGA addressed many of the weaknesses of the earlier wage employment programmes through introducing several features in its design. However, if the remedial measures are taken to address its limitations, the effectiveness of NREGA would increase with experience and would go a long way in ensuring livelihood security to the rural poor in a sustainable manner and in altering the balance of power in rural society. The key lies in proper implementation ensuring participation of affected persons and planning of the scheme as per the guidelines laid down in the Act.

174. Name of the study: Assessment of Marketable Surplus, Marketed Surplus and Post-Harvest losses of Paddy in West Bengal

Year of Publication: 2013

Main Findings:

After a detailed analysis of data by conducting primary survey of about 318 farm households in six eminent blocks from over three major paddy producing districts in West Bengal, the study makes a number of crucial observations. Based on those findings, the following specific observations can be made:

- Average marketed surplus ratio, taking all farms together, stands at 55.30% of net availability of paddy (or 61.19% of current production of paddy). In contrast,

average marketable surplus ratio stands at 43.49% of net availability of paddy (or 36.43%of current production of paddy).

- Marketed surplus ratio for the marginal farms stands at 44.15% of net availability of paddy, which for the small, semi-medium and medium farms stand at 58.66%, 64.77% and 69.12% respectively. As proportion to current production, the marketed surplus ratio for the marginal farms turn out to be 46.59%, which for the small, semi-medium and medium farms are found to be 65.18%, 74.55% and 78.56% respectively.
- Marketable surplus ratio for the marginal farms is estimated at 23.91% of net availability, which for the small, semi-medium and medium farms turn out to be 50.05%, 59.96% and 66.04% respectively. As ratio to current production, the marketable surplus ratio for the marginal farms stands at 20.15% of current production, which for the small, semi-medium and medium farms turn out to be 41.86%, 48.19% and 59.17% respectively.
- The marketed surplus ratio is found to be influenced positively by farm-size, average price received, access to credit and possessing permanent storage facilities, while it is negatively related to household size and indebtedness of farmer households.
- Estimated total post-harvest loss stands at 3.42% of current year production on an average; showing a decreasing trend over increase in farm-size.

175. Name of the study: Assessment of pre and post harvest losses in rice and wheat in West Bengal

Year of Publication: 2013

Main Findings:

As perceived by the respondents, cent per cent of the farmers are facing constraints in rice and wheat cultivation. However, the degree of severity of these constraints varies. Among these constraints, high cost of inputs and low output price ranked first and pest and disease problems ranked second both in rice and wheat. Similarly, farmers perceived water deficiency as one of the most important constraints in rice cultivation and poor quality of seed in wheat cultivation.

The magnitude of crop loss due to pests, disease and weed infestation in paddy is very high. The actual production with attack is varied from19.36 quintal to 20.88 quintal per acre. The overall loss with attack has been found to be 3.54 quintal per acre. However, the percentage loss over normal production is less (15.05 per cent) than that of percentage loss over actual production.

Similarly the magnitude of crop loss due to pests, disease and weed infestation in wheat has also been found very high. The actual production with attack is varied from 3.90 quintal to 5.96 quintal per acre. The overall loss with attack has been found to be 0.92 quintal per acre. However, the percentage loss over normal production is less (15.29 per cent) than that of percentage loss over actual production.

It has been observed that the quantity lost in harvest is 0.78 kg in rice and 1.26 kg per quintal of harvest in wheat. Quantities losses during threshing in rice and wheat are 0.32

kg and 0.26 kg, respectively. Similarly, 0.13 kg and 0.12 kg are lost during winnowing of rice and wheat. Thus winnowing is one of the post harvest operations that incur high amount of loss. These losses were attributed to improper handling and inefficient machine. Care should be taken to properly handle the machine during winnowing. The transport lost varies from 0.55 kg in rice to 0.83 kg in wheat. Quantity losses in handling are 0.31 kg in rice and 0.63 kg in wheat and quantity lost during storage is 1.78 kg in case of rice and 3.93 kg in case of wheat. The total post harvest loss in rice has been found to be 9.39 kg per quintal and 76.84 kg per acre, whereas it is 7.22 kg per quintal and 30.59 kg per acre in case of wheat. It is worthwhile to note that the total post harvest loss increases with the increase in farm size. Therefore, it has been observed that post-harvest handling has led to considerable loss in rice and wheat. The share of storage loss has been found to be maximum than that of other losses. The improvement in storage facilities required immediate attention of the policy makers for reducing post-harvest loss in rice and wheat. There is a need to impart training to the farmers, traders and extension officials at the block level on the practical aspects of storage and preservation of food grains. It is also essential to popularise scientific techniques of storage amongst farmers, etc through demonstrations and wide publicity and to develop selected villages to serve as model villages. There is also need to arrange facilities for farmers for purchase of improved types of storage structures and to maintain liaison with State Governments and to arrange steady supply of storage structures and pesticides to the users.

In general and according to the suggestions of the respondents, provision of pest and disease resistant quality seeds along with technical know-how, soil testing facility etc. are call for the day to minimize the losses at pre-harvesting stage of rice and wheat. Similarly, provision of infrastructural facilities including ware houses, marketing infrastructure and good condition of road can restrict the losses at the post-harvest stage of rice and wheat.

In view of the above, it can be concluded that if pre and post harvest losses are reduced, the farm income can be increased substantially without cultivating additional acres of land or increasing any additional expenditure on seed, fertilizer, irrigation and plant protection measure to grow the crops.

176. Name of the study: Problems and prospects of oilseeds production in West Bengal

Year of publication: 2013

Main Findings:

The major findings have been stated below as follows:

Trends and Pattern of Growth of Oilseeds

Over the decades, there has been a shift in the cropping pattern in West Bengal agriculture, wherein area under oilseeds increased considerably (about 4 times). The relative share of oilseeds (comprising mainly of rapeseeds and mustard) in total cropped area also increased considerably from 2.8% to 9.8%. Net positive changes in relative terms for oilseeds during TE 1993-94 and TE 2009-10 has been particularly prominent in districts South 24 Parganas (163.53%), Midnapore (89.62%) and Murshidabad (61.80%). For the state total, net change during the period stated for oilseeds stands at 28.58%.

Comparative Economics of Oilseeds vis-à-vis Competing Crops

Cost of production per hectare of oilseeds (sesame) is much lower than that of its competing crop (summer paddy). In particular, while cost per hectare of sesame turns out to be 23,364/- per hectare, that for summer paddy turns out to be 33,203/- per hectare. Net Profit per hectare for oilseeds (sesame) is much lower than that of its competing crop (summer paddy). In particular, while net profit for sesame stands at about 6,468/- per hectare that of summer paddy stands at 19,052/- per hectare. This phenomenon of lower cost per hectare as also lower profit per hectare for oilseeds (as compared to those of competing crop of summer paddy) arises particularly because of the fact that value of output per hectare (main product + by-product) is much less for oilseeds than that of summer paddy.

Constraints in the Production of Oilseeds

Technological Constraints- The major technological constraints comes out to be poor crop germination (96.30%), followed by non-availability of suitable varieties (88.50%) and incidence of deceases (79.30%). Agro-climatic Constraints- Major agro-climatic constraints include drought at critical stages of crop growth (91.20%), followed by excessive rain (91.00%) and extreme variation in temperature (75.20%). Economic Constraints- The major economic constraints in cultivation of oilseeds are low and fluctuating prices (92.50%), followed by shortage of human labour (80.60%) and high input costs (80.10%). Institutional Constraints- In case of institutional constraints, it is observed that timely availability of seed (90.90%) comes out to be the most severe constraint, followed by inadequate knowledge about disease and pest management (73.80%) and Non-availability of institutional credit (67.30%). Constraints in post-harvest management, marketing and value addition- The major post-harvest problems include exploitation by market intermediaries (98.40%), followed by lack of processing facilities in the area (57.30%) and inadequate storage facilities (55.80%).

177. Name of the study: Baseline Data on Area, Production and Productivity of Horticulture Crops in Sikkim

Year of publication: 2013

Main Findings

It should be noticed that only 0.76%, 2.06%, 0.52% and 0.31% area in East, North, South and West districts, respectively had been surveyed as compared to the area estimated by the agency across the district. So, a variation in results of productivity between the survey and estimate is quite natural, especially for the group of crops, like, kharif vegetables, rabi vegetables, etc. Though, the productivity of rabi vegetables in North Sikkim was almost same for these two estimates. On the other hand, individual crop like, mandarin orange, ginger and turmeric exhibited parity in result of productivity between survey and estimates. But there was a vast gap in productivity of cymbidium orchids and large cardamom between village and district level estimates. Fruits other than orange exhibited almost equal productivity in village and district level estimates in East Sikkim, but not even almost equal in West Sikkim. However, only 260.56 ha area in four districts of Sikkim was surveyed and it was only 0.82% of the area that was estimated by the agency across the districts. This small

area of course showed a compatible result of productivity as compared to district level estimates in a number of horticulture crops in Sikkim state.

We came across a number of crops that could not register their share in the horticulture estimate. In East Sikkim were crops like Leafy vegetables and Tomato, while in North were Leafy and Mixed vegetables, Brinjal, Tree Tomato, Chayote, Chilli and in South were Cabbage, Chilli and Tomato.

In the grass root, the Horticulture Inspectors did opined having no exact and updated record about the area under various horticultural crops. Though the Village Level Officers under the Department of Revenue have some records of area, but it seems deficient. The record there is kept for major field crops. Secondly, there is no agency other than the horticulture department, except for RKVY and VIUC in South district, which is collecting these data. So, no cross verification of the estimates could be made to ascertain authenticity.

In the East district Cymbidium orchid present separate problems. Cymbidium orchids are planted in pots – one pot for one plant. The plants starts flowering after 3-4 years of plantation. From 5-6th year onwards production increases till about 10th year. After 10th year production once again declines. Fully grown plant give 5-6 spikes per plant but for the older and younger plant productivity is low. Moreover, the spikes vary in size across the plants. So, it becomes difficult to estimate the exact productivity. Hence, four spikes per plant on an average is assumed to estimate productivity of Cymbidium orchid.

Large Cardamom, cultivated extensively in the North District, has different specificities and problem of its own in the process of estimation. Large Cardamom plantation is done in the undulated terrains of the hills. It is difficult in such a tract to estimate the area under cultivation. Hence, in crop cutting experiments an indirect method is applied. Taking the standard spacing norm for Large Cardamom about 55-60 plants are selected that are supposed to cover an area of 5 metre square. Productions from those plants are measured and productivity thus estimated. But under such circumstances the level of exact productivity cannot be estimated. Though record of area under Cardamom plantation is kept by the revenue officials, the information is not updated at regular interval.

In South and West Sikkim, however, the basic problem remains the same – dearth of reliable area estimate. In Southern district there is abundance of different kinds of vegetables both under sole and mixed cropping practices. Under such circumstances, with no reliable estimate of area under crops, it becomes difficult for the horticulture department to estimate area, production and productivity (Table 8.2c). The West district, however, presents shortage of trained personnel as one of the main problems (Table 8.2d). Another important problem for Ginger lies in the fact that during crop cutting experiments the weight of Ginger that is recorded gets reduced with passage of time as it becomes dry. This results in a difference in productivity estimates which does not get its reflection.

178. Name of the study: Effect of farm mechanization on agricultural growth and comparative economics of labour and machinery

Year of publication: 2013

Main Findings:

- In case of trends of growth in mechanization in West Bengal, it comes out that except for potato, costs of machinery has grown much faster than costs of bullock labour, human labour as well as value of production over the period 1996-97 to 2009-10. This perceivably acts as a major constraint in the spread of mechanization of farming in the cultivation of crops like paddy, wheat and mustard.
- It comes out that ownership of expensive machines like shallow tube wells, tractors, etc. is fairly limited in numbers owing to involvement of higher capital cost, but they are extensively used on hiring basis to perform various farming operations in the study region. As such, ownership and use of machinery is two completely different aspects, especially in case of a highly marginalised economy like West Bengal.
- The study observes that 70 percent of the farmers held time-efficiency of mechanized farming as the prime reason (rank I) behind mechanization. This is why we find that with comparable costs, the tractor operated machines are gaining popularity in the study region especially in operations like ploughing, marketing and transportation.
- However, among the major problems faced in mechanization, about 26 percent of the farmers consider tractor operated plough as expensive to purchase, while another 14 percent considered that it is expensive even to hire tractor operated plough. Further, about 26 percent of the farmers responded that tractor operated plough is not readily available for hire at a time when it is actually needed the most.

179. Name of the Study: Spread of New Varieties of Hybrid Rice and their Impact on the Overall Production and Productivity in West Bengal

Year of Publication: 2013

Main Findings:

- ***Extent of adoption of hybrid rice at the farm level***

  It can be seen that during the year 2009-10 the proportion of rice area allocated to hybrid rice accounted for 18.03 per cent in marginal sized land holdings which declines consistently with the rise in the size of holding to 11.52 per cent. Similar relationship is also observed during the year 2010-11. Considering all the farm sizes together, the percentage of rice area allocated to hybrid rice is 21.09 per cent in 2010-11, which was 14.72 per cent in 2009-10. The small and marginal farmers who produce mainly for household consumption have shown interest in hybrid rice. Needless to say, hybrid technology has vast potential for improving the level of productivity of rice.

- ***Yield performance of hybrid and HYVs***

  Overall, rice hybrid performed better with an average yield of 6408.53kg per ha than average yield of 5377.60kg per ha for HYVs during the 2009-10. During 2010-11, too hybrid rice recorded higher yield at 6551.28kg per ha as against 5340.89kg per ha for HYVs. Among various farm size groups, smaller sized holdings obtained highest yield in both the years. The mean yield of HYV rice however increased with the increase in the size of farm over the years. In other words, mean yield levels of HYVs were higher on larger sized holdings as compared to smaller ones in case of HYVs.

- ***Yield Gain from Hybrid Rice over the Inbred Rice Varieties***

  On an average the yield gain of hybrids over HYVs was 19.17 per cent in 2009-10. During 2010-11 it was about 22 per cent. Across farm sizes, smaller sized holdings obtained higher yield gain as compared to larger sized holdings in both the years under study. Thus based on farm level performance of hybrid rice over the period it is clearly indicative of the fact that hybrid rice technology has its higher yield potential under the production environments prevailing in West Bengal.

- ***Economic Returns to Hybrid and Inbred Rice Cultivation***

  During the year 2010-11 the farmers growing hybrid rice realised a gross return of Rs.67, 583.51 per hectare while the gross return realised in inbred varieties was Rs.61, 327.32. Thus the gross return was 10.20 per cent higher in hybrid rice cultivation. However the profit (net return) realised in hybrid rice and inbred rice was of the order of Rs.38,696.10 and 37,776.32 per hectare respectively. Thus the profit gain realised in hybrid rice production was only Rs.919.78 per hectare or 2.43 per cent over inbred varieties of rice. Consequently the benefit cost ratio was also lower in hybrid rice cultivation (2.34:1) in comparison with that for inbred rice (2.60: 1). Inter-temporarily net return from hybrids over the reference periods has increased from Rs.35, 549.76 per hectare in 2009-10 to Rs.38, 696.10 per hectare in 2010-11. Correspondingly for inbred rice, the net return decreased from Rs.38, 383.69 per hectare to Rs.37, 776.32 during the same period. The net result has been increase in benefit cost ratio for hybrid rice cultivation from 2.24: 1 in 2009-10 to 2.34: 1 in 2010-11. Correspondingly, there has been decline in benefit cost ratio from 2.63: 1 to 2.60: 1 during the same period.

- ***Famers' overall perception of hybrid rice cultivation***

  Analysis of farmers' overall perception about hybrid rice cultivation hinted that future research on hybrid rice development should focus on improvement of grain quality besides yield in the next generation hybrids.

- ***Reasons for non-adoption of hybrid rice cultivation (non-adopters' experience)***

  The main reasons for non-adoption of hybrids were lower price of hybrid rice as compared to inbred, poor extension activities by the government for the popularization of hybrids, un-availability of quality hybrid seed, higher seed cost, higher yield loss for hybrids due to pests and diseases and higher risks associated with hybrid rice cultivation. Though higher seed cost is considered a constraint, it was given the least importance compared with other constraints. The foremost constraint confronting the diffusion of hybrid rice technology is poor grain quality and as a result lack of market acceptance leading to lower price fetched for hybrid rice as compared to inbred variety.

180. Name of the Study: Spread of New Varieties of Hybrid Rice and their Impact on the Overall Production and Productivity (Consolidated Report)

Year of Publication: 2013

Main Findings and Recommendations:

- Yield and productivity under paddy in all states together increased in all the periods. Area fluctuated and there was no upward trend. In fact the area under paddy at the end of the entire study period was lower than at the beginning. This indicates that the scope of

increasing output through extension of area has been exhausted and it is imperative to concentrate on yield improvement, through Hybrid seeds, etc. It is also noticeable that yield and productivity performed substantially better during the pre-hybrid period (1984-85 to 1993-94). This probably indicates the fact that HYV performance tapered off since the 90s. Hybrid cultivation did not spread sufficiently so as to compensate.

- It can also be observed that the increase in production can be attributed more to gain in productivity than to increase in area under crop, which in fact declined, as we have already indicated. Both yield and production showed similar and substantial gains.
- For both years surveyed the receptivity by size class to hybrid cultivation takes the form of a U, with the size class 2 to 4 ha being the least receptive***. This suggests that there is a conflict between equity and efficiency in the case of hybrid cultivation.***
- In striking contrast the receptivity to HYV takes the form of an inverted U, with the same size class being most receptive.
- Further apart from the largest farms, area under hybrid cultivation has increased between 2009-10 and 2010-2011. Correspondingly, there has been a decline in area under HYV. Though the time span is too short, the result is intuitively expected. With time information about and confidence in hybrid cultivation is likely to increase.
- A significantly higher proportion of head of households adopting hybrid farming belong to the *younger generation*.
- The ability to read literature on hybrid cultivation is *sufficient* for adoption of new technology and that higher formal education is unnecessary.
- A significantly larger proportion of SC, ST farmers compared to general caste cultivators go in for hybrid cultivation.
- The state plays predominant role in dissemination of information of new agricultural technology mainly through extension workers and, next through training programmes. ***So the spread of this technology cannot be entirely entrusted to the private sector.***
- ***Training programmes have to be toned up***, as the extension workers are more effective in persuading farmers to adopt appropriate input mix, while participation in training programmes yields much poorer results. Participation in demonstration programmes is even less effective for disseminating knowledge about proper input mix.
- There is also great regional variation in effectiveness of government servants and programmes in disseminating information. ***This suggests that some monitoring devise has to be positioned.***
- Hybrid technology is substantially more productive compared to HYV across farm sizes. It is noticeably more productive in the largest farm size. ***This suggests that the spread of the technology may have regressive impact on distribution.***
- Hybrid cultivation is more labour intensive than HYV cultivation. Hybrid rice cultivation also involves greater use of female labour. ***Hybrid rice cultivation is thus likely to generate additional employment opportunities for workers in general and specially for female labour rural areas.***
- Area wise the cost of hybrid cultivation was significantly higher. But the higher productivity compensated. Thus the cost per quintal was lower for hybrid. ***This suggests that to popularise hybrid cultivation credit needs have to be addressed.***

- The average rate of return on working capital was higher for hybrid cultivation, though in some states the opposite obtained.
- Grain quality of hybrid rice, in terms of hulling and milling ratios is inferior to HYV rice. ***This suggests that research must concentrate on improving this aspect of hybrid rice.***
- A greater percentage of hybrid output is marketed compared to HYV. ***This suggests that hybrid cultivation is suitable to the expansion of grain markets.***
- The price of hybrid rice is lower than that of HYV rice, on an average.
- Though government is the main source of hybrid seeds, there is great regional variation in the proportion of seeds supplied by government sources. ***There is, therefore, scope for improving government intervention in this area.*** Also seeds are not often supplied in time. ***This needs to be looked into.***
- There is a perception of poor quality of seeds supplied. The reasons for this are not clear. This needs investigation.
- Hybrid cultivators are often using inputs in incorrect proportion. Though lack of financial ability has been indicated as a reason, lack of knowledge has also played a significant role. ***Thus the government needs to improve the quality of knowledge dissemination and also provide sufficient credit. The need for proper credit provision is more pronounced because hybrid cultivation is costlier.***
- The quality of hybrid rice, in the perception of the consumer, is poorer than HYV rice. This makes marketing difficult. ***This suggests that research should concentrate on improving quality like decreasing stickiness of cooked hybrid rice. The rate of degeneration or 'keeping quality' also needs to be improved.***

181. Name of the Study: End Term Evaluation Study in Respect of the Implementation of Bringing Green Revolution to Eastern India (BGREI) Program (Consolidated Report)

Year of Publication: 2013

Main Findings and Recommendations:

BGREI program and changes in Cropping Intensity:

The results of CI across rice ecologies indicate differentiated pattern between BGREI beneficiaries and non-beneficiaries. On the whole it can be said that there has been marginal changes over two years in cropping intensity for both beneficiary and non-beneficiary farmers with variations across states. The change in CI in the states (as derived from sample survey results) cannot be attributed to the program of BGREI. There may have been some other factors influencing the cropping intensity in the states in the years of reference. Over and above, the BGREI program as conceived had focused on increasing the yield of crops of which we shall be discussing presently.

BGREI program and rise in grain yield:

It is revealed from the mean yield achieved by the beneficiaries and non-beneficiaries that there exists a difference in grain yield between them. In most of the states the average yield of crops among beneficiaries was substantially higher than their counterparts (i.e. non-beneficiaries).

Yield Gap analysis amongst BGREI beneficiaries and non- beneficiaries:

The ecology specific yield gap analysis in rice and wheat crops in BGREI States except eastern Uttar Pradesh reveals that wide gap exists across ecologies and districts within a state and between states too. This exercise, however, was not carried out by AER Centre, Allahabad. Normally yield gap is the difference between yield obtained at the farm level and the potential yield of a particular variety on the experiment station. Differences in yield gap between beneficiary and non-beneficiary farmers would suggest the impact of changes brought about in terms of yield enhancement. However, the yield gap analysis has been made differently for different states with differential benchmark. On the whole substantial yield gap is observed between beneficiaries and non-beneficiaries, the former registering higher yield.

Hence, it can be said that the beneficiary farmers in general in all the BGREI States had an edge over the non-beneficiaries in enhancing the yield of crop.

Recommendations and Policy Suggestions

- Efforts should be made to reduce the gaps between recommended, promoted and implemented strategies.
- In course of dissemination of technology, provision of Progressive Farmers and regular monitoring from State agriculture departments can play vital role. As such, such links between the beneficiaries and State machineries should be encouraged.
- Interventions through crop demonstrations has helped decline the gap between ecology specific potential and actual yields across beneficiary farms. Hence, such demonstration programs should be encouraged.
- Eastern India covered under the BGREI program has exhibited a glimpse of a high potential for yield enhancement of rice, wheat and *Rabi* pulses through a favourable positive crop response. There is a huge scope to exploit this potential through scientific and technological intervention like BGREI, and hence the program should continue with greater effort and coordination.
- An all round effort should be made to ensure the timeliness of input delivery system prescribed under the recommended technology.