
CHAPTER XI

SUMMARY AND CONCLUSION

The present study entitled "An enquiry into the farm structure, cropping pattern and level of income in Sikrara Block, District Jaunpur, U.P." was undertaken during the year 1973-74, with the main purpose to make a comprehensive study of cropping pattern, costs and returns for various crops and live-stock enterprises and to work out the level of income of the farms of different sizes in district Jaunpur. The main objectives of the study were :

1. To study the farm structure, level of resource use and cropping pattern on different size of farms,
2. To compute input-output relationship of each crop and live-stock enterprise separately,
3. To analyse the farm business on different size of farms in terms of level of income and returns to capital employed, and
4. To work out the productivity of different farm resources used.

~~The experimental design of~~ the study consisted in the random selection of 100 cultivators from 10 villages of Sikrara Block, district Jaunpur, U.P. A multistage stratified purposive random sampling technique was used to select the sampling units at the respective stages, in order, being block, villages and the cultivators. The cultivators were selected under four size groups, namely, 0-1, 1-2, 2-3 and 3 and above hectares. The number of cultivators under each size group was kept in proportion to their number in the universe of 10 villages.

The general economy of the district took into account the cultivated area which was 74.28 per cent of the total

geographical area and the percentage of the double crop^{ped} area to the total cultivated area was 34.25. The percentage of the irrigated area to the total cultivated area in the district was 56.31. In case of the block under study, i.e. Sikrara, out of the total geographical area of 16,898 hectares, 75.10 per cent was under cultivation. The percentage of the double cropped area to the total cropped area stood for 42.80 while 75.40 per cent of the total cultivated area was under irrigation.

The land utilization pattern of the sample holdings showed that there was 100.00 per cent utilization of the land under cultivation in all size groups and no land was found under cultivable waste or under permanent pasture, indicating thereby that the future expansion of the farm business in the region depends exclusively on intensive farming.

The study of farm structure shows that the average size of the sample farm came to 1.78 hectares. The smallest size group of holding with an average size of 0.48 hectare comprised 36.0 per cent of the sample, those with an average size of 4.82 hectare, constituted 14.0 per cent of the sample holdings. As against this situation, the smaller the holdings size group, the smaller is the percentage of the total cultivated area in the entire sample operated by the group, thereby clearly indicating the inequitable distribution of the cultivated area under different size of farms in the study area.

An analysis of irrigated area shows that, on an average, 63.0 per cent of the cultivated area on sample farms was under irrigation. The percentage irrigated area to the cultivated area tended to increase with the increase in the size of holdings,

except for the highest size group i.e. 3 and above hectares.

The average number of agricultural workers per farm came to 2.16 which showed an increasing trend with the rise in the farm size. On per hectare basis, this figure tended to decrease with the increase in the size of holdings.

As regards the live-stock position, it was seen that the average number of drought cattle per farm and per hectare was 2.02 and 1.03, respectively. The number of drought cattle increased with the increase in the size of holdings while on per hectare basis, it decreased. The lowest size group of holdings, although numerically more dominant (66.0 per cent of all farms) possesses less than 48.0 per cent of all the drought cattle in the entire sample. It reflects generally greater poverty of the smaller farms in an overall picture of small farm size. The overall average commanded area per pair of bullocks came to 1.76 hectare which increased with the increase in the size of holdings as it was 0.91 hectare on lowest size group and 2.50 hectares on the largest one. It revealed an important structural weakness in the farm economy of sample area and calls for measures to economise bullock labour on all farms specially on those in the smaller size group.

The number of milch animal per farm tended to increase with the increase in the size of farms while there was reverse tendency on per hectare basis. The average number of milch animal on the sample as a whole was calculated at 1.20 per farm out of which 0.88 were under milk and the remaining 0.32 dry.

The investment in livestock per farm increased with the increase in the size of farms which on per hectare basis, showed

a decreasing trend with the increase in the farm size. On an average, the investment in drought cattle and milch animal per farm came to Rs. 1,412.16 and Rs. 661.58, respectively.

The average investment in fixed capital per farm came to Rs. 42,458.80 which showed an increasing trend with the increase in the size of holdings because of increasing size of farm business. The investment in fixed capital including land per farm rose from Rs. 6,364.61 on the smallest size group to Rs. 20,369.72 to Rs. 33,636.58 to Rs. 63,600.93 as farm size increased. On per hectare basis, the overall investment in fixed capital came to Rs. 13,475.19 which varied from Rs. 13,259.67 on the smallest size group to Rs. 13,579.81 to Rs. 14,015.26 to Rs. 13,195.20 as the farm size increased. The investment in fixed capital without land, on an average, came to Rs. 6,841.09 per farm and Rs. 2,071.25 per hectare, which in general, tended to increase with the increase in the size of holdings, both on per farm as well as per hectare basis.

The itemwise investment in fixed capital revealed that the land, on an average, accounted for the highest percentage, being 84.63 to the total value of fixed investment followed by livestock (drought + milch animals) 8.03 per cent, farm machinery including irrigation structure, pumping sets etc. 5.19 per cent and farm buildings 1.94 per cent.

The analysis of the cropping pattern revealed the acreage under different crops on the farms of different sizes. It has further indicated the level of cropping intensity, area under high yielding varieties crops and cash crops and their influence on the level of income on the farms of different sizes.

The major crops grown in the study area were maize, paddy, wheat, barley and sugarcane.

On an average, maize occupied the largest fraction (27.09 per cent) followed by wheat (local + high yielding varieties) 28.25 per cent, paddy (local + high yielding) - 23.89 per cent, barley (7.23 per cent) and sugarcane (6.81 per cent) to the total cropped area. The percentage area under maize, barley and pea showed a decreasing trend with the increase in the size of farms. In case of paddy (local and high yielding) and wheat (local + high yielding), the trend was practically reversed. The area under cash crops, i.e. sugarcane tended to rise sharply with the rise in the size of holdings.

So far as the adoption of high yielding crop varieties is concerned, it was noticed that the area under high yielding varieties of crops totally as well as the respective season crops, paddy and wheat, tended to rise with the rise in the farm size. The overall percentage ^{area} under high yielding varieties came to 31.92 of which 13.07 per cent was under under high yielding paddy and rest 18.85 per cent under high yielding wheat.

The analysis of area under crops and fallows during kharif, rabi and zaid seasons showed that, on an average, 4.47 and 23.46 per cent area remains ^{as} fallow during kharif and rabi seasons, respectively. In zaid, no crop was grown by the cultivators of any size group ^{with an} on average of 63.0 per cent land under irrigation, leaving the entire holdings uncropped in the zaid season.

The average intensity of cropping had been worked out to 161.57 per cent which, in general, increased with the increase

in the size of farms upto 2-3 hectare size group after which it declined. The increased intensity of cropping on larger farms was associated with higher investment and higher percentage area under irrigation.

The analysis of relationship between cropping pattern, size of farm and net farm income showed that there had been a positive and significant correlation between the farm size, cropping intensity, percentage area under high yielding varieties of crops, percentage area under cash crops and per hectare net income. With the increase in the farm size, intensity of cropping percentage area under high yielding crop varieties and percentage area under cash crops, there had been a significant rise in per hectare net income.

In regard to economics of growing individual crops under the present level of technology, the sugarcane gave the highest net return of Rs. 2,315.27 followed by high yielding wheat (Rs. 1,075.69), paddy high yielding (Rs. 980.72) and barley (Rs. 934.54). The average net returns from pea, wheat local, maize and paddy local came to Rs. 661.16, 467.81, 476.38 and Rs. 437.08, respectively. The high yielding varieties of paddy and wheat yielded much higher net returns as compared to their local varieties because of relatively much higher output.

The average input per hectare was also highest in sugarcane, being Rs. 3,100.41 per hectare followed by wheat high yielding (Rs.1,768.56), wheat local (Rs. 1,386.03) and paddy high yielding (Rs. 1,309.53). The average input per hectare for barley, maize, paddy local and pea came to Rs. 1,289.48, 1,114.36, 1,102.18 and Rs. 933.06, respectively.

The output per hectare, on an average, was maximum in

sugarcane, being Rs. 5,415.68 followed by wheat high yielding (Rs. 2,844.25), paddy high yielding (Rs. 2,290.25), barley (Rs. 2,224.02), wheat local (Rs. 1,853.84), pea (Rs. 1,594.22), maize (Rs. 1,590.74) and paddy local (Rs. 1,539.26).

The yield of main product per hectare, on an average, came to 27.26 and 16.13 quintals for high yielding and local paddy 28.16 and 16.34 quintals for wheat high yielding and local, 433.25 quintals for sugarcane, 10.84 quintals for pea, 14.34 quintals for barley and 16.92 quintals for maize.

The values of output, net income and yield per hectare practically for all crops, in general, were higher on larger farms mainly because of higher investment made by the farmers of larger size groups on cash inputs like manures and fertilizers, irrigation, hired labour etc.

A comparative study of high yielding and local varieties of paddy and wheat showed that the high yielding varieties of paddy yielded an additional net income of Rs. 549.64 and additional output of Rs. 750.99 with an additional input of Rs. 207.35 per hectare. Similarly, high yielding variety of wheat gave an additional output and net income of Rs.990.41 and Rs. 607.88 per hectare, respectively, with an additional expenditure of Rs. 382.52. The additional input, output and net income were, in general, higher on larger farms. The higher additional input on larger farms was responsible for higher additional output and net income on these farms. Thus, it may be said that the high yielding varieties of paddy and wheat are much more remunerative than their local varieties.

The cost of production per quintal of main product of

—————>local and high yielding paddy, on an average, came to 52.98 and Rs. 42.31, of high yielding wheat and local wheat Rs. 47.26 and Rs. 56.82, respectively, of sugarcane Rs.7.16, of pea Rs. 79.01, barley Rs. 66.88 and maize Rs. 51.84. The input-output ratio, on an average, came to 1:1.43 for maize, 1:1.40 for paddy local, 1:1.75 for paddy high yielding, 1:1.34 for wheat local, 1:1.61 for wheat high yielding, 1:1.75 for sugarcane, 1:1.71 for pea and 1:1.72 for barley.

The analysis of contribution made by various crops to the total value of crop output depicted that wheat made the highest contribution of 31.60 per cent (23.54 per cent high yielding wheat and 8.06 per cent local wheat) followed by paddy 21.54 per cent (13.56 per cent high yielding paddy and 7.98 per cent local paddy), sugarcane (18.60 per cent) and maize (17.46 per cent) to the total value of crop output. The contribution made by barley and pea to the total value of crop output was only 6.37 and 2.14 per cent, respectively.

The size groupwise comparison showed that the percentage contribution to the total value of crop output in case of maize, barley and pea was higher on the smaller size group (0-1 hectare) and declined with the rise in the size of farms because of relatively higher percentage area under these crops on small farms. As against this situation, the percentage contribution to the total crop output made by crops like paddy (local + high yielding), wheat (local + high yielding) and sugarcane tended to increase with the increase in the size of holdings because of the fact that these crops occupied relatively higher percentage area on large farms.

An analysis of economics of various crop rotations revealed that, on an average, the highest net return of Rs.2056.41 per hectare was received from high yielding paddy-wheat high yielding followed by maize- high yielding wheat (Rs.1552.07) and paddy local - barley (Rs. 1371.62). The lowest returns was received from paddy local - pea being Rs. 1098.24 per hectare. The higher returns from high yielding varieties of paddy and wheat resulted into higher net returns to crop rotations where these crops were included.

An analysis of the livestock enterprise bringforth the following facts :

The average yield per cow/lactation came to 844.93 litres. An average net income of Rs. 571.08 was received from a cow during a lactation. The yield and net income per cow, in general, were higher on larger farms because they maintained relatively good breeds of cows and had made higher investment in concentrates etc. On an average, the cost of production of cow milk came to Rs. 132 per litre. The average input-output ratio came to 1:1.51.

In case of she buffaloes, a net income of Rs. 985.16 per lactation per she buffalo was received. A she-buffalo, on an average, gave an yield of 1007.54 litres of milk per lactation. The average net maintenance cost of a she-buffalo was worked out to Rs. 1081.81 during a lactation. The average cost of production of milk per litre came to Rs. 1.27. The average input-output ratio was worked out to 1:1.77.

A comparative economic analysis of cow and she-buffalo milk production reveals that the she-buffalo yielded higher returns than the cow during a lactation period because of

relatively higher milk yield. Though the net maintenance cost per she-buffalo was higher than a cow, the cost of production of milk per litre was low in case of she-buffalo because of much higher yield of milk.

The cost of production of milk per litre in case of cow as well as she-buffalo tended to decrease with the decrease in the size of farms while a reverse trend was noticed in case of input-output ratio. These trends were associated with the good breeds of milch animals maintained by the large sized farmers on one hand and better feeding by them on the other which resulted into higher yield of milk per milch animal as compared to their net maintenance cost.

An economic analysis of farm business revealed that a net income of Rs. 4695.36 per farm was received from crops, as a whole, ranging from Rs. 426.65 on the lowest size group to Rs. 6446.65 on the largest one. The values of input, output, net income, family labour income and farm business income tended to increase with the increase in the size of operational holdings because of larger size of farm business. On an average, the respective values per farm came to Rs. 7890.46, 12585.82, 4695.36, 5541.56 and Rs. 5761.06. On per hectare basis, the overall average values of input, output, net income, family labour income and farm business income were worked out to Rs. 2310.29, 3666.32, 1356.03, 1618.48 and Rs. 1682.50, respectively, on the sample farms. The per hectare values of input, output, net income, family labour income and farm business income, in general, showed a rising trend with the increase in the size of farms except for the highest size group (3 and above hectare) where the magnitude of these values had declined. These rises were associated with

better availability of irrigation water, higher investment on cash inputs like high yielding varieties ^{seeds}, fertilizers, plant protection measures, hired labour etc. and higher intensity of cropping ^{on} of larger farms.

The analysis of individual cost revealed that the human labour cost accounted for the highest percentage, being 24.58 to the total cost followed by bullock labour- 16.79 per cent (keeping rental value of land constant), manures and fertilizers (12.60 per cent), seed (9.59 per cent) and irrigation (7.59 per cent).

The rental value of land has been estimated on the basis of prevailing rates in the study area. On an average, it was worked out to Rs. 504.26 per hectare. Its share in total cost came to 21.83 per cent. The overhead charges mainly included charges on account of depreciation, repairs and interest. This item, on an average, accounted for about 6.60 per cent to the total cost of cultivation.

The milk production business, as a whole, when analysed separately revealed that the milk production, on an average, yielded a net income of Rs. 1103.25 per farm with an average cost of Rs. 1658.23 and gave ^{an} average output of Rs. 2761.48. The average values of family labour income and farm business income came to Rs. 1219.30 and Rs. 1255.89 per farm, respectively. These values, in general, showed an increasing trend with the increase in the size of farms mainly because of the fact that higher number of livestock per farm were maintained on larger farms. The average input-output ratio was worked out to 1:1.66 which rose from 1:1.50 on the smallest size group to 1:1.68 on the largest one because of relatively higher output per milch animal

on larger farms. On per hectare basis, the average values of net income, input, output, family labour income and farm business income were worked out to Rs. 341.22, 533.36, 874.58, 385.40 and Rs. 396.97, respectively from milk production. As against per farm basis, these values ^{on per hectare basis} tended to decline with the rise in the farm size mainly because the farmers of larger size group did not maintained the number of milch animal in proportion to their cultivated area.

An economic analysis of combined crop + milk production on farms, as a whole, revealed that, on an average, a net income of Rs. 5798.61 per farm was received with an average input of Rs. 9548.69 and output of Rs. 15347.30 per farm. The average values of family labour income and farm business income were worked out to Rs. 6781.33 and Rs. 7016.96 per farm, respectively. These values, in general, tended to increase with the increase in the size of farms mainly because of larger size of farm business in respect of both crop and milk production on larger farms. On per hectare basis, the average values of input, output, net income, family labour income and farm business income came to Rs. 2843.65, 4540.90, 1697.25, 2003.88 and Rs.2079.36 , respectively. The average input-output ratio was worked out to 1:1.60 which showed an increasing trend with the increase in the size of farms because of relatively higher output received on larger farms.

The percentage contribution to total output and input from crop and milk enterprises came to 80.52 and 19.48 in case of output and 81.15 and 18.85 per cent, respectively, in case of total input. The percentage contribution made by crop production to total values of output and input increases with the increase

in the size of farms while that of milk production decreases with the increase in the size of farms mainly because the farmers of small size group maintained ^{larger} number of milch animals as compared to their size of farms.

In regard to utilization of human labour on crop and milk production, it was observed that the per farm average utilization of human labour units came to 5224 hours. It was 3894 units on crop production, 378 on maintenance of drought cattle and 952 on ^wkeeping of milch animal. On per hectare basis, the total utilization of labour units stood at 1574.02 units out of which 1142 units were utilized on crop production, 124 on maintenance of drought cattle and 307 units on upkeep of milch animals. In terms of percentage, on an average, 72.56, 7.91 and 19.53 per cent of the total labour utilized were used in crop production, maintenance of drought cattle and upkeep of milch animals, respectively. The utilization of family and hired labour showed that out of an average 5224 hours utilization of human labour per farm, the family labour accounted for 3096.20 hours and hired labour 2127.80 hours. Both of these figure showed an increasing trend with the increase in the size of holding because of the larger size of farm business. Of the total average utilization of 1574 hours per hectare, family labour contributed for 1017.26 hours, being 64.63 per cent and that of hired labour 556.76 hours accounted for 35.37 per cent of the total labour utilization per hectare. The percentage share of family labour to total labour used in crop production declined from 85.10 to 40.12 from smallest size group to largest size group with an average of 51.48 only. The utilization of family labour was ^{only} 59.71 per cent to the total

availability of family labour. About 40.0 per cent of the available family labour could not be utilized. The per farm utilization of family labour to its total availability varied from 23.26 per cent on the smallest size group to 67.23 per cent on the largest one.

The average utilization of bullock labour hours per farm per hectare came to 865.09 and 256.77 hours, respectively, in a year. It varied from 124.20 hours per farm on the smallest size group to 1188.54 hours per farm on the largest one. On an average, with a total availability of 3684.65 bullock labour hours per farm, only 865.09 hours were utilized leaving 2819.56 hours of bullock labour ^{was} utilized during one year.

The maintenance cost per year of a pair of bullock, on an average, came to Rs. 1191.38. It tended to increase from Rs. 969.61 on the 0-1 hectare size group to Rs. 1254.40 in the highest size group. On overall basis, fodder accounted for 56.15 per cent to the total maintenance cost. The fraction of total cost on fodder gradually declined from 60.42 per cent on smallest size group to 54.54 per cent on the highest one. The ^{next} largest item was overhead cost claiming about 15.38 per cent to the total cost which when expressed as a fraction of total cost steadily increased from 14.65 per cent on 2-3 hectare size group to 15.88 per cent on the highest size group. Concentrates, on the whole, accounted for 14.06 per cent to the total cost. It rose from 9.44 per cent in the smallest size group to 15.50 per cent in the highest one. Labour charges on upkeep of drought cattle varied from 11.06 per cent on 1-2 hectare size group to 9.88 per cent on the highest one to the total maintenance cost

of per pair of bullock.

The analysis of different measures of farm efficiency like return per labour day, percentage return to capital investment capital turn over ratio and test ratios etc. revealed that the return per labour day of family member increased with the increase in the size of holding. It rose from Rs.8.48 on the smallest size group to Rs. 18.92 on the largest one. The lower family labour earning per day on small farms was due to the small size of holdings.

On an average, the percentage return to capital investment came to 13.08. In general, it increased with the increase in the size of holdings upto 2-3 hectare size group, above which it declined. The average capital turnover was 27.75 per cent which varied from 27.31 per cent on the smallest size group to 30.00 per cent on 2-3 hectare size group of farms. The average capital turnover ratio came to 0.28 ranging from 0.27 on smallest size group to 0.30 on 2-3 hectare size group indicating thereby that the cultivators of 2-3 hectare size group were operating farming business more profitably than the farmers of other size groups. The gross ratio, fixed ratio and operating ratio, on an average, were worked out to 0.63, 0.25 and 0.24, respectively. These ratios in general, showed declining trend with the increase in the size of farms showing that the expenses to per rupee of revenue obtained declined as the size of holdings increased.

The analysis of production efficiency under different size group of farms revealed the fact that the farms of 2-3 hectare size group were found to be optimally in the use of different resources thereby had the highest net return of Rs. 2016.78 per hectare as compared to the farms of other size

groups. The highest return per hectare on this size group was associated with ^{the} highest cropping intensity of 168.72 per cent, area under high yielding varieties-33.88 per cent, area under cash crops - 7.91 per cent and area under irrigation - 67.62 per cent. The utilization of human and bullock labour per hectare was also highest on farms of this size group being 216.28 and 34.47 days per hectare, respectively. Likewise, the return per family labour day, percentage return to capital and return to capital turnover were also highest on these farms, being 15.51, 14.81 and 30.00, respectively.

To estimate the marginal value product of input factors at their geometric mean, production function analysis was made. Only Cobb-Douglas type of production function was used for the regression analysis as it gave the best fit. To test the statistical significance, 't' test was used.

The production function analysis for business as a whole (crop + milk production combined), for crop production, as a whole only and for milk production, as a whole, only, stated as a general proposition for farmers in the area that ways and means should be found to push in and augment the use in production process of all the variables listed in the final functions. More specially, in order of importance the manures and fertilizers, irrigation, seed (high yielding) and concentrates for feeding milch animal has to be encouraged.

The similar production function analysis was carried out for important crops. The analysis of marginal value products relative to factor costs, clearly indicated that under a situation of general scarcity of working funds, it pays relatively much

more for every rupee invested in high yielding variety of paddy (fertilizer, irrigation and seed), in high yielding wheat (irrigation followed by manures and fertilizers and seed) and in sugarcane manures and fertilizers followed by irrigation. These guidelines are very much needed to be followed in optimizing farm business in the study area.

The importance of livestock enterprise can not be over ruled in raising the level of income of the sample farms. Such a proposition is particularly true of small farms where the land base is small, hence greater emphasis is needed to improve the livestock sector through better feeding and breeding which in turn would call for the reservation of a portion of the farm land for fodder crops to establish a near perfect relationship between crop and livestock enterprises.

The level of employment of family labour which is a very important factor of production will have to be raised to minimise the extent of unemployment by transferring the surplus labour on the farms to non-farm sector through the development of a net work of cottage industries, subsidiary to agriculture like oil crushing, paddy hulling, cane crushing, rope and basket making etc.

The Governmental and extension agencies have a special responsibility to see that the adoption of modern farm technology by the farmers may not widen the gap among the incomes of small and large farmers, because large farmers have the strategic position among the farming community. The economic benefits provided by the Government through subsidy, grants and the like should go to small farmers in particular to raise their level of income.