



S U M M A R Y A N D I M P L I C A T I O N S

The study entitled "Farm Mechanisation and Social Change in Rural Haryana", carried out in 1982, had three objectives : (1) to study the nature and extent of farm mechanisation; (2) to examine the socio-cultural and economic impact of farm mechanisation; and (3) to suggest a suitable strategy for rural development. Depending upon the number of tractors, all the districts of Haryana were grouped into high, low and medium tractor-concentration zones and one district was randomly selected from each zone, the respective districts were : Karnal, Bhiwani and Hissar. One block was randomly selected from each district and one village with highest tractor concentration was purposely selected from each block. The village, thus, selected were : Nachharauli (Karnal), Chang (Bhiwani) and Balsanand (Hissar). The sample constituted 370 respondents : 90 tractor-owners, 150 bullock-owners and 130 non-owners. Cross-sectional design was followed for the study.

The analysis of socio-economic profile indicated that over two-thirds of the respondents were in the middle-age group of 26-50 years.

A greater proportion of tractor-owners as compared to bullock-owners and non-owners were represented among highest age group. An overwhelming majority of the selected respondents belonged to higher caste group in all the zones and little over two-fifths figured in the top 25 per cent in terms of socio-economic status. Most respondents had agriculture as main occupation and majority of them own more than 10 acres of land each. The dominant pattern of the family system was joint. About half of the respondents were illiterate. On an average 3 out of 4 households have at least one member represented in village institutions. The media exposure in most cases was poor; so was true of extension and urban exposure. Though landholding was small, the position of respondents in respect of socio-economic conditions was relatively better in Zone-I than in remaining zones. It appears that the relative difference in development of the respective districts was reflected at the village level.

There were seven makes of tractors which are in use, but only Escort and Eisher were more popular (66.7%). Usually, tractor of higher horse power was purchased irrespective of the land size. Tractor-owners generally have higher landholding than bullock-owners and non-owners. The number of farm machinery owned and used by farmers tended to increase with farm size. Further, tractor-owners had larger number of other farm machinery than did other farming groups. The tractor was purchased mostly with the help of bank loan (61.1%). The proportion of farmers installing tubewell with bank loan was lower than that for tractor (49.4%); among such farmers there were more bullock-owners (51.1%) than tractor-owners (47.1%). Non-owners, in general, depend upon others for different machinery.

The difficulties faced more frequently by tractor-owners were in respect of its maintenance (64.4%) followed by repair (54.4%) and operation (14.4%). None of them received any training for the purpose. The tractor is being used also for non-agricultural and social purposes, most common of which are mobilisation of people for political purposes (78.9%) and transporting of goods and people from one place to another for different objectives.

As has been observed at State and district levels, mechanisation was found to be associated with irrigation, cropping pattern and intensity, input use and crop yields. The area under irrigation, cropping intensity, high yielding varieties and fertilizer use was found to be higher on tractorised farms than that on bullock operated farms and non-owner farms. In general, higher average yields of various crops were obtained on tractorised farms followed by bullock operated farms and non-owner farms.

Contrary to the expectation, the use of hired labour, both permanent and casual was higher on tractorised farms than bullock operated farms. Non-owners hardly use hired labour for their own purpose. Rather, they hire out labour during slack season for supplementing their family income. Further, use of female casual labour also registered an upward trend. The use of animal power however declined sharply on tractorised farms.

One of the functions of mechanisation is to increase efficiency of the farmer and productivity of the farms and thereby farm production and incomes. It was noted that upper income categories were represented more by tractor-owners as compared to bullock-owners and non-owners.

Some trend was noted in respect of material possessions and distribution of sophisticated and more valued household articles which tend to make the living more comfortable and pleasant.

The association of mechanisation and socio-economic status indicated that a greater proportion of tractor-owners belonged to higher caste followed by non-owners and bullock-owners. In terms of socio-economic position in the community, more tractor-owners than bullock-owners and non-owners place themselves on top 25 per cent. As regards caste relations, tractor-owners were more strongly against untouchability than their counterparts ($F \angle .01$), and more liberal in preferred relationship with other castes of different status. However, resentment against intercaste marriages continues to be strong. The dependence on servicing castes showed a decline more in case of tractor-owners than bullock-owners and non-owners.

Among different occupations, farming continues to be perceived as prestigious occupation followed by service. It is considered prestigious more by tractor-owners than by bullock-owners and non-owners, service being more prestigious for the later. It is in the same order that respondents were against any change in their present occupation ($P \angle .01$) and also unhesitant about taking up high income generating occupations traditionally associated with lower castes ($P \angle .01$). Among the preferred occupations for the children, service has received the priority followed by farming and business. While preference for service was more amongst non-owners followed by bullock-owners and tractor-owners, farming was favoured more by tractor-owners followed by bullock-owners and non-owners. Likewise, city was preferred as a location for children's

occupation more by tractor-owners followed by non-owners and bullock-owners. In practice, average number of persons working outside the village particularly in cities was higher in case of bullock-owners followed by tractor-owners and non-owners.

The joint family is still a dominant pattern. In comparison to bullock-owners and non-owners, more of the tractor-owners belong to joint family and their average family size was larger. In practice, however, more of them favoured nuclear family ($T \angle .05$). Further, most of the traditional roles associated with females and children were withdrawn more in case of tractor-owners than bullock-owners and non-owners. Similarly, the traditional role of adult males were affected more amongst tractor-owners than other farming groups. Same trend was observed regarding their attitude towards women taking up employment ($T \angle .01$).

In the domain of marriage institution, more of tractor-owners than other farming groups were in favour of giving freedom to the party concerned in the selection of marriage partners and assigning importance to achieved factors like education over ascribed ones like caste.

The close association between farm mechanisation and health and hygienic practices is evident from the fact that more of the tractor-owners than bullock-owners and non-owners found regular in following hygienic practices, consulted trained medical practitioners ($P \angle .01$), favoured limited children in the family ($T \angle .01$) as also use of family planning practices ($P \angle .01$) and had knowledge about and adopted family planning themselves ($P \angle .05$). Further, the intake of nutritive foods was relatively higher among tractor-owners than other farming group ($T \angle .01$).

however, in respect of food habits, more non-owners were non-vegetarian than tractor-owners and bullock-owners.

The literacy rate of the respondents and the average schooling period of the highest educated person in the family were found to be higher in case of tractor-owners compared to bullock-owners and non-owners. In the same order, respondents expressed their favour for education of boys as also of girls ($P \leq .01$) and for educating them at higher levels and outside the village ($P \leq .01$).

In respect of external exposure also, tractor-owners had an edge over bullock-owners and non-owners : they have more frequent contacts with extension personnel and urban centres and are more exposed to mass media; over the years they had perceived more increase in the above respect ($P \leq .01$). The positions of power in village institutions are also held more by tractor owning households than other farming groups. Same holds true of people approaching them for seeking advice ($P \leq .01$) and contacts with leaders operating at different levels ($P \leq .01$).

Change in attitudes and values is manifested in the conception of good life and agreement/disagreements towards traditional institutions and non-scientific beliefs. While the three farming groups attach more or less same value to the things they aspire most i.e. good income, education, standard of living etc., more of tractor-owners expressed disagreement than bullock-owners and non-owners regarding traditional institutions and non-scientific beliefs; their modernity-rationality score was highest (68.4%) followed by bullock-owners (61.5%) and non-owners (53.7%).

More or less similar trend was noticed in different zones with respect to most of the factors considered. However, some differences exist between zones, though not consistent. With respect to average land holding, Zone-I was at the bottom (6.9 acres), the average holding size being highest in Zone-II (22.2 acres) followed by Zone-III (9.4). The use of high yielding varieties and fertilizers was highest in Zone-I followed by Zone-III and II. However, Zone-II follows Zone-I in respect of per cent of cultivated area irrigated, cropping intensity, and per cent area covered by foodgrain crops. These variations, combined with differences in other factors are reflected in inter-zone differences with regard to socio-economic development and change.

The broad conclusions which emerged from the study are : (1) farm mechanisation and technological development in agriculture tended to affect each other; (2) farm mechanisation directly and derivatively exerts varying influence on socio-cultural and economic life of the people as manifested in agricultural organisation, household income, standard of living, occupation, education, external exposure, values and attitudes and the like, and (3) effects of farm mechanisation on different zones and on different farming groups tend to vary relative to host of agro-climatic, socio-cultural and economic factors.

Implications :

The study has clearly shown that farm mechanisation has worked as one of the important forces in bringing about widespread changes in social and economic life of rural people : production and income, labour and employment; traditional relations and role pattern; group life and

leadership, values and attitudes. While all farmers with or without mechanisation have experienced these changes in varying degree, the intensity was greater among mechanised farmers than that among non-mechanised ones. Further, the development of the region as well as several other socio-cultural factors, many of which may be the consequences of farm mechanisation itself, have also intervened in varying degrees. Thus, it is difficult to ascertain the degree to which these changes have been caused by farm mechanisation alone. Nevertheless, role of farm mechanisation as one of the factors was evident and this has several implications for future development policy and research.

The study indicated that so far big farmers were able to derive greater benefits from farm mechanisation than smaller ones. Serious efforts therefore are needed to make the mechanical innovations scale-neutral so that small can also benefit from seed-cum-fertilizer revolution. For this purpose custom service may be thought as one of the solutions. Till this is done, some arrangement for joint or co-operative ownership of costly machines may be worked out. Wherever farmers are not in a position to take advantages of such services owing to location or absence of levelling, necessary facilities needed to be provided. In this respect different alternatives may be examined to run custom service and ownership of costly machines. Institutional constraints, if any, may be removed such as non-availability of credit, technical guidance etc. Many of the small farm operators neither have bullocks nor machines. They may be encouraged to have them through credit facilities or custom hiring and reduce dependence on others. Commercial banks may also be made more responsive to the needs of such farmers.

Further, small farmers should be given preference in availing of the facilities to derive benefits from secondary effects of mechanisation such as

those accruing from allied industries related to repair and maintenance of machines, processing and marketing of agricultural products etc.

For deriving economic benefits from mechanisation, there exist certain constraints like fragmentation of holdings and insecurity of tenancy. Effective implementation of land reforms and similar measures will help in the spread of mechanisation. The study suggests that due to differential effects on production and incomes of different zones and on different groups within the same zone, existing inequalities between regions and groups are likely to be accentuated and in this process small and marginal farmers, tenants and agricultural labourers are likely to be adversely affected by the technological development and farm mechanisation. Owing to poor resource base, weak bargaining power and low information and communication level, they will hardly be able to derive benefits from secondary or tertiary effects of farm mechanisation and other development programmes.

In case farm mechanisation displaces labour at certain point, it would result in the decline of wages of the poorer sections. It is due to these and other factors, that weaker sections need to be helped to own and share machines and also to offer custom services to others for their effective utilization. Besides, complementary enterprises like dairying, repairing of machines etc. may be encouraged to provide additional employment opportunities. The gap created by declining draft animals may be effectively exploited for dairying purposes.

The traditional and jajmani relations are also undergoing change and assuming more and more contractual character. The services offered by various servicing castes are either not required or are performed by machines.

In absence of suitable source of livelihood, they are compelled to join labour force in agriculture or to migrate to cities. Their economic position is getting further deteriorated. This situation also calls for development of secondary and tertiary sectors.

So far mechanisation has not made much dent in labour displacement particularly the hired one. But if in the long run, when many more operations would be mechanised, labour displacement occurs, serious efforts may be initiated to develop non-farm sector systematically for absorption of surplus and additional labour force. It is well known that beyond a certain extent, agricultural sector can no longer afford to bear the burden of additional labour force resulting from rapid population growth. One of the possible areas may be the development of small farm machinery and equipment which can be operated by small farmers manually or with bullock power. This alone has vast scope for rural industrialization and better employment.

Farmers are experiencing serious problems of repair and maintenance of farm machines particularly tractors. None of them have undergone any training in this regard. Facilities are also not locally available. Hence, some steps need to be taken to meet the existing problem and growing challenge resulting from increasing use of machines. This may include offering relevant training facility at Farmers Training Centres and Agro-Service Centres, a provision of repair and service facilities by Agro Industries Units, encouraging interested young farmers to start their own workshops after some essential training and provision of financial assistance from Government or Banks. The training should focus besides the above, size and horse power by tractor most suited to land size and farm needs.

In many cases machines used by farmers are larger in size than are required. Unless these are effectively used, or their use is diversified, they may be uneconomic. Several non-agricultural uses of tractor have been reported. Hence, farmers may be encouraged to explore various uses and if possible efforts in this direction may be coordinated so as to extend benefits of farm mechanisation to small farmers also.

An overwhelming preference expressed by respondents for non-farm occupations for the children is a happy indicator in the sense that the existing lands cannot afford the pressure of population beyond a certain limit and that proportion of rural and agricultural population in the country remained more or less stagnant for several decades. Rather, this process needs to be further encouraged by developing non-agricultural, secondary and tertiary sectors.

Though education and communication have influenced all the categories of farmers, but relatively greater exposure of tractor-owners calls for determined efforts to focus attention in extension work and mass media programmes on non-mechanised groups also for the speedy improvement in the technology used as also for increasing their income. The higher education in these sections would also encourage occupational shift from agriculture to non-agricultural sections of the economy. Moreover, difference noted in the use of improved inputs and thereby in production and incomes can also be minimised through such an approach.

Though mechanisation did not affect family size or joint families to an appreciable extent, attitudinal change in this regard is reflected in the preferences for small family norm and family planning. This psychological change may be effectively utilised for making a dent in family planning programme and population control.

The increase in production and income and simultaneous investment in technological improvement and in sophisticated and valued goals such as education, living standard etc. provide some indications of the direction toward which policies pertaining to development, savings and investment may be further pursued. The promotion of investment in agriculture and allied sectors is likely to help in achieving both growth and justice. The findings further suggests that with the withdrawal of female members from active farm work, there lies a greater opportunity to involve this neglected section in the task of their improvement. This may be through promotion of education and implementation of programmes of women and child welfare, health, nutrition and family planning etc. Attitude towards women are also undergoing change as reflected in willingness of the people to educate them and allow them to join employment.

In addition to the above, this study has certain implications for future researches in the area. As has been noted, there are several elements involved in farm mechanisation and each has different implications for society and economy. There is a need to carry out a series of systematic investigations about the socio-economic consequences, both direct as well as derivative, of each of these elements. This is necessary in order to evolve a sound policy of farm mechanisation that can ensure both growth and justice.

While attempting to study socio-economic consequences of farm mechanisation, a wide spectrum is yet to be investigated. The stress has so far remained confined more or less to production and income gains, labour and employment and other economic issues. This calls for intensive studies of community behaviour, caste, family, religion, values and attitudes and

In order to be able to draw some firm conclusions, which are yet to emerge, about the likely effects of farm mechanisation on labour and employment and income distribution, a series of studies both at macro and micro levels need to be initiated covering different regions and groups.

In order to bring to the fore varied influences of farm mechanisation, research focus needs to be interdisciplinary. The compatibility-technological, economic and cultural-of existing machines and those which are being developed or refined is required to be investigated in different conditions before rejecting or adopting them.

In addition to the impact studies, depth studies in different regions are required to be initiated to investigate conditions—social, economical or otherwise - in which mechanisation is likely to achieve greater success without undermining distributive justice and causing negative effects.

Lastly, a systematic research venture needs to be undertaken to find out how development in one technological area affects the development of the other and which one assumes priority over the other. Likewise, relationship between development of a region and of its constituent units offers fascinating area of investigation.