

CHAPTER VIII

SUMMARY

Technological change in this study was considered as a change from traditional farming to a production syndrome encompassing the use of HYV, chemical fertilizers, insecticides and non-traditional farm management techniques on the one hand and use of modern irrigation equipment and machinery like tractors on the other. Though, the new agricultural development strategy has permitted easing of one critical development constraint - technology - atleast for some areas, farms and crops, warnings have already been voiced as to the possible social and political repercussions that could follow. Of the problems created by the recent technological change in farming, most important from the stand point of economic and political stability are related to equity, welfare and employment effects.

The study was directed at examining the impact of recent technological change on the income distribution pattern between different farm size groups and the demand for farm labour input. A representative (random) sample of 115 farmers operating at different levels of technology was selected from six villages of Udaipur and Chittorgarh districts of Rajasthan.

The impact of HYV programme was studied by comparing the participants (farms with atleast 50 per cent of the area under maize and wheat sown with HYV) with non-participants. Effect of mechanization was studied by identifying three mechanization levels viz., tractor operated, pump operated and non-mechanized farms. Farms were further categorised into small (below 5 acres), medium (5 to 15 acres) and large (above 15 acres). The results are based on the study of farming operations and business analysis of these farms for the year 1971-72. Results on the comparative position of farms of different size groups operating at different technological levels were presented in Chapters V to VII to show contrast between groups of technologically advanced farms and traditional ones. These provide insights into the impact technological change has on farm sector in general and farm employment and income distribution in particular.

CROP MIX INVESTMENT AND COST STRUCTURE

Participant farms have higher cropping intensity compared to non-participants in each size group and mechanization level. Tractor operated farms have higher cropping intensity compared to other farms. Cropping intensity decreases with the increase in farm size except on tractor operated farms. The HYV of maize and wheat have substituted for only other cereals and existing varieties of these crops. Tractorized farms have higher relative area under food crops and HYV compared to other farms.

The introduction of HYV has lead to higher demand for fertilizers, insecticides and bullock labour. Mechanization has created conditions for higher use of fertilizers but has displaced bullock labour input. Participant farms have relatively higher irrigated area compared to non-participants. Machinery investment is relatively higher on participant compared to non-participant and on large compared to small farms. Participants, particularly non-mechanized farms have higher relative investment in irrigation compared to non-participants. Total and per acre value of capital stock (investment) is higher on participant compared to non-participant farms.

All the forms of costs studied viz., conventional, non-conventional, variable, fixed, mechanical and non-mechanical (expressed on per acre basis) were higher on participant farms. Higher relative levels of non-conventional, variable and mechanical inputs on participant farms indicate that the expansion of HYV programme will lead to higher demand, in addition to fertilizers and insecticides, for pumping equipment, fuel, oil, electricity and tractors on the one hand and cash/kind credit for their procurement on the other. Pump operated farms have higher non-conventional inputs per acre compared to non-mechanized farms and tractor operated farms have higher non-conventional inputs per acre compared to others.

INCOME DISTRIBUTION

The results presented in Chapter VI reveal that the proportion of farmers participating in the HYV programme is higher in small (65 per cent) compared to medium (59 per cent) and large (42 per cent) size group. The proportion of cropped area devoted to HYV was also highest on small (45 per cent) farms and lowest on medium (27 per cent) farms. The large farms had 35 per cent area under HYV. The yield per acre for the HYV of wheat was higher on large compared to medium and small farms.

The difference in the net farm income between participants and non-participants was 132 per cent for small, 38 per cent for medium and 186 per cent for large size group. The difference in the net farm incomes between participants and non-participants was 55 per cent for non-mechanized and 97 per cent for pump operated farms. This difference between tractor operated participant and non-mechanized non-participant farms was more than 200 per cent. The income differential between participant and non-participant farms was accentuated by tractorization of some participant farms. Since tractorization is more on large farms, it has increased the disparity in the incomes of large and other farms.

Total 'net farm income' of all farms increased by 46.3 per cent from 'pre-technological change' situation to 'post technological change' situation. Between these two situations, share of small size group increased from 22.6

per cent to 25.3 per cent, of large size group increased from 22.9 per cent to 26.1 per cent and the share of medium size group declined from 54.5 per cent to 48.6 per cent. Total family labour income increased by 107 per cent from 'pre-technological change' situation to 'post technological change' situation. The shares of the small and large size groups increased from 14.2 per cent and 18.1 per cent to 24.0 and 26.7 per cent respectively, but for medium size group, it declined from 67.7 per cent to 49.3 per cent. While absolute levels of income of all the size groups have increased, the relative incomes have increased for only the large and small size groups. For medium size farms, it has declined. Small farms, although they suffered from inadequacy of resources and low risk bearing capacity, did not lag much as was feared initially. The disparity in the incomes of large farms and others has increased and between medium and small farms has reduced.

As far as sharing of additional benefits of the new technology is concerned, it was found that, as groups, all have shared equal benefits, but on per farm basis, large farmers have gained the most and small farmers the least.

Ratio of hired labour wage bill to gross output revealed that HYV programme, coupled with the existing extent of mechanisation, has provided more incomes and employment to the hired labourers.

Assuming Rs.37.50 per head per month as the minimum consumption requirements and a family of five members, it was observed that all farms below 6.65 acres are non-viable. The farms above 4 acres (more exactly 3.85 acres) can be made viable if 33 per cent of their cropped area is devoted to HYV. However, farms below 4 acres will not become viable even if they devote 33 per cent of their area to HYV.

FARM EMPLOYMENT

The results presented in Chapter VII reveal that participant farms employ 52.8 per cent more labour compared to non-participants. The difference was highest (110 per cent) on large farms. When examined across mechanization levels, it was found that the introduction of HYV has increased labour use by 36.3 per cent to 55.0 per cent and for given levels of participation, two discrete levels of mechanization have decreased labour use by 18.0 per cent to 36.8 per cent, the extent of increase/decrease depending upon the level of mechanization and participation in the HYV programme, initial level of labour employment and the magnitude of non-negative change in the cropping intensity.

Use of pumps decreases labour employment by 20 per cent, but if it is accompanied by 29 per cent area under HYV and 16.5 per cent increase in the cropping intensity, labour use, actually increases by 23.3 per cent. In the absence of

the change in cropping intensity, labour use increases by only 8.7 per cent.

Tractorization (compared to non-mechanized participants) has decreased labour use by 27.3 per cent even with 15 per cent additional area under HYV and 20 per cent increase in the intensity of cropping. Tractorization (compared to non-mechanized non-participants), accompanied by 50 per cent area under HYV would reduce employment by 13.8 per cent but if, simultaneously, cropping intensity is increased by 35.5 per cent, labour use would be 12.7 per cent more.

On small farms, installation of pumping sets was accompanied by higher area under HYV and increased cropping intensity and thus no reduction in labour employment has occurred. On large farms, pumping sets as well as tractors have not reduced employment on the same grounds. However, on medium farms, both pumping sets and tractors have decreased labour employment. The increases in the HYV area and cropping intensity were not sufficient to offset the negative effect of mechanization on labour employment on these farms.

There has occurred an upward shift in the demand for labour by the HYV and downward shift by the mechanization. However, increase in the cropping intensity and upward effect of HYV were sufficient to offset the downward effect of

mechanization on all farms in general and small and large in particular. The elasticity of demand for labour with respect to wage rate and product price increases when one compares non-participants and participants. Labour demand is more elastic with respect to product price, compared to wage rate at all the technological levels studied.

~~ble~~ Elasticities of labour demand with respect to non-price factors indicate that conventional inputs have no significant effect. Labour demand elasticities with respect to non-conventional inputs are positive and statistically significant for participant non-mechanized farms and all participant group. Elasticities with respect to non-mechanical capital inputs are significantly positive at all technological levels and with respect to mechanical inputs are negative. Family labour demand relations show that HYV area has positive effect on family labour demand and the magnitude is higher on non-participant compared to participant farms. Employment of family labour can considerably be increased by introducing HYV programme on non-participant farms. Machine and canal water use have no significant negative effect on family labour use. Area under HYV has positive significant effect on hired labour demand. Machine and canal water use have no significant effect on hired labour.

The proportion of labour contributed by the hired labour is more on participant compared to non-participant

farms. Similarly, pump operated and tractor operated farms employ relatively more hired labour compared to non-mechanized farms. Proportion of permanent hired labour is highest on tractor operated farms. Pump operated farms employ relatively less permanent labour and more casual labour compared to non-mechanized ones. Thus demand for casual labour increases with both pumping sets and tractors and the demand for permanent labour increases with tractors and decreases with pumping sets.

The HYV programme has reduced and the mechanization has increased the inequality in the seasonal pattern of labour employment. The peak and lean seasons have been shifted and the corresponding levels of employment have been raised.

The shift in the production function from non-participant to participant technology was highly significant. Shift from non-mechanized non-participant (NMNP) to non-mechanized participant (NMP) technology increases the production elasticity of labour. As presented in Table VIII-1 this type of shift is labour using. The relative share of labour and capital - labour factor ratio are changed, as the equilibrium is approached, in favour of labour. The shifts from NMNP to non-participant (NP) and participant (P) technology are labour saving and

relative share of labour and capital-labour factor ratios are changed against labour.

Table VIII-1

Effect of Different Technological Shifts
on Labour Employment (in
the Equilibrium)

| Type of Shift | Labour saving or using | Capital/ labour ratio | Relative share of labour |
|---------------|---------------------------|-----------------------------|--------------------------------|
| NMNP to NMP | Using | falls | rises |
| NMNP to NP | Saving | rises | falls |
| NMNP to P | Saving | rises | falls |