CHAPTER - VII

SUMMARY-CONCLUSIONS, POLICY AND SUGGESTIONS
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SUMMARY CONCLUSIONS AND POLICY SUGGESTIONS

The Chapter VII has been divided into two sections. In the First section major findings are presented and in the Second section policy suggestions are given.

A detailed analysis of both primary and secondary data of farm Mechanisation and productivity differentials has been found out. We have got quite a good number of insights which are presented in the form of major findings in order.

7.1.1. The vast review of the literature reveals that though there is a lot of scope for tractorization in Indian agriculture, the progress achieved in this front has been very slow. This was due to various problems at different levels among Indian farmers. Changing attitude among Indian cultivators and aggressive structures has undoubtedly encouraged cultivators to adopt advanced technology viz., HYVs, fertilizers, pesticides and farm implements.

7.1.2. The farm Mechanisation led to increase in production and productivity. However, unfortunately, they indicate that the animal and human labour are being displaced. The studies failed to explain whether the Mechanisation led to generating employment and income through various other avenues

7.1.3. There is a fast growth of machine power in the country. However, the growth is not uniform as it is concentrated in few states only. Therefore, there is a
necessity to spread the same in all the regions of the country. Hence, in this study an effort is made to understand the growth of machine power in the state of Karnataka.

7.1.4. The farmers' interest in increasing the yield levels and the government's effort to increase farm mechanisation, both at the state and central level led to the growth and development of farm mechanisation in the country. Therefore, an effort is made in the present study, to understand the extent of the adoption of the same in the state of Karnataka and Mandya district. A detailed methodology adopted to take up the present study has been presented in the 3rd chapter.

7.1.5. During 2003, it is very much interesting to observe that Gulbarga division gained a lot. During 1983 the percentage of tractorization was just 13.32 per cent, which has gone up to 20.75 per cent. This may be due to the special attention given to the region over a period of about a decade. This is a welcome trend and further this has to be promoted.

7.1.6. It is interesting to observe that in all the divisions there is a positive growth rate in terms of owning tractors. However, in case of Gulbarga division the growth rate is recorded as 42.60 per cent, which is more than any other region. This is followed by Bangalore division constituting 38.64 per cent. The lowest in terms of growth seems to be the Belgaum division consists of only
15.76 per cent. This tells that there exists regional inequalities in terms of the mechanisation of agriculture and therefore, the government has to balance this and see that there is a kind of uniform growth for overall development of the state’s agriculture sector.

7.1.7. As in the case of the growth of tractors, even in case of power tillers also the growth rate in Gulbarga division is very high constituting about 50 per cent. In case of Belgaum division it is about 37.50 per cent and the least seems to be the Mysore division constituting only 13.81 per cent. This is mainly due to the purchase rate was high in Mysore division in the beginning and over a period of time the same tempo could not be continued.

7.1.8. It is very much heartening to understand that in all the divisions the growth rate of in the number of sugarcane crushers showing a negative sign. That to, the negative growth rate is too high. For example in Bangalore division the growth rate is declining at the rate of 52.40 per cent. This has been followed by the Gulbarga district showing about 27.03. Even in the state as a whole the growth rate is negative, which is about 29 per cent. This may be because of two reasons. First, the sugarcane area is declining at a faster rate or there is further increase in the establishment of sugar factories. The secondary data reveals that there is an increase in the sugar factories in three directions, viz., co-operative sugar factory units, public enterprises and also the private sugar factories. Therefore, the farmers, instead of undergoing heavy harassment of
producing joggery just they are taking the sugarcane to the factories. Therefore, the sugarcane crushers have been declining.

7.1.9. The growth rate has been worked out for all the regions/divisions, which are presented in Table-4.5. As expected the Gulbarga division shows that highest growth rate constituting about 69 per cent. This has been followed by Belgaum division constituting about 50 per cent. The Bangalore division shows the lowest constituting only 8.96 per cent. The low rate of growth in Bangalore and Mysore may be due to the stagnation in terms of technology. One more reason may be in the northern Karnataka the irrigation facilities are provided very recently and therefore, Mechanisation is going on in these areas and therefore, the high rate of growth in these areas.

7.1.10. The Table-4.6 clearly reveals that there is a fast growth of seed-cum fertilizer drillers in the state. Among the divisions, Gulbarga division showed the highest growth constituting about 121 per cent per annum. This is followed by Bangalore division where the growth rate is about 101 per cent. The lowest growth rate seems to be in Mysore division constituting about 60 per cent per annum. If we observe the growth rate of the seed-cum fertilizer drillers, one can realize that the farmers could understand the importance of these equipments and therefore, the fast growth.
7.1.11. Even the growth rate is worked out across the division. In Mysore division the GR is the highest constituting 20.84 per cent. This is followed by Bangalore division where the number of diesel engines grown at the rate of 10.06 per cent. In Belgaum division the GR is negative constituting 3.89 per cent. This clearly reveals that the number of diesel engines in Belgaum and Gulbarga divisions have been declining. It is very difficult to say to what extent this will have impact on the Mechanisation of agriculture because the diesel engines are related Mechanisation, their prevalence was high during 1980’s. However, with the increase in providing irrigation facilities their importance has come down over a period of time.

7.1.12. During 1983 the availability of tractors per lakh ha. was 179 numbers. Over a period of time the number increased and it has reached to 534 tractors per lakh ha. of land showing an increase of about 300 per cent. This reveals that to what extent farm Mechanisation is increasing in the state. Though the tractors are used for various purposes, they are first used for agricultural purposes and its surplus labour has been used for other non-farm activities. In general one can say that purchasing a tractor is economical and therefore, even the marginal and small farmers own them if they can afford to purchase them.

7.1.13. The availability of power tillers has been sharply increased from 1983 to 2003. Power tillers have been increasing at a faster rate like tractors. However, compared to tractors the increase in the number of power tillers is
marginally low. This is mainly because, power tillers have a kind of disadvantage in terms of its structure. Therefore, the growth rate is little lower compared to the tractors.

7.1.14. The density of sugarcane crushers has been decreasing at a very faster rate. The availability of sugarcane crushers was 104 per lakh hectares of gross cropped area in 1983. However, in 2003 we have just 31 sugarcane crushers per lakh hectares of gross cropped area. The spread of sugarcane crushers is unevenly distributed and has been just limitedly used on sugarcane growing areas of the state. This shows a major gap between the requirement and availability of machineries in the state. As discussed already, the decline in sugarcane crushers is due to increase in sugar mills started by private, public enterprises and also through cooperatives.

7.1.15. The spread of sprayers and dusters across the districts is not very impressive. Only a few districts claim larger share of this machineries. Southern districts of the state have a lion share in sprayers and dusters on their operational fields. The increase in the number of sprayers and dusters is about five times which is about 500 per cent from 1983 to 2003.

7.1.16. Diesel engine pump-sets availability per lakh hectare of gross cropped area was 612 in 1983. There is a constant increase in the density of diesel engine pump-sets. The growth is more stable as there is increase from one point of
time to another point of time. In 1983 there were 612 units per lakh ha. of land and this has increased to around 903 in 1987, and they are further increased to 962 by 2003.

7.1.17. The density of electric engine pump-sets have been increasing at a faster rate when compared with other machineries. As compared to 2,046 electric engine pump-sets per lakh hectare of gross cropped area in 1983, we have 6,047 electric engine pump-sets per lakh hectare by 2003. This is mainly because, in case of diesel engines, the price for the diesel is increasing during the liberalization period and therefore, the demand is not increasing at a faster rate. On the other hand the demand for electric pump-sets is increasing due to the governments support for the farmers through various kinds of loans. Therefore, the fast growth in electric pump-sets and this is a welcome trend.

7.1.18. In general we could observe from the analysis that that all the agricultural machineries have been increasing over a period of time, except, the sugarcane crushers. This clearly reveals that there is a growing demand for the agricultural machineries in the state. This is not only a welcome trend, but it has to be appreciated because the state is empowered the farmers to own these equipment. However, one has to estimate the impact of the farm machineries on the increase of production and productivity of the agricultural crops in the state.
7.1.19. The crops like paddy, sugarcane and groundnut have been showing the positive growth rate of 7.66, 22.94 and 6.42 per cent respectively in terms of area. It is interesting to mention here that the crops, which have commercial characters have been showing positive growth and the crops like ragi and jowar, which are stapple crops, are showing the negative growth rate of 3.01 to 5.36 from 1983-84 to 2002-03 respectively. During the liberalization period, there is a greater impetus for the growth of commercial crops like paddy, sugarcane and groundnut. The food grain crops shown decline trend, which is not a healthy trend. However, because of the commercialization of agriculture there is a scope for Mechanisation where the farmers more and more use modern inputs including the farm machineries.

7.1.20. The crops like ragi, jowar, sugarcane and groundnut have shown a high growth rate in the yield levels constituting 11.25, 4.66, 5.48 and 6.89 respectively. As it is already explained it is due to the usage of hybrid seeds and modern farm equipment. However, in case of paddy the yield level is low mainly due to decline in the fertility of soil in Mandya district. This conclusion is drawn by many studies in the state. Therefore, one can conclude that there is a close relationship between increase in area, production and productivity with the increase in the farm Mechanisation.
7.1.21. The area under marginal farm holdings has gone up at the rate of 19.63 per cent from one point of time to another. The same trend continues in case of small farm holdings also. Whereas the medium and large farm holdings have been showing declining trend, which is at the rate of 4.78 and 7.62 per cent respectively from one point of time to another. The increase in the area of marginal and small farm households has gone up and in case of medium and large farm holdings had declined, which reveals that there is fragmentation of holdings.

7.1.22. The average area under marginal, small and semi-medium farm holdings remained more or less the same showing no improvement in the average land size. Whereas in case of medium and large farm holding the average land per holding declined continuously from 1981-82 to 2001-02. This clearly reveals the fragmentation of holdings.

7.1.23. The foregone analysis clearly reveals that there is a serious problem in case of land holdings as there is fragmentation of holdings. The usage of farm equipment like machinery comes down as it is uneconomical to go for costly equipment like tractors, tillers, threshers, etc. However, one consolation is, that the usage of farm machinery is increasing as the owners of these equipment using it for non-farm activities also. But only the point is how long it continues. Hence, some effort has to be made in the consolidation of holdings. In this direction the corporate agriculture is a kind of oasis in the
desert. There is a danger of this again because there will be exploitation of labour by the corporates.

7.1.24. Well irrigation is no way different from tanks as the percentage of well irrigation has started declining from 27 per cent to 18 per cent (1981-82 to 2001-02). Interestingly, the area under bore-well irrigation has gone up considerably. The percentage of bore-well irrigation was three per cent in 1981-82, which has gone up to 19 per cent by 2001-02. This is mainly due to the support given by the government through various schemes by providing subsidies. May be this is also one of the positive factor for increase in the agricultural Mechanisation.

7.1.25. During the liberalization period, there is a greater impetus for the growth of commercial crops like paddy, sugarcane and groundnut. The food grain crops shown a declining trend, which is not a healthy trend. However, because of the commercialization of agriculture there is a scope for Mechanisation where the farmers more and more use modern inputs including the farm machineries. Therefore, one can conclude that there is a close relationship between increase in area, production and productivity with the increase in the farm Mechanisation.

7.1.26. One more issue, which is very much striking in the analysis is that as a result of the increase in net irrigated area there is a positive impact on the fertilizer
application. The quantity of the fertilizer used has gone up at the rate of 14.52 per cent from one point of time to another. This clearly reveals that the farmMechanisation increases with the increase in irrigation facilities.

7.1.27 detailed district profile reveals that the Mandya district is rich in providing irrigation facilities, the farmers have been using machinery intensively over a period of time. However, more mechnisation of agriculture is curtailed by the land fragmentation and sub-division of holdings. Therefore, it is suggested that there should be consolidation of holdings or there has to be change in the credit policy of the government.

7.1.28 It is interesting to observe from the table that in 1981-82 the marginal farmers were (below 0.01 to below 1 ha.) constituting 64 per cent which has gone up to 79 per cent by the year 2000-01. The percentage of semi-medium, medium and large farm holdings has become very low and it is negligible. The large farm holdings in Mandya constitutes only 0.05 per cent.

7.1.29 The growth rate of the various farm holdings educates us that in the district the marginal farm holdings have been increasing at the rate of 26.85 per cent per period, the small farm holdings are growing at the rate of 5.59 per cent. The semi-medium farm holdings have been declining at the rate of 8.57 per cent,
This clearly reveals that there is subdivision and fragmentation of land holdings in the district. The land fragmentation and sub-division does not promote the farm Mechanisation. However, as the farmers have been using the machinery both for agriculture and for other commercial activities, there is an increase in the machinery stock.

7.1.30 The number of tractors in the district has been increasing continuously. In 1983 the number of tractors were, 512, which has increased to 1,338 by 2003. This is approximately, almost one tractor in each village of the district. The growth rate per point of time seems to be 26.34 per cent. In almost all the years the percentage of tractors in Mandya district to the state total number constitutes around two per cent – except in 1983 where it was 2.50 per cent. This may be due to the intensity of irrigation in Mandya district – during that period. Even in case of power tillers also the same increasing trend is noticed. In 1983 the number of power tillers were 187, which has gone up to 564 by 2003 showing a growth rate of 33 per cent. The growth rate of power tillers is much lower compared to the tractors. When we observe the percentage of the same power tillers to the state we found that it is about two per cent. This clearly reveals that the status of farm machinery in Mandya district growing on par with the state’s average.
7.1.31 In case of Sugarcane crushers we find a declining trend because in Mandya the sugar cane growers started sending the produce to the sugarcane factories and therefore, there is a declining trend in terms of sugarcane crushers. However, the growth rate seems to be positive constituting 13.24 per cent per point of time. It is interesting to observe from the same table that in Mandya the percentage of Sugarcane crushers constitutes 21.27 per cent of the total in the state. This is more than 1/5 of the state’s total. This explains that even now in the district the sugarcane growers giving importance for the production of joggery.

7.1.32 The data relating to the equipment like sprayers and dusters, seed-cum fertilizer drillers and threshers we found that there is a lot of inconsistency in terms of number and also the percentage of the district farm machinery to the state’s total. The reason for this kind of performance is not known. However, in case of diesel engines, there is an increase from one point of time to the another. In 1983 there were 1559 diesel engines, which have gone up to 7,579 by 2003 showing a growth rate of 34.80 per cent.

7.1.33 There is a positive growth in case of electrical engines. The electrical engines, in 1983, were 4,698, which have been increased to 20,558 in 2003 showing a growth rate of about 39.45 per cent per point of time. This is mainly because, over a period of time the supply of water through canals has been declining.
and therefore the farmers have gone for wells and bore-wells, this has resulted in the increase in the pump-sets.

7.1.34 As the water table is too high, it is convenient for the farmers to cultivate a crop even in the summer season, where the chances of getting irrigation water through canals is bleak. Therefore, in conclusion one can say that in the district farm Mechanisation is constantly increasing and that is the reason why the farmers are self-sufficient in terms of owning all these equipment.

7.1.35 Access to organized credit facility is very high in case of the medium and large farmers and it is less in case of their counterparts like marginal and small farmers. Therefore, the marginal and small farmers have been getting loans from the money lenders who have been exploiting them to a greater extent.

7.1.36 Interestingly, the primary data analysis reveals that about fifty per cent of the total farm power (all types) is being used by very large holdings and it declines as the farm size declines in the study area.

7.1.37 In the sample farms, marginal farmers operate around nine percent of the gross cultivated area and these farmers use around six percent of the total farm power. Similar pattern has been noticed for small and medium farmers. On the other hand, large farmers use farm power more than the proportion of their land operated.
7.1.38 On an average, per acre human power use ranges from 55 hp hours to 65 hp hours in the sample districts; animal power ranges between 2.68 hp hours and 3.68 hp hours and machine power ranges from 48 hp hours to 448 hp hours. It may be noted from this that the mechanical power dominates other types of farm power.

7.1.39 It is estimated that marginal holdings use around 56 per cent of the biological power, whereas only 44 per cent of the machine power; the large holdings use only around 19 per cent of the biological power and similarly, machine power contributes 81 per cent. From this it is very clear that the contribution of biological power is more on lower strata of farm holdings and it steadily declines as the farm size increases. Contrast to this the proportion of machine power use contributes more to upper strata of holdings and it declines as the holding size declines.

7.1.40 However, there is a lot of variation across farm size classes in terms of the type of power used. In case of labour power we find the inverse relationship between the farm size and the human power used. As the size class increases, there is a decline in human power used. This holds good both for HYV and traditional crops in the study region. The same trend can be seen even in case of the animal power used across varieties of crops and size classes.
7.1.41 The magnitude of the use of each type of power varies across different operations, which is mainly due to the differences in the availability of alternative sources of farm power stock, cropping pattern, methods of operation, seasonality and irrigation source.

7.1.42 The regression results reveal that the factors like availability of farm power stock and land holdings coupled with cropping intensity influence the aggregate farm power use. Thus, the analysis supports the findings of the earlier analysis, where it was observed that the above factors are positively related with farm power use.

7.1.43 The $R^2$ shows that variability of different variables by the independent variables are turned out to be fairly high indicating the goodness of fit of the model.

7.1.44 As the size class and the intensity of farm power use increases, the farmers more or less tend to use more inputs. The differences in gross expenditure on inputs across size classes and the farm power intensity are attributable to their access to various inputs, availability of resources like credit, irrigation and differences in agro-environmental factors.

7.1.45 One has to highlight two points based on the analysis. First as the size class increases the net returns also increases and Second, as the intensity of farm
power increases the net returns showed in an increasing order. This clearly reveals that there is a positive relationship between the size class – farm power intensity and the net returns.

7.1.46 There is a clear indication that in case the farmers use more and more farm power the returns increases for all the land size classes. However, there is a positive relationship between the farm size and the returns because the larger farm holders use more and more farm power as they are rich in resources and its trickle down impact leads to more returns. Unfortunately in India, as the land-size is very less they are not economical to use more machine power and hence most of the marginal and small farmers are not able to use more machine power and simply depend on the traditional farm power, which is not remunerative. Therefore, the development agencies have to think the alternatives for these category of farmers. The present study, uniformly, for all the farm size classes, clearly indicates that as the intensity of farm power increases the production and productivity also increases.

7.2 Policy Suggestions:

1. There is a wide variation in terms of farm equipment across the divisions in the state. Therefore, to maintain uniform development the Government has to provide financial assistance to the farmers to own various farm equipment.
2. As there is a close relationship between the farm Mechanisation and increase in area, production and productivity, farm Mechanisation has to encouraged.

3. The land fragmentation and sub division of holdings has been increasing. This does not encourage the farm Mechanisation. Hence, impetus should be given to consolidation of holdings.

4. There is a close relationship between irrigation facilities and the farm Mechanisation. Hence, the development agencies have to provide irrigation facilities as much as possible.

5. The primary data records that as the farm size increases; there is a greater increase in the farm power use. Therefore, the marginal and small farmers have to be provided financial assistance from the organized credit market.