SUMMARY, CONCLUSIONS AND IMPLICATIONS
CHAPTER - IX

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Under the context of integrated rural development, rural electrification is rightly regarded as an instrument of growth and change in rural areas. In the rural areas it can bring overall development so as to mitigate the effects of socio-economic dualism between rural and urban areas, accelerating agricultural development, stimulation of industrial activity, and generation of employment and income for the benefit of the rural community. The present study is taken up to assess the impact of rural electrification on agricultural and rural industrial/small industrial development including the transformation of rural artisan trade.

OBJECTIVES:

This study is undertaken with the following specific objectives:

1. To assess costs and returns for important crop enterprises on energised farms.

2. To examine the impact of rural electrification on agriculture development in
terms of additional area brought under irrigation, changes in cropping pattern, change in productivity, increase in agricultural production, increase in gross returns and generation of additional employment potential.

3. To estimate resource productivity, scale returns and resource use efficiency on energised farms.

4. To assess the impact of rural electrification on small/rural industries in terms of number and types of units set up, capital investment, output produced, employment generated and type of entrepreneurship came forward to set up industries.

5. To find out the impact of rural electrification on the transformation of technology in rural artisan trades and

6. To trace the degree and effectiveness of co-ordination among the existing development agencies of rural development.
SAMPLE DESIGN:

After discussions with the officials of REC regional office at Hyderabad, the talukas of Armoor, Bheemgal, Bodhan and Yellareddy in Nizamabad district were selected for evaluating the impact of rural electrification. All the electrified villages in the selected blocks which had some energised wells between 1979 and 1985 were listed out. Out of the above listed villages 20 villages viz; Donkeshwar, Mallaram, Nuthapally, Talweda, Thondapur (Armoor Taluka), Devekkapally, Lingapur, Pandimadugu, Thatapally, Thallapally (Bheemgal taluka), Bhiknelli, Hangerga, Mandharna, Siddapur, Taggelli (Bodhan Taluka), Brahmanpally, Lingareddy pet, Machapur, Thipparam and Thimmareddypet (Yellareddy taluka) were selected according to probability proportion to pumps energised.

All the energised wells between 1979 and 1985 in each selected village with the names of the farmers were listed out and these farmers were classified into three farm size groups viz. small (less than 9.9 acres) Medium (10 to 19.9 acres) and large (20 acres and above) on the basis of operational holdings. From each size group, 40
farmers were selected at random to give a total 120 farmers in 20 selected villages.

There were 24 industries run by electric power in the selected villages and all of them were considered for indepth study. Altogether, 40 artisans representing seven trades viz: weaving, carpentry, pottery tailoring, blacksmithy, and cobbler's were selected randomly.

Thus, 4 talukas, 20 villages, 120 farmers, 24 industries and 40 artisans constituted the materials for the study.

The data were collected by personal investigation with the help of specially devided questionnaire. Discussions were held with different oficers at various levels to obtain information on problems of co-ordination. The reference period for the study was 1988-89 agricultural year.

TOOLS OF ANALYSIS:

Tabular analysis was used to find the impact of rural electrification. Paired "t" test was used to test the significance of difference between before and after energisation in agriculture. The Cobb - Douglas production function model was used to examine the resource productivity, returns
to scale and resource - use efficiency on energised farms.

RESULTS:

Labour requirements:

The human labour requirement for paddy per acre was highest when compared with other crops on all farm size groups. A direct realtionship existed between farm size and human labour utilization per acre for all the crops. The human labour requirement per acre of paddy for the small, medium, large and on all farms were 70 mandays, 73 mandays, 75 mandays and 72.3 mandays respectively.

The human labour utilisation per acre of sugarcane were 50 mandays, 65 mandays, 68 mandays and 61 mandays, for small, medium, large and on all farms respectively.

The human labour utilisation in the case of groundnut varied from 35 to 43 mandays on small farms to large farms, with an average of 40 mandays on all farms. The cattle labour utilisation per acre of paddy was 6, 5, 5, 5.3 and 5.6 cattle pair days for small, medium, large and all farms respectively. With regards to other crops i.e. paddy [summer crop], sugarcane and groundnut
the cattle labour utilisation was around 3 cattle pair days per acre.

The cattle labour utilisation was very low as the tractors used for many operations for the crops grown in the region.

**COSTS:**

The total cost of cultivation of all crops per acre for small, medium and large farms was Rs.1138.20, Rs.1190.00 and Rs.1921.10 respectively. The same for the sample as a whole was Rs.1493.20.

**Returns:**

The gross returns per acre of all crops were Rs.1840.70, Rs. 2566.60, and Rs. 2770.40 on small, medium and large farms. The same for the sample as a whole was Rs. 2571.90.

**RESOURCE RETURNS AND RETURNS TO SCALE:**

The analysis revealed the operation of constant returns to scale in all the selected crops viz: paddy, sugarcane, groundnut, turmeric and maize in all farm size groups. Though for certain resources, increasing returns were prevailing, in general, diminishing factor returns seems to be in operation. On all farm size groups and
for all crops, there was inefficient use of resources. Resource adjustment on all farms had to be effected to increase the output and profitability. The analysis further indicated wide scope for readjustment of resource based on the marginal value product to opportunity cost ratios.

**Impact of rural electrification on agricultural development:**

The study indicated that the value of farm assets per farm was relatively higher on all farm size groups after energisation as compared to before energisation situation. Wide variation was also observed in the additional value of assets per farm after the energisation. It varied from Rs. 47,958 on small farms to Rs. 2,38,858 on large farms. The additional increase on all farms was Rs. 1,65,121.

The analysis revealed that the additional gross irrigated area, was 230 acres, 382 acres and 837 acres on small, medium and large farms respectively. The same on all farms was 483 acres. The additional gross irrigated area per filter point was 2.2 acres, 2.1 acres, 4.1 acres and 2.9 acres on small, medium, large and on all farms respectively. As a result of energisation, the irrigation intensity has increased by 49, 59, 54
and 55 per cent on small, medium, large and on all farms respectively. This clearly indicates that energisation has had a positive impact on bringing more area under irrigation.

As a consequence of energisation, the additional gross cropped area per farm varied from 3.6 acres on small farms to 14.9 acres on large farms. The same was 7.2 acres on medium farms and 8.6 for the whole sample. It was also observed that the cropping intensity showed a direct relationship with farm size. From this it could be concluded that the impact of electrification on gross cropped area and cropping intensity was positive irrespective of farm size.

Though energisation had not helped the farmers in bringing radical change in cropping pattern, it helped the farmers to bring more area under the same crop or to reduce the area and to introduce new crops to a certain extent or in replacing low income crops and taking up of commercial crops. As a consequence the area before energisation for small, medium, large and all farms which was 328 acres, 626 acres, 1,271 acres and 741 acres respectively. It has increased to 470 acres, 915 acres, 1,669 acres and 1,084 acres in the same order after energisation.
Enquires revealed that after energisation, the farmers allocated more area for high yielding varieties. Further, cropping pattern indicated significant increase in the area under sugarcane, groundnut and turmeric. The area under traditional low value crops and pulses had significantly decreased in favour of high value commercial crops.

The study indicated that the energisation had helped the farmers to increase the productivity of paddy, sugarcane, groundnut and turmeric irrespective of farm size.

Rural electrification has helped the farmers, in all farm size groups, to increase production. The energisation has resulted in additional output of 1,120 quintals of paddy for the sample as a whole. The same was 239, 1,322 and 1,800 quintals on small, medium, and large farms respectively. The output of sugarcane sample as a whole has increased from mere 211 tonnes before energisation to 2,220 tonnes after energisation. The additional production varied from 195 tonnes on small farms to 4,340 tonnes on large farms. The total additional production varied from 2,795 quintals on small farms to 46,816 quintals on large farms. The same for all farms was 22,156 quintals.
Energisation has resulted in an additional gross returns on all crops and resulted in increasing the total gross value on all size group of farms. The increase in gross value of paddy varied from Rs. 43,020 on small farms to Rs. 3,24,000 on large farms. With regards to sugarcane increase was Rs. 46,800 on small farms; Rs. 3,57,840 on medium farms with Rs. 4,82,080 for the sample as a whole. The gross value also increased for groundnut crop with Rs. 1,48,200 on small farms, Rs. 3,87,000 on medium farms and Rs. 3,51,200 for all farms.

The total additional gross value varied from Rs. 11,43,540 on small farms to Rs. 21,09,600 on large farms, with Rs. 11,43,540 for the sample as a whole.

The increase in the per acre wise gross value due to energisation was Rs. 366.5, Rs. 897.4 and Rs. 1138.8 on small, medium and large farms respectively. The same on all farms was Rs. 952.6 only.

The study also revealed that energisation helped the farmers to generate additional employment to human labour. As a consequence of energisation, the increase in human labour
employment for paddy 2,755 mandays, 4,962 mandays, 8,556 mandays and 5,425 mandays on small, medium, large and on all farms respectively. In the case of sugarcane farms the additional employment to human labour was 182 mandays, 2,376 mandays, 1,454 mandays and 593 mandays on small, medium, large and all farms respectively. In groundnut the additional human labour was increased 1660 mandays, 803 mandays, 1,037 mandays and 1,620 mandays on small, medium, large and all farms respectively. After the energisation the increase in per acre wise human labour was 72 man days, 50 man days, 24 man days and 49 man days on small, medium, large and all farms respectively.

The analysis further indicated that the cattle labour utilization on small, medium and large farms on Paddy were 6, CPD, 5.5, CPD and 5.3 CPD respectively. The same on all farms was 5.6 CPD. The cattle labour utilisation on all other crops were only 3, CPD irrespective of size groups.

It is further observed that all the farmers in the sample resorted to tractor cultivation irrespective of farm size. From this it could be concluded that the decline in cattle labour employment was due to predominant use of tractors but not due to the energisation.
Thus, the study has revealed that rural electrification has helped farmers of all farm size
groups. Energisation has a positive impact on the creation of farm assets, increase in the area under
irrigation, cropped area, productivity, gross returns and human labour employment, but there was
not much impact on cropping pattern.

Impact of rural electrification on small industry.

Rural electrification has made a positive impact on rural industrialisation. There were 24
industrial units in the study area. All these units were set up consequent to the electrification
of villages and all the 24 units were selected for indepth study. Out of the total 24 units it
consisted 3 job work units (12.5%), 20 agro-processing units (83.3%) and 1, manufacturing unit
(4.2%).

The fixed capital investment of these units was Rs.28.11 lakhs with an average of Rs.1.17 lakhs
per unit. The main source of fixed capital was own funds. Out of 24 units as many as 15 units utilised
their own funds and only 4 units availed the institutional finance.

Since majority of units (including agro-processing) were of job work type, the working
capital component formed a small share of total capital investment. While 18 units out of 24 units had a monthly working capital of less than Rs. 700 per unit. 6 units had working capital of more than Rs. 700 per month per unit.

Rural electrification resulted in an out turn of Rs. 28.29 lakhs per annum in these units, which accounted with an average of Rs. 1.18 lakhs per unit.

The study revealed that these units had provided employment to 78 persons which indicated an average of about 3.25 persons per unit. From this it is clear that rural electrification has not generated much employment potential on the study area.

The entrepreneurial profile indicated that majority of them were individual owners and in the age groups of 21-50 years. All the entrepreneurs except 5 were literates. Thus the study revealed that educated people are coming forward to start industries in the rural areas. Majority of the entrepreneurs were agriculturists before they have taken up the industries. The study further revealed that the DIC and extension agencies had
not made any appreciable impact in motivating the people to start industries in rural areas.

Rural electrification has positive impact on small/rural industrialisation in Nizamabad district. Some processing units have come up in the study area as a result of village electrification. There were manufacturing units in rural areas, as such these units could not generate adequate employment in rural areas. The DIC as well as extension agencies should prepare a perspective plan to set up resource and demand based small scale processing-cum-manufacturing units in rural areas.

Impact of rural electrification on the formation of technology in artisan trade:

Altogether 40 artisans representing different trades viz: weaving, carpentry, blacksmithy, goldsmithy, tailoring, pottery and cobblerly were selected for the study. The study pointed out that the rural electrification has not made any impact on modernisation of artisan trades in the study area. None of the artisans were using power driven tools. All were using age old traditional tools. Majority of the artisans have undertaken these activities as main occupation. Almost all the
artisan units were working with only family members. On an average the employment per artisan family varied from 1-2 person in blacksmith and goldsmith and to 3-6 persons in pottery.

It was found that all the artisans except potmakers and weavers were undertaking their activities on job work basis. The artisans invested a small amount in fixed assets which on an average varied from Rs.50 in potmaking to Rs.1500 in tailoring. The monthly working capital per artisan family was low and varied from Rs.5 in blacksmith to Rs.350 in weaving. It is quite interesting to note that despite their poor economic conditions, the selected artisans have determination to stay on in their occupations. The study further pointed out that majority of artisans were unwilling to switch over power driven tools. This warrants a concerted action on the part of the extension agencies and Khadi and Village Industries Board (KVIB) to convince the artisans to switch over to power driven tools so as to increase the productivity of the unit.

Co-ordination among various development agencies

Co-ordination is the fulcrum for the success of any development programme. The study revealed
that all the departments seem to be working in co-ordination on paper but in reality this co-ordination was lacking or inadequate in the study area. It is observed that the existing agencies of rural development have not been properly understood the philosophy follow up action immediately after Zilla parishad General-body and consultative committee meetings. This clearly warrants unless the existing development agencies co-ordinate their activities, integrated rural development seems to be a myth.

Further, the Zilla parishad general-body and consultative committee should take up the problems of rural development in its right perspective rather than dealing them in a routine way. There should be a follow up action immediately after the committee meetings and responsibilities should be fixed on the officers concerned to achieve the contemplated goals. The district collector should provide the needed team spirit to achieve the desired co-ordination among the existing development agencies.
CONCLUSIONS:

The following conclusions emerged from the present study.

1. Among crops studied, paddy required the highest human labour per acre. The human labour requirement indicated an direct relationship with farm size in respect of paddy in both the seasons.

2. The cost of cultivation of paddy had indicated an direct relationship with farm size in all seasons revealing scale economies in raising paddy.

3. There was an direct relationship between productivity and farm size with respect to paddy, turmeric and groundnut. In the case of sugar-cane and others, there was no perceptible relationship.

4. For the farm as a whole, all measures of income per acre and per farm revealed direct relationship with farm size with the exception of farm business income per acre which had not indicated any perceptible trend with farm size.

5. The production function analysis had revealed the operation of constant returns to scale and
diminishing factor returns in general though increasing factor returns were observed for certain resources. Further marginal value products to opportunity cost ratios indicated inefficient use of resources and offered good scope to adjust resource so as to achieve higher profitability.

6. The value of farm assets per farm was relatively higher on all farm size groups after energisation as compared to before energisation situation.

7. Energisation had resulted in an additional gross irrigated area. The irrigation intensity has direct relationship with farm size.

8. As a consequence of energisation, the cropping intensity has increased. The cropping intensity indicated an direct relationship with farm size.

9. Energisation had not helped the farmers in bringing a radical change in cropping pattern. It only helped the farmers to bring more area under paddy, sugarcane, groundnut, and turmeric.

10. As a result of energisation the productivity of all crops were increased.
11. As a consequence of energisation an additional area was brought under irrigation and cropping. A significant increase in production of all crops was noticed except the pulses where the production has declined.

12. Energisation has helped the farmers to get additional gross income Rs.12,893, Rs.36,277 and 45,546 on small, medium and large farms respectively.

13. The study revealed that energisation had resulted in generating additional human labour employment. The same per filter point was highest (309 mandays) on small farms and lowest (192 mandays) on medium farms. But it was observed that the cattle labour utilisation declined from 408 cattle pair days to 286 cattle pair days. All the sample farmers were resorted to tractor cultivation irrespective of farm size. Therefore, it could be concluded that the decline in cattle labour employment was due to predominant use of tractor but not as a result of energisation.

14. All the 24 existing industrial units in the study area have covered up consequent to village electrification. This itself is a positive
impact of rural electrification on rural or small industry.

15. Out of 24 units 3 job type, 20 units undertaking mainly agro-processing, and 1 was manufacturing unit. Flour mills were predominant type (58%) followed by Rice mills (16%).

16. All the 24 units in the study area were selected for indepth study. They had invested Rs.28.11 lakhs with an average of Rs.1.17 lakhs per unit. Since majority of them were of Job work type (including agro-processing). The working capital component formed a small share of total capital investment.

17. These 24 units obtained an annual out turn of Rs.28.29 lakhs which worked out to be Rs.1.18 lakhs per unit.

18. These units provided employment to 78 persons which indicated an average of about 3.25 persons per unit.

19. The study revealed that the DIC and extension agencies had not made any appreciable impact in motivating the entrepreneurs to start industries.
20. The study pointed out that rural electrification had not made any impact on modernisation of artisan trades in the study area, since none of the artisans was using power driven tools.

21. It was found that all the artisans except pot makers and weavers were undertaking job work and the investment towards fixed and working capital was less.

22. Majority of the artisans were not aware of power driven tools that could be used in their trades and most of them were not willing to switch over to power driven tools.

23. The study further revealed that there was lack of co-ordination among various agencies functioning in the district.

POLICY IMPLICATIONS:

This study has brought out certain facts which have a bearing on policy implications and need action programme.

1. It is observed from the study that farmers of the energised wells have not realised the importance of judicious cropping pattern. Since
energisation involved high cost, to derive benefits from the investment they should have taken new crops which yield high returns. Instead of this, they simply increased the area under these crops but with high irrigation varieties. This indicates the need to develop model farm plans for energised wells under different farm size groups. The Department of Agriculture and the specialists of Agricultural Universities have to collaborate their activities and help these farmers in bringing radical changes in the cropping pattern. The extension agency has to play a vital role in motivating the farmer to go for new cropping pattern, convincing them fully by organising demonstrations on energised farms with new crop sequences.

2. The study revealed that rural electrification has had a positive impact on small or rural industrialisation. Though industries have come up as a consequence of village electrification, majority of them were of job type (including agro-processing) and as such they could not generate adequate employment opportunities in the rural areas. The DIC should identify growth centres in rural areas and try to prepare plans
to set up more number of manufacturing units of processing-cum-manufacturing units to generate adequate employment opportunities. The SEB officials should collaborate their activities with DIC in implementing their schemes. Entrepreneurial development is the basic prerequisite for rural industrialisation of small industry. The DIC should organise campaign to identify potential entrepreneurs and needed training is to be given for them to set up industries. Entrepreneurial motivation is also lacking and here also the DIC has to play a vital role.

3. The rural electrification has made no impact in transforming the rural artisan trades. Most of the artisans have no idea about the power driven tools that could be used in their trades. The DRDA should take up this matter in collaboration with KVIC and demonstrate the use of power driven tools in various artisan trades. In the initial stages these power driven tools are to be supplied to artisans on free of cost who ever indicates their willingness to switch over to power driven tools. If necessary, the needed training is to be imparted by the DIC.
The DIC should also make available the raw materials needed by the artisans.

4. The study revealed either inadequate co-ordination or complete absence of co-ordination among various developmental agencies functioning in the district at different levels. The District Consultative Committee and Zilla Parishad general body headed by the district collector though meet periodically and discuss problems, no follow up of action is envisaged. Specific responsibilities are to be fixed on the concerned officials to achieve targets. The district collector should provide the needed leadership to create team spirit so as to achieve the goals of rural development.