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LEVELS OF AGRICULTURAL MODERNIZATION IN NELLORE DISTRICT ANDHRA PRADESH

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ABSTRACT : Agricultural modernisation means the increased inputs in farming to produce more crop yields. The inputs are fertilizers, chemicals, pesticides, improved farm implements, mechanisation, Hyv seeds, irrigation, storage etc. The modernisation among farmers is influenced by economic, social, political and institutional factors apart from nearness to towns and cities. In the present study an attempt has been made to bring out the level of modernisation among farmers and its spatial variation in Nellore district of Andhrapradesh. This study is based on primary data collected from II villages, choosing 20 farmer in each village drawn from all size farmers. The study has broughtout the influence of caste, income, nearness to towns, age and education on agricultural modernisation.

INTRODUCTION

In India, since the cultivable land is limited and almost fully occupied, there is a need to raise the yield of food grains in order to feed the teeming millions of its people. In order to achieve this objective, adoption of new package programmes like high yielding seeds, fertilizers, pesticides with irrigation are introduced. This has created a transformation in Indian agricultural sector and this may be termed as Agricultural Modernization. According to Chakravarthi, A.K. (1973), the high yielding variety programme is the key element in starting India's Green Revolution; and the successful adoption of the high yielding seeds depends on judicious combination and use of chemical fertilizers, the application pf pesticides and adequate supply of irrigation water. Singh, J. and S. S. Dhillon stated that agricultural modernization implies technological as well as organizational improvement (1984). Studying the levels of agricultural development in Uttar Pradesh, Mohammed, N. (1991) observed that the diffusion of new farm technology is not uniform throughout the country both in space and time.

Therefore, modernization is a process where there is an increasing modern inputs in farming and maximising the yield levels. This shows a variation over space through time. In order to understand the spatial patterns in the level of modernization in Nellore district, the present study is attempted.

STUDY AREA

Nellore is one of the 23 districts of Andhra Pradesh located in the south eastern coast and spreads over an area of 13,160 sq.km. The district represents a coastal plain with almost a flat topography except a few points in the western part. Based on the relief, the district could be broadly divided into three physiographic divisions. They are–

1. Coastal plains with an elevation of 50 m, above mean sea level.

2. Interior uplands with an elevation of 100 m and above, and

3. Transition zone between coastal plains and interior uplands with an elevation of 50-100 m.

The principal rivers which drain the district seasonally are the Pennar and Swarnamukhi. Major soil groups found in Nellore district are red soil (43%), black soil (23%), coastal sand (15%), deltaic and coastal alluvium (10%). The district has a hot climate with a mean annual rainfall of 1019 mm. Bulk of the rainfall is received from North-East Monsoon only, i.e., from October to December. The rainfall variability ranges from 28 to 45 per cent with an increasing trend from south to northwest. The eastern half of the district is endowed with fertile agricultural land and sufficient rainfall.

DATA AND METHODOLOGY

The study is based on secondary data. Data pertaining to 25 variables of agricultural modernisation (List-A), were collected at taluk level for 1989-90. In the first instance an attempt is made to establish the empirical relationship among the parameters of agricultural modernization by multiple correlation. This formed the basis for Factor analysis, which in turn bring out the underlying dimensions among 25 variables on the basis of association among the modernization Variables in the nine taluks of Nellore district. In order to bring out the spatial patterns of levels of modernization, factor scores were computed and was subjected to cluster analysis to group the 9 taluks of Nellore district.

Based on the intercorrelation matrix (25 x 25), the following conclusions are drawn. They are :

1. In the canal irrigated areas the gross irrigated area is more, more land is put under HYV Paddy, there is a greater use of farm machinery, more use of fertilizers, higher literacy and the people utilise the banks for financial support. Ultimately the yield of Paddy is high.

2. The dry crops and their yields are insignificant in the canal irrigated wet crop areas.

3. In general, dry crop cultivation is predominant in tank irrigated areas. Here the association is among large land holdings, low literacy, lesser use of farm machinery and fertilizers, less financial institutions, and higher yields among dry crops.

This has empirically established the relationship among the modernization Variables. The correlation matrix when subjected to factor analysis has resulted into 5 factors explaining a total Variance of 92%. The first three dimensions are very important because they account for about 80% of the total variance explained by 25 Variables in nine taluks of the district.

In the first dimension variables such as canal irrigation, HYV Paddy, Paddy yield, use of tractors, chemical fertilizers, pesticides, sprayers and dusters, literacy and banks show high loadings. While the variables such as tank irrigation, Groundnut yield /hectare have high positive loading on the second component and the negative adoption of pesticides and insecticides reveals the second dimension.

In the third dimension well irrigation, use of pumpsets, area sown more than once have high loading on this component. This analysis clearly brings out the most important dimensions underlying the levels of modernization in Nellore district.

The factor loading matrix (5 x 25) was the input to compute factor score and the factor

Table 1

Components	Eigen Values	Variability	
		In per cent	Cumulative
I	13.100	52.400	52.400
II	4.508	18.034	70.435
III	2.499	9.997	80.432
IV	1.892	7.568	8.001
V	1.085	4.341	92.342

scores inturn formed the basis for cluster analysis to group the taluks of Nellore district on the basis of similarity in the levels of modernization.

LEVELS OF MODERNIZATION

The cluster analysis has grouped the taluks in an hierarchical order on the basis of similarity in the level of modernization. Accordingly, high level of modernization is observed in Nellore, Kovur, Kavali, Venkatagiri and Rapur taluks. In Sullurpet and Udayagiri taluks the level of modedrnization is moderate. In rest of the taluks such as Gudur and Atmakur the level of agricultural modernization is identified to be low (Fig. 1).

The taluks that show high level of agricultural modernization, except Venkatagiri and Rapur are located in coastal delta region. The factors influencing high level of modernization are fertile alluvial, black and red loamy soils, well developed irrigation, particularly, canal irrigation, more rainfall, plain topography (less than 100 m of elevation above mean sea level), nearness to urban centres, more literates, well established Road and Rail network, more consumption of fertilizers and pesticides, farmers zeal and other institutional factors like location of Rice Research Station in Nellore, Sugar Factory in Kovur and Millet Research Station in Podalakur (Rapur taluk) etc. The important crops in these taluks are food crops and commercial crops such as Paddy and Sugarcane in Nellore and Kovur taluks, Paddy, Tobacco, Groundnut, Spices and condiments in Kavali taluk, Paddy, Fruit crops and Groundnut in Rapur and Venkatagiri taluks.

The moderately modernized taluks are located at the two ends. Sullurpet is an southern coast, where as Udayagiri is in the interior upland region. In Sullurpet, the moderate level of modernization may be attributed to the hybridisation of Paddy and Groundnut crops, cultivated in the red and sandy soils with tank irrigation. Even though it is a coastal taluk, during the field work it has been learnt that due to the location of Nelapattu Bird Sanctuary in Sullurpet taluk, limitations are imposed by the Government on the utilization of land, water and pesticides. Here, the farmers grow only one crop, mostly dry crops like Groundnut, Chillies, Fruit crops etc. Whereas in Udayagiri, though it is experiencing semi-arid climate and upland topographic conditions, due to the hybridisation of dry crops like Bajra and commercial crops like Groundnut the level of modernization is moderate. Tobacco is another important commercial crop raised in this taluk. The quality of tobacco grown in this tract under rainfed conditions is considered to be good. Efforts of the Tobacco Board to

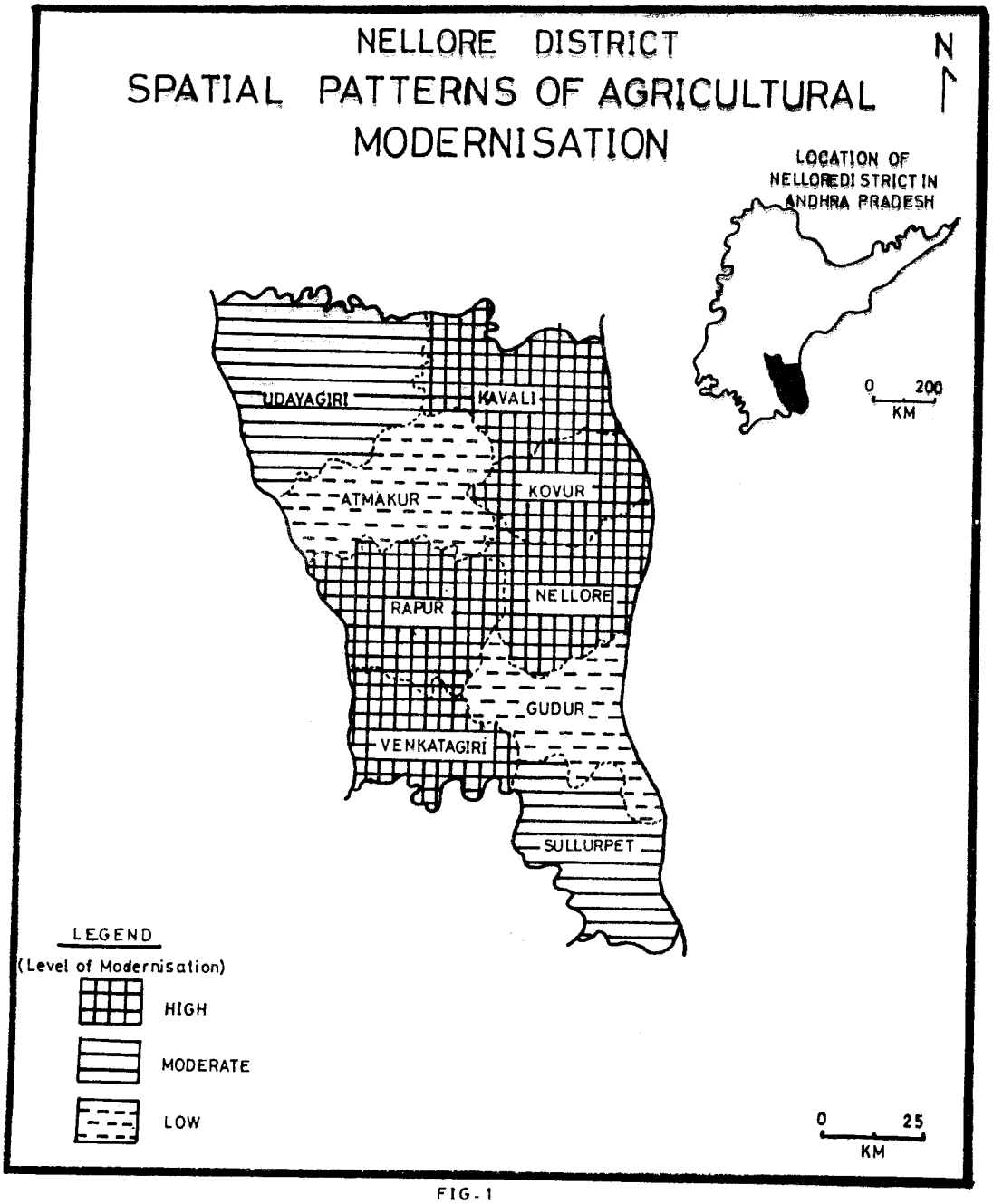
NELLORE DISTRICT
SPATIAL PATTERNS OF AGRICULTURAL MODERNISATION
N
LOCATION OF NELLOREDISTRICT IN ANDHRA PRADESH
0 200 KM
UDAYAGIRI
KAVALI
ATMAKUR
KOVUR
RAPUR
NELLORE
GUDUR
VENKATAGIRI
SULLURPET
LEGEND
(Level of Modernisation)
HIGH
MODERATE
LOW
0 25 KM

FIG-1

improve market condition and price structure might have influenced the tobacco cultivation.

A low level of modernization is observed in Gudur and Atmakur taluks. The reasoning behind the low level of modernization in Gudur taluk may be attributed to increasing mica mining activities, secondly, most of the cultivable land is converted for developing prawn culture. This taluk located in coastal belt is one of the most important taluks as a mica producer in the country. Atmakur taluk which is geographically confined to north-western corner of the district is also experiencing low level of modernization. It is due to poor soils, interior upland location, scanty rainfall, low intensity of irrigation, backwardness of farmers, and socio-economic and other institutional fators.

CONCLUSION

It may be concluded that due to the diversity in physical, social, economic and institutional factors, the farming activities and ultimate outputs are not uniform within the district. Further, because of the differences in the awareness, availability of the modern inputs of agriculture, the spatial variations are surfacing up. The study has clearly brought out the spatial patterns of levels of agricultural modernization in Nellore district. The Factor and Cluster analysis are extremely helpful to discover the dimensions and group the taluks according to their level. The Variables chosen also are appropriate because all Variables showed a communality (h^2) value of more than 90. In order to find out the influence of socio-economic, political, instituional factors on modernization, a detailed field work has been carried out in sampled villages with considerable samples. The same will be analysed and discussed as a continuation of this work.

List - A

1. Area under HYV Paddy (in hectares).
2. Area under HYV Jowar (in hectares).
3. Area under HYV Bajra (in hectares)
4. Area under Commercial crops (in hectares)
5. Area under Canal irrigation (in hectares)
6. Area under Tank irrigation (in hectares)
7. Area under Well irrigation (in hectares)
8. Gross area irrigated (in hectares)
9. Number of tractors
10. Number of Dusters and Sprayers
11. Number of Ploughs and other implements.
12. Number of Oil and Electrical engines.
13. Consumption of Fertilizers (N+P+K) (in tonnes)
14. Number of Dusts including granules (in tonnes)
15. Consumption of liquid formulations (in litres)
16. Average size of holding (in hectares).
17. Number of banks (including credit societies).
18. Percentage of literacy to the total population.
19. Net sown area (in hectares).
20. Area sown more than once (in hectares).
21. Yield levels of Paddy (Kilograms/hectare).
22. Yield levels of Jowar (Kilograms/hectare).
23. Yield levels of Bajra (Kilograms/hectare).
24. Yield levels of Groundnut (Kilograms/hectare).
25. Yield levels of Chillies (Kilograms/hectare).

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