CHAPTER-IV

METHODS OF ANALYSIS

This chapter has three parts. The first part deals with choice of the study area and the way in which the secondary data had been collected for the study. The second part deals with the primary data, specifically the sampling procedure and methods of data collection. The third part describes the methods of analysis including specification of variables and empirical application of specific models.

Choice of the Study Area:

"Thanjavur district" of Tamilnadu was purposefully chosen for this study for several reasons. Thanjavur district is primarily an agricultural district endowed with very good irrigation system by river Cauvery. It is the first district in Tamilnadu where all innovative methods in agriculture were introduced to usher in green revolution and several government sponsored schemes were introduced to achieve higher productivity in the farm sector.

Two extreme conditions were observed in this district. East Thanjavur was dominated by Communist Party of India whereas West Thanjavur was dominated by other traditional political parties of Tamilnadu. Agricultural
labourers of East Thanjavur were well organised and always demanding higher wages from farmers but west Thanjavur labourers were not as ferocious as those of the east. Fair wage Act was in practice in East Thanjavur and Minimum Wage Act was in practice in West Thanjavur. This heterogeneity provided an opportunity to make comparative study between farming communities of West and East Thanjavur. This was the first such attempt in this district. Thus Thanjavur district formed the universe for this study.

Sources of Data:

'This study was based on, both secondary and the primary data. Secondary data were used to study the wage differentials over a period of time. To study the wage differentials between East and West Thanjavur, primary data were used. The secondary data relating to the annual average of daily wages paid to agricultural labourers, the Consumer Price Index Number of rural Tamilnadu and area under high yielding varieties of paddy were taken from 'Season and Crop Report of Tamilnadu' published by the Government of Tamilnadu.'

The data concerned with productivity of paddy, greengram, blackgram, percentage of net area irrigated to net area sown and district wise population details were taken from 'Basic Agricultural Statistics' published by the Commissioner of Statistics, Madras. The data regarding minimum wage rate were collected from the officials of the Collectorate of Thanjavur.
The general data such as climate, rainfall, size of holding, composition of labour force, agricultural institutions and schemes to promote agricultural labourers were collected from various government publications. Published records like Census of India, published by Government of India, Techno-Economic Survey of Thanjavur district, published by Soil and Water Management Research Institute, Thanjavur, Agricultural Data Bank, published by Joint director of agriculture, Thanjavur, provided general information about this district.

To study the wage differentials between agricultural labourers of East and West Thanjavur, primary data were collected for the year 1994-95 by the following method.

**Sampling Procedure:**

Thanjavur district comprised of 20 taluks which had 103 fircas. There were 1408 village panchayats in these 103 fircas. For cross section analysis, multistage random sampling method was used.

Thanjavur district was divided into two areas viz. (i) West Thanjavur (where trade union activities were low and Minimum Wage Act was in practice) and (ii) East Thanjavur (where trade union activities were very high and Fair Wage Act was in practice). West Thanjavur had 12 Taluks and East Thanjavur
had eight taluks. Since West Thanjavur was bigger than East Thanjavur, six

taluks from West and four taluks from East Thanjavur were selected by simple
random sampling method after listing the taluks by their names in English in
the alphabetic order. The selected taluks in West Thanjavur were Kumbakonam,
Nidamangalam, Papanasam, Peravurani, Thiruvaiyaru and Valangiman; from East
Thanjavur, Nagapattinam, Sirkazhi, Tiruvarur and Vedaranyam were selected.

From each taluk, four fircas were selected through lottery method. Now
there were 24 fircas in West Thanjavur and 16 fircas in east Thanjavur. From
each fircas two villages were selected again by the same lottery method leading
to 48 sample villages in West Thanjavur and 32 sample villages in East
Thanjavur. In each village five farmers were selected after listing all the
farmers in the ascending order of their operational area. At the time of
collecting data from the farmers, the names of hired agricultural labourers who
were regularly employed by the selected sample farmers were assessed and from
each farm one labourer was randomly chosen for further study. Thus in West
Thanjavur 240 farmers and 240 agricultural landless casual labourers and in
East Thanjavur 160 farmers and 160 landless casual labourers were interviewed
with the help of prepared questionnaires (see APPENDIX-II) made specially for
this purpose.
Fig. II
TALUK LOCATION MAP OF THANJAVUR DISTRICT AND SAMPLE TALUKS OF WEST AND EAST THANJAVUR
This study was restricted to the field labourers only. The secondary data relating to the annual average of daily wages paid to agricultural labourers were collected from Season and Crop Report, published annually by the Government of Tamilnadu. From 1974-75, field labourers were classified as follows: Ploughmen, Sower and Pluckers of seedlings, Transplanters and Weeders, Reapers and Harvesters. Wages paid to the male and female workers were reported separately for every operation.

To know average daily wage rate of the field labourers, daily wage received by male and female workers for different operations were summed up and averaged accordingly. The average wage was not a weighted one due to absence of information such as the number of days spent by male and female workers for different agricultural operations. It was one among the major limitations of data regarding wage rates of agricultural labourers in Thanjavur district.

To find out real wage rate from money wage rate, the consumer price index of agricultural labourers of Tamilnadu, published by Labour Bureau, Simla, was used as a deflator. The data on consumer price index were collected from Reserve Bank of India Bulletin. Since there was no separate agricultural labourers' Consumer Price Index for Thanjavur district, the consumer price Index of Tamilnadu (see APPENDIX-III) was used to calculate real wage
rates of Thanjavur District. Since consumer price index varies from district to district, the real wage rate calculated in this study involved some approximation.

To find out the real wage from the money wage, the following formula was used.

\[
\text{Real Wage} = \frac{\text{Money Wage}}{\text{Consumer Price Index}} \times 100
\]

The trend of wage differentials between money wage and real wage was studied with the help of regression equation as follows:

\[y = a + bt\]

\[y = \text{wage rate}\]
\[a = \text{intercept of } y\]
\[b = \text{Regression coefficient}\]
\[t = \text{time}\]

To analyse the growth rate of real wage rates and productivity of crops, annual compound growth rates were estimated. For this study, the researcher had taken the major crops cultivated in Thanjavur district such as paddy, greengram and blackgram. To study the trend of changes in real wage rates and productivity of major crops, simple regression technique was used separately for each crop. Graphs were drawn wherever necessary for the above analysis.
To study the wage differentials between minimum wage was prescribed and actual wages paid, the following formula was used for each operation such as ploughing without bullock, sowing, plucking, planting, weeding, harvesting etc.

\[ \frac{W_a - W_m}{W_m} \times 100 \]

\( W_d = \) Wage differentials from minimum wage
\( W_a = \) Wage actually received by the labourers
\( W_m = \) Minimum wage fixed by the government.

**Tools of Analysis:**

Simple tabular analysis was used to compare the two regions and the male and female workers for several variables. To study the share of different components of income and expenditure percentage analysis was used. Frequency tables were used to rank different entities. To study wage differentials by gender and between regions multiple regression analysis was used.

**Model:**

The linear multiple regression model was used to study regional and gender wage differentials. The wage rate per worker depended upon the number of days of work, because without serious restrictions of trade unions, the labourers would be able to bargain both wage rates and the days of work. However, farmers ability
to pay would depend upon his income, which was depended upon technology adopted, availability of irrigation, use of high yielding varieties and use of modern inputs were the variables that decide the level of technology adopted. Finally the markets for farm products would influence farm income through prices received by farmers. Further, there might be some size effect, large farmers did not face resource crunch while small farmers had to use of his family labour, seeds, manures etc. There size of the farm was a variable to be considered. Several inputs were used in crop production, including machinaries, fertilisers, manures, pesticides, weedicides, energy sources in the form of bullock powers, electricity, diesel etc. As a summary measure of the level of use of these inputs their total monetary value (called non-labour cost for simplicity) was included.

To study wage differentials by gender or trade unionism, dummy variables were handy. As the difference in mean wage was the focus in attention, only intercept dummy was specified. Thus the model was specified as below.

\[ AW = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5 + b_6 x_6 + b_7 D + U \]

\( AW \) = Average wage rate (in Rs./day)

\( x_1 \) = No.of hired labour (mandays)

\( x_2 \) = Non-labour cost (in Rs.00)

\( x_3 \) = Irrigation intensity

\( x_4 \) = High yielding variety index
\(x_5 = \text{Farm income (in Rs.'00)}\)

\(x_6 = \text{Size of farm (in ha.)}\)

\(D_1 = \text{Dummy variable with values}\)

\(D = 1 \text{ if the labour was a member of a trade union.} = 0 \text{ otherwise.}\)

\(D = 1 \text{ if male worker} = 0 \text{ if female worker}\)

\(a = \text{regression constant (intercept)}\)

\(b_1...b_7 = \text{are parameters to be estimated with the expectation that all of them are non-negative.}\)

\(U = \text{random error term.}\)

An important result of this study was that trade unionism increased wage rate but only at the cost of number of days of employment. If the effect of loss of work days were larger than that of wage rise; their cumulative effect would be a fall in wage income. To study this the same regression was run with wage income (WI) of the worker in the place of AW.

In all, there were three multiple linear regression. They were estimated by ordinary least squares methods and evaluated for their explanatory power with the help of t, f statistics and the value \(R^2\) and sign of the regression coefficients. All statistical tests were conducted for five per cent and one per cent levels of significance.
Specification of variables:

The variable used in these models were specified as follows:

**Average Daily Wage Rates (AW):**

It was the average payment made to the labourers (both male and female) for the services rendered to cultivate. It included wage paid in kind, cash or both in return for the services. In order to find out the wage rate of a labourer the following formula was used.

\[
W = \frac{S.W.}{N}
\]

- \(W\) = Wage rate per person (Rs./day)
- \(S.W.\) = Sum of the Wage paid to all operations (Rs.)
- \(N\) = Number of days employed in all operations

All the payments were valued at the prevailing market rates.

**Labour Employed (X₁):**

It is the total number of labourers employed to raise the crops in a farm. It is measured in terms of mandays. Number of days worked by women are converted to mandays equivalent in proportion of their wage rates.
Non-Labour Cost ($X_2$):

It is the total cost of cultivation minus total value of wages in rupees. Expenses on hired bullock, machines, seeds, farm yard manure, fertilizers, pesticides, herbicides, and electricity charges and depreciation of producer assets other than land and rent on land came under the non-labour cost variable.

Irrigation Intensity ($X_3$):

It was measured as the percentage of area irrigated to the gross area owned by the farmers.

High yielding variety index ($X_4$):

It would show the area of land put under high yielding varieties. It was measured as percentage of area under high yielding varieties to the gross cropped area.

Farm Income ($X_5$):

This is the gross value of output (main plus by products) produced with reference to a particular period and evaluated at harvest prices. It was expressed in rupees per hectare.
Farm size ($X_6$):

It is the size of the farm operated by the farmers in hectares. It included the land owned, plus land leased in minus land leased out.

Period of study

To study the trend in money wages (nominal), real wages and wage differentials sexwise, operationwise and between minimum, fair wage and actual wage, the secondary data for a period of 20 years i.e. from 1974-75 to 1994-95 were used.

In order to study the wage differentials between East and West Thanjavur and the factors that influence the daily wage rates, primary data were used with reference to the agricultural year (July-June) 1994-95. Field enquiries were conducted during the months of July to October of 1995.