Chapter III

FACTORS INFLUENCING THE LEVEL AND STRUCTURE OF AGRICULTURAL WAGES

The analysis of the previous chapter has shown that the inter-district wage differentials in agriculture had shown a tendency to expand during the period 1956-57 to 1960-61, while between 1960-61 to 1967-68 these geographic wage differentials had tended to narrow down. This has been shown by the changes in the coefficient of variation. The coefficient of variation of the inter-district structure of agricultural wage differentials (16 districts) increased from 22.50 per cent in 1956-57 to 28.27 per cent in 1960-61 and fell to 22.54 per cent in 1967-68.

Secondly the wage rate of the median districts in the upper quartile of the inter-district wage structure expressed as percentage of the wage rate of the median districts in the lower quartile of the inter-district wage structure of 16 districts highlights two aspects. In the first place, the high-low differences in agricultural wages among the districts were quite substantial i.e. in 1956-57 the upper quartile median district wage as percentage of the lower quartile median district wage was 192.79 and it increased to 209.01 in 1960-61. Subsequently it declined and in 1967-68 it was 183.75. In other words even in 1967-68 the high-low differential was

about 84 per cent. The second aspect is that even the high-low differentials have shown widening upto 1960-61 and have narrowed down thereafter. Similar trend was observed in respect of 11 districts but the level of high-low wage differentials was lower than in respect of 16 districts in the state.

The third aspect which is highlighted by the previous chapter is that between the top group (i.e. first 4 districts ranked according to the level of agricultural wage rate and constituting the upper quartile of the inter-district wage structure in agriculture) and the bottom group (i.e. the last 4 districts in terms of their ranks of agricultural wage rate levels. They constitute the lower quartile or the bottom of the 16 districts wage structure), the bottom of the wage structure has remained more stable. This has been shown by the fact that the agricultural wage rates in the districts constituting the bottom of the inter-district wage structure, have not increased fast enough to come out of the bottom for most of the years during the period analysed. As against this the wage rates in the districts belonging to the upper quartile of the wage structure have not risen sufficiently rapidly thereby causing these districts to fall out of the upper quartile group in certain years during the same period.

In the context of these findings of the previous chapter the objective in the present chapter is three fold:

(1) To explain the levels of these wage rates among districts or in other words to explain why such high differences exist among the districts despite the fact that agriculture, in terms of work requirement and the nature of the activity, is homogeneous and it is all the more so when considered in the context of the small regional units like the districts within the state. The attempt is made to explain these differences in terms of cost of living on the one hand and demographic and economic factors which tend to influence the demand and supply of labour in agriculture on the other.

(2) To explain the tendency of widening and narrowing of these wage differentials over time by analysing the changes in real wage rates.

(3) By using dynamic analysis in terms of "shifts" of supply and demand we have explained the actual changes in real wage rates over the period 1960-61/61-62 to 1966-67/67-68.

Section I

Differences in Levels of Agricultural Wage Rates Among the Districts

Cost of Living and Levels of Wage rates:

To begin with let us examine to what extent these differences in money wage rates in districts are attributable to the differences in cost of living for agricultural labourers among

the districts. If differences in the cost of living are high and correspond to the levels of district agricultural wage rates, there would be no differences in real terms among the districts. The differences in money terms would be what are called "equalising differentials" only.

However, the cost of living for agricultural labourers is not likely to differ much among the districts within a state. The prices of agricultural produce, in particular, prices of cereals are no longer governed by local conditions. The growth of efficient transport net work, extension of regulated markets, the administrative set up of the government to handle the supplies and distribution of grain have all integrated the local markets into state and national markets for agricultural produce.

To find out the differences in the cost of living for agricultural labourers among the districts we have taken the retail prices of coarse cereals i.e. coarse rice, coarse wheat, Jowar and Bajri. It is wellknown that the large part of the consumption expenditure of the poorest people is on coarse foodgrains. However the retail prices of these cereals prevailing in district head quarters will not be truly representative for our purpose. Therefore we have taken the retail prices of these coarse cereals prevailing in different centres within each district in the state. These data were available for the year 1962-63. It was not possible to know

how much of each of these coarse cereals is consumed in each district by the agricultural labourers. Hence we have taken a simple average of the retail prices in centres within each district for coarse rice, coarse wheat, Bajri and Jowar. These average prices and their combined simple average for each of the 16 districts in Gujarat are shown in Table III-1.

Table III-1

Average Retail Prices of Coarse Rice, Coarse Wheat, Bajra and Jowar and their combined averages for the year 1962-63 in 16 districts in the State of Gujarat

(Prices in Rs. per Kg.)

District	Coarse rice	Coarse wheat	Jowar	Bajri	Combined simple average
1	2	3	4	5	6
1. Ahmedabad	0.73	0.56	0.50	0.49	0.57
2. Surat	0.59	0.57	0.51	0.55	0.56
3. Baroda	0.61	0.56	0.48	0.55	0.55
4. Kaira	0.66	0.54	0.40	0.43	0.51
5. Mehsana	0.60	0.53	0.44	0.42	0.50
6. Broach	0.60	0.57	0.49	0.52	0.55
7. Panchmahals	0.58	0.58	0.52	0.57	0.56
8. Sabarkantha	0.66	0.50	0.45	0.47	0.52
9. Banaskantha	0.63	0.57	0.48	0.50	0.55
10. Rajkot	0.61	0.53	0.46	0.53	0.54
11. Jamnagar	0.67	0.53	0.47	0.53	0.55
12. Bhavnagar	0.66	0.60	0.47	0.61	0.58
13. Junagadh	0.62	0.55	0.47	0.54	0.55
14. Surendranagar	0.71	0.55	0.44	0.48	0.55
15. Amreli	0.73	0.55	0.47	0.58	0.58
16. Kutch	0.67	0.49	0.47	0.52	0.54

Source: District Statistical Abstract, 1962-63, Bureau of Economics and Statistics, Government of Gujarat.

The table shows that the combined simple average of retail prices (Column 6) of these four cereals was around Rs.0.55 to 0.57 per kilogram in most of the districts. At the same time it is interesting to see that in respect of individual cereals the variations in prices are much wider than for the combined simple average. For example in case of coarse rice the lowest price is in Panchmahals i.e. 0.58 per kilogram while the highest is 0.73 per kilogram in Amreli and Ahmedabad districts. In other words the price variation in coarse rice is about 25 per cent. Similarly in coarse wheat, while the lowest price is in Kutch i.e. Rs.0.49 per kilogram, the highest is 0.60 per kilogram in Bhavnagar district, which is the variation of about 22 per cent. Similarly in Bajri Mehsana has the lowest price of Rs.0.42 per kilogram while Bhavnagar has the highest i.e. Rs.0.61 per kilogram. In Jowar the lowest price is Rs.0.42 in Kaira and the highest is Rs.0.52 per kilogram in Panchmahals.

Due to these variations in prices of individual cereals, it is necessary to see in details as to whether they make any significant difference in the cost of living in the districts as revealed by the combined simple average of these four cereals. Let us consider the prices of these cereals in the top four districts which had highest agricultural wage rates and the bottom four districts which had the lowest wage rates in 1962-63, the year for which the cereal prices are taken. The top four districts, in order of the level of agricultural

wage rates, were Jamnagar, Junagadh, Kutch and Rajkot. While the four districts which had the lowest agricultural wage rates were Panchmahals, Surat, Broach and Baroda. (Table II-2). It will be noted from table III-1 that the price of Bajri in the above mentioned four low wage districts was in the range Rs.0.52 to Rs.0.57 per kilogram. While in the four districts with high agricultural wage rates it varied between Rs.0.52 to Rs.0.54 per kilogram. Similarly the price of Jowar in the four low wage districts was in the range Rs.0.49 to Rs.0.52 per kilogram and in the range of Rs.0.46 to Rs.0.47 per kilogram in high wage districts. The price of coarse wheat in the four low wage districts has varied between Rs.0.56 to Rs.0.58 while in the four high wage districts it happened to be in the range of Rs.0.49 to Rs.0.55 per kilogram. In coarse rice the price range per kilogram is Rs.0.58 to Rs.0.61 in low wage districts and for the high wage districts it is Rs.0.61 to Rs.0.67.

Thus in respect of three out of four cereals, the quoted retail prices in the four lowest wage districts have not been lower than those in the four highest wage districts. On the contarary these prices happen to be slightly lower in the high wage districts than in the lower wage districts.

So far as the retail price of coarse rice is concerned, it is true that it was higher in the high wage districts and lower in the low wage districts. However it is necessary to note that rice is a locally grown product in South Gujarat to

which our above mentioned low wage districts belong. While it is not a locally grown product in Saurashtra and Kutch. In the dietary habits of agricultural labourers rice is likely to be more important in South Gujarat or in the low wage districts where it happens to be a local product. Whereas in Saurashtra and North Gujarat Jowar and Bajri will be the main cereals consumed by the agricultural labourers. Moreover in Surat district there is hardly any significant difference in the prices of coarse rice and other cereals. Thus when we consider the additional factor of dietary habits of agricultural labourers in different districts, our conclusion, that the inter-district variations in the prices of coarse cereals consumed by agricultural labourers are only marginal is strengthened. In order to find out the precise extent of overall variation in the cost of living in the districts coefficient of variation was calculated for the combined simple average prices shown in Column 6. It turned out to be 4.06 per cent. This shows that the inter-district variations in the cost of living of agricultural labourers are only marginal and hence the inter-district differences in the money wage rates of agricultural labourers also represent the real wage differences* among the districts.

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*In order to ascertain the relation between the level of money agricultural wage and cost of living in districts, coefficient of correlation between money agricultural wage and cost of living was calculated. It was $v = -0.0428$ which is insignificant.

Economic and Demographic Factors and Levels of Wage Rates:

If the cost of living does not explain the differences in district wage levels, the explanation has to be found in terms of other economic and demographic factors as they exist in the districts. A cross-section analysis of the various economic and demographic characteristics of districts would enable us to identify the major factors which explain the differences in the levels of agricultural wage rates. Since the detailed information on demographic features at the district level is contained in census of India 1961, we have chosen the year 1960-61 to carry out the cross section analysis.

The wage rate, as the price of hiring labour, on theoretical plane, would depend on the demand for and supply of labour. Differences in wage rates at any point of time among the districts can therefore be attributed to different factors affecting the demand for hired labour and the supply for hired labour among different districts.

On the demand side we have irrigation, ability to pay, cultivation of cash crops, whereas on the supply side we have taken pressure of population on land, proportion of female labourers in the total number of agricultural labourers, employment in factories and cottage and small scale industries (as the factors reducing the available supply of labour to agriculture), proportion of family worker to hired labourers etc.

Before examining individual correlationship between wage rate and various factors and constructing a regression model, we have briefly analysed the theoretical relationship between daily agricultural wage and the factors which tend to influence it.

Irrigation:

Irrigation facility implies assured supply of water to agriculture and thus it is a basic requirement to modernise agriculture. In the absence of irrigation the use of modern inputs such as chemical fertilisers and high yielding seeds is not likely to expand. On the other hand intensity of cropping (taking more than one crops) without irrigation will be limited. In the present analysis we have considered the net area irrigated as percentage of net sown area as a factor which would affect the demand for labour in agriculture.

Ability to pay:

The principle of ability to pay has to be looked at from three angles. In the first place we have to consider the productivity per acre of land. One would expect a positive correlationship between per acre productivity and wage rate. Higher per acre productivity can be taken to reflect higher paying capacity. Similarly the agricultural income per cultivator (family worker) would also reflect the paying capacity of a farmer or cultivator. In the same way high

labour productivity would reflect greater paying capacity. A worker who produces more has a claim to demand higher wage. Paying capacity of a farmer is enhanced by high labour productivity. However it is necessary to note that high income per farmer per acre, or high labour productivity do not automatically guarantee high wage rate but would depend on the nature of supply and demand of labour.

Labour Productivity:

The wage paid may be in accordance to the level of average productivity of a worker. Workers with low productivity would have lower wages than those with high productivity. Agricultural income per agricultural worker (cultivators + labourers) is taken as a measure of labour productivity.

Cultivation of Cash Crops:

Area under cash crops is defined as area under the total crops minus the area under foodgrains. Gujarat is specialising in the production of cash crops like cotton, groundnut and tobacco. Since 1960 the area under cash crops has expanded. Moreover the commercial crops like cotton, tobacco are industrial raw materials and hence their demand and prices are influenced by more dynamic conditions. While the cereals lack this advantage.

Pressure of Population on land (Manland Ratio):

On the side of the supply, we have the existing pressure of population on land. This is defined as the number of agricultural workers (cultivators plus labourers) per 100 acres of net area sown. It is expected that the districts showing high Manland ratio would have low wage rate. The agriculture in such conditions is faced with the excess supply of labour which exerts downward pressure on wage. In other words it would show negative correlation with wage rate.

Proportion of female labourers:

Traditionally the women workers are paid lower wage rates than what the male workers are paid even for the same type of work. One would therefore expect that in a region where the women labourers account for a sizable proportion of agricultural labourers, the wage rate would be lower.

Employment in Factories and in Cottage and Small scale Industries:

Employment in industry i.e. factory employment and employment in cottage and small scale industries are taken on the supply side. The industrial employment actually reduces the total available supply of labour to agriculture. The high industrial employment would siphon off the excess labour from agriculture and thereby induce better and more efficient

organisation of factors of production within agriculture. By reducing the available supply, the conditions for higher wages within agriculture will be created. It is also important to note that in order to narrow down regional disparity and improve the living standards of disadvantaged class like the agricultural labourers, industrialisation is regarded as an ultimate remedy. It is interesting to know what impact industrialisation has on the wages of agricultural worker. For the purpose we have taken factory employment per 1000 of total population as an index of industralialisation. Similarly cottage and small scale industries are particularly suited to agricultural labourers. These industries are generally scattered in rural areas and they are rural in character, technique and use locally available raw materials. Hence the adoption of such activities by agricultural labourers is likely to be easy and natural. In Gujarat there is greater concentration of these industries in the Western region (Saurashtra region) of the state. We have taken the employment in cottage and small scale industries per 1000 of total population as a variable.

Ratio of Family workers to Hired Labourers:

Along with the above main factors on the supply side, we have also considered the ratio of family workers to the hired labourers in agriculture. This factor would show the extent of participation in agricultural activity by family members.

In areas where family participation is high, there will always exist a possibility of substitution between hired and own labour.

Correlation Analysis Between Individual Factors and Agricultural Wage:

In the foregoing pages we have set forth and explained the theoretical relationship which would be expected to exist between each of the factors mentioned above and daily agricultural wage in different districts. To what extent such relationship is borne out in actual situations for the districts in Gujarat is shown below by the correlation analysis. For correlation analysis each of the above discussed factors are quantified as under:

X_1 Net area irrigated as percentage of net sown area.

X_2 Factory employment per 1000 of total population.

X_3 Manland ratio (agricultural workers per 100 acres of net sown area).

X_4 Area under cash crops as proportion of total croped area.

X_5 Number of female agricultural labourers per 100 of male agricultural labourers.

X_6 Employment in cottage and small scale industries per 1000 of total population.

X_7 Agricultural income per cultivator (per family worker).

X_8 Ratio of family workers to hired labourers.

X_9 Agricultural income per agricultural worker (Labour productivity in the crop raising sector).

X_{10} Agricultural productivity per acre.

Y Daily agricultural wage (Rs.)

The individual correlationship between these factors and daily agricultural wage rate is shown by the coefficient of correlation as shown in Table III-2.

Table III-2

Coefficients of Correlation Between Daily Agricultural Wage and Various Factors in 16 Districts for the year 1960-61

	Factor	Correlation with daily agricultural wage
X_1	Percentage area irrigated.	+ 0.384
X_2	Factory employment per 1000 of total population	- 0.117
X_3	Manland ratio	- 0.719
X_4	Percentage area under cash crops.	+ 0.361
X_5	Ratio of female labourers to male agricultural labourers.	- 0.218
X_6	Employment in cottage and small scale industries per 1000 of total population.	+ 0.688
X_7	Agricultural income per cultivator.	+ 0.537
X_8	Ratio of family workers to hired labourers.	- 0.113
X_9	Agricultural income per agricultural worker.	+ 0.713
X_{10}	Agricultural productivity per acre.	- 0.235

Source: Calculated from Appendix III-1 and Table II-2.

Note: Critical values of correlation coefficients at 1% and 5% levels of significance (with 14 d.f.) are 0.623 and 0.497 respectively.

It will be noted that among the factors shown in the table, manland ratio i.e. agricultural workers (cultivators + labourers) per 100 acres of net sown area shows the highest correlation with daily wage rate in 16 districts. It is significant at 1 per cent level of significance. The negative coefficient shows that the districts which have high Manland ratio or high pressure of population on land have low agricultural wage rates. Agricultural income per worker (cultivators + labourers) or productivity per worker in agriculture is also very significantly correlated (at 1% level) with daily agricultural wage. The relationship is positive meaning thereby that the low wage is the result of low labour productivity. However such a conclusion appears to be drastic. Because labour productivity which is calculated as Total agricultural income $\div$ Agricultural workers, assumes that all those who are available are actually engaged in crop production. This may not be so looking to the large available supply of labour in the districts like Surat, Broach, Baroda etc. In such a situation the productivity of a person actually engaged may be higher than revealed for these districts. Employment in cottage and small scale industry shows high positive correlation ($r = + 0.688$) which is significant at 5 per cent level of significance. The correlation between agricultural income per cultivator (family worker) and daily wage is also quite high + 0.537. It is also significant at 5 per cent level of significance. If we consider this as a measure of paying capacity,

it can be said that wage rate would depend on farmer's paying capacity as well. Irrigation (X_1) and cash crop proportion (X_4) do not show significant correlation with daily agricultural wage. However the correlation coefficients are not altogether negligible. On the other hand the correlation between factory employment and daily agricultural wage is not only low but the coefficient shows an unexpected negative sign. This only means that the prevailing factory employment or extent of industrialisation of districts has not had any impact on the wages of agricultural labourers in these districts. Similarly the ratio of family workers to hired labourers and the ratio of female agricultural labourers to male agriculturalllabourers have expected signs but are not significant. The relationship between per acre productivity and daily agricultural wage is negative, though it is not a significant relationship.

Regression Model:

We have fitted linear regression of the form $Y = a + b_1X_1 + b_2X_2 + b_3X_3 \ldots$ to the cross section data for the year 1960-61 for 16 districts. The purpose of carrying out the multivarite analysis was two fold: (i) to know the precise role which each individual factor plays in influencing the agricultural wage, and (ii) to find out the total explanation of the dependent variable (wage rate) by all these independent explanatory factors when they are taken together.

Before we incorporate these factors as explanatory variables in a model it is necessary to check upon the inter correlation among these independent variables. For, in case multi collinearity exists it becomes difficult to disentangle the separate influences of independent variables and hence it is not possible to obtain a precise estimate of their relative effects. Moreover as we have shown above, not all factors are important and hence we have to make a choice from among the 10 variables mentioned above. For the purpose, we have prepared the correlation matrix for these 11 variables including the dependent variable i.e. daily agricultural wage. The matrix is in Table III-3.

It will be seen from table III-3 that Manland ratio (X_3) is significantly correlated with: (i) Employment in cottage and small scale industry (X_6), (ii) Agricultural income per cultivator (X_7), (iii) Agricultural income per agricultural worker (X_9), (iv) Agricultural productivity per acre (X_{10}). However considering each variable individually it will be noted that among all, Manland ratio explains the dependent variable (daily agricultural wage) maximum. Further we notice a peculiar relationship among land productivity, labour productivity and Manland ratio. For example labour productivity (X_9) and Manland ratio (X_3) are negatively and significantly correlated. ($r = - 0.677$). This means that the existing pressure of population

Table III-3

Correlation Matrix

		X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
X_1	Percentage area irrigated.	-									
X_2	Factory employment per 1000 of total population.	-0.107	-								
X_3	Manland ratio	-0.243	-0.186	-							
X_4	Percentage area under cash crops	-0.257	+0.317	-0.422	-						
X_5	Ratio of female labourers to male agricultural labourers.	-0.163	+0.130	+0.200	+0.104	-					
X_6	Employment in cottage and small scale industries per 1000 of total population.	+0.133	-0.347	-0.557	+0.227	-0.241	-				
X_7	Agricultural income per cultivator. (crop in rising sector)	-0.019	+0.161	-0.538	+0.617	+0.162	+0.128	-			
X_8	Ratio of family workers to hired labourers.	-0.107	-0.355	+0.421	-0.629	+0.284	-0.117	+0.037	-		
X_9	Agricultural income per agricultural worker (labour productivity)	+0.102	+0.190	-0.677	+0.490	-0.014	+0.260	+0.257	-0.226	-	
X_{10}	Agricultural productivity per acre.	-0.112	-0.138	+0.620	+0.169	+0.121	-0.460	+0.079	+0.044	+0.285	-
Y	Daily Agricultural Wage (Rs)	+0.384	-0.177	-0.719	+0.361	-0.218	+0.688	+0.537	-0.113	+0.713	-0.235

Source: Appendix III-1 and Table II-2.

Note: Critical values of correlation coefficients at 1 per cent and 5 per cent levels of significance (with 14 d.f.) are 0.623 and 0.497 respectively.

on land has kept labour productivity low which in consequence would affect the wage rate. Moreover as pointed out earlier the labour productivity is calculated on the presumption that all those who are recorded as either cultivators or labourers are actually engaged in crop production. It is appropriate to argue that the labour productivity as calculated in the present analysis is the function of Manland ratio and not vice versa. Hence Manland ratio turns out to be the basic factor. On the other hand per acre productivity (X_{10}) and Manland ratio are positively and significantly correlated which may imply that the districts in which the pressure of population on land is high, probably the labour input is high and hence the productivity per acre is high. We do not find any significant relation between per acre productivity and wage rate. In fact the correlation between per acre productivity (X_{10}) and daily agricultural wage is negative.

The fact that the productivity per worker is mainly influenced by Manland ratio is clearly seen from the correlation matrix. It will be noted that labour productivity (X_9) is not significantly correlated with any of the 10 variables except Manland ratio. Thus it can be said that the pressure of population on land as measured in terms of Manland ratio is the basic factor which tends to affect the relationship of other variables with each other and also with the agricultural wage (Y). Hence it is essential to retain Manland ratio in

the regression model and drop the other inter correlated variables. Thus we have dropped employment in cottage and small scale industries (X_6); Agricultural income per cultivator (X_9); Productivity per agricultural worker (X_9); and Per acre productivity (X_{10}). Further the percentage area under the cash crops (X_4) is correlated with the ratio of family workers to hired labourers (X_8) and labour productivity (X_9) and agricultural income per cultivator (X_7). Between X_4 and X_8, it will be seen that percentage area under cash crops (X_4) explains the dependent variable (Y) more. Therefore ratio of family worker to hired labourers (X_8) is dropped. Percentage area under cash crops (X_4) is significantly correlated with agricultural income per cultivator (X_7). However X_7 is already dropped as it was highly correlated with Manland ratio (X_3). While X_9 (labour productivity) is already dropped due to intercorrelation with X_3 (Manland ratio). Factory employment (X_2) is not significantly crorelated with any one of the independent variables. At the same time it seems unrelated with the prevailing agricultural wages among the districts. With a view to ascertain the effect of this variable i.e. factory employment on agricultural wage we have retained the factory employment (X_2) as variable in the regression model. It will be also seen that irrigation does not show any significant correlation with any of the independent variables. At the same time its correlation with daily agricultural wage is not very low. Thus

the following independent variables will be included in the model.

X_1 Net area irrigated as percentage of net sown area.

X_2 Factory employment per 1000 of total population.

X_3 Manland ratio.

X_4 Area under the cash crops as proportion of total cropped area.

X_5 Number of female agricultural labourers per 100 male labourers.

The multiple regression run to the cross section data is,

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5$$

where,

Y is the dependent variable i.e. Daily agricultural wage (Rs.) and

Xs are the explanatory variables already specified above.

The values of regression coefficients (bs) and their t-values are given below:

a	+ 2.023327		
b_1	+ 0.029856	t_1	1.3511
b_2	- 0.008520	t_2	- 1.4762
b_3	- 0.023674	t_3	- 2.4918
b_4	+ 0.011210	t_4	+ 1.2826
b_5	- 0.002581	t_5	- 0.4414

R^2 = 0.669688 F ratio 4.054886

It will be seen that the coefficients of all the explanatory variables except X_2 i.e. factory employment per 1000 of total population, have the expected signs. The negative sign of the coefficient for factory employment (X_2) only shows that there is no link whatsoever between the level of industrial employment as it existed in 1960-61 and agricultural wage rates prevailing among the different districts. It may be also noted that among the five independent variables only Manland ratio (X_3) is significant at 5 per cent level of significance. Percentage area irrigated and percentage of area under cash crops seem to be the next important factors though their coefficients are not significant at 5 per cent level of significance.

The value of the multiple correlation coefficient (R^2) turns out to be 0.6697 which means that the above five variables taken together explain about 67 per cent of the variation in daily agricultural wage rates among the districts in 1960-61. However this does not mean that the other factors have no influence. We have been that some of the independent factors like labour productivity, agricultural income per worker and employment in cottage and small scale industries were dropped due to the inter-correlation with the other retained independent factors like Manland ratio, though individually they showed significant correlation with the dependent variable wage rate (Y). Thus in the interpretation of the results of the regression model constructed above these implications must be borne in mind.

Section II

Behaviour of Real Wages and Wage Determination

Changes in Real Wage rates and Wage Structure:

Starting from the year 1956-57, in each of the 16 districts under examination daily agricultural money wages have risen almost continuously though, as per expectations, these increases have not been at the uniform rates. The cost of living has also increased continuously. On the other hand the real factors such as agricultural production and acerage, intensity of cultivation, irrigation, fertilizer consumption etc., have also risen. The shifts in many of these demand generating factors have been quite substantial and are not confined to any specific districts. On the supply side the rural population in the districts has increased at varying rates. Under these circumstances it is pertinent to investigate as to whether the real wages have risen or not. The increase in money wages may represent only a compensation for rising cost of living of agricultural labourers and may not indicate any real gain for the labourers employed in agriculture. Of particular interest would be the questions such as:

(1) whether real wage rates have increased, remained constant or declined?

(2) whether the changes in the real agricultural wage rates have been in the same direction and magnitude or they have shown significant differences in these respects?

The examination of the above two aspects would also provide an explanation of the changes in the inter-district structure i.e. of widening upto 1960-61 and narrowing thereafter.

We have shown earlier that among the districts there are only negligible differences in the cost of living for agricultural labourers. Hence the district real agricultural wages are obtained by deflating district money wage rates with the cost of living index for agricultural labourers in the state of Gujarat. Thus the deflator used is the same for all the districts. This procedure, to the extent that cost of living differs among the districts will hide the differentials in real wages among the districts. But on account of the fact that the differences in cost of living are negligible, our method will not materially affect the conclusion. We have presented below the levels of real agricultural wage rates among the 16 districts of Gujarat at three points of time i.e. 1956-57/57-58, 1960-61/61-62 and 1966-67/67-68. (Table III-4). A note explaining the calculations of real wage rates and the cost of living index numbers for agricultural labourers in Gujarat state is given in Appendix III-2.

Columns 4 and 6 in table III-4 show the percentage changes in real wages during 1956-57/57-58 to 1960-61/61-62 and 1960-61/61-62 to 1966-67/67-68 respectively. While Column 7 indicates the percentage change in real wages during the entire period 1956-57/57-58 to 1966-67/67-68.

Table III-4

Real Agricultural Wages and Percentage Changes in 16 districts of Gujarat in 1956-57/57-58, 1960-61/61-62 and 1966-67/67-68

District	1956-57/57-58	1960-61/61-62	Percentage change	1966-67/67-68	Percentage change	Percentage change in 1966-67/67-68 over 1956-57/57-58
1	2	3	4	5	6	7
1. Ahmedabad	1.80	1.88	+ 4.44	1.86	- 1.07	+ 3.33
2. Banaskantha	1.77	1.70	- 3.96	1.57	- 7.65	- 11.30
3. Baroda	1.39	1.37	- 1.44	1.26	- 8.03	- 9.36
4. Broach	1.18	1.26	+ 6.77	1.25	- 0.80	+ 5.93
5. Kaira	1.89	1.80	- 4.77	1.55	- 13.89	- 1.80
6. Mehsana	1.69	1.91	+ 13.10	1.73	- 9.43	+ 2.36
7. Panchmahals	1.14	1.15	+ 0.88	1.15	0.00	+ 0.88
8. Sabarkantha	1.48	1.77	+ 19.59	1.46	- 17.52	- 1.36
9. Surat	1.28	1.24	- 3.13	1.19	- 4.04	- 7.04
10. Amreli	1.62	2.42	+ 49.38	1.86	- 23.15	+ 14.81
11. Bhavnagar	1.84	2.26	+ 22.82	1.72	- 23.90	- 6.53
12. Jamnagar	2.51	2.84	+ 13.14	2.45	- 13.74	- 2.40
13. Junagadh	2.11	2.53	+ 19.90	2.31	- 8.70	+ 9.47
14. Kutch	2.23	2.44	+ 9.41	2.07	- 15.17	- 7.18
15. Rajkot	2.49	2.52	+ 1.20	2.23	- 11.51	- 10.45
16. Surendranagar	2.36	2.05	- 13.14	1.91	- 6.83	- 19.07

Source: Calculated from Money wage rates given in Table II-2, and cost of living index for agricultural labourers in the state of Gujarat given in Agricultural Labour in India: A Compendium of Basic Facts, Labour Bureau, Department of Labour and Employment, Government of India.

Note: Methodology of computations is given in Appendix III-1.

It can be noted that during 1956-57/57-58 to 1960-61/61-62 the real agricultural wages in the districts of Banaskantha, Baroda, Kaira, Surat and Surendranagar have fallen though the decline except in Surendranagar is small. On the other hand in the rest of the 11 districts the real wages have shown increases. The increase is more than proportionate to the state wage increase, in the districts of Mehsana, Sabarkantha, Amreli, Bhavnagar, Jamnagar and Junagadh.

However between 1960-61/61-62 and 1966-67/67-68 real agricultural wages have fallen in almost all the districts except perhaps Panchmahals and Broach, the districts which had (except Surat) the lowest wage rates in 1960-61/61-62. It will be noted that the fall in the real wage in Surat district is only marginal.

Another feature which we notice is that the real wages have fallen more than proportionately (to the fall in the state wage rate) in Kaira, Sabarkantha, Amreli, Bhavnagar, Jamnagar, Kutch and Rajkot. In the rest, the relative fall in the wage rate is lower. Most of the districts which have lower real wages in 1960-61/61-62 have lower percentage fall in their real wages by 1966-67/67-68.

If we consider the entire period 1956-57/57-58 to 1966-67/67-68 we find that real agricultural wages have either fallen or remained constant in most of the districts except in Ahmedabad, Amreli and Junagadh which have experienced notable

rises in their real wage rates. Our findings of the changes in the real wage rates can be summarised as under:

(1) The real agricultural wages in majority of districts have risen and in the remaining, there is a relatively small fall during 1956-57/57-58 to 1960-61/61-62,

(2) While during 1960-61/61-62 to 1966-67/67-68 almost all the districts have experienced a fall in their real agricultural wage rates.

(3) In respect of the entire period 1956-57/57-58 to 1966-67/67-68, it can be said that a majority of the districts i.e. 10 out of 16 have shown a fall in real wage rates while among the remaining in 5 i.e. Ahmedabad, Broach, Mehsana, Amreli and Jamnagar real wages have risen. There is no change in the real wage in the district of Panchmahals.

Level of real wages and percentage changes in them overtime:

We may try to ascertain whether the high real wage districts have experienced higher percentage changes or not. For the purpose we may first consider the period 1956-57/57-58 to 1960-61/61-62. The inter-district structure during the period as revealed in chapter II has somewhat widened, which would imply that the districts which had relatively higher wage rates in 1956-57 experienced relatively faster growth than those which had low wages. The table III-5 shows the relation between levels of real wages and percentage changes in them during 1956-57/57-58 to 1960-61/61-62.

Table III-5

Relation Between Level and Percentage change in Real Agricultural Wages in 16 Districts: 1956-57/57-58 to 1960-61/61-62

District (1956-57/57-58)	Percentage increase/decrease in real wage rates in 1960-61/61-62			Absolute Rise/fall in real wage (Rs)
	High increase	Low increase	Decrease or no change	
1	2	3	4	5
Very high real wage rates (VH)				
1. Jamnagar	Jamnagar	-	-	+ 0.33
2. Rajkot	-	-	Rajkot	+ 0.03
3. Surendranagar		-	Surendranagar	- 0.31
4 Kutch	Kutch	-	-	+ 0.21
High real wage rates (H)				
5. Junagadh	Junagadh	-	-	+ 0.42
6. Kaira	-	-	Kaira	- 0.08
7. Bhavnagar	Bhavnagar	-	-	+ 0.42
8. Ahmedabad	-	Ahmedabad	-	+ 0.08
Low real wage rates (L)				
9. Banaskantha	-	-	Banaskantha	- 0.07
10. Mehsana	Mehsana	-	-	+ 0.22
11. Amreli	Amreli	-	-	+ 0.80
12. Sabarkantha	Sabarkantha	-	-	+ 0.29
Very low real wage rates (VL)				
13. Baroda	-	-	Baroda	- 0.02
14. Surat	-	-	Surat	- 0.04
15. Broach	Broach	-	-	+ 0.08
16. Panchmahals	-	-	Panchmahals	+ 0.01

Source: Table III-4

Note: (i) VH - Districts with ranks (level of wage rate in 1956-57/57-58) I to IV.

H - Districts with ranks V to VIII

L - Districts with ranks IX to XII.

VL - Districts with ranks XIII to XVI.

(ii) High increase is in ranks I to VIII (percentage rise in wage rate) and low is between IX to XVI.

It will be noted from table III-5 that out of 8 districts showing high to very high levels of real wages in 1956-57/57-58, 4 have experienced high increases in real wage rates by 1960-61/61-62. Similarly, in the group of 8 districts with low to very low level of wage rates in 1956-57/57-58, 4 have high increases in real wage rates. It is noteworthy that in the 4 districts with the lowest real wage rates 3 have either no change or actual decline in real wage. Thus while the majority of the districts in the first three quartiles have experienced percentage rise in real wages, the lowest wage districts do not have such increases. Perhaps it is this tendency which explains why the inter-district structure has somewhat widened during 1956-57/57-58 to 1960-61/61-62. In terms of absolute changes also, it will be noted from column 5 that 5 out of 8 districts with high to very high wage levels have increases in real wages in the range of 20 paise to 42 paise. In the third quartile of low wage districts also the absolute rise in wage rates are quite significant (except in Banaskantha where it has actually fallen). On the other hand in the very low real wage districts - Baroda, Surat, Broach and Panchmahals, there is hardly any rise.

Table III-6

Relationship Between Level and Percentage fall in Real Wages in 16 districts :1960-61/61-62 to 1966-67/67-68

District (1960-61/61-62)	Percentage fall in real wage (1966-67/67-68) High	Low	Increase	Absolute Rise/fall in real wage
1	2	3	4	5
Very high real wage rates (VH)				
1. Jamnagar	Jamnagar	-	-	- 0.59
2. Junagadh	-	Junagadh	-	- 0.22
3. Rajkot	Rajkot	-	-	- 0.29
4. Kutch	Kutch	-	-	- 0.37
High real wage rates (H)				
5. Amreli	Amreli	-	-	- 0.56
6. Bhavnagar	Bhavnagar	-	-	- 0.54
7. Surendranagar	-	Surendranagar	-	- 0.14
8. Mehsana	Mehsana	-	-	- 0.18
Low real wage rates (L)				
9. Ahmedabad	-	Ahmedabad	-	- 0.02
10. Kaira	Kaira	-	-	- 0.25
11. Sabarkantha	Sabarkantha	-	-	- 0.31
12. Banaskantha	-	Banaskantha	-	- 0.13
***Very Low real wage rates (VL)**				
13. Baroda	-	Baroda	-	- 0.11
14. Broach	-	Broach	-	- 0.01
15. Surat	-	Surat	-	- 0.05
16. Panchmahals	-	Panchmahals	-	- 0.00

Source: Table III-4.

*In the very low wage group the percentage decline in real wage (except in Baroda) is almost negligible.

Note: i) (VH), (H), (L) and (VL) are defined in the same way as in preceding table (Table III-5).

ii) High decrease indicates percentage fall with rank (percentage fall in wage rates arranged in discending order - highest to the lowest fall) I to VIII and low decrease indicates percentage fall with rank IX to XVI.

The table III-6 highlights the relation between the levels of real wages in the districts in 1960-61/61-62 and percentage fall in them by 1966-67/67-68. Out of the 8 districts with high to very high wage levels in 1960-61/61-62, 6 have experienced high decrease in real agricultural wage rates. On the other hand the fall in real agricultural wages in 6 out of 8 low wage districts, is low. This explains the contraction or narrowing of the inter-district structure of agricultural wages during 1960-61/61-62 to 1966-67/67-68. The decline in real agricultural wages in absolute terms also throws more light on the narrowing of the wage structure. For example the real wages in high to very high wage level districts (showing the ranks (discending order) I to VIII in terms of wage level) have fallen in the range of about 20 paise to 60 paise for most of these districts. In the very low wage group consisting of the districts of Baroda, Broach, Surat and Panchmahals one finds practically negligible decline in real wages (except in Baroda where it is 11 paise). In the low wage group Kaira and Sabarkantha have also experienced significant fall in their daily agricultural wages. The changes in the real wage rates during 1960-61/61-62 to 1966-67/67-68 can be summarised as under:

(1) In all the districts except Panchmahals, the real agricultural wage rates have declined. The district of Panchmahals had the lowest wage rate in 1960-61/61-62.

(2) The percentage fall in real wage rates are related to the levels of real wages which prevailed in 1960-61/61-62. The districts which had very low levels of real wages in 1960-61/61-62 (i.e. Panchmahals, Broach, Surat and even Baroda) have experienced a negligible decline in their real wage rates. Whereas those districts which had high real wage rates (Amreli, Bhavnagar, Jamnagar, Rajkot etc.) had experienced relatively greater percentage fall in their real wages.

(3) The narrowing of the inter-district wage structure during the period is explained by the above mentioned behaviour of real wage rates - greater decline in those districts which had high levels of wages and smaller decline in those which had very low wage rates.

Shifts in demand, supply and wage Determination:

We may now attempt how the "shifts" of demand for labour and supply of labour have affected the changes in the district agricultural wage rates. In other wards our objective is to explain actual changes over time in wage rates in terms of relative impact of shifts in demand and supply of labour.

Change in the supply of labour and levels of wage rates:

In the present analysis, the percentage change in the supply of labour in agriculture is measured in terms of percentage change in the rural population in the districts between 1961-1971 (the two census years). The growth of

rural population is thus a proxy for the change in supply of labour available to agriculture. The table III-7 shows the growth of rural population in different districts during 1961-1971.

Table III-7

Percentage Change in Rural Population in 16 Districts and the State of Gujarat 1961-1971

District	Percentage change in rural population
1, Ahmedabad	21.08*
2. Surat	23.75
3. Baroda	21.82
4. Kaira	22.91
5. Mehsana	27.22
6. Broach	20.39
7. Panchmahals	24.79
8. Sabarkantha	26.40
9. Banaskantha	23.18
10. Rajkot	34.97
11. Jamnagar	32.84
12. Bhavnagar	26.91
13. Junagadh	30.68
14. Surendranagar	29.37
15. Amreli	29.33
16. Kutch	12.92
State	25.22

Source: Census of India, 1971, Series 1, Paper 1 of 1971 - Supplement Provisional Totals.

*Excludes Gandhinagar.

It will be noted that in 8 districts the percentage change in rural population is lower than that for the state as a whole while in the remaining 8 districts the rural population has increased at a faster rate than for the state as a whole. It is interesting to note that all the districts of Saurashtra region i.e. Rajkot, Jamnagar, Bhavnagar, Junagadh, Surendranagar and Amreli have experienced faster growth in their rural population during 1961-1971 whereas most of the districts in the Gujarat region in the state have lower increase in rural population.

Unfortunately it is not possible to disentangle the growth of rural population of districts, which is due to immigration or inter-district mobility, which otherwise would have given us precise information on the relation between wage rates and inter-district mobility of labour force. In the absence of such break down of changes in rural population for districts, it is hoped that the growth of rural population between 1961 and 1971 would indicate, though in a limited way, the changes in the supply of labour to agriculture in relation to the prevailing levels of agricultural wage rates in the districts. We have presented in table III-8 the real agricultural wage rates in 16 districts in 1960-61/61-62 and percentage changes in rural population during 1961-1971.

Table III-8

District Agricultural Wage Rates and the Growth of Rural Population in 16 Districts

District (1960-61/61-62)	Percentage change in rural population: 1961-1971			
	Very High increase (VH)	High increase (H)	Low increase (L)	Very low increase (VL)
1	2	3	4	5
Very High Level of Wage Rate (VH)				
1. Jamnagar	Jamnagar	-	-	-
2. Junagadh	Junagadh	-	-	-
3. Rajkot	Rajkot	-	-	-
4. Kutch	-	-	-	Kutch
High Level of Wage Rate (H)				
5. Amreli	-	Amreli	-	-
6. Bhavnagar	-	Bhavnagar	-	-
7. Surendranagar	Surendranagar	-	-	-
8. Mehsana	-	Mehsana	-	-
Low Level of Wage Rate (L)				
9. Ahmedabad	-	-	-	Ahmedabad
10. Kaira	-	-	Kaira	-
11. Sabarkantha	-	Sabarkantha	-	-
12. Banaskantha	-	-	Banaskantha	-
Very Low Level of Wage Rate (VL)				
13. Baroda	-	-	-	Baroda
14. Broach	-	-	-	Broach
15. Surat	-	-	Surat	-
16. Panchmahals	-	-	Panchmahals	-
Total	4	4	4	4

Source: Table III-4 and Table III-7.

Note: Very high (VH) is the group showing I to IV ranks in discending order.
High (H) ranks V to VIII.
Low (L) ranks IX to XII.
Very Low (VL) ranks XIII to XVI.

Table III-8 highlights the relation between changes in rural population and wage levels in the districts. The first four districts with very high wage rates in 1960-61/61-62 have also experienced very high increases in their rural population between 1961-1971. On the other hand the last four districts with the lowest wage rates have low to very low increases in their rural population between 1961-1971. In other words, out of the 8 districts having high to very high wage levels in 1960-61/61-62, 7 have experienced very high increases in their rural population. The district of Kutch is perhaps an exception as a large part of its population has migrated to distant urban areas. Similarly, of the remaining 8 districts with low to very low levels of agricultural wages, none has experienced very high increase in rural population. Only one district i.e. Surendranagar has shown high increase while the 7 districts have low to very low growth in their rural population. This type of response of supply of labour in relation to the prevailing levels of wage rates in agriculture is noteworthy in the context of the general belief that the economic mechanism of demand and supply of labour in rural labour markets does not work satisfactorily.[1] It is true that in a situation of uncertain employment in agriculture, labour is not likely to

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[1] Vyas V.S. "Agricultural Labour in Four Villages: Some observations," in Agricultural Labourers in Four Indian Villages, (Memiographed) edited by V.S. Vyas. Ad-hoc Research Studies, No.4, Agro-economic Research Centre for Gujarat and Rajasthan, Sardar Vidyapith, Vallabh Vidyanagar.

be attracted to other areas if the wage differential is low. However if we take a simple average of the daily agricultural wage in the first 4 very high wage paying districts (Jamnagar, Junagadh, Rajkot and Kutch) and compare it with the average of wage rates in the very low wage paying districts (Baroda, Broach, Panchmahals and Surat), we find the striking difference. The very high wage paying 4 districts' average being Rs.2.58 per day while it is Rs.1.26 in the very low wage paying 4 districts. In other words the average daily agricultural wage in the top wage paying districts is more than twice that of the wage paid in very low wage paying districts. Therefore it is not surprising that such a vast difference is bound to attract more labour over time.

We have no direct measure of estimating the change in demand for hired labour in relation to the level of wage rates. A cross section study[2] of the Gujarat districts has shown that the demand for hired labour is elastic to the wage rate. However as the author himself has pointed out, "A time series

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[2]Misra V.N. "Labour Markets in Agriculture: A study of Gujarat districts." Indian Journal of Agricultural Economics, Conference Number, July-September 1970. Misra has taken the demand for hired labour per acre as the dependent variable and (i) daily wage, (ii) per capita income in the rural sector, (iii) crop pattern (proportion of crops needing more than 100 mandays per hectare to the total cropped area), and (iv) percentage net area irrigated as independent variables. He finds positive and significant relation between demand for hired labour and 2, 3 and 4 and negative and significant relation with (1), $R^2 = .87$.

analysis but not at a highly aggregative level, can give us a more reliable idea of the working of the rural labour markets". In other words what is most pertinent is the study of shifts in supply, demand and wage rates over time, or a dynamic analysis as against static cross section. In the dynamic analysis attempted here, the change in the total agricultural production is taken as the index of change in total demand for labour. The factors such as growth of irrigated acerage, productivity per worker as well as per acre, use of modern inputs like chemical fertilisers and high yielding seeds and also the enhanced values of crops will be reflected in the output (in value terms) changes. In other words the index of agricultural output will incorporate the demand generating separate influences of individual factors as mentioned above. Here it is necessary to note that the increased demand for labour (measured in terms of the growth of agricultural output) may not fully reflect the increase in the demand for hired labour. Broadly it can be said that in the South Gujarat districts such as Surat, Broach, Baroda, where supervisory cultivation prevails, the increased labour requirements would be practically completely met by hired labour. In other words in such districts there will be only negligible difference between the total increase in the demand for labour and increase in the demand for hired labour. Whereas in the regions of North Gujarat and Saurashtra peasant proprietorship or family farming is the rule. Therefore a part of the additional labour requirement would be met from

the household itself (and particularly when the wage rates are high the substitution between family labour and hired labour can also occur). Hence the increase in the demand for hired labour will be lower than the increase in the total demand for labour in agriculture as measured in terms of the growth of agricultural produce. The index of agricultural production has the year 1960-61 as Base Year. Prices of crops used as weights are the district prices of each crop in 1960-61. Thus the index is in terms of constant prices of crops in each district. The index number for the years 1961-62, 1966-67 and 1967-68 are shown in the Appendix III-3 .

Since the percentage changes in wage rates are based on the two year averages i.e. 1960-61/61-62 and 1966-67/67-68, it is necessary to use the average of two years for measuring the change in agricultural production. Moreover the agricultural output is subject to greater fluctuation from year to year. For example the year 1966-67 was a drought year. While 1967-68 was an above average one. Similarly while 1960-61 was normal, 1961-62 was above average. Due to these reasons it is desirable to take an average of two years to measure the growth of output rather than a single year figures. We have therefore considered the average of the index number of agricultural production in 1960-61/61-62 (with 1960-61 = 100) and the average of index number of 1966-67 and 1967-68. The change in agricultural output is measured on the basis of these averages at two points of time. If we classify the changes in the agricultural

production in 16 districts between the above mentioned two points of time, we have the following pattern of growth of demand (Table III-9).

Table III-9

Growth of Agricultural Output in 16 Districts: 1960-61/61-62 to 1966-67/67-68

District	Percentage growth of agricultural output: 1960-61/61-62 to 1966-67/67-68		
	1960-61/ 1961-62	1966-67/ 1967-68	Percentage growth
1	2	3	4
1. Ahmedabad	119.12	125.53	+ 5.38
2. Banaskantha	145.17	121.57	- 16.25
3. Baroda	104.64	109.51	+ 4.65
4. Broach	111.89	105.34	- 5.85
5. Kaira	105.79	138.88	+ 31.27
6. Mehsana	140.58	145.81	+ 3.72
7. Panchmahals	127.98	100.19	- 21.71
8. Sabarkantha	106.42	136.56	+ 28.32
9. Surat	102.91	130.81	+ 27.11
10. Amreli	97.81	91.76	- 6.18
11. Bhavnagar	106.44	124.18	+ 16.66
12. Jamnagar	105.88	139.23	+ 31.49
13. Junagadh	100.88	106.20	+ 5.27
14. Kutch	233.76	245.33	+ 4.94
15. Rajkot	102.18	122.64	+ 20.02
16. Surendranagar	131.67	147.95	+ 12.36

Source: Based on the Index Number of agricultural production given in Appendix III-3 .

It will be noted that the total demand for labour measured in terms of change in the total output, has declined in four districts - Broach, Banaskantha, Panchmahals and Amreli. In the districts of Panchmahals and Banaskantha there was a significant fall in production. In the districts of Jamnagar, Rajkot, Surat, Sabarkantha and Kaira the agricultural production has grown significantly.

Let us now consider the actual changes in the district real agricultural wage rates in the context of the changes in the demand for labour and the supply of labour in agriculture. Changes in the agricultural production and rural population represent the change in real factors and hence they have to be related to the changes in real wage rates. Moreover the changes in the money wage rates might not have any real significance due to the rising cost of living since 1960-61. At the outset it is necessary to note that the analysis in the daily agricultural wage rates in the districts will have to take into account the facts of prevailing pressure of population on land and the level of already prevailing wage rates in districts. It can be said that if the prevailing real wage rate is a subsistence wage, (as for example in the districts of Panchmahals, Surat etc.) the further downward pressure on real wage is not likely to exist. This would be the situation irrespective of the actual force of demand or supply or both. And hence in all probability one would expect that real wage

rates would not fall below such minimum level and hence either they would remain steady or show an increase. The increase in real wage under the conditions of already prevailing high population pressure is much less likely even if the expansion of demand happens to be very strong. This is because the existing stock of labour would be more than enough and one would expect that the demand for labour could be increased without causing any increase in the real wage. The real wage under such conditions would rise only if the forces on demand side - increasing the demand for labour and factors on supply side - reducing available pool of labour to agriculture, work sufficiently strongly and for a reasonably long period of time.

Second, if the prevailing level of real agricultural wage is quite high, (which itself might be the result of demand and supply conditions in agriculture) such high level may not be maintainable with the altered conditions of demand and supply. Probably what will happen is that the increased supply of labour will exert downward pressure on the real wage. In areas of peasant cultivation as in North Gujarat and Saurashtra region, the additional factor will be the substitution between own labour and hired labour. This would also tend to exert a downward pressure on wage. The already prevailing high level of agricultural wages would be expected to induce labour force to it and hence we would expect a

significant rise in the supply of labour in response to high real wage rates. The fact of increased demand for labour would then serve the purpose of increasing employment either at constant or even lower real wage rates. This is likely to happen when the real wages even after a decline, are, at a much higher level than those prevailing in the other regions. As a consequence high level of real wage accompanied by relatively large increase in the supply (which one would expect) will pull down the real wage even when there exists a strong pull from demand side. The fact that the real wage is not driven near the subsistence level shows the force of demand and also the relatively low total stock of labour which is available for agriculture.

It will be noted from table III-4 that the districts of Panchmahals, Broach, Surat have very low real wage rates i.e. ranging between Rs.1.15 to Rs.1.26 in 1960-61/61-62. Even in Baroda the daily real wage was Rs.1.37. These real wage rates (in the districts of Panchmahals, Broach, Surat and Baroda) are much lower than those prevailing in the districts like Jamnagar, Rajkot, Junagadh, Kutch etc., in the same year i.e. 1960-61/61-62. They range between Rs.2.42 to Rs.2.84 per day. Even in Surendranagar and Bhavnagar the real wage rates are above Rs.2.0 per day.

Now when we examine the wage levels in 1966-67/67-68 it is striking that the real wage rates in Broach, Surat,

Panchmahals have remained remarkably unchanged. The real wage in Baroda is also in line with the real wages in the other three districts. Whereas in the high wage districts of 1960-61/61-62 one notices significant decline in 1966-67/67-68. None the less these districts - Jamnagar, Rajkot, Kutch, Junagadh, Amreli and even Bhavnagar continued to be high real wage districts in 1966-67/67-68 also.

Let us now consider the actual relative changes in demand, supply and percentage changes in real daily agricultural wage rates. We have presented in table III-10 showing the classification of 16 districts according to the nature and extent of changes in demand for labour, supply of labour and real wage rates during 1960-61/61-62 to 1966-67/67-68.

The four districts - Banaskantha, Broach, Panchmahals and Amreli have actually experienced a decrease in agricultural production (Column 2) between 1960-61/61-62 to 1966-67/67-68. On the supply side it will be noted that three of these four districts i.e. Panchmahals, Broach and Banaskantha have shown low to very low percentage increase in their rural population (1961-1971, Columns 5 and 6). If we consider the levels and changes in real wage rates in these districts it will be noted that in the districts of Panchmahals and Broach, the real wage rates have practically remained unchanged between 1960-61/61-62 to 1966-67/67-68. In Panchmahals the real agriculture wage was Rs.1.15 in 1960-61/61-62 and also in 1966-67/67-68, which is the lowest. It was Rs.1.26 in Broach in 1960-61/61-62 and Rs.1.25 in 1966-67/67-68. If we assume that approximately a real wage rate of Rs.1.15 to Rs.1.25 is subsistence, then, Panchmahals, Broach, Baroda, Surat have only subsistence wage rates (real). The result is therefore that even a substantial fall in demand for labour as represented by the decline in agricultural production in these districts practically would not leave any scope for further reduction in the real wage of subsistence level. The increase in the money wage rates in these districts has to be looked at from this angle. These increases have only protected the subsistence real wage. By the same logic, the district of Surat on the one hand (which shows the highest pressure of population on land) has experienced a significant increase in agricultural production (Column 2)

and it is accompanied by a relatively lower growth in the rural population on the other. Still however, real wage in Surat has remained unchanged. This is the further evidence of the reasoning outlined above that a substantial rise in demand might fail to raise real wage in a district where agriculture is already burdened with exeessive population. Moreover the absolute size of labour force dependent on agriculture is large in the districts like Surat and Broach and hence even a relatively low percentage increase in rural population whuld add upto a large number in absolute terms. In Amreli district, as one would expect, the fall in demand accompanied by medium increase in the supply, has led to a substantial fall in the real wage (Column 10). This however still leaves real wage in Amreli district much above the subsistence level as shown earlier. For instance the real wage in Amreli district in 1966-67/67-68 was Rs.1.86 as against the real wage rates of Rs.1.15 to Rs.1.25 which prevailed in Panchmahals, Surat etc. In fact even after the decline of 23.9 per cent the real wage in Amreli remained higher than those in 9 districts. Similarly, in Banaskantha district, decrease in demand was accompanied by low increase in the supply. This decreased the real wage by 7.65 per cent. This leaves the real wage Rs.1.57 in Banaskantha in 1966-67/67-68.

The districts of Ahmedabad, Baroda, Mehsana, Junagadh and Kutch have very low increase in demand (0 to 9 per cent)

while Bhavnagar and Surendranagar have low increase (10 to 19 per cent) in demand for labour. These two groups can be taken together as showing low demand increase districts for analysis. It will be noted that of these, Baroda district shows the lowest real wage in 1966-67/67-68. Theoretically speaking a relatively low growth of demand accompanied by a small increase in rural population would not have much effect on the wage. Baroda has experienced a fall of 8.03 per cent in its real wage between 1960-61/61-62 to 1966-67/67-68. Perhaps, Baroda being already a district with high pressure of population on land, a relatively low further addition to the already available labour force in agriculture, has pushed down the real wage to some extent. Moreover the real wage in Baroda district was somewhat higher Rs.1.37 in 1960-61/61-62 (in comparison to the range of subsistence to Rs.1.15 to Rs.1.25). It seems this has been reduced to the range of real wage rates as it operates in districts of Panchmahals, Broach and Surat.

Ahmedabad is a district with low pressure of population on land. The district has experienced very low increase in rural population (Column 6). At the same time demand has also grown very slowly (Column 2). So far the impact on wage rate is concerned, we find that the real wage has remained unchanged (Column 7). As against this in Mehsana district medium growth of supply together with low increase in demand, has brought about a fall in real wage i.e. by 9.43 per cent. The district

of Junagadh has also shown a fall in real wage of 8.70 per cent - which is relatively low. In Junagadh the real wage seems to have fallen mainly due to the supply factor - the growth of rural population is high (column 3) and demand has shown low increase (0 to 9 per cent). This however leaves the real wage of Rs.2.31 in Junagadh in 1966-67/67-68.

The districts of Bhavnagar and Surendranagar have shown the growth of demand for labour in the range of 10 to 19 per cent during 1960-61/61-62 to 1966-67/67-68. These two districts have high and medium growth in rural population. However the real wage in Bhavnagar is reduced much more (more than 20 per cent) than in Surendranagar (5 to 9 per cent). The explanation of this dichotomy is perhaps to be found in the levels of real wage rates in 1960-61/61-62 and 1966-67/67-68 in these districts. For example the real wage in Bhavnagar district was Rs.2.26 and it was Rs.2.05 in Surendranagar in 1960-61/61-62. This seems to have left a relatively greater scope of decline in Bhavnagar in the context of the additional supply of labour. The real wage rate in Bhavnagar had become Rs.1.86 and in Surendranagar Rs.1.91. Thus they seem to have converged to the similar level during the period. The district of Kutch stands as a special case. Because a substantial part of its population has migrated to distant urban areas for trade and other urban occupations and has labour shortage. On the other hand it has semi-desert condi-

tions with scanty rainfall and hence stable agriculture would be confined only to irrigated tracks. Kutch has very low growth in rural population (column 6) and also a relatively low increase in demand (10 to 19 per cent). This would have been expected to leave the real wage unchanged. However Kutch has shown a fall of 15.7 per cent in its real agriculture wage. It is to be noted that Kutch happened to be one of the highest real wage paying district both in 1960-61/61-62 and in 1966-67/67-68. It was Rs.2.44 in 1960-61/61-62. This is reduced to Rs.2.07 in 1966-67/67-68. In 1966-67/67-68 only Junagadh, Jamnagar, Rajkot and Kutch paid a real wage of Rs.2.00 and above. This itself happened to be 80 to 100 per cent above the subsistence level or real wage as they prevailed in Panchmahals, Broach, Surat and Baroda. This argument can be elaborated further. If the existing level of real wage is high and the district experienced rapid increase in its rural population, the impact of demand - even when the growth of demand is relatively large, is likely to be negligible and the real wage will fall. Jamnagar and Rajkot districts seem to fall in this category. Both of them have medium to high growth of demand for labour, and in both the levels of real wages are very high i.e. Jamnagar Rs.2.84 (Rank I) and Rajkot Rs.2.52 (Rank III) in 1960-61/61-62. These are also low population pressure districts. Under normal circumstances we would have expected that the high and medium growth in demand (despite high growth in supply) would have at least protected

wage. But the prevailing wage levels in 1960-61/61-62 do not seem to be protectable and they have actually fallen with the increase in the supply of labour. In Rajkot it is Rs.2.25 or fallen by 11.51 per cent and in Jamnagar it is Rs.2.45 or fallen by 13.74 per cent. Perhaps in the absence of the strong demand pull the level of real wage would have gone down further. Thus along with the growth in the supply of labour and demand for labour, the existing level of real wage is also a factor to be taken into account in explaining the determination of wages in agriculture in the districts of Gujarat.

Conclusion:

(1) The differences in the cost of living of agricultural labourers among the districts are only negligible. Hence the money wage rate differences also reflect the differences in real wages in different districts.

(2) The cross section analysis of 16 districts for the year 1960-61 reveals that the pressure of population on land (which is measured as the number of agricultural workers per 100 acres of net sown area in the study) is the most important factor causing wide regional differences in agricultural wages in 1960-61. However the partial correlation analysis also shows positive and significant relationship with factors like employment in cottage and small scale industries, agricultural income per cultivator, and productivity

per worker. However the land productivity and wage rate have shown negative and insignificant relationship. The employment in factories has no relation at all with the prevailing levels of wage rates in different districts in 1960-61.

(3) During 1960-61 to 1967-68 the real agricultural wage rates have declined in all the districts except in Panchmahals. However they have generally risen in majority of the districts during 1956-57 to 1960-61. Considering the entire period 1956-57 to 1967-68 one finds that in the majority of the districts real agricultural wage rates have declined.

(4) During the period 1960-61 to 1967-68 it is found that the districts which had low real wages have experienced either a marginal decline or no decline in their real wages. Whereas in those districts where the real wage rates were comparatively high, the percentage fall in real wages is also large.

(5) The pattern of changes in district real wage rates i.e. relatively greater fall in those which had high initial wages and negligible or no fall in those districts which had low initial wage levels, explains the narrowing tendency of the inter-district wage structure in agriculture during 1960-61 to 1967-68. In the same way somewhat expansion of the wage structure during 1956-57 to 1960-61, is due to relatively larger increase in real wage rates in the districts with high initial wages in 1956-57 and relatively low increases in the districts which had low initial wages.

(6) The dynamic analysis of percentage changes of district agricultural wage rates and percentage changes in factors which tend to increase the demand for labour in agriculture and also changes in supply reveal interesting results.

i) There is positive relationship between levels of wages and percentage changes in supply - rural population, during 1960-61 to 1967-68. In other words the rural population has increased at a faster rate in those districts which had high agricultural wage rates (both in money and real terms).

ii) The demand for labour (measured in terms of the growth of agricultural output) has increased in majority of the districts (in 12 out of 16 districts). In the districts like Jamnagar, Kaira, Sabarkantha, Rajkot and Surat agricultural output has risen significantly during 1960-61/61-62 to 1966-67/67-68. On the contrary in Banaskantha and Panchmahals agricultural production shows significant fall.

iii) The changes in real wage rates during 1960-61 to 1967-68 are explained by the changes in the supply of labour to agriculture, change in demand for labour, prevalent population pressure on land and existing levels of real wage rates. Generally in the districts of Saurashtra region relatively larger growth in the rural population (supply) during 1961-1971

accompanied by relatively high real wage rate levels have led to significant decline in real wages during 1960-61 to 1967-68. On the other hand in the districts of Panchmahals, Broach, Surat the prevalent levels of initial wages together with the high pressure of population on land explain the changes in real wage rates.

Appendix III-1

Inter-district Variations in Various Factors influencing demand for and supply of labour in Agriculture in Gujarat: 1960-61

District	Net area irrigated as percentage of net sown area	Factory employment per 1000 of total population	Agricultural workers (cultivators + labourers per 100 acres of net sown area	Area under cash crops as percentage of total cropped area	Number of Female labourers per 100 male agricultural labourers	Employment in cottage and small scale industries per 1000 of total population	Agricultural income per cultivator (per family worker)	Ratio of family workers to hired labourers	Agricultural income per agricultural worker (cultivators + labourers	Agricultural productivity per acre (crop rising sector)
1	2	3	4	5	6	7	8	9	10	11
1. Panchmahals	2.36	3.00	57.00	24.10	90	10	183	20.9	174.60	99.17
2. Banaskantha	8.27	0.40	21.00	22.60	50	26	215	11.4	196.60	40.79
3. Sabarkantha	8.49	5.00	32.00	57.20	53	21	372	10.8	339.20	107.35
4. Broach	1.03	10.00	30.00	63.40	97	8	567	1.1	314.50	90.59
5. Baroda	2.57	21.00	31.00	59.80	79	6	536	1.5	322.00	101.25
6. Surat	2.65	16.00	42.00	52.80	113	15	407	1.6	249.30	107.45
7. Ahmedabad	7.35	77.00	17.00	61.80	75	11	493	2.2	354.00	58.21
8. Kaira	7.71	10.00	38.00	46.70	56	9	388	3.1	286.50	108.89
9. Bhavnagar	9.60	12.00	18.00	54.00	79	30	742	3.2	536.70	94.32
10. Surendranagar	2.17	16.00	9.00	60.30	72	40	622	3.9	466.00	44.74
11. Amreli	7.22	3.00	18.00	61.00	80	46	299	4.0	222.90	41.76
12. Kutch	14.37	4.00	12.00	43.10	104	15	666	4.1	531.70	59.40
13. Junagadh	9.44	7.00	25.00	67.80	79	35	528	5.1	420.80	108.64
14. Mehsana	20.27	9.00	28.00	40.40	74	21	391	5.4	305.50	84.94
15. Rajkot	5.79	10.00	16.00	67.30	74	21	707	6.7	573.00	92.88
16. Jamnagar	4.97	13.00	13.00	60.20	66	31	771	8.6	652.90	84.77

Source: i) Basic Agricultural Statistics of Gujarat State: 1949-50 to 1961-62. Directorate of Agriculture, Gujarat State Ahmedabad, 1968.
ii) Regional Disparities in Income of Gujarat State, Quarterly Bulletin of Economics and Statistics, July-Sept. 1963.
iii) Quarterly Bulletin of Economics and Statistics, January-March 1963. - Population census special Number.
iv) Handbook of Basic Statistics, Gujarat State: 1962 and 1963, Bureau of Economics and Statistics, Ahmedabad.

Note: Agricultural income for districts was available for the year 1959-60.

Appendix III-2

The cost of living index numbers (general) for agricultural labourers in Gujarat state are taken from Agricultural Labour in India: A Compendium of Basic Facts, Labour Bureau Department of Labour and Employment, Government of India. The base year of the index is 1960-61. (Agricultural year - July to June). However the index numbers for each year are for calander year (January to December). The agricultural wage rates on the other hand relate to agricultural years. Thus in order to compute real wage rates it was necessary to make some adjustment. To deflate money wage rates we had two alternatives: (1) Deflate wage say of 1961-62 with the index of 1961, of 1961-62 with the index of 1962 and so on. Thus the agricultural money wage of 1967-68 will be deflated by index of 1967. (2) To take an average of index numbers of two calander years and use it to deflate the wage of agricultural year. For example index 1961 = 101 and 1962 = 106. Thus the average of two calander years (1961 and 1962) will be 103.5 and this could be used to deflate the money wage of 1961-62 agricultural year. In either of the alternatives price effects of either preceding or succeeding years will be included. However in the second method the cost of living index series would appear to be smooth, though the actual differences in real wage rates would not be materially different from each other whether the first or second approach is used.

We have calculated the real wage rates by using both the methods. The cost of living index numbers (general) of agricultural labourers in Gujarat State for the period 1961-1968 (1960-61=100) are shown in Appendix III-2a.

Appendix III-2a

Cost of Living Index Numbers (general) for Agricultural Labourers in Gujarat: 1961-1968

(1960-61=100)

Year	Index	Average of two years' indices
1	2	3
1961	101	103.3
1962	106	104.0
1963	102	110.5
1964	119	127.0
1965	135	138.0
1966	141	153.0
1967	165	160.5
1968	156	

Source: Agricultural labour in India: A Compendium of Basic Facts, Labour Bureau, Department of Labour and Employment, Government of India.

The real wage rates computed by using both the series of index numbers shown above are given in Appendix III-2b.

Appendix III-2b

Real Agricultural Wage Rates for 1960-61/61-62 and 1966-67/67-68 obtained by two alternative index numbers

District	Real agricultural wage rates				Percentage change in 1966-67/67-68 over 1960-61/61-62	
	1960-61/61-62		1966-67/67-68			
	Method I	Method II	Method I	Method II	Method I	Method II
1	2	3	4	5	6	7
1. Jamnagar	2.84	2.81	2.45	2.37	-13.74	-15.66
2. Junagadh	2.53	2.51	2.31	2.26	- 8.70	- 9.97
3. Rajkot	2.52	2.49	2.23	2.17	-11.51	-12.86
4. Bhavnagar	2.26	2.23	1.72	1.67	-23.90	-25.12
5. Surendranagar	2.05	2.02	1.91	1.86	- 6.83	- 7.93
6. Amreli	2.42	2.40	1.86	1.82	-23.05	-24.17
7. Kutch	2.44	2.41	2.07	2.02	-15.17	-16.19
8. Ahmedabad	1.88	1.85	1.86	1.80	- 1.07	- 2.71
9. Mehsana	1.91	1.89	1.73	1.69	- 9.43	-10.59
10. Banaskantha	1.70	1.68	1.57	1.53	- 7.65	- 8.93
11. Sabarkantha	1.77	1.75	1.46	1.43	-17.52	-18.29
12. Kaira	1.80	1.78	1.55	1.51	-13.89	-15.17
13. Baroda	1.37	1.35	1.26	1.23	- 8.03	- 8.89
14. Panchmahals	1.15	1.14	1.15	1.11	0.00	- 2.64
15. Broach	1.26	1.24	1.25	1.22	- 0.80	- 1.62
16. Surat	1.24	1.23	1.19	1.16	- 4.04	- 5.70

Source: Table II-2, Table III-4 and Appendix III-2a.

It will be noted from the table that the differences in real wage rates - either in absolute or percentage terms arising from the use of two alternative index series are only marginal. Method II (i.e. average of index numbers of calanders years used as deflator) will give a little greater fall in real wages during 1960-61/61-62 to 1966-67/67-68 than the first method.

Since we did not have the index number for agricultural labourers for 1956-57 we have used the index of the old Bombay state of which the present Gujarat state was a part and for 1957-58 Kerala state index for agricultural labourers was taken as proxy. (The index number for Kerala and Gujarat during 1960-61 to 1967-68 moved close to each other). These were converted to the base 1960-61 = 100. For 1956-57 it was 91 and 1957-58 was 91.

Appendix III-3

Index Number of Agricultural Production in different districts of Gujarat

(Base Year 1960-61=100)

District	1961-62	1966-67	1967-68
1	2	3	4
1. Ahmedabad and Gandhinagar	138.23	103.35	147.72
2. Banaskantha	190.34	80.06	163.07
3. Baroda	109.28	93.50	125.52
4. Broach	123.78	92.05	118.63
5. Kaira	111.57	119.49	158.27
6. Mehsana	181.16	120.89	170.73
7. Panchmahals	155.97	89.38	110.99
8. Sabarkantha	112.83	112.67	160.45
9. Surat and Bulsar	105.82	95.18	166.44
10. Amreli	95.61	74.58	108.94
11. Bhavnagar	112.88	102.20	146.15
12. Jamnagar	111.77	115.97	162.49
13. Junagadh	101.77	96.34	116.06
14. Kutch	367.53	162.00	328.66
15. Rajkot	104.35	96.42	148.85
16. Surendranagar	163.34	134.84	161.06

Source: Market Research and Intelligence Bureau, Gujarat State Fertilisers Company Limited., Fertilisernagar, Baroda.

Note: Price weights are corresponding to prices of agricultural produce prevailing in different districts in the year 1960-61.