Chapter 7

EXTENT OF USE OF LAND AND LABOUR

7.1 INTRODUCTION

7.1.1 The basic problem of our study is to examine the distance between the potential of the use of land and labour and their exact use in the grass-root rural area economy of Dinhata. One objective, as we have stated in the first chapter, is to verify the hypothesis that traditional pattern of development of the Indian type leaves ~~the~~ a huge part of the nationally inexpensive inputs of land and labour unused. Secondly, as we shall illustrate in the concluding chapter, ~~the~~ faster use of these resources will enable us to reach ~~the~~ fast real economic demographic equilibrium in the grass-root area economies. There is no denying that India could not fully exploit her production potentials because she did not seek to implement a proper model of development since independence. Development planning in India is now marked by dichotomy of a main investment plan and a supplementary anti poverty programme. We have thus to assess the impact of this dichotomy on the use of the two nationally most inexpensive resources for economic development namely land and labour. The task of this chapter, therefore, is to present the existing picture of extent of use of land and labour in our sub-divisional economy of Dinhata.

7.2 WORK PARTICIPATION RATE

7.2.1 In this section, workers who have been employed at least for a day are taken as workers. In the census enumeration, on the other hand, the marginal workers are workers who work for less than 183 days and main workers are those who work for more than 183 days. But we do not believe, as surveyers of village life, that it is ~~not~~ possible for census enumerators to find the number of days of employment so easily. The receipt of a correct returns on days of employment depends on a great deal of indirect questions and a number of sittings with each individual worker. However, the sum of the main workers and the marginal workers of the 1981 census might have been easily treated as equivalent to our number of workers who worked at least for a day during the last year if we treated children as being eligible to be workers.

Table 7.1

Work Participation Rate

Area	Participation Rate		
	Male	Female	Total
India (rural) 1981	53.61	23.18	38.87
West Bengal (rural) 1981	50.56	8.89	32.79
Burdwan (rural) 1981	50.32	8.47	30.12
Hooghly (rural) 1981	50.95	8.44	30.32
Malda(rural)1981	50.40	9.66	30.55
Jalpaiguri (rural)1981	52.59	14.74	34.52
Kooch Behar (rural)1981	54.29	4.12	30.04
Sample 1985	49.36	8.41	29.86

Source : Govt.of West Bengal (1989-90), Economic Review, (Statistical Appendix, pp.6-7 and pp.13-14) is the source of all data except those of the sample.

7.2.2 On the whole, we have several points to make. In the first place, ~~since~~ the number of days of employment recorded by census enumerators are viewed as most unreliable by us. So the difference as noticed among different districts for the census year does not represent the real difference in productive employment among these districts. Secondly, we have excluded children upto age of 15 from our category of workers. So those who are included in our category of workers are numerically smaller than the sum of main and marginal workers of the 1981 census. This is mainly why, rather than because of a fluctuation due to the process of sampling, the percentage of workers in sample is lower than that in the district of Koch Behar as calculated on the basis of census measurements.

7.3 GOOD AND BAD EMPLOYMENT

7.3.1 To calculate the total labour force we simply leave out the children who are just 15 years or less but do not leave out the old. On the basis of this measure the total labour force of our sample stands at 2386 or 56.59 per cent of the total sample population. Again, to know the employment and unemployment rates of our sample we also leave out the students who are fully engaged in studies, people above 15 years found sick or living on social charity and one female member from each family. So the active labour force now stands at 1415 or 33.62 per cent of the total sample population. This is shown in table 7.2. It can be seen from this table that of the 1415 employable adults of our sample

1257 adults are employed, if by employment we mean employment for a day or more during the last year from the date of our enumeration. Thus 11.17 per cent employable adults are found to be unemployed in our sample during the last year. Although the incidence of unemployment is not uniform among the sample villages, the differences are not significant statistically. If we widen the concept of unemployment by including those who are employed for less than 150 days in a year, then the unemployment rate will increase as much as to 35.19 per cent. ~~If, however, we count employment as employment for a day or more, the rate of employment will be 88.83 per cent.~~

7.3.2 We define good employment as employment for more than 150 days and bad employment as employment for less than 150 days (Sarkar 1990). On the basis of this distinction we distribute all the employed adults by good and bad employment for every village of the total sample. This is shown in table 7.3. Similarly, we distribute all the employed adults on the basis of good and bad employment for every sub-sample of the total sample. The results are presented in table 7.4. The rates of good employment for each of the three categories : employed adults, employed male adults and employed female adults in our sample are 72.95 per cent, 83.06 per cent and 8.77 per cent respectively. As for the bad employment the rates for each of the three categories are 27.05 per cent, 16.94 per cent and 9.23 per cent respectively. This merely leaves the colossal scope

to bring about improvement in our area economy through a method of planning to assure fuller utilisation of the underemployed labour force.

7.2.3 One notices from table 7.3 that the incidence of good employment is not uniform among the sample villages. The highest incidence of good employment among employed adults is recorded by village-5 and the lowest is recorded by village-4. The two rates are 82.10 and 67.44. We can easily see that the difference in proportion of those in good employment among employed adults in these two villages is statistically significant. To test the statistical significance of the difference in this proportion the 257 employed adults may be treated as 257 trials of an experiment for which the probability of obtaining a success, that is good employment, in a single trial is 0.68. Thus the number of employed adults is treated as binomial variable and the hypothesis to be tested is

$$H_o : P = 0.68$$

Under H_o $= np = 0.68 \times 257 = 174.76$

$$= \sqrt{npq} = \sqrt{55.92} = 7.48$$

The critical region following the normal curve approximation will consist of the two intervals

$$X - 2 = 174.76 - 14.96 = 159.80$$

$$X + 2 = 174.76 + 14.96 = 189.72$$

Table 7.2

Active labour force and the Rate of Employment

Sl. No.	Category	Village-1	Village-2	Village-3	Village-4	Village-5	Sample
1.	Total population	773	685	981	784	986	4209
2.	People not included in the Labour force:						
	(a) Population upto 15 years	337	254	458	315	459	1823
	(b) Students above 15 years and fully engaged in studies	20	17	22	10	42	111
	(c) People above 15 years found sick or lived on social charity	9	3	5	10	6	33
	(d) One Female member per family	155	136	193	163	180	827
3.	Item 2(a) + 2(b) + 2(c) + 2(d)	521	410	678	498	687	2794
4.	Emoloyable Labour Force (Col.1-Col.3)	252	275	303	286	299	1415
5.	Number of employed persons	233	250	269	258	257	1257
6.	Percentage of workers to employable labour force	88.49	90.91	88.78	90.21	85.95	88.83
7.	Percentage of Unemployed Labour Force	11.51	9.09	11.22	9.79	14.05	11.17

Table 7.3

Percentage of Persons in Good and Bad Employment by Villages

Sl. No.	Village	Male Adults		Female Adults		Adults	
		Good employment	Bad employment	Good employment	Bad employment	Good employment	Bad employment
1.	Village-1	76.10	23.90	00.00	100.00	69.96	30.04
2.	Village-2	84.34	15.66	3.85	96.15	67.60	32.40
3.	Village-3	83.13	16.87	00.00	100.00	76.95	23.05
4.	Village-4	84.88	15.12	00.00	100.00	67.44	32.56
5.	Village-5	86.46	13.54	46.43	53.57	82.10	17.90
	Total	83.06	16.94	8.77	91.23	72.95	27.05

Table 7.4

P.C. of Persons in Good and Bad Employment by Sub-Samples

Sl. No.	Sample	Male Adults		Female Adults		Adults	
		Good employment	Bad employment	Good employment	Bad employment	Good employment	Bad employment
1.	Sub-Sample-1	81.29	18.71	2.22	97.78	71.70	28.30
2.	Sub-Sample-2	85.71	14.28	16.05	83.95	74.76	25.24
	Total	83.06	16.94	8.77	91.23	72.95	27.05

Out of 257 employed adults 211 are having good employment. So the difference is statistically significant. Again the incidents of good employment among employed male adults is found to be high in Village-5 and low in Village-1. The two rates are 86.46 per cent and 76.10 per cent respectively. By using the same testing method we see that the difference is significant statistically. On the other hand, most of the employed female adults of our sample are unable to cross the limit of bad employment. This simply means that the kinds of work the regional economy throws open to women are not acceptable to all (Sarkar, Munshi and Kar 1989).

7.3.4 As for the incidence of good employment among employed adults, the percentages in sub-Sample I and in sub-Sample II are 71.70 per cent and 74.76 per cent respectively. Here the difference is apparent and is not statistically significant. Similarly, we find that the difference between two proportions of employed male adults who employed for good employment, in two Sub-Samples is not significant statistically and here also the difference is apparent.

7.4 EMPLOYMENT IN DIFFERENT OCCUPATIONS

7.4.1 We have divided all the persons belonging to various occupations into eight broad groups to find the occupational distribution of the area economy. They are :

1) Farmers, those who farming on own land (any amount) as well as on land taken on lease;
2) Tenant farmer, those who farming on wholly tenancy land;
3) Agricultural labourer;
4) Non-agricultural labourer, including Fishermen, Weavers, Transport Operators and those who engaged in dehusking of paddy;
5) Service holders, including Teachers and Government officials;
6) Village artisans, including Quacks, Priests, Moulavies, Carpenters, Cobblers, Barbers, Blacksmiths and Tailors;
7) Village Traders, including Businessmen and Shop keepers; and
8) Bidi Workers.

We further assemble these eight categories in two groups. They are the farming group and the non-farming group. The first three occupations constitute our farming group, while the non-farming group is constituted by the rest five.

7.4.2 The number of employed adults of our sample is 1257. We distribute these 1257 employed adults by their main occupations[1] under the eight occupational groups. This is shown in table 7.5. Of the total employed adults 353 have some subsidiary occupations along with their main occupations. The picture is presented in Table 7.6. The employment enjoyed by the employed adults as the sum of main occupations and subsidiary occupations is demonstrated

in table 7.7. It is very clear from table 7.7 that more than 80 per cent employed adults find activities related to farming. The mean man days of employment enjoyed by the farming and non-farming groups are respectively 192.00 and 243.52. The difference is highly significant.

7.4.3 Among the different occupation groups agricultural labourers appear as a single biggest occupation group. The second biggest occupation group is that of farmers who are followed by the non-agricultural labourers and village traders. But in respect of mean man days of employment, service holders rank first who are followed by village traders and bidi workers. One notices from table 7.6 and 7.8 that the role of subsidiary occupation in raising the level of employment is rather poor in our area economy. Of the total employed adults 28.08 per cent have some subsidiary occupations along with their main occupations. Subsidiary occupation plays the most vital role for the farmers, while the service holders depend less upon subsidiary sources of employment. However, to provide 330 days of employment per capita per annum to the employed adults of our sample we need a creation of additional 161,307 man days per year or 128 mandays per capita.

7.4.4 The incidence of good employment and bad employment among the various occupation groups can be seen from table 7.9. One notices that the incidence of good employment is rather high in the non-agricultural group than that of farming group. The two rates are 78.39 per cent and 64.35 per cent respectively.

Table 7.5

Employment Enjoyed in the Main Occupation

Sl. No.	Occupation	Persons Employed in Main occupation		Mean Employment through main occupation	Total employment through Main Occupation	
		Number	P.C.to total		Number	P.C.to total
1.	Farmers	465	36.99	180.23	83807	36.42
2.	Tenant Farmers	12	0.95	175.00	2100	0.91
3.	Agricultural labourers	544	43.28	165.70	90184	39.19
4.	Non-agricultural labourers	88	7.00	203.70	17926	7.79
5.	Service holders	29	2.31	320.29	9288	4.04
6.	Village artisans	43	3.42	209.12	8992	3.91
7.	Village Traders	53	4.22	244.85	12977	5.64
8.	Bidi Workers	23	1.83	210.39	4839	2.10
9.	Farming Group	1021	81.23	172.47	176091	76.52
10.	Non Farming Group	236	18.77	228.91	54022	23.48
	Total	1257	100.00	183.07	230113	100.00

Table 7.6

Employment Enjoyed in the Subsidiary Occupation

Sl. No.	Occupation group (status by primary occupation)	Persons Employed in Subsidiary occupation		Mean Employment through the subsidiary occupation	Total Employment through subsidiary occupation	
		Number	P.C.to total		Number	P.C.to total
1.	Farmers	212	60.06	57.59	12209	52.20
2.	Tenant Farmers	5	1.42	52.10	261	1.12
3.	Agricultural labourers	91	25.78	82.10	7471	31.94
4.	Non-agricultural labourers	19	5.38	87.53	1663	7.11
5.	Service holders	1	0.28	60.00	60	0.26
6.	Village artisans	2	0.57	52.50	105	0.45
7.	Village Traders	20	5.66	64.50	1290	5.51
8.	Bidi workers	3	0.85	110.33	331	1.41
9.	Farming Group	308	87.25	64.74	19941	85.25
10.	Non-Farming Group	45	12.75	76.64	3449	14.75
	Total	353	100.00	66.26	23390	100.00

Table 7.7

Employment Enjoyed Through All Occupations

Sl. No.	Occupation Group	Persons Employed		Mean Employment through all occupations in Mandays	Total Employment through all occupations	
		Number	P.C. to total		Number	P.C. to total
1.	Farmers	465	36.99	206.49	96016	37.87
2.	Tenant Farmers	12	0.95	196.75	2361	0.93
3.	Agricultural Labourers	544	43.28	179.51	97655	38.52
4.	Non-agricultural Labourers	88	7.00	222.60	19589	7.73
5.	Service holders	29	2.31	322.34	9348	3.69
6.	Village artisans	43	3.42	211.56	9097	3.59
7.	Village Traders	53	4.22	269.19	14267	5.63
8.	Bidi workers	23	1.83	224.78	5170	2.04
9.	Farming Group	1021	81.23	192.00	196032	77.33
10.	Non-farming Group	236	18.77	243.52	57471	22.67
	Total	1257	100.00	201.67	253503	100.00

Table 7.8

Share of Primary and Subsidiary Occupation in Employment

Sl. No.	Occupation Group	P.C. of employment through Primary occupation to employment through all occupations	P.C. of employment through subsidiary occupation to employment through all occupations	Total
1.	Farmers	87.28	12.72	100
2.	Tenant Farmers	88.94	11.06	100
3.	Agricultural labourers	92.35	7.65	100
4.	Non-agricultural labourers	91.51	8.49	100
5.	Service holders	99.36	0.64	100
6.	Village artisans	98.84	1.16	100
7.	Village Traders	90.96	0.04	100
8.	Bidi Workers	93.60	6.40	100
9.	Farming Group	89.83	10.17	100
10.	Non-farming Group	94.00	6.00	100
	Total	90.77	9.23	100

Table 7.9

Percentage of Persons in
Good and Bad Employment in Main Occupation

Occupational Group/ Employment Category	Farmers	Tenant Farmers	Agricultural labourers	Non-agricultural labourers	Service holders	Village artisans	Village Traders	Bidi workers	Farming group	Non-farming Group	Total
Percentage of people with good employment	63.44	74.23	66.73	69.69	100	72.09	93.22	69.57	64.35	78.39	66.99
Percentage of people with bad Employment	36.56	25.77	33.27	30.41	-	27.91	6.78	30.43	35.65	21.61	33.01
Total	100.00	100.00	100.00	100.00	100	100.00	100.00	100.00	100.00	100.00	100.00

To test the statistical significance of the difference between two proportions of those who in good employment we have treated 236 employed adults of non-farming group as 236 trials of an experiment for which the probability of obtaining a success, that is good employment, in a single trial is 0.6435. Thus the number of employed adults is treated as binomial variable and the hypothesis to be tested is binomial variable and the hypothesis to be tested is

$$Ho : P = 0.6435$$

$$\text{Under} \quad Ho : nP = 0.6435 \times 236 = 151.87$$

$$= \sqrt{npq} = \sqrt{54.14} = 7.36$$

The critical region following the normal curve approximation will consists of two intervals

$$X - 2 = 151.87 - 14.72 = 137.15$$

$$X + 2 = 151.87 + 14.72 = 166.59$$

Out of 236 employed adults 185 are having good employment. So the difference is significant statistically.

7.5 INPUT EMPLOYMENT RELATIONS

7.5.1 To measure the impact of various non-labour inputs on employment we use the simple linear regression model of the following form -

$$Ei = a + bX_j$$

where, E = number of man days employed per acre

X = Cost on inputs per acre

and $i = 1, 2, \ldots\ldots\ldots\ldots, 30$

$j = 1, 2, \ldots\ldots\ldots\ldots, 7$

Thus the independent variables are

X_1 = Cost on irrigation

X_2 = Cost on chemical fertilizer

X_3 = Cost on organic manure

X_4 = Cost on fixed capital

X_5 = Cost on irrigation and chemical fertilizer

X_6 = Cost on current inputs

X_7 = Cost on non-labour inputs

7.5.2 The results are displayed in table 7.10. All the regression co-efficients as revealed from table 7.10 are positive which means all the explanatory variables are positively related with employment. The high R^2 value means that the independent variables can explain a higher proportion of changes in employment. All the values of 't' of the co-efficients are greater than the table value of 't' at the relevant degrees of freedom. Therefore the co-efficients are significant statistically. Similarly, we present the employment function of tobacco, the most important commercial crop of this region in table 7.11. Here also the co-efficients of all seven explanatory variables are positive with high good ness of fit. Thus an injection of additional doses of inputs in the process of production will cause an increase in the use of labour and opens the opportunity of employment to the employable labour forces.

Table 7.10

Employment Function for Total Output

Independent Variables	Constant Terms	Co-efficients and their S.E.	R^2	T Statistic	F Statistic
X_1	90.33	0.2833 (0.018295)	0.95	15.49	239.87
X_2	99.06	0.1127 (.008652)	0.85	13.03	169.68
X_3	65.11	0.4969 (.027956)	0.92	17.77	315.87
X_4	55.29	0.2239 (.018762)	0.84	11.93	142.47
X_5	96.25	0.0811 (.005824)	0.87	13.92	193.66
X_6	88.65	0.0591 (.003892)	0.89	15.18	230.36
X_7	79.51	0.0480 (.002960)	0.90	16.22	263.12

Table 7.11

Employment Function for Tobacco

Independent Variables	Constant Terms	Co-efficients and their S.E.	R^2	T Statistics	F Statistics
X_1	50.26	0.2432 (.024147)	0.78	10.07	101.40
X_2	42.79	0.2267 (.018984)	0.83	11.94	142.55
X_3	35.12	0.2191 (.017336)	0.85	12.64	159.66
X_4	43.75	0.2855 (.017353)	0.90	16.45	270.63
X_5	45.02	0.1207 (.010219)	0.83	11.81	139.41
X_6	41.56	0.0765 (.006179)	0.84	12.38	153.28
X_7	41.46	0.0610 (.004506)	0.86	13.53	183.08

7.6 MEASURES OF INTENSITY OF USE OF LAND

7.6.1 To measure the intensity of use of land we adopt three methods. The first is the ratio of number of days the plot was put to use to the total number of days in a year. Therefore, on the basis of existing technilogy mix if the lands are used for twelve months intensity is given as 1.00. If a land is used only for aman paddy, intensity is calculated at 0.50. For the production of both aman paddy and aus, or aman and jute, intensity is given as 0.75. Similarly, for the production of tobacco and jute or tobacco and aus or vegetable and jute, intensity stands at 0.63. And if the land is used only for rabi crops, intensity is given as 0.33 (Sarkar 1984c). The second method is a traditional one and used by the agricultural department of our country. It is simply the ratio of gross cropped area to net cultivable area. To measure the intensity of use of land of third kind, we simply assume that three HYV paddy and a quick yielding vegetable are raised in a plot throughout the year. Therefore according to this method intensity is the ratio of number of crops raised in a plot to the total number of crops could be raised. The total number of crops according to our assumption is 3.5.

7.6.2 The two intensity indices as computed on the basis of the first and third method are 0.72 and 0.54 respectively. If these intensity rates stand at 1.00, we can say that there is no slack in respect of use of land at the level of present technology mix. Since the present rates are far below 1.00,

the slack in respect of land use is rather vast. On the other hand, the intensity of use of land calculated as the ratio of gross cropped area to net cultivable area stands at 1.90, simply leaves us in a position to hold that intensity figure assumes that the existing technology is being used. This means intensity index 3.5^2 will lead to different yields under different technologies.

7.7 SIZE OF FARMS AND INTENSITY OF USE OF LAND

7.7.1 It is very clear from tables 7.12 to 7.19 that the inverse relationship between farm size and the intensity of use of land is a general phenomenon in this grass-root rural area economy. Obviously, relatively smaller farms of our region are used their land more intensively than the farmers of the relatively larger group. This finding further strengthens our earlier inference that smaller farms are better in respect of use of reproducible resources and output per acre (Sarkar and Kar 1986). The factors which lead to the smaller farms in our region to use their land more intensively are rather two. Firstly, the scarcity of land and secondly, the crisis of existence. However, some sort of aids like crop loans, mini-kits etc. (we shall discuss it in Chapter 9) have lead to more intensive use of land on smaller farms. On the other hand, relatively larger farms are yet to get the benefit of the established market for inputs. What is more, they are not assured of the opportunity of selling all their output at fixed fair price.

Table 7.12

Intensity of land use of Village - 1 by Farm Size

Operational holding (acre)	Amount of Net cultivable area (acre)	Intensity Index-I	Intensity Index-II	Intensity Index-III
Upto 2	80.33	0.82	2.10	0.62
2-5	119.72	0.73	1.88	0.55
Above 5	58.63	0.71	1.76	0.49
Total	258.63	0.75	1.92	0.56

Table 7.13

Intensity of Land Use of Village-2 by Farm Size

Operational holding (acre)	Amount of Net cultivable area (acre)	Intensity Index-I	Intensity Index-II	Intensity Index-III
Upto 2	33.94	0.76	1.98	0.58
2-5	96.35	0.73	1.93	0.54
Above 5	83.12	0.65	1.72	0.45
Total	213.41	0.70	1.86	0.51

Table 7.14

Intensity of Land Use of Village-3 by Farm Size

Operational holding (acre)	Net cultivable area (acre)	Intensity Index-I	Intensity Index-II	Intensity Index-III
Upto 2	82.19	0.83	2.25	0.66
2-5	64.42	0.79	2.14	0.62
Above 5	43.14	0.74	1.74	0.56
Total	189.75	0.80	2.10	0.62

Table 7.15

Intensity of Land Use of Village-4 by Farm Size

Operational holding (acre)	Net cultivable area (acre)	Intensity Index-I	Intensity Index-II	Intensity Index-III
Upto 2	64.90	0.79	2.02	0.60
2-5	70.24	0.76	1.95	0.57
Above 5	94.43	0.65	1.49	0.47
Total	229.57	0.72	1.78	0.54

Table 7.16

Intensity of Land Use of Village-5 by Farm Size

Operational holding (acre)	Net cultivable Area (acre)	Intensity Index-I	Intensity Index-II	Intensity Index-III
Upto 2	62.74	0.74	1.95	0.58
2-5	101.04	0.74	1.89	0.54
Above 5	47.23	0.72	1.71	0.49
Total	211.01	0.73	1.87	0.54

Table 7.17

Intensity of Land Use of Sub-Sample I by Farm Size

Operational holding (acre)	Net cultivable Area (acre)	Intensity Index-I	Intensity Index-II	Intensity Index-III
Upto 2	196.45	0.76	2.14	0.62
2-5	280.49	0.71	1.96	0.55
Above 5	184.99	0.68	1.67	0.45
Total	661.93	0.72	1.93	0.54

Table 7.18

Intensity of Land Use of Sub-Sample II by Farm Size

Operational holding (acre)	Net cultivable Area (acre)	Intensity Index-I	Intensity Index-II	Intensity Index-III
Upto 2	127.64	0.77	1.99	0.59
2-5	171.28	0.74	1.92	0.55
Above 5	141.66	0.67	1.62	0.46
Total	440.58	0.72	1.85	0.53

Table 7.19

Intensity of Land Use of Total Sample by Farm Size

Operational holding (acre)	Net cultivable Acre (acre)	Intensity Index-I	Intensity Index-II	Intensity Index-III
Upto 2	324.09	0.76	2.08	0.61
2-5	451.77	0.72	1.94	0.55
Above 5	326.65	0.68	1.66	0.45
Total	1102.51	0.72	1.90	0.54

7.8 IMPACT OF IRRIGATION ON THE USE OF LAND

7.8.1 The factors which determine the raising of crops from a land throughout the year other than irrigation they are the good drainage system, good temperature, easy credit facilities to the farmers, assured market for outputs and fixed fair prices for inputs. In respect of these factors the two sub-Samples do not differ from each other. Thus the difference in respect of use of land between these two sub-Samples is rather nil. This is shown in Table 7.20.

Table 7.20

Irrigation coverage and Land Use Intensity

Sample	Percentage of irrigated area to net cultivable area	Intensity Index I	Intensity Index II	Intensity Index III
Sub Sample-I	6.84	0.72	1.93	0.54
Sub Sample-II	12.16	0.72	1.85	0.53
Total Sample	8.97	0.72	1.90	0.54

7.9 MEASURE OF INTENSITY OF USE OF LABOUR

7.9.1 One of the main problem of our rural agricultural economy is the problem of underemployment. A large proportion of gainfully employed adults are remained underemployed in some

seasons in our rural economy, while the acute shortage of labour has also been found in the periods of peak agricultural activities when normally inactive persons such as house wives, students etc. have also taken some part in such activities. Thus the measurement of intensity of employment is more important than that of unemployment. We have computed intensity of employment from the distribution of gainfully employed adults by days of work per annum by considering the employment for a period of 330 days or more as full employment. The intensity value[3] for 330 days is given as 1.00. Therefore, the intensity value for 50 days is calculated at 0.15, for 100 days at 0.30 and so on. A total of seven classes that we have taken to examine the existing level of utilisation of labour power in our area economy. Tables 7.21 to to 7.26 exhibit the labour use index of the total sample as well as of the every sample villages for each of the three categories of employed adults, employed male adults and employed female adults.

7.9.2 It can be seen from table 7.21a that the percentage of employed adults who succeed to make use 60 per cent of their labour power is nearly 54. The corresponding percentage for the employed male adults, as can be seen from table 7.21b is 61.14 and for employed female adults the rate as revealed from table 7.21c is 6.26 only. Similarly, the percentage of employed adults who succeed to make use 76 per cent of their labour power stands at 25.78 per cent. The corresponding percentages for employed male adults and employed female adults are 29.46 per cent and

Table 7.21a

Labour Use Index of Employed Adults in Total Sample

Percentage of employed Adults	Intensity of Use (Less than)
4.22	0.15
14.80	0.30
27.05	0.45
46.46	0.60
74.22	0.76
86.79	0.91
100.00	1.00

Table 7.21b

Labour Use Index of Employed Male Adults in Total Sample

Percentage of employed male Adults	Intensity of Use (Less than)
1.01	0.15
6.81	0.30
16.94	0.45
38.86	0.60
70.54	0.76
84.90	0.91
100.00	1.00

Table 7.21c

Labour Use Index of Employed Female Adults in Total Sample

Percentage of employed female Adults	Intensity of Use (Less than)
24.56	0.15
65.50	0.30
91.23	0.45
94.74	0.60
97.66	0.76
98.66	0.91
100.00	1.00

Table 7.22a

Labour Use Index of Employed Adults in Village-1

Percentage of Employed Adults	Intensity of Use(less than)
4.93	0.15
15.24	0.30
30.04	0.45
53.81	0.60
82.51	0.76
91.93	0.91
100.00	1.00

Table 7.22b

Labour Use Index of Employed Male Adults in Village-1

Percentage of Employed male Adults	Intensity of Use(less than)
2.44	0.15
9.76	0.30
23.91	0.45
49.76	0.60
80.98	0.76
91.22	0.91
100.00	1.00

Table 7.22c

Labour Use Index of Employed Female Adults in Village-1

Percentage of Employed Female Adults	Intensity of Use (less than)
33.33	0.15
77.78	0.30
100.00	0.45
100.00	0.60
100.00	0.76
100.00	0.91
100.00	1.00

Table 7.23a

Labour Use Index of Employed Adults of Village-2

Percentage of Employed Adults	Intensity of Use(less than)
10.80	0.15
23.20	0.30
32.40	0.45
44.40	0.60
67.20	0.76
82.80	0.91
100.00	1.00

Table 7.23b

Labour Use Index of Employed Male Adults of Village-2

Percentage of Employed Male Adults	Intensity of Use (less than)
1.51	0.15
8.08	0.30
15.65	0.45
29.79	0.60
58.58	0.76
78.28	0.91
100.00	1.00

Table 7.23c

Labour Use Index of Employed Female Adults of Village-2

Percentage of Employed Female Adults	Intensity of Use(less than)
46.15	0.15
80.77	0.30
96.15	0.45
100.00	0.60
100.00	0.76
100.00	0.91
100.00	1.00

Table 7.24a
Labour Use Index of Employed Adults of Village-3

Percentage of Employed Adults	Intensity of Use(less than)
4.09	0.15
14.13	0.30
23.05	0.45
45.35	0.60
72.86	0.76
86.99	0.91
100.00	1.00

Table 7.24b
Labour Use Index of Employed Male Adults of Village-3

Percentage of Employed male Adults	Intensity of Use (less than)
1.20	0.15
8.83	0.30
16.86	0.45
40.96	0.60
70.68	0.76
85.94	0.91
100.00	1.00

Table 7.25c
Labour Use Index of Employed Female Adults of Village-3

Percentage of Employed female Adults	Intensity of Use(less than)
40.00	0.15
80.00	0.30
100.00	0.45
100.00	0.60
100.00	0.76
100.00	0.91
100.00	1.00

Table 7.25a

Labour Use Index of Employed Adults of Village-4

Percentage of Employed Adults	Intensity of Use (less than)
1.55	0.15
15.89	0.30
32.56	0.45
52.71	0.60
83.72	0.76
95.74	0.91
100.00	1.00

Table 7.25b

Labour Use Index of Employed Male Adults of Village-4

Percentage of Employed male Adults	Intensity of Use(less than)
0.00	0.15
3.41	0.30
15.12	0.45
40.49	0.60
79.51	0.76
94.63	0.91
100.00	1.00

Table 7.25c

Labour Use Index of Employed Female Adults of Village-4

Percentage of Employed Female Adults	Intensity of Use (less than)
7.55	0.15
64.15	0.30
100.00	0.45
100.00	0.60
100.00	0.76
100.00	0.91
100.00	1.00

Table 7.26a

Labour Use Index of Employed Adults of Village-5

Percentage of Employed Adults	Intensity of Use(less than)
0.00	0.15
5.84	0.30
17.90	0.45
36.97	0.60
65.76	0.76
77.04	0.91
100.00	1.00

Table 7.26b

Labour Use Index of Employed Male Adults of Village-5

Percentage of Employed male Adults	Intensity of Use(less than)
0.00	0.15
3.93	0.30
13.54	0.45
33.19	0.60
63.32	0.76
75.11	0.91
100.00	1.00

Table 7.26c

Labour Use Index of Employed Female Adults of Village-5

0.00	0.15
21.43	0.30
53.57	0.45
67.86	0.60
85.72	0.76
92.86	0.91
100.00	1.00

Table 7.27a

Percentage of Employed Adults Using More than 60 per cent of labour power in Village-1 and Village-5

Village	Percentage of employed adults using more than 60 p.c. of labour power	
Village-1	46.19	(103/223)
Village-5	63.04	(162/257)

Table 7.27b

Percentage of Employed Adults Using More than 76 per cent of Labour power

Village	Percentage of employed adults using more than 76 p.c. of labour power	
Village-1	17.49	(39/223)
Village-5	34.24	(88/257)

Table 7.27c

Percentage of Employed Adults Using More than 91 per cent of labour power

Village	Percentage of employed adults using more than 91 p.c. of labour power	
Village-1	8.07	(18/223)
Village-5	22.96	(59/257)

Table 7.28a

Percentage of Employed Adult Males Using More than 60 per cent of Labour Power in village-1 & 5

Village	Percentage of adult males using more than 60 per cent of labour power	
Village-1	50.24	(103/205)
Village-5	66.81	(153/229)

Table 7.28b

Percentage of Employed Adult Males Using More than 76 per cent of Labour Power

Village	Percentage of adult males males using more than 76 per cent of Labour power.	
Village-1	19.02	(39/205)
Village-5	36.68	(84/229)

Table 7.28c

Percentage of Employed Adult Males Using More than 91 per cent of Labour Power

Village	Percentage of adult males using more than 91 per cent of Labour Power	
Village-1	8.78	(18/205)
Village-5	24.89	(57/229)

Table 7.29

Mean and Standard Deviation of Man days Employed

Type of persons employed	Mean Mandays employed					S.D.of Mandays employed				
	Vill-age-1	Vill-age-2	Vill-age-3	Vill-age-4	Vill-age-5	Vill-age-1	Vill-age-2	Vill-age-3	Vill-age-4	Vill-age-4
Employed adults	185	193	200	184	221	75	95	78	70	72
Employed male adults	195	227	211	208	228	69	74	71	56	68
Employed female adults	69	63	65	89	164	37	42	37	30	73

Note : No. of employed adults, employed male adults and employed female adults in the respective villages are as follows.

Type of persons employed	Village-1	Village-2	Village-3	Village-4	Village-5
Employed adults	223	250	269	258	257
Employed male adults	205	198	249	205	229
Employed female adults	18	52	20	53	28

Figure- 7.1

Zones of Used and Unused Labour power of Employed Adults

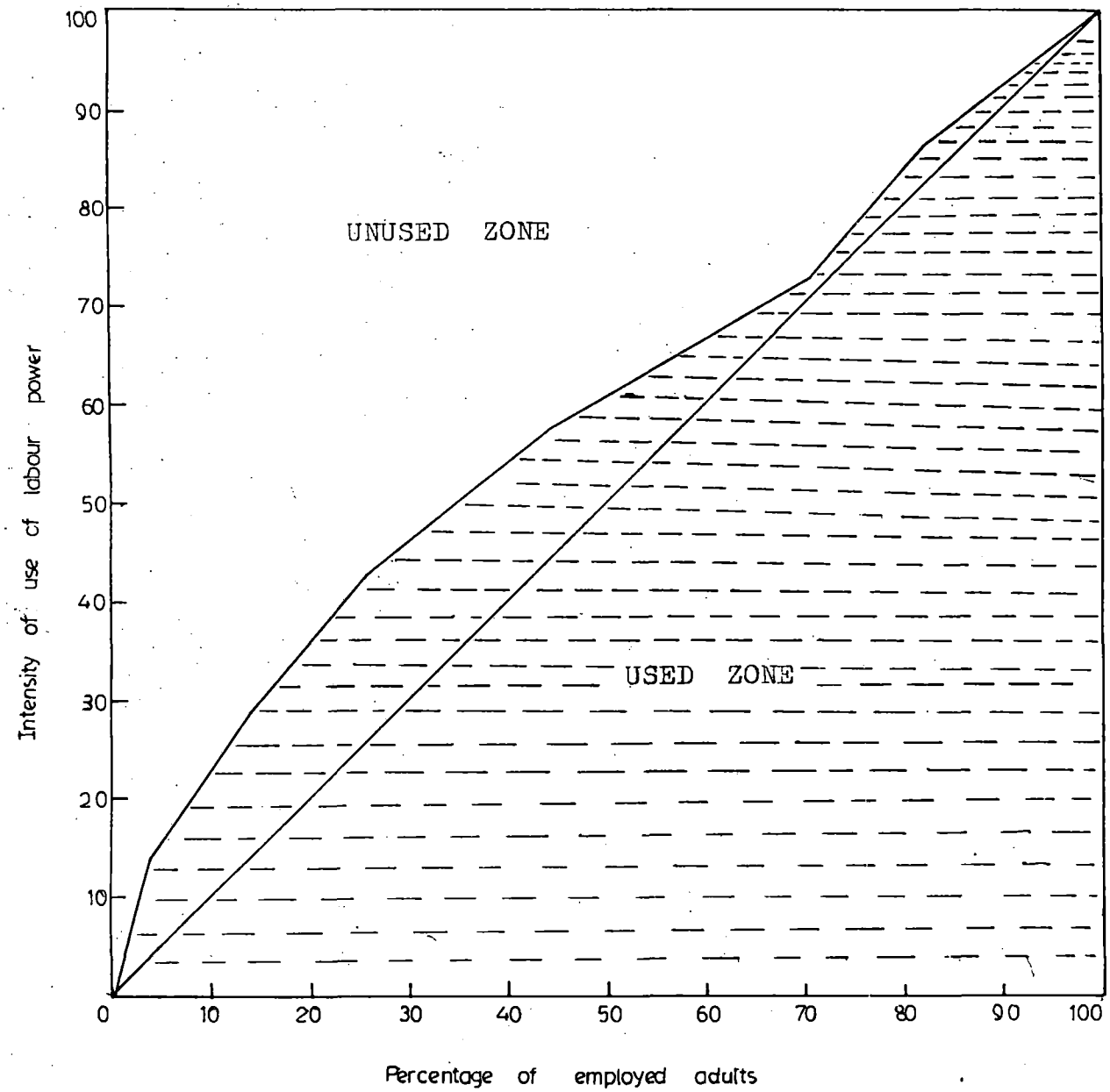


Figure- 7.2

Zones Of Used and Unused Labour Power of Employed Male Adults

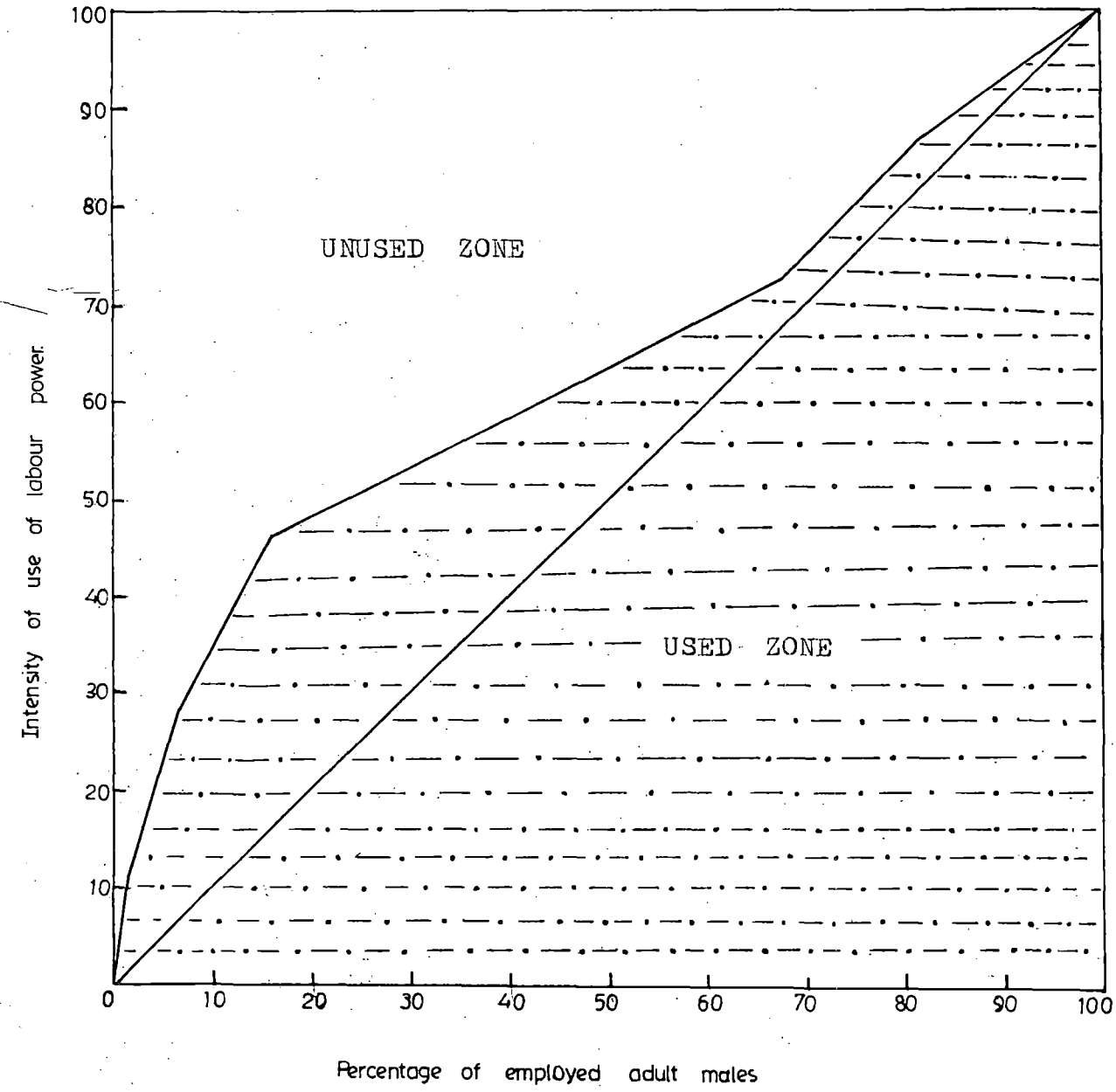
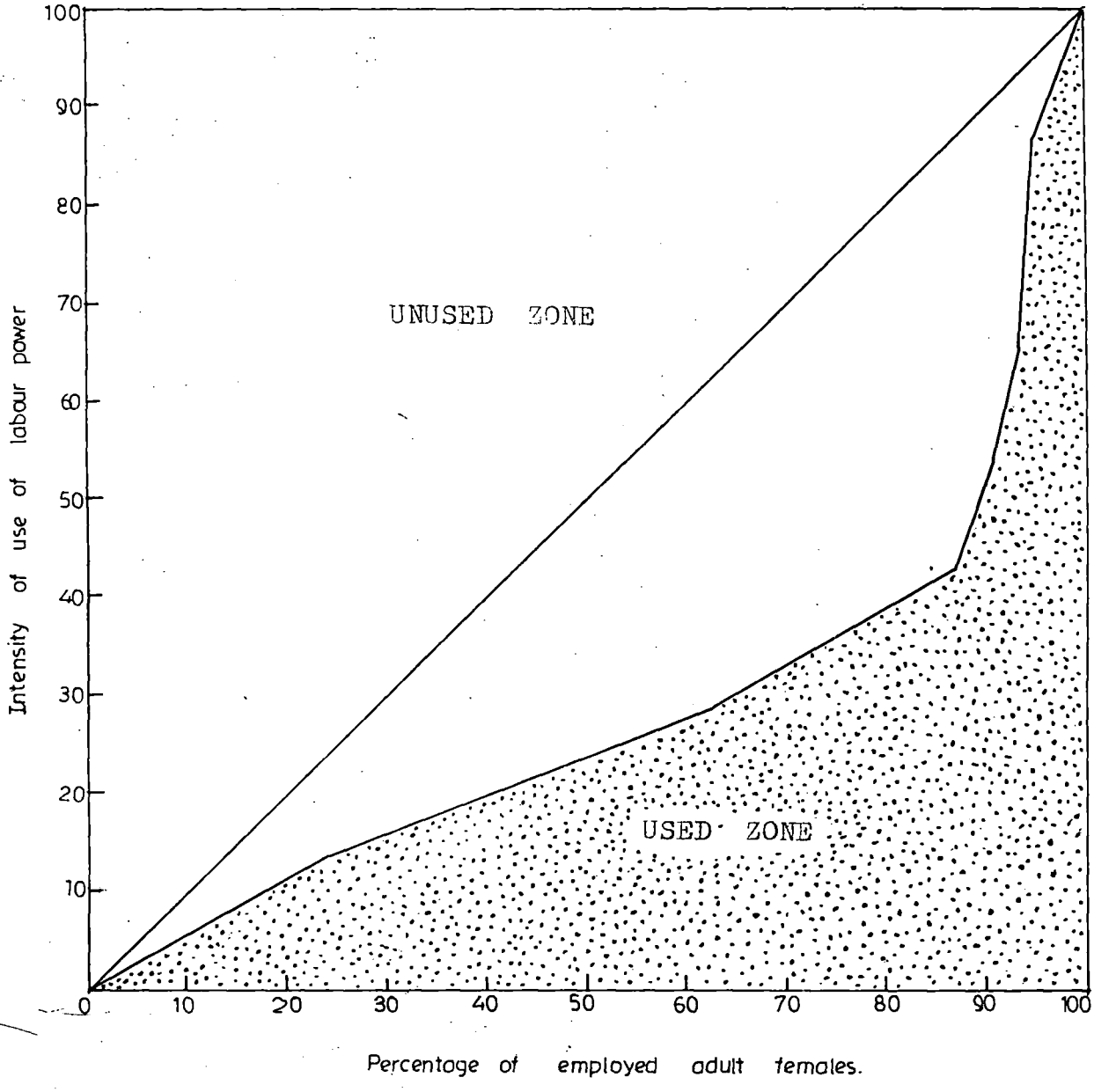


Figure- 7.3

Zones of Used and Unused Labour Power of Employed Female Adults



2.34 per cent respectively. We also present the picture of use of labour power for each of the three categories in figures 7.1 to 7.3.

7.9.3 To make a comparison about the use of labour powers among the sample villages we select village-1 and village-5. One notices from table 7.22a that the percentage of employed adults who succeed to make use 60 per cent of their labour power stands at 46.19. The corresponding percentage for the employed adults of village-5, as table 7.26a depicts, is 63.04. To test the difference between two proportions we derive table 7.27a on the basis of tables 7.22a and 7.26a. We can immediately see from this tabl e that the employed adults of village-5 are succeeded to make use more intensively their labour powers than the employed adults of village-1. In order to test the statistical significance the 257 adults may be treated as 257 trials of an experiment for which the probability of obtaining a success, that is using more than 60 per cent of labour power, in a single trial is 0.4619. Thus the number of employed adults is treated as binomial variable and the hypothesis to be tested is

$$H_0 : P = .4619$$

$$\text{Under } H_0 = nP = .4619 \times 257 = 118.71$$

$$= \sqrt{npq} = \sqrt{63.88} = 7.99$$

The critical region, following normal curve approximation will consist of two intervals

$$X - 2 = 118.71 - 15.98 = 102.73$$
$$X + 2 = 118.71 + 15.98 = 134.69$$

Out of 257 employed adults 162 are succeeded to make use 60 per cent of their labour power. So the difference between proportions is significant statistically. Similarly, we can see from table 7.27b and 7.27c that the differences are statistically significant.

7.9.4 Again we can see from table 7.22b and table 7.26b that the percentage of employed male adults who succeed to make use 60 per cent of their labour power are 50.24 per cent in Village-1 and 66.81 per cent in Village-5. Similarly, the rates for the employed male adults who could make use more than 76 per cent of their labour powers are respectively 19.02 per cent and 36.68 per cent and who could make use more than 91 per cent of their labour are respectively 8.78 per cent and 24.89 per cent. By using the same testing method here also we see that the differences are significant at each of the three percentage levels : 60 per cent, 76 per cent and 91 per cent.

7.9.5 Table 7.29 shows the mean and standard deviation of mandays employed among the sample villages for each of the three categories of employed adults, employed male adults and employed female adults. We can see from this table that the mean man days of employment enjoyed by the employed adults, employed male adults and employed female adults are decisively high in

village 5. To test the difference between two means we simply consider a comparison between village 1 and village 5. A null hypothesis assuming no difference among the means of the two villages is rejected at a very high level of significance for each of the three categories : employed adults, employed male adults and employed female adults. The values of the standard normal variable (Z) are shown in table 7.30.

Table 7.30

Testing the Difference of Two Means Between Village-1 and Village-5

Employment category	Z values
Employed adults	5.34
Employed adult males	4.75
Employed adult females	5.82

7.10 IRRIGATION AND USE OF LABOUR

7.10.1 We present table 7.31 and table 7.32 to examine the impact of irrigation upon the intensity of use labour power in our area economy. Table 7.33 shows the mean and standard deviation of man days employed in two Sub-Samples. A relatively higher mean recorded by the second Sub-Sample permits us to say that irrigation has some positive effect on employment. A null hypothesis assuming no difference among the means of two Sub-Samples is rejected for each of the three categories of employed adults, employed male adults and employed female adults.

Table 7.31a

Labour Use Index of Employed Adults in Sub-Sample I

Percentage of Employed Adults	Intensity of Use (less than)
6.60	0.15
17.52	0.30
28.30	0.45
47.57	0.60
73.85	0.76
87.06	0.91
100.00	1.00

Table 7.31b

Labour Use Index of Employed Male Adults in Sub-Sample I

Percentage of Employed Male Adults	Intensity of Use (less than)
1.69	0.15
8.90	0.30
18.72	0.45
40.34	0.60
70.25	0.76
85.28	0.91
100.00	1.00

Table 7.31c

Labour Use Index of Employed Female Adults in Sub-Sample I

Percentage of Employed Female Adults	Intensity of Use (less than)
42.22	0.15
80.00	0.30
97.78	0.45
100.00	0.60
100.00	0.76
100.00	0.91
100.00	1.00

Table 7.32a

Labour Use Index of Employed Adults in Sub-Sample II

Percentage of Employed Adults	Intensity of Use (less than)
0.78	0.15
10.88	0.30
25.25	0.45
44.86	0.60
74.76	0.76
86.41	0.91
100.00	1.00

Table 7.32b

Labour Use Index of Employed Male Adults in Sub-Sample II

Percentage of Employed Male Adults	Intensity of Use (less than)
0.00	0.15
3.69	0.30
14.29	0.45
36.64	0.60
70.97	0.76
84.33	0.91
100.00	1.00

Table 7.32c

Labour Use Index of Employed Female Adults in Sub-Sample II

Percentage of Employed Female Adults	Intensity of Use (less than)
4.94	0.15
49.38	0.30
83.95	0.45
88.89	0.60
95.06	0.76
97.53	0.91
100.00	1.00

Table 7.33

Mean and Standard Deviation of Mandays Employed

Type of persons Employed	Mean Man days employed			S.D.of Man days employed		
	Sub-Sample I	Sub-Sample II	Total Sample	Sub-Sample I	Sub-Sample II	Total Sample
Employed adults	193	202	197	84	73	80
Employed male adults	211	219	214	72	63	69
Employed female adults	65	115	89	40	61	57

Note : No. of employed adults, employed male adults and employed female adults in Sub-Sample-I, Sub-Sample-II and totel Sample are shown below.

Type of persons employed	N U M B E R		
	Sub-Sample-I	Sub-Sample-II	Total Sample
Employed adults	742	515	1257
Employed male adults	652	434	1086
Employed female adults	90	81	171

Table 7.34a

Percentage of Employed Adult Males Using More than 60 per cent of labour power in Subsample-I and II

Sample	Percentage of adult males using more than 60 per cent of labour power	
Sub-Sample - I	59.66	(389/652)
Sub-Sample - II	63.36	(275/434)

Table 7.34b

Percentage of Employed Adult Males Using More than 76 per cent of labour power

Sample	Percentage of adult males using more than 76 per cent of labour power	
Sub-Sample I	29.75	(194/652)
Sub-Sample II	29.03	(126/434)

Table 7.34c

Percentage of Employed Adult Males Using More than 91 per cent of labour power

Sample	Percentage of adult males using more than 91 per cent of labour power	
Sub-Sample I	14.72	(96/652)
Sub-Sample II	15.67	(68/434)

Table 7.35

Percentage of Employed Adult Females Using more than 15 per cent of labour in subsample - I and II

Sample	Percentage of adult females using more than 15 per cent of labour power	
Sub-Sample I	57.78	(52/90)
Sub-Sample II	95.06	(77/81)

Table 7.35b

Percentage of Employed Adult Females Using More than 30 per cent of labour power

Sample	Percentage of adult females using more than 30 per cent of labour power	
Sub-Sample I	20.00	(18/90)
Sub-Sample II	50.62	(41/81)

Table 7.35c

Percentage of Employed Adult Females Using More than 45 per cent of labour power

Sample	Percentage of adult females using more than 45 per cent of labour power	
Sub-Sample I	2.22	(2/90)
Sub-Sample II	16.05	(13/81)

Figure- 7.4

Comparison of Use of Labour Power of Employed Adults in Sub-sample I and II

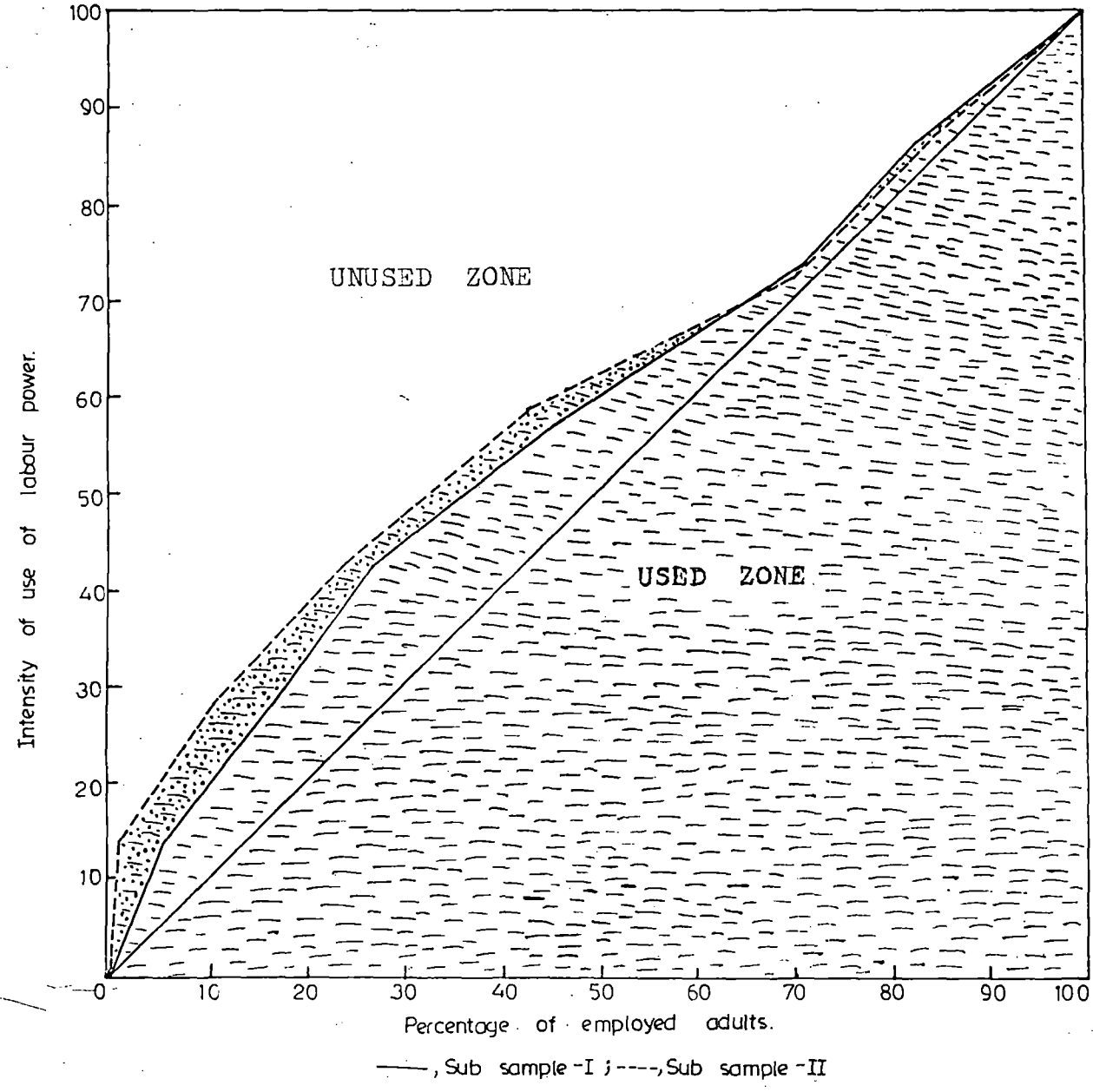


Figure- 7.5

Comparison of Use of Labour Power of Employed Male Adults in Sub-sample I and II

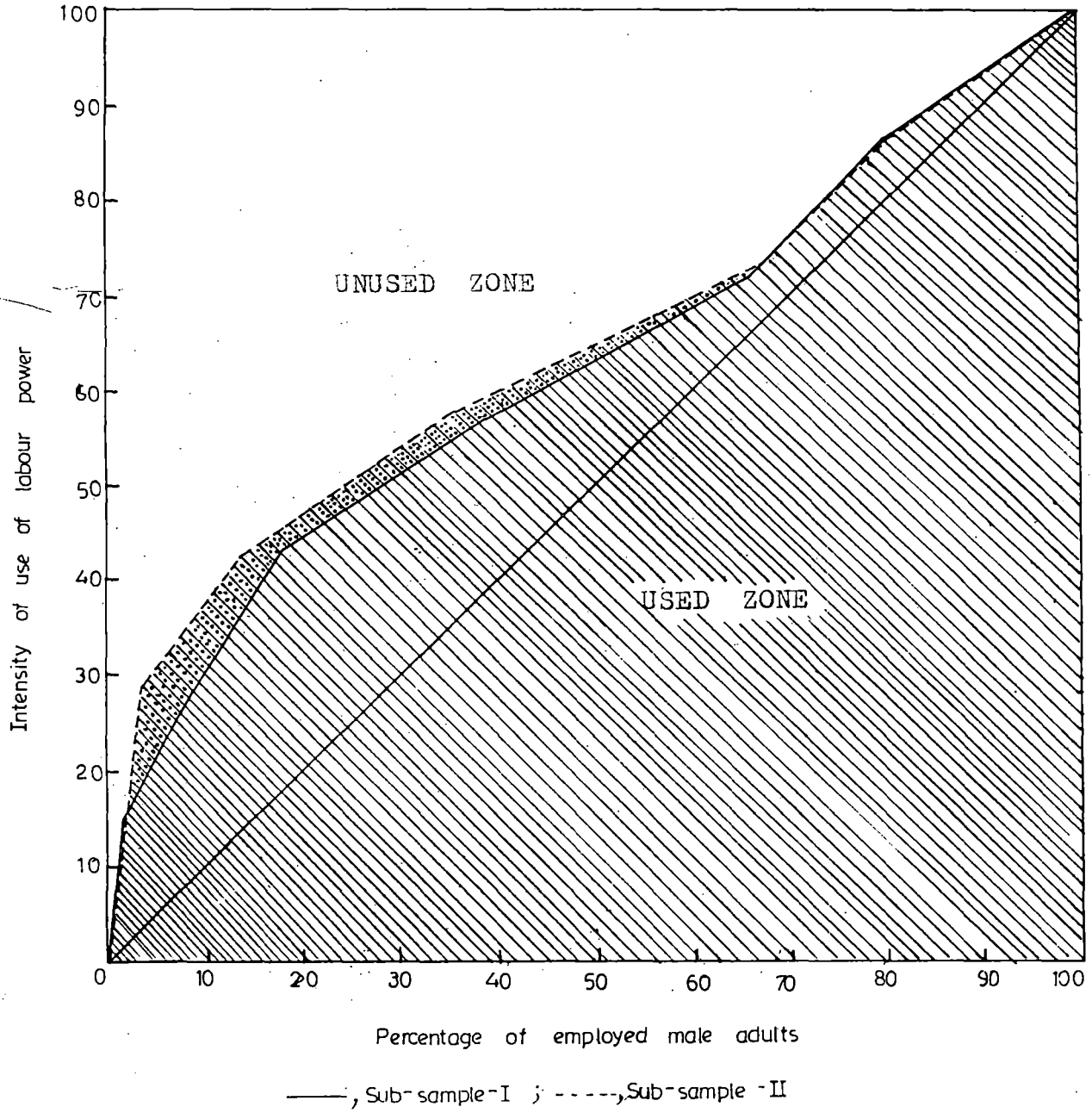
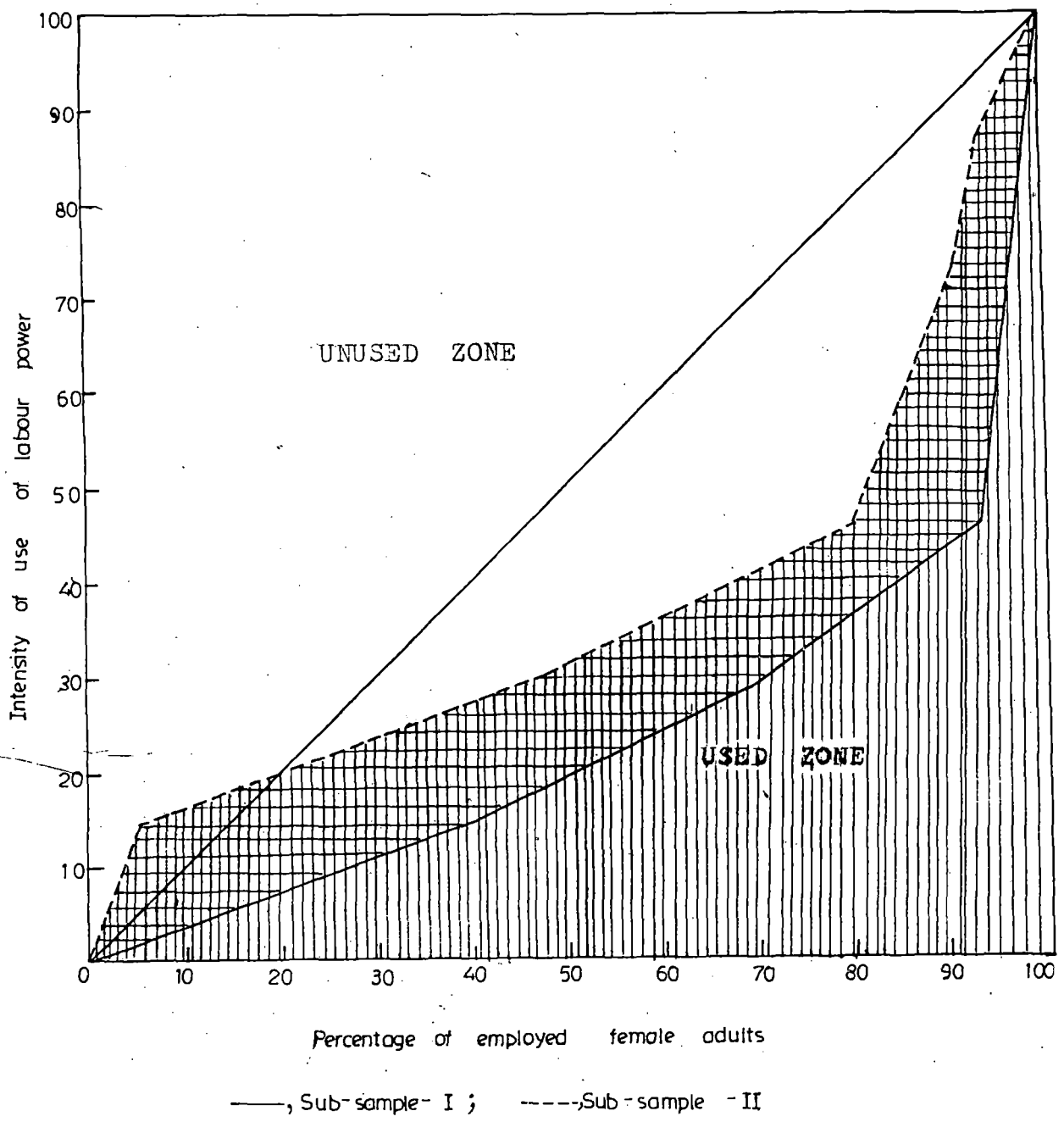


Figure- 7.6

Comparison of Use of Labour Power of Employed Female Adults in Sub-sample I and II



For employed adults and employed male adults the differences are significant at 0.05 and 0.07 level of significance, while for employed adult females the difference is highly significant.

7.10.2 It can be seen from tables 7.31a and 7.32a that the percentages of employed adults who succeed to make use 60 per cent of labour powers are 52.43 in first sub-Sample and 55.14 in second Sub-Sample. The two rates for the employed adults who succeed to make use 91 per cent of their labour powers are 12.94 per cent and 13.59 per cent respectively. Here the differences are apparent and not significant statistically. Similarly, the differences in percentages in respect of use of labour power among the employed male adults of the two Sub-Samples are not significant statistically. However, one notices from table 7.35 that the differences in percentages are statistically significant. The comparison has also been shown in figures 7.4 to 7.6. Thus, as a whole, we are in a position to hold that the labour power in second Sub-Sample are utilised more intensively than that of first Sub-Sample.

7.11 EDUCATION AND INTENSITY OF USE OF LABOUR POWER

7.11.1 To measure the impact of education on employment we categorise all employed adult males of our sample in two broad groups. They are (1) those who completed 6 years of education and more and (2) those who completed education less than 6 years. We get the initial impression from tables 7.36 and 7.37 that employed male adults with education 6 years or more are succeeded

Table 7.36

Labour Use Index of Employed Male adults having completed 6 years education and more

Percentage of employed male adults	Intensity of Use (less than)
0.37	0.15
8.24	0.30
19.48	0.45
37.45	0.60
56.18	0.76
69.66	0.91
100.00	1.00

Table 7.37

Labour Use Index of Employed Male Adults having completed less than 6 years Education

Per cent of employed male adults	Intensity of Use (less than)
1.22	0.15
6.35	0.30
16.12	0.45
39.32	0.60
79.21	0.76
89.86	0.91
100.00	1.00

Table 7.38a

Percentage of Employed Adult Males Using more than 60 per cent of labour power

Group	Per cent of adult males using more than 60 p.c. of labour power	
Those who completed 6 years of education and more	62.55	(167/267)
Those who completed education less than 6 years	60.68	(497/819)

Table 7.38b

Percentage of Employed Adult Males Using more than 76 per cent of labour power

Group	Per cent of adult males using more than 76p.c. of labour power.	
Those who completed 6 years of education and more	43.82	(117/267)
Those who completed education less than 6 years	24.79	(203/819)

Table 7.38c

Percentage of Employed Adult Males Using more than 91 per cent of labour power

Group	Per cent of adult males using more than 91 p.c. of labour power	
Those who completed 6 years education and more	30.34	(81/267)
Those who completed education less than 6 years	10.13	(83/819)

to make use their labour power more intensively than the employed male adults with education less than 6 years. The two means are respectively 226 and 200. The null hypothesis assuming no difference among the means of two groups is rejected at a very high level of significance.

7.11.2 On the basis of tables 7.36 and 7.37 we derive tables 7.38a, 7.38b and 7.38c to test the statistical significances between the two proportions. Although the difference between two proportions of the employed male adults who succeed to make use 60 per cent of their labour powers is apparent, the difference is not significant statistically. But the differences in proportions shown in tables 7.38b and 7.38c are statistically significant. So, on the whole, we are in a position to hold that the employed male adults with education 6 years or more are succeeded to make use more intensively their labour powers than the male adults with education less than 6 years. This is mainly because of the fact that, some salary earners are included in the group of more educated persons who find permanent employment through out the year.