

**RURAL DEVELOPMENT AND MICRO LEVEL PLANNING:  
A CASE STUDY ON AGRICULTURAL PRODUCTION PLANNING IN  
A RURAL ECONOMY OF COOCH BEHAR**

*A Thesis submitted to the University of North Bengal  
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Economics*

*By  
Sri Ranjit Kumar Ghosh*



**GUIDE**  
*Dr. Sadhan C Kar*  
Associate Professor  
Department of Economics  
Dinhata College

**Co-GUIDE**  
*Prof. Anil Bhuimali*  
Department of Economics  
University of North Bengal  
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## DECLARATION

I declare that the thesis entitled "RURAL DEVELOPMENT AND MICRO LEVEL PLANNING: A CASE STUDY ON AGRICULTURAL PRODUCTION PLANNING IN A RURAL ECONOMY OF COOCH BEHAR" has been prepared by me under the guidance of Dr. Sadhan Ch. Kar, Head & Associate Professor, Department of Economics, Dinhata College, Cooch Behar and Prof. Anil Bhuiimali, Department of Economics, the University of North Bengal. No part of the thesis has formed the basis for the award of any degree or fellowship previously.

*Ranjit Kr. Ghosh*

Ranjit Kr. Ghosh  
Department of Economics,  
North Bengal University  
PO: Raja Rammohunpur, Siliguri-734013  
District: Darjeeling, West Bengal  
India  
DATE: 28.05.2014

CERTIFICATE

We certify that *Ranjit Kr. Ghosh* has prepared the thesis entitled "*RURAL DEVELOPMENT AND MICRO LEVEL PLANNING: A CASE STUDY ON AGRICULTURAL PRODUCTION PLANNING IN A RURAL ECONOMY OF COOCH BEHAR*", for the award of Ph.D. degree in Economics of the University of North Bengal, under our guidance. He has carried out the work in the Department of Economics, the University of North Bengal.

*Sadhan Chandra Kar*  
**Dr. Sadhan C Kar**  
(Supervisor)  
Associate Professor in Economics  
Dinhata College  
Cooch Behar

**Dr. S.C. Kar**  
Associate Professor in Economics  
Dinhata College  
Dinhata, Cooch Behar

Date: 23.05.2014

*Anil Bhuiamali*  
**Prof. Anil Bhuiamali**  
(Co-Supervisor)  
Department of Economics  
University of North Bengal  
Siliguri

**Professor**  
Department of Economics  
University of North Bengal



### Abstract

The title of our thesis is “**Rural Development and Micro Level Planning: A Case Study on Agricultural Production Planning in a Rural Economy of Cooch Behar**”.

The object of this research enterprise is to make a specialised study on agricultural production of the rural economy of *Baneswar*, of Cooch Behar Block-II in Cooch Behar district. The wider aim of this write up is to divulge the various causes of the loss of tempo that has been occurring in respect of agricultural development in this area even after the second call for green revolution. We know very well that the agricultural development is a rhythm depends on the synchronisation of different factor and does not depend solely on the sector of agriculture itself. Keeping this view in mind a number of aspects covering all the related sphere have been covered by this investigation.

At the end, the study will enable us to chalk out a development plan as well as an institutional framework for an expanding productive system for this grass-root area economy and for other alike areas. At the same time the analysis of agricultural production carried out so far in local level rural economies of West Bengal by several investigators under the supervision of Prof. P.C. Sarkar, already developed in detail, will be carried still further to investigate in detail some of the important points about which there is great deal of obscurity in the international academic circles. All these have been clearly described in our introduction chapter 1.

In our 2<sup>nd</sup> chapter we have given an outline of the socio- economic characteristics that exist in that rural economy. These socio- economic characteristics is also appeared as an important instrument to maintain a sustainable level of growth within the area economy. This stock-taking gets its importance not only to see the existing endowments but also to make it clear about the need of the area economy in the coming decades to usher in the sustainable development what we plead for the area economy in the previous chapter. Another point to be noted here is that this stock-taking also provides us the information about the existing use of the various endowments with the existing rules of the game in the one hand and also to find out the unexplored resources that are being left in the existing process of planning conceived at the top.

In the 3<sup>rd</sup> chapter we have tried to examine, in details, the existing state of housing, sanitation and healthcare facilities that have been enjoyed by the rural people within the existing socio-economic framework of our sample economy to formulate a plan for housing, sanitation and healthcare at the grass- root level of our type

The existing demographic characteristics of labour in our grass-root area economy have been analysed in the 4<sup>th</sup> chapter which is important not only for planning but also for the achievement of the production potentiality of any area economy in the one hand and also for achieving the economic-demographic equilibrium. For giving the short and long run planning for the area economy we have explained the birth and death rates, GFR, TFR, GRR and NRR, future projection of the sample population and other demographic indicators.

In our 5<sup>th</sup> chapter we have given a detail account of input use and output raised in our sample economy in a very simple manner. In this chapter we have used the concepts like output-input ratio, home labour co-efficient, various farm incomes and yield rates, farm-size productivity, etc. to measure input use efficiency in a very crude aggregate manner.

In the 6<sup>th</sup> chapter we have used both the Linear and Log- linear regression functions to clarify the input responses on output of total as well as individual crops. Both the attempts are in aggregative in nature and they did not provide any information about the farm efficiency at individual level.

To measure farm efficiency at individual level by using the Data Envelopment Analysis (DEA) Technique is the task of the 7<sup>th</sup> chapter. Using DEA Technique, here we have tried to find out the relatively efficient and inefficient farms particularly in case of Aman paddy, Potato and Boro paddy production, the mostly produced crops in our sample economy, within the existing setup. We have also explained the causes of inefficiency of the farms and the ways to make the farms efficient.

The main task of the 8<sup>th</sup> chapter is to divulge the ground reality of the extent of use of land and labour in this grass-root rural area economy. We have tried to do this by finding out of different occupational distributions of the employable adults of the area, by good

and bad employment and especially through our intensity index measures. Similarly, the analysis of land use index is also an important part of this chapter.

Our 9<sup>th</sup> chapter covers the important findings and recommendations.

## PREFACE

*The basic problem as we face to deal with our development plans is the denial of the two basic cheap resources like land and labour at the grass-root area. A lot of difficulties have been facing by the downtrodden men in discharging their labour power, the only source of their livelihoods, in an efficient manner. Similarly, the relatively lower intensity value of land use releases the picture of under utilisation of land resource. The main aim of this write-up is to divulge these two facts in a very smooth manner. This research work is carried out at the University of North Bengal, Darjeeling, West Bengal. Except our second chapter, all other chapters are written on the basis of information collected by us covering the period 2008-09. All the comments we have made in this write up are solely in our own responsible. If any part or any finding of this write up is to be used in future for the betterment of our rural folk then it will be our great achievement and satisfaction.*

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## DEDICATION

*The entire work is dedicated to our beloved sir and Pathfinder*

*Prof. P.C.Sarkar D.Sc. (Rtd.)*

*Department of Economics  
The University of North Bengal  
Raja Rammohunpur  
Siliguri, Darjeeling (W.B)*

## Chapter 1 INTRODUCTION

### 1.1 INTRODUCTION

- 1.1.1** The direction and magnitudes of productivity of land and labour, the two most important basic resources of any grass-root economy, occupy a paramount important position in the analysis of local level economic situation and hence local level planning. The importance of this kind of study stems from the fact that there is an infinite diversity among the economic agents of special circumstances of local level rural economies even when they appear covered by a haze of common markings.
- 1.1.2** The diversity of special setting of local level rural economies is not confined to fine or distinct differences in agro-climatic characteristics of the economy. For one thing even when agro-climatic characteristics do not differ perceptively, the extent of their utilisation for strengthening the process of development often differs for historical or political reasons. Secondly, the co existence of local economies with different degrees of utilisation of their purely natural characteristics offers us invaluable data for innovating methods to study not merely the productivities but also the degree of primacy of various facilities contributing to the heightening of output and employment. More importantly, however, there are many areas, and almost invariably the ones which are much away from the national or the state capital, which escape notice of the policy-makers and as a consequence are generally labelled as desertish or marginal areas. Plan for the development of these marginal areas remains as prolonged unfinished task yet after consuming of six decades of our national planning.
- 1.1.3** Subjecting such areas for meticulous and careful research is of first importance because contrary to official presumption, they may portend a future much brighter than areas which have come to prominence through the receipt of political and official patronage for decades. Two national objectives of studying these types of grass-root economies may be mentioned. In the first place, the need of an autonomous planning of a local level economy for the purpose of giving employment at doorsteps is supported by various ills of the present day centralised

planning in India. Secondly, the integration of projects of such local level economies into the national investment plan renders the rate of growth of output per capita faster than the plan conceived at the top.

## **1.2 SLOW DEVELOPMENT OF INDIAN AGRICULTURE**

**1.2.1** There are now unmistakeable signs that India is emerging as an exporter of agricultural crops. Between 1921 and 1991 India has at least thrown portents to be appeared as an important agricultural power in this globe and has established to put a sign about her ability to sell food grains to the international economy. This has been possible because of an impressive upsurge of her agricultural production mainly since the early seventies of the last centuries.

**1.2.2** During the six decades of National Planning and during the 67 years of National Government between 1946 and now, agriculture moved up rather very late and at a very constant slow rate at about 2 percent to 2.5 percent per annum. This can be understood if we trace the process of evolution of a planning design of this country. The Mahalanobis foundation of the Indian planning and the intergovernmental trade agreement between India and Russia since 1955 disguised a covert rapprochement policies of India and the erstwhile Soviet Russia. The stress on capital goods ignoring the usefulness of two nationally cheap resources like land and labour up to the third plan and the consequent expansion of the role of public sectors continued beyond the third plan.

**1.2.3** The Kashmir war and the two years of drought in the mid sixties and consequent difficulties put a break on the kind of planning design. One must acknowledge that although investment planning for the rural sector was sought to be replaced by reorganisation of agrarian relations, important changes took place in the rural scene. All most all the states abolished Zamindaries or intermediaries. Legislation was enacted for ceiling on land holdings. Surplus lands were distributed among the poor. Administrative divisions were so reorganised as to lay the foundation for a block level planning. The office of a Block Development Officer or its analogue in every block accommodated many technical officials equipped with very modern techniques in various departments for offering services to the rural people

covered by the block. But the productivity of the personnel so engaged has been imperceptible at least till the early seventies.

- 1.2.4** Some of the official economists who were aware of the virtual neglect of agriculture till the end of the third plan pleaded that agriculture was a bargain sector and could be developed at will. This was one of the reasons why the country depended so far on American disposal of surplus food grains and PL 480 in 1960s of the last century. But the Kashmir war of 1965 was the greatest single factor that forced Indian planners to look for speedy substitution of imports of foodstuffs.
- 1.2.5** Indian planners, however, made a wrong decision on the location of productive agricultural enterprises. In what has been known as New Agricultural Strategy the planners sought to raise more agricultural production in two or three states which were historically favoured with greater agricultural facilities since after independence. This eventually created some sort of a duality in Indian agriculture. The western India was allowed to produce much more than the eastern half of the country, though the later region has a vast potentiality to raise agricultural production equally in an efficient way.
- 1.2.6** Under the pressure of the donor institutions especially the World Bank under the presidency of McNamara in late 70s of the last century the Government of India intensified an antipoverty programme specifically to help the poor. During the earlier period relief was distributed both in urban and rural areas in times of distress only to the microscopic minorities. But now the target group of the poor was sought to be directly helped for raising their income streams. The peculiarity of this third phase of Indian planning is that we have a clear-cut duality in our plan aims. That is to say, on the one hand we have a main investment plan of development but on the other we have a supplementary anti-poverty plan designed especially for the poor. Some of which are the IRDP, NREP, RLEGP and very recently adopted SGSY, JGSY, EAS and NSAP lack complementarity and co-ordination.

**1.2.7** As we review this brief review of agricultural planning we find that our short-range, medium range and long-range objectives of agricultural development have not been made mutually consistent. In the language of chess, we have lost valuable tempo and the rate of development of agriculture has been slow.

### **1.3 IMPORTANCE OF GRASS ROOT PLANNING**

**1.3.1** There have been various approaches to Grass-Root planning. The AVARD approach and the approach of R.P. Mishra and others have been widely circulated. None of these approaches view the plans of grass-roots as autonomous plans. Professor P.C.Sarkar seeks to build up National Plan as an aggregation of autonomous plans of grass-roots. A complete autonomous plan for a grass-root economy is suggested for both short and long ranges. A grass-root economy is delineated on two considerations. In the first place, a grass-root economy should be of such a size that the planners at the local level have no difficulty to monitor the behaviour of all economic agents at the grass-roots. This easy monitoring is an indispensable instrument for realising the aims at the grass-roots. In the second place, the determination of the boundaries of the grass-root economy will be made on the basis of immaculate uniformity of agro-climatic characteristics.

**1.3.2** A consistent path of development in South Asian countries is the path of concurrent development of agriculture and non-agriculture. The content of this concurrent development is that the development of non-agriculture will follow the needs of rise and revolutions in agriculture. If this development has to gain momentum then it is of first importance to make sure that the location of agricultural enterprises is not based on subjectivism of political advantage seekers but on the objective considerations of maximum advantage to the national economy as a whole. From the planning centre of Delhi we cannot view the unused productive resources in various regions of the country. Even from a state capital, say of Kolkata, the official experts cannot see the power of productive resources in relatively distant parts of the state.

**1.3.3** For the type of South Asian countries the basic aims may be to realise in the shortest possible time high rise in agricultural production, income and employment, a half to the growth of population and making our army of workers

at the base well-fed, energetic and literate ( Viner.1952). The realisation of these basic aims will be quickened by resorting to autonomous planning at the grass-roots.

- 1.3.4** All the planning exercises that are made for national plans are to be done for the autonomous grass-root plans. As in the case of the whole nation so also for a grass-root economy an inter-action model requiring a simultaneous setting up of sectors and enterprises is needed. A country town will be at the centre and an integral part of a grass-root economy.

#### **1.4 THE BASIC PROBLEMS**

- 1.4.1** The object of this research enterprise is to make a specialised study of agricultural production of the rural economy of *Baneswar*, as defined in the preceding section. The wider aim is to discover the various causes of the loss of tempo that has been occurring in respect of agricultural development in the area. Obviously, as the summary of the previous studies indicates, the agricultural development does not depend solely on the sector of agriculture itself. There are thus a number of aspects which this investigation must cover.
- 1.4.2** At the end the study will enable us to chalk out a development plan as well as an institutional framework for an expanding productive system. At the same time the analysis of agricultural production carried out so far in local level rural economies of West Bengal under the supervision of Prof. P.C. Sarkar will be carried still further to investigate in detail some of the important points about which there is great deal of obscurity in the international academic circles.
- 1.4.3** It does not mean that there is consensus in respect of other important points in the national and international academic circles. There is not a single method now being used in economic research that may be used blindly. All methods have their defects. It is of paramount importance that the design of the study is well laid and is not unnecessarily exposed to excessive sampling fluctuations, and what is more, the data are organised and reorganised enabling correct use being made of mathematical, statistical or econometric techniques. The more we study about the new local level rural economies the more we have opportunities of using

improved methodology as well as using traditional or used methods with adequate care. Local level studies are especially important because here we have complete command of the setting of farms and good scope of testing the quality of simple or sophisticated methods. Innovation of methodology especially in respect of measuring responses of inputs, infrastructural facilities and other sorts of cooperative endowments and institutions is possible in a really fruitful way through visits and revisits paid to local level economic agents.

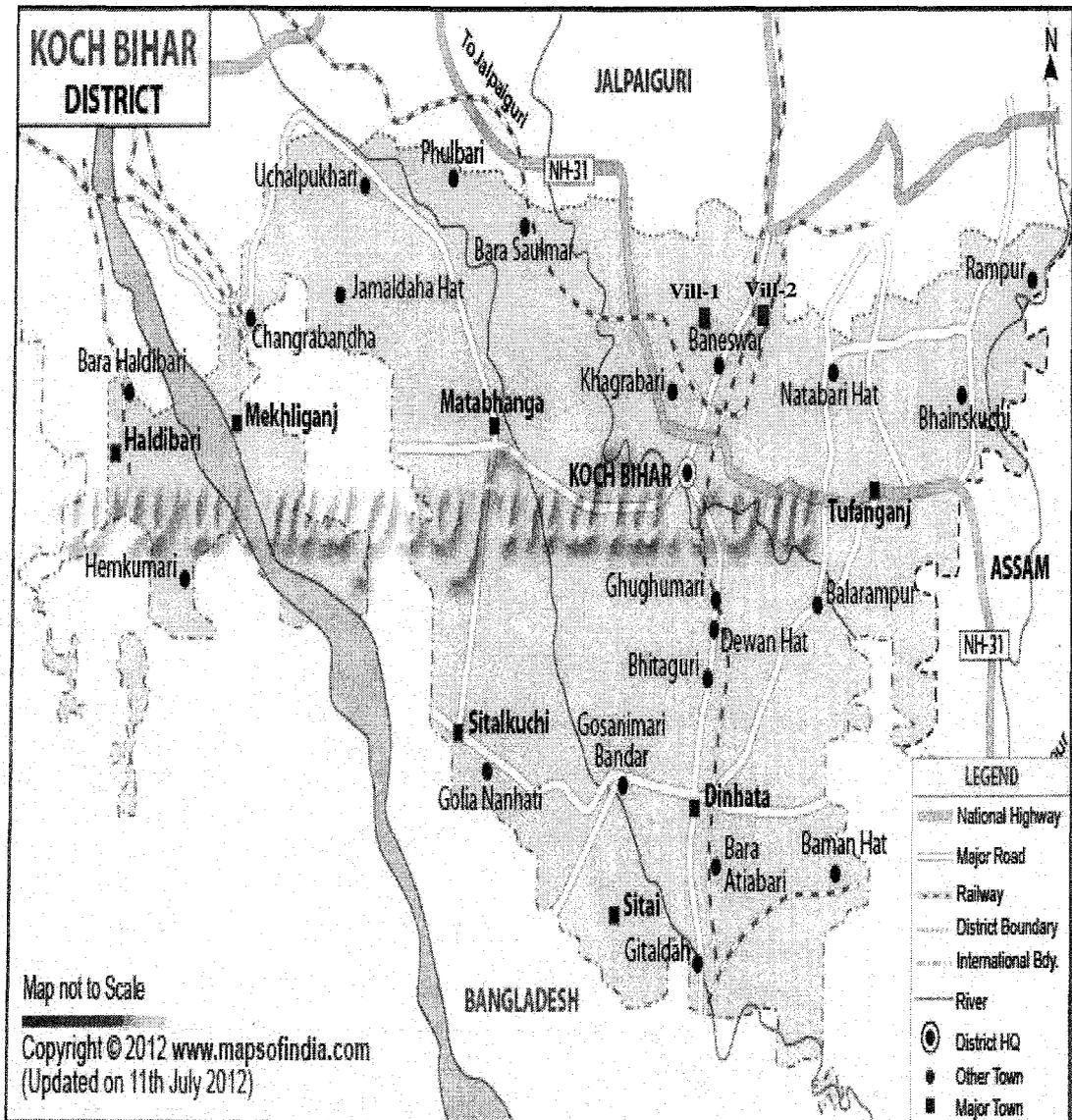
1.4.4 There is no denying that this research scheme will use various means to measure the responses referred to in the preceding paragraph. Methods whether they are referred to in the preceding paragraph or not, will be used to measure the productivities of the productive agents. The measurement of these productivities will be sought to rival methods. A maximum possible conformation of the deductions through a larger number of alternative methods will help us to arrive at fundamentals so valuable for national process of development.

1.4.5 Equally important must be the question of primary or productive agents. The usual models, as briefly summarised in the preceding section of this studies, can at best release measures of productivities and show how these productivity can be manipulated for allocation of various sorts of resources. They can hardly give us information, in undeveloped or traditional rural economies, as to which agents have a prior claim on uses for production. This is of great importance because a priori ignorance in this respect can do, and has done, a most inefficient allocation of resources. This means that huge investible funds are blocked mostly unproductively, when the productive use of these investible funds through alternative agents would have heightened the production and the productive system. Another fundamental objective is the investigation into a system of production and system of integrated rural economy that would assure a low-cost resource enhancing and purity heightening life of the households of the economy concerned.

## 1.5 THE STUDY AREA

1.5.1 For the purpose of this present study the local level rural economy being studied which is made up with the villages around the village market town of **Baneswar**

## MAP OF COOCH BEHAR DISTRICT



and the market town itself. The two villages are *Ichhamari* and *Borokhata*. The first village is nearer to the market town Baneswar and relatively more developed in all respects than of the second village. Elsewhere these two villages will be termed as village-1 and Village-2. In fact, the whole Baneswar Gram Panchayat area is synonymous with the local level rural economy being studied. The sale town or market town of Baneswar is the centre of interaction of the activities of the villages around. We will provide a detail stocktaking of the endowments of our study area in the subsequent chapter of this write up.

## **1.6 PREVIOUS STUDIES**

**1.6.1** No one has in the past subjected the process of production of the rural economy of Baneswar to rigorous economic investigation. One of the villages of the Baneswar Gram Panchayat, however, was studied to analyse agricultural production to produce the M.Phil. Dissertation of this candidate under the supervision of Prof. P.C.Sarkar of North Bengal University. But the scope of study of that Dissertation was rather narrow, though it made some contribution in some important respects.

**1.6.2** A more comprehensive study requires a list of previous works. Because the scientific discovery is a process of work being done by generations of investigators, it is necessary to know, to do justice to an investigation under the title given, the important steps put forward in the direction. This direction is basically multi-dimensional. The dimensions involved are: Development planning, local level studies and planning, economies of production of agriculture, mathematical, statistical and econometric methods of isolating productivity of productive services and facilities and empirical studies in these fields.

**1.6.3** Of the empirical studies carried out in the state of West Bengal mention may be made of some reports of official studies organised by the Ministry of Agriculture, Government of India. Studies in the Economics Farm Management in Hooghly District, Report for the year 1969-70 to 1972-73 and these may be read with the Report of the National Commission of Agriculture parts I to XV and Rainfall and Cropping patterns Vol. XVI published by the Ministry of Agriculture between 1976 and 1977. These studies suffer from a uni-method approach. Besides, the

basic approach of covering inter-sectoral interaction in the possible provocation or consequence in primary as well as secondary rounds. This is also manifest in a contemporary study on rural employment, October, 1979,1980 published by the Ministry of Agriculture, Government of India.

- 1.6.4** The preceding paragraph gives but an exceedingly brief review of the main trend of analysis of agricultural production in West Bengal during 1950s, 1960s and 1970s. Outside these decades, both before and after, a great deal of work has been undertaken abroad. These studies gradually extended and exposed the analysis of agricultural production to more influences than considered conventional. To begin with mention must be made of the work done at the pioneer agricultural experimental stations of USA and UK and the US Department of Agriculture. Of the experimental stations Maine and Rothermstead are known for their input specific production functions. We should mention some of the earlier personal works in the twenties and thirties authored by J.D.Black (1926) and Sune A. Carlson (1939). Of the works produced in the US Department of Agriculture, W.J. Spillman, E. Lang and E. Jensen (1933) figure among the investigators in the inter-war period. Of the same period an important work is also needed to be mentioned made by H.R. Tolley, J.D.Black and M.J.B. Ezekiel (1966).
- 1.6.5** The analysis of agricultural production took a new turn following the experiments in general production analysis by C.W Cobb and P.H.Douglas. The development of Econometrics quickened the pace of work on agricultural production analysis. Mentions may be made about some of the earliest applications of econometrics: Bronfenbrenner's (1944) " Production Functions: Cobb-Douglas Interfirm, Intrafirm"; Smith's (1945) "The Statistical Production Function"; Tintner and Brownlee's (1944) " Production function Derived from Farm Records"; Tintner's (1944) " A Note on the Derivation of Production Functions from Farm Record Data"; Heady's (1946) " Production Functions from a Random Sample of Farms"; Marschak and Andrews's (1944) "Random Simultaneous Equations and the Theory of Production" ; Tinbergen's (1951) book "Econometrics"; Heady's (1952) book "Economics of Agricultural Production and Resource Use" and Valavanis's (1959) book "Econometrics".

- 1.6.6** The Cobb-Douglas production function was generalised by Arrow, Chenery, Minhas and Solow (1962) in their joint article "Capital and Labour Substitution and Economic Efficiency". This production function is known as the constant elasticity of substitution production function. The Cobb-Douglas production function is treated as a special case of this function. The difference is that in the CES production function its elasticity of substitution is not constrained to be unity.
- 1.6.7** Outside the strictly conventional factors, price and similar factors have been used to study the supply response. Nerlove has initiated studies leading to the use of greater number of similar variables through his article "Estimates of Elasticities of Supply of Selected Agricultural Commodities published in the journal of Farm Economics in the year 1956 and his book *The Dynamics of Supply: Estimation of Farmers' Response to Price* published in the year 1958.
- 1.6.8** A great prospect has been opened up in the analysis of agricultural production by the innovation of the general input-output model and its dynamic system by W.W. Leontief. In this view some of the multi-variate analyses, even "if spun sufficiently long", could not truly represent a system of general interdependence. But the Lontief model not merely appeared as a system of general interdependence. He also demonstrated that his system can, in addition, get the concrete numerical results giving reactions of products and prices to different types of primary changes. These numerical results were comparable to elasticities derived by methods of conventional statistical supply and demand analyses. The great point is that his model can be used for questions of diverse types. Jan Tinbergen, Hillis B Chenery, H. Uzawa and J. Sandee have made great use of the Lontief model for specific purposes.
- 1.6.9** Dantzig and Koopmans have pioneered in the creation of a new type of inter-industry model bringing in linear and non-linear programming into the arena. The programming formation was also independently innovated by Kantorovitch and extended by specific uses by A. Carter, Arrow, Hurwicz, Uzawa, Chenery and Manne. The important works in summary are: Dantzig's "The Programming of Interdependent Activities: Mathematical Model" published in the year 1951 in

Koopmans (ed.) Activity Analysis of production; Koopmans "Efficient Allocation of Resources" published in *Econometrica* in 1951 and Koopmans book three essays on the State of Economic Science published in the year 1957

**1.6.10** Agricultural production is also influenced in a host of other ways. Grand models of development pioneered by Rosenstein-Rodan, Mandelbaum and provided with variations by Nurkse, Lewis, Rostow, Libenstein, Ranis & Fei, Jorgenson and Kuznets throw insights as to the various agencies influencing agricultural production. Schultz, Hyami, Ruttan, Mellor, Nakamura, Chhawa, Johoston provide in varying measure ingredients for heightening agricultural production.

**1.6.11** A. Banerjee (1993) in his paper "The Impact of New Economic Policy on Agricultural Labour" has explained the segmented nature of the agricultural labour market by examining the basic components of recent economic policy changes with special reference to the farm policy and highlighted the implication of such changes for agricultural labour. The study concludes that the condition of agricultural labour will improve if their asset holding and entitlement can be increased through Land Reform and availability of other inputs.

**1.6.12** Jha (1997) has analysed the condition of male and female agricultural labourers; money wages and real wages; time rate and piece rate, daily, weekly, off-season, busy season scenario; Income level and Consumption and so on. The study tried to relate the findings of all in one direction, i.e. changes in the labour process in the changing socio-economic scenario in the process of agricultural development. The studies of N. Bondyopadhaya (1977), L. Gulati (1977), H.R.Sharma (2005) may be mentioned in this regard.

**1.6.13** Chadha (1994) has analysed the changing incidence of landless in terms of (i) the number of rural households owning arable land, (ii) the number of households operating no land and (iii) the number of agricultural labour households. The study concludes that between the years 1964-65 and 1982-83 the incidence of landless has increased in each state looked at from each of the three angles above.

**1.6.14** B.D.Dhawan(1998) in his paper “India’s Irrigation Sector: Myths and Realities” has discussed a variety of structures comprise the Indian irrigation sector. These can be dichotomized in more than one way: (1) major or minor; (2) surface water or ground water based; (3) gravity flow or lift irrigation works; (4) public or private; and (5) traditional or modern. The first classification is no doubt peculiar to India; in the plan and other official documents large scale irrigation is described under the head ‘major and medium’ irrigation, and small scale irrigation under ‘minor’ head. He also calculated the unit cost of irrigation from different sources. A.Vaidyanathan (1987) “Presidential Address—Irrigation and Agricultural Growth”, Government of India (1994) – Report of the Census of Minor Irrigation Schemes 1986-87, Minor Irrigation Division, Ministry of Water Resources, New Delhi may be mentioned in this case.

**1.6.15** U.K.Dey (2003) in his paper “Changing Cropping System in Theory and Practice: An Economic Insight into the Agrarian West Bengal” tries to examine the basic reasons for crop diversification in the context of agricultural situation on West Bengal. The whole analysis reveals that development of irrigation and technology in other fields are the main factors behind the relatively rapid expansion of cultivation of Boro rice, Potato and Mustard in West Bengal. Growth of chemical fertilizer also plays an important role in accelerating the growth of these crops. Though availability of inputs, location of plots and technology of cultivation of crops play some important role, the relative profitability accepted by the farmers from different combinations of crops ultimately becomes instrumental in the planning of allocation of limited land holdings of the cultivators. Sustainability of income that can be obtained from their limited plots is also considered by the rational farmers. The other studies by Sarkar (1988), Vyas (1996), Gulati and Sharma (1994), Narayanamoorthy (1997), Chand (1996) and Bhalla and Singh (1997) also analyze the allocation of land among the competitive crops grown during the same season and found that either of the factors, relative price (market/ administered), irrigation facility, soil condition, price policies of the government, yield of crops, technology, infrastructure, etc. are responsible for crop diversification in different places.

**1.6.16** R. Kumar (2005) in his paper “Constraints Facing Indian Agriculture: Need for Policy Intervention” attempts to spell out some of the constraints like stagnancy in production and factor productivity growth, inadequate institutional support, migration of agricultural labour, etc. It also seeks to highlight some of the major areas of concerns facing Indian agriculture: Land Market and Use, Agriculture Labour-Rural Unemployment and Poverty, Capital Formation and Investment, Agriculture inputs-Supply and Availability, Agriculture Credit—Extent of and Access to Institutional Credit and Agriculture Extension Network. He concluded that India continues to be predominantly an agrarian economy and without improvements and developments in this sector, the economy as a whole cannot expect to achieve and maintain a balanced and sustainable growth trend. Other important studies in this field are made by S.M.Dev (2004), D.N.Ghosh (2005), V.S.Vyas (2004).

**1.6.17** T. Haque (2006) in his paper “Resource Use Efficiency in Indian Agriculture” explained that an efficient farmer should allocate his land, labour, water and other resources in an optimal manner to maximise his income, at least cost, on sustainable basis. But as resources and managerial efficiency of different farmers vary widely, the net returns per unit of inputs used also vary significantly from farm to farm. Again a farmer’s access to technology, credit, market and other infrastructure and policy support, coupled with risk perception and risk management capacity under erratic weather and price situations would determine his farm efficiency. He concluded that farmers must have timely access to adequate credit, at reasonable rate of interest, quality seeds, fertilizers and other inputs, along with knowledge of integrated resource management and facilities for convenient and competitive marketing of agricultural produce to confirm optimal use of all resources. Besides, appropriate risk management policy would be crucial for stabilizing farm income which would encourage the farmers to take proper interest in farming and maintain resource use efficiency.

**1.6.18** The study of R.S.Sidhu and S.S.Gill (2006) reveals that the expansion of agricultural credit shall have to be improved further by covering large number of farmers, who still are unable to access to formal credit due to rigidity in lending procedures and requirements, rigidity in loan products such as oral lease, lack of

ownership title, lack of capital, etc. inadequacy of the staff in rural branches and low profitability of institutions; and by increasing quantum of flow, for the rapid development of Indian agriculture. According to them, modern marketing infrastructure, processing, value addition, grading, standardization, efficient and modern transportation, modern storage, contract farming, etc. are going to step up the financing requirements of the agricultural sector to drive full benefits from commodity production.

**1.6.19** The authors like Debreu (1951), Koopmans (1951) and Farrell (1957, models for evaluating productivity) who for the first time understood and elaborated the concept of relative efficiency. However, as a mathematical programming DEA technique, although based on earlier work of Ferrell, has been used by the researchers in a number of fields since its inception in the year 1978 by Charnes , Cooper and Rhodes (CCR). It is an important non-parametric method of evaluation. In their originating article Charnes, Cooper and Rhodes (CCR) described DEA as a “mathematical programming model applied to observational data (that) provides a new way of obtaining empirical estimates of relations- such as the production functions and/or efficient production possibility surfaces- that are cornerstones of modern economics”.

**1.6.20** Conservation of the basic natural resources and increasing the purity and quality of human resources have been the compelling considerations for a set of authors and institutions to look for the maximization of production not for indicate years but for a totality of longer period.

**1.6.21** Finally, mention must be made of location theories and approaches to local level planning for boosting agricultural production system. About the locational planning, Gustav Ranis, Marc Nerlove, Robert Darfman and Paul Samuelson may be mentioned selectively. Even though most of the writings on local level planning are grossly wanting, AVARD, Misra, Srivastava and the documents of the Planning Commission of Government of India during the fourth plan period merit a mention.

## 1.7 THE METHODOLOGY

- 1.7.1 There is no end of diversities of methodologies used in rural studies. The National Sample Survey has used a sample design that uses only sample households on a broad division of rural and urban areas. Such designs are not suitable for analysis of a very large number of variables. A survey like the National Sample Survey can be used only for one or two variables for which its design is consistent. But the pity is that the analysts of the Indian Statistical Institute forget the limitations of the design of that survey and use the data for purposes which a survey of that design cannot serve.
- 1.7.2 Some experts devised a method of studying modal farms for input-output relations. The method might be useful for obtaining information about the productivity and use of inputs in different areas and serves as a basis for comparison of efficiency of agriculture in different local rural economies. This method can also be used as a basis for the planning of an extension service for farm management. But the method is not suitable for fitting production functions and exercises in quantitative analysis and specially for the local level studies.
- 1.7.3 Some Indian investigators have resorted to sample survey without a scientific design. They have used only elementary Census data to build a simple sample frame. In many cases about 100 households cover such a sample. The difficulty of such a sample is that since the sample is not stratified on the basis of size of farms, the sample is not good enough for study of variation of output and inputs according to size. Such a sample is also not good for representing productivity and other variables.
- 1.7.4 Thus we are in need of selecting a methodology that will be more suitable for our type of object. We resort to a two-phase and one stage stratified sample. In the first phase, we have surveyed each and every household of the sample villages *Ichhamari* and *Borokhata* with a specially prepared household schedule and the number of household is 693. Chapters 3, 4 and 8 are being represented on the basis of these 693 households. In the second phase we have surveyed 100 households from each sample village on the basis of farm size including the land less households for special study on farm activities. These 200 households were

selected on the basis of stratified sampling considering farm size as strata for special study of farms. Chapter-5, Chapter-6 and chapter -7 are being produced on the basis of the results of this stratified sampling. All the information is collected for the period 2008-09 which is synonyms to the traditional agricultural year.

**1.7.5** The traditional methods being used are the various sorts of simple and multiple production functions to measure the degree of responsiveness between input used and output raised. The goodness of fit will be the main consideration in choosing among elasticities. The mathematical model of inter-sectoral dependence will be used also with a view to testing how these elasticities computed conform to the elasticities obtained from an inter-sectoral mathematical model. Yet the main insights or confirmation of a priori theories in regard to complementarities an integration of mutually supporting activities, agriculture and non-agriculture.

**1.7.6** Among the non-traditional methods that have been used by us involve simple quantification based on a method of abstraction. A multiplicity of these methods can be devised depending on the availability of comparable data either between clusters or between modal units or among a larger number of modal units.

**1.7.7** Conceptually, therefore, the framework is not confined to the fixed or current inputs. Nor certain infrastructural facilities or complementary activities are the residual additions. The schema of a problem solving technology being generated within through radical reforms in legislation is an important part of the conceptual framework.

## **1.8 HYPOTHESIS**

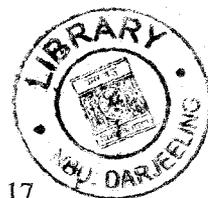
**1.8.1** The basic hypothesis that has been tested in this research enterprise is that the over centralised nature of planning might open the case of formulation of dynamic plans in a rather less expensive manner and also releases the faster growth of output per capita for the nation as a whole by using the two cheap national resources say land and labour.

**1.8.2** The second most important hypothesis that has also been tested is that the local level resources might be so allocated in such a manner that the substitution of

organic inputs for chemical inputs will increase both output and employment in all time periods. This will no doubt increase the organic base of the farm sector and rescue the farm sector from unscientific use of inorganic manure in their production process.

**1.8.3** The third hypothesis that we have tested in this study is that a part of gains in productivity have been eating out completely by the increasing cost of cultivation irrespective of price of the produce during the plan era.

**1.8.4** It is rather beyond doubt that more than six and half decades of our national planning left a great deal of our nationally inexpensive resources like land and labour unused in this grass-root rural economy. To test this hypothesis is also an important exercise of this work.



## Chapter 2

### ENDOWMENTS OF THE BANESWAR RURAL ECONOMY

#### 2.1 INTRODUCTION

2.1.1 The level of living of the people and the production potentiality of a particular economy depends upon the socio-economic characteristics that exist in that economy. These socio-economic characteristics is also appeared as an important instrument to maintain a sustainable level of growth within the area economy. The title of our research project is "Rural Development and Micro Level Planning", It is thus obvious to take the stock taking of the existing endowments of the Baneswar rural economy. This stock-taking gets its importance not only to see the existing endowments but also to make it clear about the need of the area economy in the coming decades to usher in the sustainable development what we plead for the area economy in the previous chapter. Another point to be noted here is that this stock-taking also provides us the information about the existing use of the various endowments with the existing rules of the game in the one hand and also to find out the unexplored resources that are being left in the existing process of planning conceived at the top.

2.1.2 We have pleaded elsewhere for the reformulation of the centrally monitored planning process that we have been enjoying since after independence. There is no denying that *the Nehru-Mahalanobish Planning* structure was failed to feed the mass during the 1950s and 1960s and we have observed a turning point in the thinking of the statesman of the Republic and the experts of planning. As a result of that turning we were got an agricultural revolution during the late 1960s and early 1970s to feed our growing population and to free themselves from the conditional food import mechanisms. In spite of that agricultural development, reasonable areas of our national economy remain outside the proximity of the Green Revolution just to the existence of the big farmer lobby at the top. This lobby was mostly cornered all the benefits of the new agricultural investment that took place under the initiation of the then Government. As a result, the two basic endowments of our national economy say land and labour remain unexplored in the areas that lie out of the proximity of the Green Revolution. One upshot of this kind of half-hearted development is that the other endowments of these area

economies remain in a nebular form and demand for the development of such endowments in the course of the time.

**2.1.3** Thus in this chapter we try to exhibit the existing endowment facilities enjoyed by this rural economy within the existing rules of the games.

## **2.2 AREA AND GEOGRAPHICAL LOCATION**

**2.2.1** Our study area is Baneswar Rural Economy. It is situated in Cooch Behar Block II within the district of Cooch Behar in the state of W.B. Cooch Behar is the North Eastern district of West Bengal. It is situated between  $26^{\circ} 19' 86''$  N to  $26^{\circ} 32' 20''$  N North Latitude and  $88^{\circ} 47' 40''$  E to  $89^{\circ} 54' 35''$  E East Longitude. It forms an irregular triangle in shape. The total area of the district is  $3387.00 \text{ KM}^2$  and is bounded by Jalpaiguri district in the North and West, on the East partially by Goalpara district of Assam and partly by the Rangpur district of Bangladesh and the south is entirely bounded by Bangladesh.

**2.2.2** On the other hand, the area of Cooch Behar Block II is  $376.42 \text{ KM}^2$  ( $37495.22$  Hectare or  $92988.14$  Acres) and it is bordered by Jalpaiguri district on the North and is encircled by other 3 Blocks of the district viz. Tufanganj I, Cooch Behar I and Mathabhanga II on the Eastern, Southern and Western side respectively. The humidity of the block is 50 percent to 70 percent from February to May and 50 percent to 95 percent during rest of the year. The area of the Baneswar Rural Economy is 8325 Acres or 3330 Hectares only and it is bounded by Ambari G.P on the North, Dhangdhinguri G.P and Gopalpur G.P on the West, Khapaidanga G.P on the South and Tufanganj subdivision on the Eastern side.

## **2.3 RAINFALL**

**2.3.1** Natural rainfall of the district is supposed to be the key factor for the agricultural production activities of the farmers. As irrigation facility in the district is still inadequate, natural rainfall causes an essential adjunct for the production of different crops. Sometimes it is observed that the district experiences heavy rainfall over the consecutive days together. The table 2.1 will delineate the fact about the actual rainfall in the district.

**Table 2.1: MONTHLY RAINFALL IN THE DISTRICT OF COOCHBEHAR**  
(Actual and in Millimetres)

| Month     | 2005 | 2006 | 2007 | 2008 | 2009 |
|-----------|------|------|------|------|------|
| January   | 26   | 0    | 0    | 58   | 0    |
| February  | 8    | 11   | 52   | 14   | 0    |
| March     | 59   | 3    | 14   | 99   | 36   |
| April     | 163  | 62   | 161  | 203  | 108  |
| May       | 253  | 355  | 216  | 373  | 287  |
| June      | 747  | 551  | 475  | 842  | 510  |
| July      | 638  | 529  | 597  | 670  | 402  |
| August    | 622  | 113  | 439  | 1183 | 629  |
| September | 288  | 382  | 496  | 273  | 196  |
| October   | 470  | 135  | 87   | 123  | 270  |
| November  | 0    | 18   | 0    | 0    | 0    |
| December  | 0    | 10   | 0    | 0    | 0    |
| Total     | 3274 | 2169 | 2537 | 3838 | 2438 |

Sources: 1. Agricultural Meteorologist, Directorate of Agriculture, Govt. of W.B  
2. Meteorological Department, Govt. of India

2.3.2 One can see from the table 2.1 that the actual rainfall in the district is different in different months. It is recorded highest in the months of June to July and lowest in the months of November and December. Thus due to irregular rainfall in different seasons the farmers can't use their land properly throughout the year for different crops. At the time of the start of the rainfall Aus Paddy and Jute production starts in the district. Rainfall is recorded highest in the Eastern part of the district. According to the variation of rainfall the cropping pattern also varies in the district. Generally, there is sufficient soil moisture for crop raising from April to December, and from December to March crop production actually necessitates irrigation facility. But some parts of Dinhata subdivision are capable enough of producing fair crop without irrigation water because in those places sufficient moisture remains in soil even up to March. Thus irrigation facilities should be extended throughout the district at the initiative of the Government to facilitate the farmers that they can continue agricultural activities throughout the year. This type of programme will not only help in agricultural activities throughout the year by increasing the gross cultivable area but at the same time it will also generate employment opportunities for the rural landless labourers.

## 2.4 TEMPERATURE

2.4.1 Temperature is also an important natural factor for smooth agricultural activities throughout the year. High temperature is necessary to dry the soil during Ravi-Season for cultivating different vegetables. Again damped weather hampers Ravi crops severely and also causes several types of crop diseases. So no one can deny the role of temperature in uninterrupted agricultural activities in an economy. We have shown the maximum and minimum temperature by months of the district in table 2.2 below. High temperatures are recorded in the months of May to September and low temperatures are recorded in the months of December to February.

**Table 2.2: MAXIMUM AND MINIMUM TEMPERATURE BY MONTH IN THE DISTRICT OF COOCHBEHAR**

Centre:CoochBehar  
Degree Celsius

| Month        | 2005 |      | 2006 |      | 2007 |      | 2008 |      | 2009 |      |
|--------------|------|------|------|------|------|------|------|------|------|------|
|              | Maxi | Mini |
| January      | 26   | 9    | 28   | 9    | 29   | 5    | 27   | 7    | 28   | 9    |
| February     | 31   | 12   | 30   | 12   | 29   | 10   | 29   | 6    | 31   | 10   |
| March        | 34   | 15   | 35   | 14   | 36   | 11   | 33   | 13   | 36   | 11   |
| April        | 33   | 17   | 36   | 17   | 36   | 17   | 35   | 16   | 36   | 18   |
| May          | 35   | 20   | 37   | 20   | 37   | 21   | 35   | 19   | 37   | 20   |
| June         | 35   | 23   | 35   | 22   | 28   | 22   | 36   | 23   | 36   | 22   |
| July         | 35   | 20   | 36   | 24   | 35   | 24   | 36   | 24   | 37   | 25   |
| August       | 35   | 24   | 38   | 24   | 37   | 24   | 36   | 23   | 36   | 24   |
| September    | 36   | 24   | 35   | 23   | 35   | 21   | 35   | 23   | 36   | 24   |
| October      | 33   | 17   | 34   | 17   | 35   | 18   | 34   | 17   | 35   | 18   |
| November     | 31   | 14   | 31   | 13   | 32   | 12   | 32   | 12   | 32   | 11   |
| December     | 28   | 10   | 28   | 10   | 29   | 8    | 29   | 10   | 29   | 7    |
| For the year | 36   | 9    | 38   | 9    | 37   | 5    | 36   | 6    | 37   | 7    |

Sources: 1.Agricultural Meteorologist, Directorate of Agriculture, Govt. of W.B  
2. Meteorological Department, Govt. of India

## 2.5 AGRO- CLIMATIC ZONES OF COOCHBEHAR

2.5.1 Topographically, the district of Cooch Behar is a level plain with gentle slope towards South- East. A large network of river and rivulets traverse the district from the North- West to the South- Easterly direction. During rainy season the rivers are with super-flowers water and with strong current. The turbulent water

carries huge amounts of sand, silt, and pebbles, which have an adverse affect on the crop production as well as on the hydrology of the region<sup>(1)</sup>. The main rivers of the district are Teesta, Mansai and Torsa. The Teesta enters Cooch Behar and forms the border of Mekhliganj and Haldibari Blocks and then running through some distance in Mekhliganj Block, it enters the Bangladesh. The river Jaldhaka enters the district at the North Eastern part of Mekhliganj and then runs along the border of Mathabhanga I and Mathabhanga II Blocks taking the name of Mansai. Then flowing through Eastern part of Sitalkuchi Block it enters into Sitai Block with the name Singimari and leaves the district after traversing for some distance through the Southern part of Dinhata I Block. The river Torsa flows along the Eastern part of Mathabhanga I Block and enters Cooch Behar I Block at the North Western corner and after running in an East- South easterly direction it bifurcates. The other rivers of the district are Dharala, Kaljani, Gadadhar, Ghargharia and Mora Torsa. All the rivers drain their water into the river Brahmaputra in Bangladesh either directly or after unity among themselves earlier. The river Mora Torsa is flowing through the southern side and the river Ghargharia is flowing through the northern side of the Baneswar Rural Economy.

- 2.5.2 The low lands situated between the rivers Mansai and Torsa raise crops without irrigation but in higher situation lands irrigation is essential for good Ravi crops or early sowing pre-kharif crops. Though not very perfect the district can be divided into three Agro- Climatic Zones along the three main rivers of the district i.e. Teesta belt, Mansai belt and Torsa belt

## 2.6 LAND AND LABOUR ENDOWMENT

- 2.6.1 The soil of the district is formed by alluvial deposition of different river system. It is mainly sandy loam to loam and heavy soil is found in some small pockets. In Cooch Behar Block II, within which our sample economy is situated, 10 percent land is sandy, 50 percent is sandy loam, 25 percent is loam, 10 percent is clay loam and only 5 percent is clay. In this Block nearly 60 percent land is acidic, 37 percent is natural and rest of the land is organic carbon. The depth ranges from 0.15 metre to 1.00 metre and is superimposed on a deep bed of sand. This is due to huge amounts of sand, silt, and pebbles carried out by turbulent water during floods in the rainy season. The soil has low levels of nitrogen with moderate

levels of potassium and phosphorus. Deficiencies of boron, zinc, calcium, magnesium, and sulphur are high<sup>(2)</sup>. The moisture retentive capacity of land in the higher situation is low and in lower situation it is high.

**2.6.2** Out of the total cultivable land in Cooch Behar Block II, 4259.258 Hectare is high land, 15068.958 Hectare is medium and 4735.954 Hectare is low land. In our sample economy, from our observation, most of the lands are medium, 10 percent to 15 percent lands are low and no high land is found. So early winter vegetables are raised rarely in our sample economy due to scarcity of high land.

**2.6.3** In the district as a whole, multiple – cropping has not gained popularity due to highly inadequate irrigation facility. The only exception is the Dinhata Subdivision where the moisture retentive capacity of the soil is very high. So in that subdivision good crop is raised even without irrigation facility. Moreover, in that subdivision multiple – cropping is possible only by draining surface water from canals, river and deep tube- wells.

**2.6.4** In our Baneswar Rural Economy, only the farmers of two villages named Kaljani and Barokhata can avail the scope of irrigation facility cheaply for multiple-cropping due to availability of RLI System based on Mora Torsa River and Ghargharia River. In all other cases irrigation is done by Deep Tube-wells at private initiative for multiple-cropping. Irrigation from Deep Tube-wells is very costly and it is beyond the capacity of small and marginal farmers. In our sample economy irrigation is required mainly for Rabi crops and Boro paddy. The classification of land utilization in the district of Cooch Behar, Cooch Behar Block II and our sample economy (from our direct observation) is shown in table 2.3.

<sup>1,2</sup>. Annual Plan on Agriculture 2003-04, Cooch Behar, Cooch Behar District Agriculture Office, p. 02

**Table 2.3: CLASSIFICATION OF LAND UTILISATION STATISTICS IN THE DISTRICT OF COOCHBEHAR, COOCHBEHAR BLOCK II AND OUR SAMPLE ECONOMY**

| Year    | Area        | Reporting area | Forest area | Area under non-ric. Use | Barren and unculturable land | Culturable waste land | Fallow land other than current | Current Fallow | Net area Sown |
|---------|-------------|----------------|-------------|-------------------------|------------------------------|-----------------------|--------------------------------|----------------|---------------|
| 2008-9  | CoB.-II     | 331 H          | 426         | 67850 H                 | 1100 H                       | 40 H                  | 10 H                           | 500 H          | 251960 H      |
| 2003-04 | CoB. II     | 374H           | 194         | 10346 H                 | -                            | 100 H                 | -                              | -              | 24064.17 H    |
| 2008-09 | Sample area | 318.H          | Nil         | 57.86 H                 | 2.92 H                       | 3.83 H                | Nil                            | Nil            | 253.38 H      |

Source: 1. Directorate of Agriculture (Evaluation), Govt. of W.B  
2. A Block Profile: Cooch Behar II, govt. of W.B (2004)

**2.6.5** In our sample economy there is no forest land except some portion for bamboos and trees for traditional fruits. Besides, in most cases some portions of land are kept along with their home stead area for kitchen garden to fulfil the self demand for vegetables. Again there are some private ponds for fish cultivation. But in most cases fish cultivation for them is not profitable. This is due to their ignorance of proper method of fish cultivation and also due to small sizes of the ponds.

**2.6.6** In our sample economy most of the lands are used for raising Aus paddy and Jute in the pre- kharif season, Aman paddy (mainly HYV) during the kharif season and during Ravi season potato, cabbages, tomato, cauliflower and some amount of late winter vegetables are raised through proper irrigation. When potatoes are raised, in many cases, the lands are used for Boro paddy and Jute cultivation for minimising the cost of cultivation. During that period, the cultivation of Boro paddy and Jute does not require more tilling and more fertilizers for the preparation of land.

## **2.7 DISTRIBUTION OF POPULATION BY SEX AND BY AGE GROUP**

**2.7.1** It is very important to know the distribution of population by sex and by age group of an economy by the researcher in order to have a correct composition of male and female and also the total working force in the economy. This kind of distribution determines not only the work force but also the total number of school going children and the number of aged people who have no productive capacity to add to national income further. In our sample economy, total employable working

force is 1424 i.e.47.28 percent (15 to 65 years) out of which 255 i.e.8.47 percent are female and total aged people (65+ years) are 60 i.e.2 percent of which female population is 51.34 percent. In our rural economy sex ratio is 93.32 only, which is slightly lower than the national and state figure (2001 Census). Again the sex ratio in case of children (up to 4 years of age) is 95.12 in our grass-root rural economy which is a better sign for future generation.

**Table 2.4: DISTRIBUTION OF POPULATION BY SEX AND BY AGE GROUP IN COOCHBEHAR DISTRICT (RURAL) AND OUR SAMPLE ECONOMY**

| Age Group (rs) | Rural population (Cob. Dist. No. in '000) :2001 Census |        |        |        |        |        | Sample Area Population :2008-09 (primary Data) |        |        |        |       |        |
|----------------|--|--------|--------|--------|--------|--------|--|--------|--------|--------|-------|--------|
|                | Male   |        | Female |        | Total  |        | Male   |        | Female |        | Total |        |
|                | No.  | P.C.   | No.    | P.C.   | No.    | P.C.   | No.  | P.C.   | No.    | P.C.   | No.   | P.C.   |
| 0-4            | 123.7  | 10.69  | 119.7  | 10.92  | 243.4  | 10.80  | 123  | 7.89   | 117    | 8.05   | 240   | 7.97   |
| 5-9            | 154.7  | 13.37  | 149.5  | 13.64  | 304.2  | 13.50  | 156  | 10.01  | 142    | 9.77   | 298   | 9.89   |
| 10-14          | 153.0  | 13.22  | 144.0  | 13.14  | 297.0  | 13.18  | 149  | 9.56   | 134    | 9.22   | 283   | 9.40   |
| 15-19          | 113.5  | 9.81   | 88.3   | 8.05   | 201.8  | 8.95   | 143  | 9.18   | 134    | 9.22   | 277   | 9.20   |
| 20-24          | 88.0   | 7.60   | 91.4   | 8.34   | 179.4  | 7.96   | 158  | 10.14  | 147    | 10.11  | 305   | 10.13  |
| 25-29          | 89.7   | 7.75   | 101.3  | 9.24   | 191.0  | 8.48   | 148  | 9.50   | 141    | 9.70   | 289   | 9.59   |
| 30-34          | 85.0   | 7.35   | 82.4   | 7.51   | 167.4  | 7.43   | 143  | 9.18   | 137    | 9.42   | 280   | 9.30   |
| 35-39          | 86.5   | 7.47   | 78.7   | 7.18   | 165.2  | 7.33   | 152  | 9.76   | 143    | 9.83   | 295   | 9.79   |
| 40-44          | 66.6   | 5.76   | 53.6   | 4.89   | 120.2  | 5.33   | 118  | 7.57   | 109    | 7.50   | 227   | 7.54   |
| 45-49          | 53.7   | 4.64   | 46.5   | 4.24   | 100.2  | 4.45   | 79   | 5.07   | 70     | 4.81   | 149   | 4.95   |
| 50-54          | 37.9   | 3.28   | 34.6   | 3.16   | 72.5   | 3.22   | 55   | 3.53   | 47     | 3.23   | 102   | 3.39   |
| 55-59          | 27.8   | 2.40   | 26.9   | 2.45   | 54.7   | 2.43   | 43   | 2.76   | 37     | 2.54   | 80    | 2.66   |
| 60+            | 77.1   | 6.66   | 79.4   | 7.24   | 156.5  | 6.94   | 91   | 5.84   | 96     | 6.60   | 187   | 6.21   |
| All Ages       | 1157.2   | 100.00 | 1096.3 | 100.00 | 2253.5 | 100.00 | 1558   | 100.00 | 1454   | 100.00 | 3012  | 100.00 |

Source: Census of India, 2001 and our collected primary data, 2008-09

## 2.8 OCCUPATION WISE DISTRIBUTION OF THE POPULATION

**2.8.1** Occupations of people in an economy are the most important determinants of standard of living of the people. It also determines the faith of future generations in many cases in rural economy. The level of income and the fulfilment of basic necessities of the families depend mainly on occupations of the people. Again,

occupational structure of people in an economy determines the stage of economic development. The Cooch Behar district is mainly an agricultural district and nearly 85 percent of the population is dependent on agriculture and agriculture allied activities for their livelihood. The only industrial centre in our district is the 'Chakchaka Industrial Growth Centre' which comprises 131 Acres of land. This growth centre is located at a distance of 4 kilometers from Cooch Behar town and 2 kilometres from the New Cooch Behar Railway Station. It is situated beside NH-31 which has linked the Industrial Growth Centre with Siliguri, Assam and the entire eastern region. As it is a growing centre and most of the small industries are infant, it has no capacity to employ more people permanently. Thus, due to industrial backwardness most of the people of Cooch Behar district have chosen agriculture and agriculture allied activities as the main source of their employment.

**2.8.2** In a grass-root rural economy, like ours, most of the people are dependent on agriculture and agriculture allied activities for their livelihood. Again, nearly 25 percent of them are agricultural day labourers. Only a few portions of the people are engaged either in government or in private services. A very negligible proportion of the people are dependent entirely on business activities (7.5 percent). The occupational structure of the people in our sample economy is shown in table 2.5

**Table 2.5: OCCUPATION (MAIN) WISE DISTRIBUTION OF THE FAMILIES IN OUR SAMPLE ECONOMY**

| Villages  | Agriculture |       | Day Labour |       | Rickshaw/<br>Van Puller |      | Small<br>Business |      | Service |      | Total |     |
|-----------|-------------|-------|------------|-------|-------------------------|------|-------------------|------|---------|------|-------|-----|
|           | No.         | %     | No.        | %     | No.                     | %    | No.               | %    | No.     | %    | No.   | %   |
| Village 1 | 313         | 58.50 | 132        | 24.67 | 13                      | 2.43 | 43                | 8.04 | 34      | 6.36 | 535   | 100 |
| Village 2 | 95          | 60.13 | 43         | 27.22 | 04                      | 2.53 | 09                | 5.70 | 07      | 4.43 | 158   | 100 |
| Total     | 408         | 58.87 | 175        | 25.25 | 17                      | 2.45 | 52                | 7.50 | 41      | 5.92 | 693   | 100 |

Source: Field Survey, 2008-09

**2.8.3** Table 2.5 shows clearly that 84.12 percent of families in our sample economy are directly related to agriculture and agriculture allied activities for their livelihood, out of which 25.25 percent of the families depend completely on wage earnings. Again, among the agriculture dependent families nearly 70 percent are marginal

farmers, 25 percent are small and the rest 5 percent are medium farmer. Only 5.92 percent of the families depend on government or private services for their livelihood. Business mentality has not grown properly in our grass-root rural economy – only 7.5 percent of the families dependent entirely on business activities. There are eight families who engaged in weaving through hand Tat. In the slack season of agriculture the day labourers do not get work except '100 Days Programmes' of the government. So a major portion of them remain unemployed day after day. The important point to be mentioned here that during agricultural slack season, a portion of the day labourers leave for Delhi and Haryana for work for 2 or 3 months. From this occupational distribution of families in our rural economy one can say that the lot of rural population depends mainly on agriculture and agriculture allied activities.

## **2.9 CASTE WISE DISTRIBUTION OF THE POPULATION**

**2.9.1** The caste wise distribution of the population is another social factor in analysing the socio- economic characteristics of an economy. It reveals to us the proportion of population of different castes in the total population and ultimately their customs, religions and economic status are known elaborately. In past the Cooch Behar district was dominated by the Scheduled Caste people and Scheduled Tribe and General Caste people were the minorities in the district. 'Rajbanshi, Namasudra and Jalia Kaibartta are the major forms of scheduled caste population in the district. The number of general caste population in the district has increased largely after independence. There had been considerable migration of general caste population in the district from different parts of East Bengal and Assam. According to 2001 Census, among the total population in the district 50.11 percent were scheduled caste and only 0.57 percent were the scheduled tribe population. Among the general caste population, Brahmin, Muslim, Hindu are important in the district. At present, the district is a miniature of all castes of people.

**2.9.2** Our sample economy is not outside the district and it possesses the same characteristics regarding caste wise distribution of population as we have seen in our district. Before independence our sample economy was also dominated by the scheduled caste population and the main categories of scheduled caste were Rajbanshi and Namasudra. At present, our sample economy is dominated by the

general caste population. There are only six families of Muslims and no scheduled tribe population in our sample economy. According to our door to door survey in 2008-09 periods, the sample economy records a population of 3012 out of which 1778 are of upper castes, 1207 are of scheduled caste and only 27 are the Muslims. It is very clear that in our sample economy the Muslims are the minorities. The caste wise distribution of population in our sample economy is shown in table 2.6.

**Table 2.6: DISTRIBUTION OF POPULATION BY CASTE IN BANESWAR RURAL ECONOMY AND ALSO IN OUR SAMPLE ECONOMY**

| Baneswar Rural Economy: Census 2001 |        |       |                |        |       |       | Sample Economy : 2008-09 |       |       |                |       |       |
|-------------------------------------|--------|-------|----------------|--------|-------|-------|--------------------------|-------|-------|----------------|-------|-------|
| General Caste                       |        |       | Schedule Caste |        |       |       | General Caste            |       |       | Schedule Caste |       |       |
| Male                                | Female | Total | Male           | Female | Total | Male  | Female                   | Total | Male  | Female         | Total |       |
| No.                                 | 8963   | 8535  | 17498          | 3429   | 3362  | 6791  | 924                      | 881   | 1805  | 634            | 573   | 1207  |
| P.C                                 | 36.90  | 35.14 | 72.04          | 14.12  | 13.84 | 27.96 | 30.68                    | 29.25 | 59.93 | 21.05          | 19.02 | 40.07 |

Source: Baneswar Gram Panchayet: Census 2001 & Primary Data from Field Survey; 2008-09

The table 2.6 depicts that both Baneswar Rural Economy and our Sample Economy are dominated by general caste population but comparatively more scheduled caste population live in our sample economy. Again the sex ratio in our sample economy is comparatively better in case of general caste than that of scheduled caste population.

## 2.10 DISTRIBUTION OF THE POPULATION BY RELIGION

**2.10.1** Religion of population is an important social indicator in describing the socio-economic characteristics of the population in an economy. In Cooch Behar district, we find people of all religions viz. Hindu, Muslim, Christian, Sikh, Buddhist, Jain and others, living together with a brotherhood mentality. According to 2001 census, 75.5 percent of the populations were the Hindus, 24.24 percent were the Muslims, 0.087 percent was the Christians, 0.013 percent was the Sikhs, 0.019 percent was the Buddhist, 0.088 percent was the Jains and the rest were the others. In our sample economy, only 27 people are Muslims and all other people are the Hindus. Thus our grass-root economy is a Hindu dominated economy. This is depicted in table 2.7 below.

**Table 2.7: RELIGION WISE DISTRIBUTION OF POPULATION IN COOCHBEHAR DISTRICT AND ALSO IN OUR SAMPLE ECONOMY**

| Religion   | Coochbehar District : Census 2001 |            | Our Sample Economy : 2008-09 |            |
|------------|-----------------------------------|------------|------------------------------|------------|
|            | Number                            | Percentage | Number                       | Percentage |
| Hindus     | 1871857                           | 75.50      | 2985                         | 99.10      |
| Muslims    | 600911                            | 24.24      | 27                           | 0.90       |
| Christians | 2162                              | 0.087      | Nil                          | Nil        |
| Sikhs      | 330                               | 0.013      | Nil                          | Nil        |
| Buddhists  | 474                               | 0.019      | Nil                          | Nil        |
| Jains      | 2193                              | 0.088      | Nil                          | Nil        |
| Others     | 1228                              | 0.05       | Nil                          | Nil        |
| Total      | 2479155                           | 100        | 3012                         | 100        |

Source: Census 2001 and Primary Data from Field Survey: 2008-09

## 2.11 IRRIGATION FACILITIES

**2.11.1** Water plays a dominant role in increasing the agricultural productivity in any region. Irrigation facilities, though an essential pre-requisite for agricultural progress, are very much limited in the district of Cooch Behar. The main source of making water available for agricultural fields is natural Rainfall, which is marked divergence in quantity, time and continuity. The present sources of irrigation in the district are Canals, River Lift Irrigation, Tank, Deep Tube wells, Shallow Tube wells and Open Dug Wells, etc. In the district the surface waters from different sources are not exploited at all and as a result the percentage of irrigated area to gross cropped area is very limited – it ranges from 10 to 12 percentages in the district. In table 2.8 we have shown the area irrigated by different sources in Cooch Behar district and Cooch Behar Block II for the recent years. One can see from table 2.8 that irrigational facilities are very negligible in comparison to the gross cropped area. It can be said safely that due to the inadequate supply of irrigation facilities, the farmers of the district are not capable to introduce multiple-cropping even in the era of Green Revolution. Moreover, main agricultural production is sometimes seriously handicapped due to the shortage of irrigation facilities.

**Table 2.8: AREA IRRIGATED BY DIFFERENT SOURCES IN THE DISTRICT OF COOCHBEHAR AND COOCHBEHAR BLOCK-II**

('000 Hectares)

| Year    | Area irrigated by |      |       |      |      |       |       |      |        |        |
|---------|-------------------|------|-------|------|------|-------|-------|------|--------|--------|
|         | Govt.Canals       | Tank | HDTW  | MDTW | LDTW | STW   | RLI   | ODW  | Others | Total  |
| (1)     | (2)               | (3)  | (4)   | (5)  | (6)  | (7)   | (8)   | (9)  | (10)   | (11)   |
| 2004-05 | 0.49              | 5.87 | 17.92 | 4.37 | -    | 50.20 | 14.30 | 6.53 | 5.48   | 105.16 |
| 2005-06 | 1.70              | 5.87 | 17.92 | 4.37 | -    | 50.25 | 14.31 | 6.56 | 5.52   | 106.50 |
| 2006-07 | -                 | 5.88 | 15.84 | 3.30 | -    | 51.01 | 11.26 | 6.56 | 5.52   | 99.37  |
| 2007-08 | -                 | 5.89 | 16.17 | 3.40 | -    | 51.36 | 11.28 | 6.63 | 5.77   | 100.50 |
| 2008-09 | -                 | 5.89 | 3.48  | 0.14 | -    | 66.41 | 14.71 | 2.28 | 8.83   | 101.74 |

**COOCHBEHAR BLOCK II**

(Hectares)

| Year    | Canal Area * | Tank | RLI  | DTW | STW  | ODW | Others | Total |
|---------|--------------|------|------|-----|------|-----|--------|-------|
| 2007-08 | 55           | 1640 | 1020 | 915 | 4326 | 544 | 756    | 9256  |
| 2008-09 | 50           | 1640 | 1400 | 427 | 7256 | -   | 1099   | 11872 |

\*Private Canals

|        |                                |          |   |
|--------|--------------------------------|----------|---|
| HDTW=  | High Capacity Deep Tube well   | Sources: | Asstt. Engineer, (Agri Mech.) & (Agri.Irri.) Coochbehar     |
| MDTW = | Middle capacity Deep Tube well | 1)       |   |
| LDTW = | Low capacity Deep Tube well    | 2)       | Sub-Div. Engineer, Minor Irrigation Corporation, Coochbehar |
| STW =  | Shallow Tube well              | 3)       | Report on Third Minor Irrigation Census, 2003               |
| RLI =  | River Lift Irrigation          | 4)       | Water Investigation & Development Deptt., Govt. of W.B.     |
| ODW =  | Open Dug Well                  |          |   |

**2.11.2** In our Baneswar Rural Economy, RLI system is available only in two villages' viz. Kaljani and Barokhata where the farmers can avail the scope of irrigation at lower costs but in all other cases irrigation is done by private initiative mainly by Deep Tube wells and Shallow Tube wells. Our sample village 1 depends completely on Deep Tube wells for irrigation at the time of winter vegetables cultivation and Boro paddy cultivation where the cost of irrigation is very high and it is beyond the capacity of poor farmers. But our sample village 2 fortunately

has got the scope of irrigation facility through RLI system based on Ghargharia River. So our sample village 2 has the scope of irrigation at lower costs compared to sample village 1. The farmers of the sample village 2 mainly use irrigation water during Boro cultivation, potato cultivation and late winter vegetables. This area is not very popular in raising early winter vegetables due to scarcity of high lands.

## 2.12 FERTILIZER CONSUMPTION

**2.12.1** Cooch Behar is an agriculture-based district and most of the people depend on agriculture for their livelihood. The nature of agriculture of this district shows the sign of low productivity. Among many factors, the reluctance as well as the inability of the poor farmers to use more chemical fertilizers is importantly responsible for low agricultural productivity in the district. Most of the farmers of the district still are utterly dependent on animal dung as manure. For the introduction of HYV programme in a wide scale, use of chemical fertilizers acts as an essential in gradient in any agriculture based rural economy. But the consumption of chemical fertilizers is very insufficient and irregular in the district. So it plays a very negligible role in raising the overall agricultural productivity in the district. The farmers are habituated to use more fertilizers during potato cultivation. The most important point to be noted here is that the farmers cannot use fertilizers in proper proportions between organic and inorganic due to lack of proper knowledge and training, which ultimately destroy the productive capacity of soil in many cases. So to maintain the productive capacity of soil in the rural economy, the Govt. at any level, should arrange proper training for the farmers. The consumption of chemical fertilizers in the district for different years is shown in table 2.9.

**Table 2.9: CONSUMPTION OF FERTILIZER IN THE COOCH BEHAR DISTRICT**  
(In thousand tonnes)

| Year    | Nitrogen (N) | Phosphate (P) | Potash (K) | Total |
|---------|--------------|---------------|------------|-------|
| (1)     | (2)          | (3)           | (4)        | (5)   |
| 2004-05 | 34.6         | 20.2          | 17.8       | 72.6  |
| 2005-06 | 32.6         | 22.0          | 18.6       | 73.2  |
| 2006-07 | 17.5         | 9.7           | 8.0        | 35.2  |
| 2007-08 | 20.8         | 9.3           | 8.3        | 38.4  |
| 2008-09 | 20.2         | 10.6          | 14.9       | 45.7  |

Source: Directorate of Agriculture, Govt. of W.B, 2009

## 2.13 TRANSPORT AND COMMUNICATION

**2.13.1** Roads and Railways serve an economy like the arteries in the human body. During pre- independence period, the districts of North Bengal, except Cooch Behar, were badly neglected in respect of transport and communication. The situation changed only after 1962. But per capita road mileage and rail lines are still very meagre in this area. Due to inadequate transport facilities the area of North Bengal is still backward in all respects. The N. H-31 has passed through the district connecting Assam and Bengal. There are also State Highways, District roads and village roads. The total length of all roads maintained by P.W.D, Zilla Parishad, Gram Panchayet and Panchayet Samity and Prime Minister's Gramin Sarak Yojana in the district was 9096.62 (both surfaced and unsurfaced) Kilometres in 2007-08 out of which surfaced roads were 1828.39 kilometres only. Most of the roads maintained by Gram Panchayet and Panchayet Samity are unsurfaced. The Railway station New Cooch Behar is situated within the district which is connecting Cooch Behar with all over India. There is also an Airport (not in operation now) in the adjacent area of Cooch Behar town. The roads of different subdivisions are metalled but the village roads are not all metalled. So the village people face some problems, mainly in the rainy season, in case of communication. The length of roads maintained by P.W.D, Zilla Parishad and Panchayet in the district of Cooch Behar will be very clear from table 2.10.

**Table 2.10: LENGTH OF ROADS MAINTAINED BY P.W.D, ZILLA PARISHAD AND PANCHAYET IN THE DISTRICT OF COOCHBEHAR**

(Kilometre)

| Year    | P.W.D.   |            |        | Zilla Parishad |            |         | Gram Panchayat & Panchayat Samity |            |         | Prime Minister's Gramin Sarak Yojana |            |        |
|---------|----------|------------|--------|----------------|------------|---------|-----------------------------------|------------|---------|--------------------------------------|------------|--------|
|         | Surfaced | Unsurfaced | Total  | Surfaced       | Unsurfaced | Total   | Surfaced                          | Unsurfaced | Total   | Surfaced                             | Unsurfaced | Total  |
| 2004-05 | 787.00   | 21.00      | 808.00 | 448.14         | 576.69     | 1024.83 | 181.44                            | 1238.87    | 1420.31 | 204.66                               | -          | 204.66 |
| 2005-06 | 793.00   | 15.00      | 808.00 | 109.35         | 240.50     | 349.85  | 263.25                            | 5735.00    | 5998.25 | 293.75                               | -          | 293.75 |
| 2006-07 | 796.00   | 17.00      | 813.00 | 140.52         | 213.18     | 353.70  | 297.95                            | 6237.86    | 6535.81 | 413.60                               | -          | 413.60 |
| 2007-08 | 803.00   | 14.00      | 817.00 | 156.26         | 173.91     | 330.17  | 376.99                            | 7079.90    | 7456.89 | 492.14                               | -          | 492.14 |
| 2008-09 | 805.00   | 14.00      | 819.00 | 169.15         | 161.02     | 330.17  | 437.69                            | 6942.54    | 7380.23 | 568.82                               | -          | 568.82 |

Sources: 1.P.W.D (Roads), 2.Zilla Parishad, 3.Panchayet Samity, 4.Ex. Eng. PWD, Torsa Division,

Govt. of W.B, Cooch Behar for PMGSY

**2.13.2** Cooch Behar Block II is not well endowed with roads and for this the rural people suffers a lot in case of communication. The N. H-31 has passed through the district by connecting the district with Assam and other parts of the country. There are also two P.W.D metalled roads: one, passing through the eastern side of the Block area, has joined Cooch Behar town with Alipurduar subdivision town of Jalpaiguri district and another one from Baneswar to Pundibari. The total length of roads (both surfaced and unsurfaced) maintained by P.W.D, Zilla Parishad, Gram Panchayet and Panchayet Samiti and Prime Minister's Gramin Sarak Yojana in the Block is 1121.39 kilometres out of which the length of surfaced roads is only 233.03 kilometres. The Baneswar Rural Economy contains 9 kilometres metalled roads, 30 kilometres gravel roads and 20 kilometres fair weather roads.

**2.13.3.** In our sample area rural economy, there are only 2 kilometres of metalled road running from Baneswar to Pundibari and all other village roads are all weather roads and fair weather roads. In sample village 1, there is also an all weather road running through the village from east to west connecting the village with Baneswar market. The village people can communicate with Baneswar market and district town through these roads. The sample village 2 has an all weather road running from west to east and all other roads are fair weather roads. These roads are used to communicate with Baneswar market and district town. Thus in our sample area economy, the villagers, particularly the farmers, face a lot of problems in buying of agricultural inputs and selling of agricultural outputs timely. In rainy season the problems become more acute.

## **2.14 POWER**

**2.14.1** Power or energy is the most important developmental infrastructure of a region. It makes the life of the people more comfortable and helps in education of the children by giving lights. On the other hand, electricity can help in agricultural and industrial activities. So, electricity stands as an important economic indicator in any economy. In Cooch Behar district, electricity is consumed mainly for domestic and commercial purposes, 2 percent to 6 percent electricity is consumed for agricultural activities and nearly 20 percent of electricity is used for industrial activities. This is shown in table 2.11. This indicates clearly that the district is still

industrially backward. Again, in Cooch Behar district and also in Cooch Behar Block II all the rural houses are not electrified still now and for this a large number of villages remain dark at night. In our sample village 1, nearly 80 percent houses are electrified but the picture is something different in case of our sample village 2 where nearly 30 percent households have not yet got the scope of electricity. There is a call centre in the local town Baneswar but no sector office, the sector office is at khagrabari, Cooch Behar. In our sample economy electricity is consumed mainly for domestic purposes and very negligible portion is consumed for agricultural and small scale industrial activities. This low consumption of electricity for productive activities indicates the nature of poor development of our rural area economy.

**Table 2.11: CONSUMPTION OF ELECTRICITY BY DIFFERENT SECTORS IN THE DISTRICT OF COOCHBEHAR**

(thousand K.W.H)

| Year    | Domestic | Commercial | Industrial | Public Lighting | Agricultural irrigation & dewatering | Public Water Works & Sewerage Pump | Railway Traction & Non-Traction | Miscellaneous | Total  |
|---------|----------|------------|------------|-----------------|--------------------------------------|------------------------------------|---------------------------------|---------------|--------|
| 2004-05 | 46397    | 18600      | 19560      | 1831            | 2879                                 | 2281                               | -                               | 1641*         | 93189  |
| 2005-06 | 52053    | 21361      | 21680      | 1800            | 3949                                 | 2640                               | -                               | 1616*         | 105099 |
| 2006-07 | 60130    | 27693      | 25030      | 1967            | 3611                                 | 2960                               | -                               | 1728 *        | 123119 |
| 2007-08 | 66734    | 24968      | 13574      | 2109            | 2958                                 | 2576                               | -                               | -             | 112919 |
| 2008-09 | 70720    | 29410      | 15060      | **              | 5210                                 | **                                 | -                               | 14290         | 134690 |

Sources: 1. Divisional Engineer, W.B.S.E.B (O & M) Div., Cooch Behar  
2. Divisional Engineer, W.B.S.E.B, Salt Lake

## 2.15 MARKETS AND HATS

**2.15.1** Markets and Hats are the places of all kinds of transactions of goods. The development of an economy depends upon the large and well organised markets and Hats. A well organised market will always provide the people all the quality products at reasonable prices. It also helps the farmers in providing all kinds of agricultural inputs and in selling all the agricultural products at reasonable prices. In Baneswar Rural Economy, there is one well-organised Hat called “ Baneswar

Hat "at Baneswar village, which commences twice in a week, the distance of which from our sample village 1 is 1.5 kilometres and from our sample village 2 is 3 kilometres. It is maintained by Cooch Behar Sadar Regulated Market Committee. Again Baneswar Market takes place daily morning and evening which is situated in Baneswar local town. The vegetables, fruits, milk, fishes and meat are bought and sold in the market. In Baneswar local town there are all kinds of shops to fulfil the demand of rural people. There are four shops for agricultural inputs, operated by private traders, from which all the village farmers purchase their seeds, manures, insecticides and other agricultural inputs. As there is no fair- priced shop for agricultural inputs in the rural economy, in many cases the village farmers do not get good quality inputs even paying high prices for them from private traders. It has happened in some cases that the farmers have been victimised due to poor quality of seeds. Again the farmers of our sample area economy and other villages are entirely dependent on the Baneswar Hat for selling their agricultural products. Due to inadequate market facility for agricultural products, the village farmers, in most cases, are bound to sell their products at lower prices to the middle men traders. Thus for proper agricultural development in our rural economy, fair- priced shops for agricultural inputs and extended markets for agricultural outputs are necessary.

## **2.16 CREDIT FACILITIES**

**2.16.1** Banking service occupies the most important place in rapid economic development of an economy. It opens the scope to the people to deposit their savings safely and lend money at cheaper rates of interest when needed. Banking service in the rural economy helps the farmers to lend money at lower rates during the period of sowing seeds. In Cooch Behar Block II, there are 7 commercial Banks and 5 Gramin Banks out of which 2 commercial Banks and one Gramin Bank are situated within Baneswar Rural Economy. The farmers of our sample economy are dependent mostly on the Gramin Bank, named 'Uttar Banga Kshetriya Gramin Bank' (U.B.K.G.B), for lending money to continue their agricultural and business activities timely. The total amount of loan disbursements up to 31st March of 2009 and 2010 in both priority and non-priority sectors are shown in table 2.6. Here agricultural activities include investment credit for crops, mainly for potato, winter vegetables and paddy and agriculture allied activities

includes purchasing of fixed assets for agriculture like tractors, power tillers etc. Again loan for small & medium enterprise includes both service and manufacturing.

**Table 2.12: TOTAL AMOUNT OF LOAN DISBURSEMENT IN PRIORITY AND NON-PRIORITY SECTORS BY U.B.K.G.B IN DIFFERENT YEARS**  
(Figures are in Rs. Lakh)

| Year    | Loan in Priority Sectors                    |                           |         |              |                  | Loan in Non-Priority Sectors |
|---------|---|---------------------------|---------|--------------|------------------|------------------------------|
|         | Agriculture & Agriculture Allied Activities | Small & Medium Enterprise | Housing | Micro Credit | Educational Loan |                              |
| 2008-09 | 303.49                                      | 87.43                     | 40.39   | 77.83        | 5.88             | 148.62                       |
| 2009-10 | 442.65                                      | 149.24                    | 41.93   | 76.40        | 7.56             | 163.58                       |

Source: 1. Branch Manager, U.B.K.G.B, Baneswar Branch, 2009, 2010  
2. Head Office, U.B.K.G.B, Cooch Behar, 2009, 2010

**2.16.2** It is seen from table 2.12 that the bank has given a huge amount of loan to the farmers for agriculture and agriculture allied activities to continue their agricultural activities timely. During potato cultivation the farmers are entirely dependent on bank loans. The most important point is that nearly cent percent agricultural loans are repaid timely to have the scope of loan in the next year. Thus for continuous agricultural activities throughout the year, the scope of banking service should be extended on the part of the Govt. to facilitate the farmers of getting bank loans quickly and also in adequate amounts.

## **2.17 EDUCATION**

**2.17.1** Education is an important factor in determining the level of living of the people and also the level of productivity in all sectors of an economy. It is required not only for its own sake, but it is also an important factor in economic development. Education widens the mental horizon of the people and it promotes a rational and scientific outlook. Education helps in bringing about improvement in health, hygiene, productivity and other components of quality of life. Moreover, it is essential for the people to be adjusted with the changes of the modern age. If their consciousness through education is not grown, any attempt to develop their economic condition by different Rural Development Programmes will stand futile.

**2.17.2** In a grass-root economy, like ours, education is mainly under the management of the Government. There are three H.S Schools, 12 Primary schools, one M.S.K, 8

S.S.K and one Degree college (established in 2008 in Hatiduba village) in Baneswar Rural Economy for primary to higher education of the people of this grass- root area economy. Out of these, our sample village 1 belongs one primary school and one S.S.K and the Degree College is very close to our sample village 1. There is also one primary school in our sample village 2. Besides these, there are also two private Kindergartens located in Baneswar local town for the pre-primary and primary education in Baneswar Rural Economy. The level of literacy in our sample area is not very bad compared to national or state level but highly educated people are very small in number. The literacy level in Cooch Behar District (Rural) and in our sample economy by sex is shown in table 2.13. Here literacy level means the level of capacity of reading, writing and understanding a simple passage.

**Table 2.13: LITERACY LEVEL IN PERCENTAGE BY SEX IN COOCHBEHAR DISTRICT (RURAL) AND IN OUR SAMPLE ECONOMY**

| Coochbehar Dist. (Rural) :Census 2001 |        |       | Our Sample Economy : 2008-09 |       |        |       |
|---------------------------------------|--------|-------|------------------------------|-------|--------|-------|
| Male                                  | Female | Total | Village                      | Male  | Female | Total |
| 74.4                                  | 53.6   | 64.3  | Village 1                    | 78.04 | 72.45  | 75.31 |
|                                       |        |       | Village 2                    | 71.6  | 70.21  | 70.92 |
|                                       |        |       | Total                        | 76.84 | 72.04  | 74.50 |

N.B: Literacy relates to population aged 7 years and above

Source: Field Survey, 2008-09

**2.17.2** One can see from table 2.13 that the literacy rates in our sample economy (Primary Data collected in 2008-09) are higher than the state level according to 2001 Census but our figures are very close to the state figures according to 2011 Census. Again in case of literacy rates, our sample village 1 is marginally superior to our sample village 2. This is mainly due to comparatively better economic condition and communication facilities in case of village 1.

**2.17.3** We have also calculated the literacy rates of both male and female according to land groups. It is very clear from our table 2.14 that literacy rates increase with the increase of land holdings in our grass-root rural economy. One can say from these figures that education bears a positive relation with economic condition in any economy. In case of higher land groups nearly all people have the capability of reading, writing and understanding a simple passage. Again the literacy rate in

case of landless group – category A is also high as these families are engaged either in service or in business which make them more conscious about education. The literacy rate is very low of the people belonging to landless group- category B in comparison to other groups in our grass-root rural economy. Most of the people of this group are day labourers and they use their children for earning wages instead of sending them to schools for education. Their massive poverty compels them to think like this. But the picture has changed in the rural areas after the introduction of ‘Mid- Day Meals’ for the school going children.

**Table 2.14: LEVEL OF LITERACY IN PERCENTAGE BY SEX AND BY LAND GROUP IN OUR SAMPLE ECONOMY**

| Land Group(Acres) |   | Male  | Female | Total |
|-------------------|---|-------|--------|-------|
| Landless          | A | 93.61 | 87.78  | 90.80 |
|                   | B | 61.67 | 61.18  | 61.43 |
| Up to 2           |   | 73.85 | 69.73  | 71.82 |
| 2-4               |   | 93.68 | 79.5   | 86.70 |
| 4-6               |   | 95.92 | 93.55  | 94.76 |
| Above 6           |   | 100.0 | 100.0  | 100.0 |
| Total             |   | 76.84 | 72.04  | 74.50 |

Source: Field Survey, 2008-09

**2.17.4** But the picture of higher education is not satisfactory in our sample economy. The table 2.15 shows clearly the picture of higher education of our sample economy. In our sample village 1, nearly 70 percent of Madhyamik passed students have also completed their H.S but it is just 50 percent in our sample village 2. Again, among the H.S passed students only 25 percent go to colleges to complete their graduation. The figure in case of female is comparatively low due to the customs of early marriage in many cases. In our local level economy, the number of Master Degree holders is only 12 (both male and female).

**Table 2.15: SEX WISE PERCENTAGE OF HIGHER EDUCATION IN OUR SAMPLE ECONOMY BY VILLAGES**

| Village   | Madhyamik |        | Higher Secondary |        | Graduation |        | Post-Graduation |        |
|-----------|-----------|--------|------------------|--------|------------|--------|-----------------|--------|
|           | Male      | Female | Male             | Female | Male       | Female | Male            | Female |
| Village 1 | 36.23     | 20.06  | 24.52            | 12.67  | 5.76       | 3.17   | 0.64            | 0.39   |
| Village 2 | 20.80     | 12.34  | 10.80            | 6.81   | 4.80       | 2.55   | 0.40            | Nil    |
| Total     | 33.36     | 18.64  | 21.96            | 11.59  | 5.58       | 3.06   | 0.60            | 0.31   |

Source: Field Survey, 2008-09

## 2.18 ADMINISTRATIVE SET-UP AND LAW AND ORDER

**2.18.1** Administrative Network occupies an important place for smooth functioning and maintaining the law and order in an economy. The calm and quiet situation always makes the economy healthy and accelerates the economic activities in all spheres. The administrative network in the district is maintained by the District Magistrate from the district Headquarter, the Sub Divisional Officers in the respective Sub Division Headquarters and the Block Development Officers at the block levels. There are also elected Zilla Parishads, Panchayet Samities and Gram Panchayets in the rural areas and Municipalities in the urban areas to maintain smooth economic activities and normalcy of lives within the district

**2.18.2** In order to maintain law and order in the district, there are different categories of police forces in the district Headquarter and Sub Divisional Headquarters. The strength of police forces by category, number of police stations and out-posts (Sub-Division wise), the number of offences reported and cases tried for different classes of offence and the number of persons convicted and acquitted for different classes of offence in the district will be clearer from tables 2.16 to 2.19.

**Table 2.16: STRENGTH OF POLICE FORCE BY CATEGORY IN THE DISTRICT OF COOCHBEHAR**

| Category of police force       | 2005 | 2006 | 2007 | 2008 | 2009 |
|--------------------------------|------|------|------|------|------|
| Superintendent                 | 1    | 1    | 1    | 1    | 1    |
| Addl. Superintendent           | 1    | 1    | 1    | 1    | 1    |
| Dy. Superintendent             | 2    | 4    | 4    | 4    | 5    |
| S.D.P.O.                       | 1    | 1    | 1    | 1    | 1    |
| Inspector                      | 22   | 23   | 24   | 16   | 20   |
| Sub-Inspector/SRO/SRT(R)       | 105  | 113  | 101  | 102  | 102  |
| Sergeant / Armed S.I.          | 4    | 4    | 4    | 4    | 3    |
| J.C.O.                         | -    | -    | -    | -    | -    |
| A.S.I./Asstt.Sergeant/W/OPR(R) | 210  | 224  | 216  | 216  | 213  |
| Head Constable                 | -    | -    | -    | -    | -    |
| Naik                           | 1(R) | 1(R) | 1    | -    | -    |
| Constable                      | 864  | 881  | 902  | 922  | 921  |
| Total                          | 1211 | 1253 | 1255 | 1267 | 1267 |

Source: Superintendent of Police, Cooch Behar, 2008, 09, 10

**Table 2.17: POLICE STATIONS AND OUT-POSTS IN DIFFERENT SUB-DIVISIONS IN THE DISTRICT OF COOCHBEHAR**

| Name of Sub-Division | Police Stations |      |      |      |      | Out-posts |      |      |      |      |
|----------------------|-----------------|------|------|------|------|-----------|------|------|------|------|
|                      | 2005            | 2006 | 2007 | 2008 | 2009 | 2005      | 2006 | 2007 | 2008 | 2009 |
| (1)                  | (2)             | (3)  | (4)  | (5)  | (6)  | (7)       | (8)  | (9)  | (10) | (11) |
| Mekhliganj           | 3               | 3    | 3    | 3    | 3    | 1         | 1    | 1    | 1    | 1    |
| Mathabhanga          | 3               | 3    | 3    | 3    | 3    | 1         | 1    | 1    | 1    | 1    |
| Sadar                | 1               | 1    | 1    | 1    | 1    | 2         | 2    | 2    | 2    | 2    |
| Tufanganj            | 2               | 2    | 2    | 2    | 2    | -         | -    | -    | -    | -    |
| Dinhata              | 2               | 2    | 2    | 2    | 2    | 2         | 2    | 2    | 2    | 2    |
| District Total       | 11              | 11   | 11   | 11   | 11   | 6         | 6    | 6    | 6    | 6    |

Source: Superintendent of Police, Coochbehar, 2008,09, 10

**Table 2.18: NUMBER OF OFFENCES REPORTED AND CASES TRIED FOR DIFFERENT CLASSES OF OFFENCE IN THE DISTRICT OF COOCHBEHAR**

| Class of Offence       | Offences Reported |      |      |      |      | Cases Tried |      |      |      |      |
|------------------------|-------------------|------|------|------|------|-------------|------|------|------|------|
|                        | 2005              | 2006 | 2007 | 2008 | 2009 | 2005        | 2006 | 2007 | 2008 | 2009 |
| Murder                 | 36                | 32   | 30   | 57   | 52   | 19          | 25   | 23   | 24   | 25   |
| Dacoity                | 1                 | 2    | 1    | 1    | 8    | -           | -    | -    | -    | 1    |
| Robbery                | 3                 | 6    | 8    | 4    | 9    | 1           | 4    | 3    | 2    | 3    |
| Burglary               | 1                 | 10   | 14   | 15   | 4    | 3           | 3    | 2    | 4    | 2    |
| Rioting                | 23                | 45   | 56   | 139  | 126  | 16          | 46   | 42   | 46   | 50   |
| Theft                  | 110               | 134  | 160  | 193  | 329  | 32          | 49   | 46   | 49   | 58   |
| Minor Offences         | 310               | 318  | 308  | 324  | 345  | 117         | 158  | 142  | 147  | 153  |
| Offences against women | 468               | 493  | 503  | 804  | 1053 | 380         | 606  | 602  | 632  | 642  |
| Others                 | 1067              | 856  | 941  | 1166 | 1712 | 811         | 849  | 856  | 878  | 884  |
| Total                  | 2019              | 1896 | 2021 | 2703 | 3638 | 1379        | 1740 | 1716 | 1782 | 1818 |

Source: Superintendent of Police, Cooch Behar, 2008, 09, 10

**Table 2.19: NUMBER OF PERSONS CONVICTED AND ACQUITTED FOR DIFFERENT CLASSES OF OFFENCE IN THE DISTRICT OF COOCHBEHAR**

| Class of Offence       | Persons Convicted |      |      |      |      | Persons Acquitted |      |      |      |      |
|------------------------|-------------------|------|------|------|------|-------------------|------|------|------|------|
|                        | 2005              | 2006 | 2007 | 2008 | 2009 | 2005              | 2006 | 2007 | 2008 | 2009 |
| Murder                 | 7                 | 9    | 8    | 7    | 8    | 1                 | 29   | 27   | 28   | 26   |
| Dacoity                | 1                 | 1    | 1    | -    | 2    | -                 | 2    | 2    | -    | 1    |
| Robbery                | 2                 | 3    | 2    | 1    | 2    | -                 | 14   | 15   | 16   | 13   |
| Burglary               | 1                 | 4    | 3    | 2    | 3    | -                 | 22   | 21   | 23   | 25   |
| Rioting                | 2                 | 23   | 24   | 31   | 34   | -                 | 34   | 33   | 35   | 37   |
| Theft                  | 4                 | 9    | 8    | 9    | 8    | -                 | 37   | 38   | 40   | 39   |
| Minor Offences         | 130               | 159  | 138  | 152  | 161  | 11                | 30   | 28   | 29   | 32   |
| Offences against women | 22                | 24   | 25   | 26   | 37   | 9                 | 11   | 10   | 12   | 15   |
| Others                 | 83                | 111  | 112  | 115  | 119  | 41                | 38   | 37   | 42   | 44   |
| Total                  | 252               | 343  | 321  | 343  | 374  | 62                | 217  | 211  | 225  | 232  |

Source: Superintendent of Police, Cooch Behar, 2008, 09, 10

**2.18.3** One can see from these tables that the numbers of offences for different classes have been increasing in the district day by day. It shows that Cooch Behar district will no longer be able to maintain its calm and quiet position in the state of West Bengal. During the period from 2005 to 2009, the number of offences reported for different classes of offence has increased by 80.19 percent in the Cooch Behar district and it is not a better sign for the present and also for the future generation.

## **2.19 ENTERTAINMENT**

**2.19.1** Entertainment is an important social factor which builds the minds of people and makes them living and energetic. This will in turn increase the productive activities in an economy. It is also the media of cultural exchanges of different castes and different religions of people. Cooch Behar is the city of entertainment and various means of entertainment are available in Cooch Behar district. In the district town there are two Big Outdoor Stadiums, *M.J.N Stadium* and *Cooch Behar Stadium* and all facilities are available there for playing Cricket, Football, Volley- ball, Badminton, Cobadi and other traditional games. Among these, Cricket is the most popular game in the district followed by Football, Swimming, Badminton, Volley ball, Cobadi. Cooch Behar has also a new Indoor Stadium named *Netaji Subhas Indoor Stadium* for Table Tennis, chess, etc. Many state level games, inter- district and inter- school meets are often held in these stadiums

and the people of Cooch Behar district enjoy the games. The interested people throughout the district can also avail the scope of both indoor and outdoor games in those stadiums. Besides, there are also some playgrounds and school grounds in rural areas which help the rural youth in their games and sports. This kind of scopes make the youth both strong and energetic.

**2.19.2** Moreover, the District Yuba Kalyan Department organises Block level cultural functions for each block every year for the youths with a variety of cultural programmes viz. debate, recitation, songs, dances, etc. to create cultural mentality among the youths. Again different clubs organises different cultural programmes throughout the year for mental entertainment of both the rural and urban people.

**2.19.3.** For mental entertainment of both the urban and rural population, there are three Cinema Halls in the Sadar Sub-Division and a number of Video Halls in the rural areas. Popular festivals celebrated in Cooch Behar include Durga puja, Ras Purnima, Pohela Baishakh( Bengali New Year Day), Rathayatra, Dolyatra or Basanta-Utsab, Diwali, Poush Parbon, Christmas, Eid-ul-Fitr, and Eid-ul-Adha. During Rathayatra a small fair is organised at Gunjabari area of the town for seven days.

**2.19.4** Every year the famous '*Ras-Mela*' on occasion of '*Ras-Purnima*' is organised in the town near the Madan Mohan Temple and it lasts for fifteen days. Cooch Behar Ras mela is the oldest in the North Bengal region and it has already completed 200 years in 2012. There we find various means of entertainment for the people of all ages like, Merry-Go-Round, Magic, Circus, Mrityukup, Break-Dance, Cultural Function with the local and famous artists from all over India, etc. There are also various stalls from different parts of the country and also from neighbouring countries with all kinds of goods. Not only the people of this district but also the people of the state and neighbouring states enjoy the Ras-Mela and purchase their necessary articles which are generally rare in the local towns.

**2.19.5** In Cooch Behar Block II, we find '*Holong Soyari Mela*' nearby Dhangdhinguri on occasion of Doljatra for one day and the famous '*Shiva Ratri Mela*' near the famous 'Shiv Temple' at Baneswar Local Town on occasion of 'Shiva Ratri' and

it lasts for seven days. The '*Shiv Temple*' is one of the oldest temples in the district. On the occasion of '*Shiv Chaturdashi*' thousands of male and female from different parts of the state come to pay their homage to the god 'Shiv'. Moreover, people from different parts of the state come to worship the god 'Shiv' throughout the year. The people of Baneswar Rural Economy and the neighbouring areas enjoy the Mela greatly. These Melas are not only the places of entertainment and business activities but also the places for cultural and social interactions among the people of different castes and religions.

## Chapter 3

### THE STATE OF HOUSING, SANITATION, DRINKING WATER AND HEALTHCARE

#### 3.1 INTRODUCTION

**3.1.1** Level of living and the productivity of labour power of any economy depend very much on the quality of housing, sanitation and the healthcare facility they enjoy either with their own effort or effort on the part of the republic. When we like to make a study in a grass-root level then the importance of these level of living ingredients get enormous attention to measure the standard of living of the population under study. There is no denying that the shelter ranks itself just after food, the basic human need, in any civil society. The quality of house is not only protecting us from rain, wind, heat and from the threat of the animals and dacoits but it also appearing as the symbol of social prestige. A good house not only gives us some sort of satisfaction but it also increases the quality of life of the whole family. A quiet and satisfactory place of taking rest and sleep not only provide the opportunity of a good positive dream but also helps to provide to build up a mentality to find out the way to fulfil that good dream. Not only that a good quality of house also protects us from various diseases. So the analysis of housing is very important in any grass-root level socio-economic study. Similarly, sanitation and healthcare are also very important elements bearing on the efficiency of workers and hence on the productivity of the productive system in which they make-up an important part (Viner, 1953). But the fact remains that India's approach to poverty is centered always on food (Sarkar, 1990) except some other help to the microscopic minority in respect of shelter in some social calamities. Generally, our experts and policy makers in making the measuring rode of poverty always excluded the two important elements of measuring poverty. These two are the shelter and health care. As pleaded by many researchers and social workers during different plan periods for the inclusion of these two factors in basket used for fixing the level of poverty line( Sarkar & Kar,1990).

**3.1.2** Thus the stocktaking of housing, sanitation and healthcare are very essential part of this write up. As we have already mentioned in the preceding paragraph that shelter ranks itself almost at the same level as food and clothing as a basic human

need. But Indian planners fondly thought eventually that housing and healthcare facilities would be given to the poor at free of cost. But the ground reality is that apart from giving occasional relief for housing in case of flood or other natural calamities, the Indian executives did little for giving assistance on housing. A very negligible fraction of BPL families have been supplied one or two living rooms by the government under "*Indira Abas Yojona*" or "*Amar Griha Plan*". On the other hand, healthcare remains as a prolonged neglected task to our national planners. Whatever has had been done for healthcare covers only some urban inhabitants keeping away almost a reasonable portion of our rural folk out of the proximity of the healthcare safety net. Further, for the country like India it is no exaggeration to say that housing relief so far being given to the poor is not properly executed. The question of politics always supersedes the economic reality of the poor. On the other hand, our planners and policy makers virtually handed over the charge of the healthcare to the jurisdiction of the citizen rather than state. Same is more or less true for sanitation also.

**3.1.3** We have already justified in our initial chapter where we pleaded for the restructuring of the development plan of the Indian type on the ground that this type of planning system is failed to incorporate the trickle-down benefit of the centralized planning. We put forward the hypothesis that a national economic plan formulated through the aggregation of autonomous plans planned at the various grass- root area economies should be the better substitute instead of a plan that has been conceived at the custody of the central planning authority. So, if we want to formulate a plan for housing, sanitation and healthcare at the grass- root level of our type, it will be necessary to examine the existing state of housing, sanitation and healthcare facilities that have been enjoyed by the rural people within the existing socio-economic setup. Through this chapter we try to frame up this on the basis of our sample area.

## **3.2 HOUSING**

**3.2.1** As we mentioned earlier that our sample villages are all class villages and the incidence of some sort of a ruling or central village being surrounded by the subject of periphery villages is nearly non-existent. At the same time there is no village which is cent percent labourers' or cent percent farmers' village. This

simply means that people of different occupations are living together in our sample villages. Accordingly, households located themselves in cluster are not accordingly to the homogeneous economic status; rather we see that the relatively richer households are clustered along with the relatively poorer households. This proves the heterogeneity character of housing cluster in our sample. Thus, there is no special cluster of houses in our sample villages which can be termed as 'labour line' or there is no such special cluster that can be termed as 'farmer line'.

**3.2.2** For the sake of simplicity here we have classified all the living rooms of the households of our sample villages into five broad categories on the basis of the roof, wall and floor materials used. They are:

**Type I:** Rooms with roof made of thatch or earthen tally, walls made of thatch or jute-sticks and earthen floor;

**Type II:** Rooms with roof that consists only one shaft of corrugated tin, walls made of both bamboo- work and jute- sticks and earthen floor;

**Type III:** Rooms with roof made of two shafts of corrugated tin, walls made of partly with bamboo- work and partly with wood and earthen floor;

**Type IV:** Rooms with roof made of four shafts of corrugated tin, walls made of wooden framed tin and earthen or cemented floor; and

**Type v:** Rooms with roof made of four shafts of corrugated tin, cemented brick walls and cemented floor.

These five types of living rooms are locally known as '*kheri-ghar*', '*chhapra-ghar*', '*dochala-ghar*', '*chowari-ghar*', and '*dalan-ghar*'. Besides these five types of dwelling units the relatively richer households use separate units with roof made of either thatch or one /two shaft(s) of corrugated tin or asbestos and earthen floor as cattle shed or kitchen or even as store room.

**3.2.3** The poorest households have no separate room for kettle shed or kitchen – they use a portion of their living room or *barandah* as cooking place and another portion of their living room for animals like, goats, hens, ducks, etc. which is very unhygienic. We have distributed all the living rooms of our sample under five categories in table 3.1. It is clear from this table that the major numbers of living rooms are being cumulated to Type III i.e. *dochala-ghar*, only 9.85 percent and 11.04 percent of living rooms are of Type V and Type IV respectively in our

sample. Living rooms of the poorest households are being cumulated mainly to Type I and Type II.

**Table 3.1: NATURE OF LIVING ROOMS OF THE HOUSEHOLDS**

| Types of Rooms | Number of Rooms | Percentage |
|----------------|-----------------|------------|
| Type I         | 306             | 16.56      |
| Type II        | 412             | 22.29      |
| Type III       | 744             | 40.26      |
| Type IV        | 204             | 11.04      |
| Type V         | 182             | 9.85       |
| Total          | 1848            | 100.00     |

Source: Field Survey, 2008-09

3.2.4. A breakup of these types of living rooms for every village and also for every land group of our sample is shown in table 3.2 and table 3.3 respectively.

**Table 3.2: DISTRIBUTION OF LIVING ROOMS BY VILLAGES**

| Villages  | Type I |       | Type II |       | Type III |       | Type IV |       | Type V |       |
|-----------|--------|-------|---------|-------|----------|-------|---------|-------|--------|-------|
|           | No.    | P.C   | No.     | P.C   | No.      | P.C   | No.     | P.C   | No.    | P.C   |
| Village 1 | 210    | 14.75 | 306     | 21.49 | 587      | 41.22 | 168     | 11.80 | 153    | 10.74 |
| Village 2 | 96     | 22.64 | 106     | 25.00 | 157      | 37.03 | 36      | 8.50  | 29     | 6.83  |
| Total     | 306    | 16.56 | 412     | 22.29 | 744      | 40.26 | 204     | 11.04 | 182    | 9.85  |

Source: Field Survey, 2008-09

From table 3.2, it is clear that the overall housing condition of village 2 compare to village 1 is marginally worsened. From the point of view of the existence of 'chowari- ghar' and 'dalan- ghar' i.e. Type IV and Type V, the symbol of rural richness, village 1 is marginally better off. Here our houses are synonyms with the living rooms. Henceforth we use the term house instead of living room in our presentation.

3.2.5 One, without any hesitation, can find from table 3.3 that there is common tendency regarding the condition of housing in our sample villages like any other sample village that as the land holding increases the better off houses are coming under the purview of the households. Here we find a clear cut inverse relationship between the quality of house and land holding for the below quality houses and positive relationship for the better quality houses. But what is surprising here is that some lands less households' possess some sort of better quality houses in

their possession. To make it clear here we divide the number of households cumulated in the land less group in two categories. They are:

**Category A:** *The households who are mainly engaged in either service or in business.*

**Category B:** *The households who are engaged mainly in agricultural activities and occasionally on some non-agricultural activities.*

**3.2.6** The above classification divulges the ground reality of the possession of better off houses by the land less group. What is important to note here is that out of 182 Type-V houses 44 houses are being owned by the landless group, category A. In percentage form it stands at 21.89 percent.

**Table 3.3: DISTRIBUTION OF LIVING ROOMS BY LAND GROUPS AND OCCUPATIONAL CATEGORY**

| Land Groups (Acres) |   | Type-I |       | Type-II |       | Type-III |       | Type-IV |       | Type-V |       | All Types |     |
|---------------------|---|--------|-------|---------|-------|----------|-------|---------|-------|--------|-------|-----------|-----|
|                     |   | No.    | P.C   | No.     | P.C   | No.      | P.C   | No.     | P.C   | No.    | P.C   | No.       | P.C |
| Landless            | A | Nil    | Nil   | 39      | 19.40 | 94       | 46.77 | 24      | 11.94 | 44     | 21.89 | 201       | 100 |
|                     | B | 239    | 38.92 | 258     | 42.02 | 100      | 16.28 | 17      | 2.77  | Nil    | Nil   | 614       | 100 |
| Up to 2 acres       |   | 67     | 13.76 | 83      | 17.04 | 241      | 49.48 | 44      | 9.03  | 52     | 10.68 | 487       | 100 |
| 2-4 acres           |   | Nil    | Nil   | 32      | 10.60 | 183      | 60.59 | 53      | 17.55 | 34     | 11.25 | 302       | 100 |
| 4-6 acres           |   | Nil    | Nil   | Nil     | Nil   | 92       | 57.5  | 38      | 23.75 | 30     | 18.75 | 160       | 100 |
| Above 6 acres       |   | Nil    | Nil   | Nil     | Nil   | 34       | 40.47 | 28      | 33.33 | 22     | 26.19 | 84        | 100 |
| <b>Total</b>        |   | 306    | 16.56 | 412     | 22.29 | 744      | 40.26 | 204     | 11.05 | 182    | 9.84  | 1848      | 100 |

Source: Field Survey, 2008-09

**3.2.7** Distribution of living rooms by materials of roofs for every village and for every land holding groups are given in table 3.4 and table 3.5 respectively. Again from the point of view of roof materials the households of village 1 are able to manage their living rooms as better as compared to the households of village 2. Here, we observe some sort of positive correlation between the quality of living rooms and land holding groups. This can be obtained from table 3.5 .One can

**Table 3.4: LIVING ROOMS BY MATERIALS OF ROOFS BETWEEN VILLAGES**

| Villages     | Thatch Roofed |       | Tin One shaft Roofed |       | Tin two shaft Roofed |       | Tin four shaft Roofed |       | Total |     |
|--------------|---------------|-------|----------------------|-------|----------------------|-------|-----------------------|-------|-------|-----|
|              | No.           | P.C   | No.                  | P.C   | No.                  | P.C   | No.                   | P.C   | No.   | P.C |
| Village-1    | 210           | 14.75 | 306                  | 21.49 | 587                  | 41.22 | 321                   | 22.54 | 1424  | 100 |
| Village-2    | 96            | 22.64 | 106                  | 25    | 157                  | 37.03 | 65                    | 15.33 | 424   | 100 |
| <b>Total</b> | 306           | 16.57 | 412                  | 22.29 | 744                  | 40.26 | 386                   | 20.89 | 1848  | 100 |

Source: Field Survey, 2008

**Table 3.5: LIVING ROOMS BY MATERIAL OF ROOFS AMONG LAND BY LAND GROUPS**

| Land Groups (Acres) | Thatch Roofed |     | Tin One shaft Roofed |     | Tin two shaft Roofed |       | Tin four shaft Roofed |       | Total |       |      |     |
|---------------------|---------------|-----|----------------------|-----|----------------------|-------|-----------------------|-------|-------|-------|------|-----|
|                     | No.           | P.C | No.                  | P.C | No.                  | P.C   | No.                   | P.C   | No.   | P.C   |      |     |
| Landless            | A             | Nil | Nil                  | 39  | 19.40                | 94    | 46.77                 | 68    | 33.83 | 201   | 100  |     |
|                     | B             | 239 | 38.92                | 258 | 42.03                | 100   | 16.28                 | 17    | 2.77  | 614   | 100  |     |
| Up to 2 acres       | 67            |     | 13.76                |     | 83                   | 17.04 | 241                   | 49.49 | 96    | 19.71 | 487  | 100 |
| 2-4 acres           | Nil           |     | Nil                  |     | 32                   | 10.6  | 183                   | 60.60 | 87    | 28.80 | 302  | 100 |
| 4-6 acres           | Nil           |     | Nil                  |     | Nil                  | Nil   | 92                    | 57.50 | 68    | 42.50 | 160  | 100 |
| Above 6 acres       | Nil           |     | Nil                  |     | Nil                  | Nil   | 34                    | 40.48 | 50    | 59.52 | 84   | 100 |
| Total               | 306           |     | 16.56                |     | 412                  | 22.29 | 744                   | 40.26 | 386   | 20.89 | 1848 | 100 |

Source: Field Survey, 2008-09

see from this table that thatch roofed and Tin one shaft roofed i.e. *chakra-ghar* living rooms are mostly cumulated to the households fallen under 'landless' (category B) and 'up to 2 acres' land groups. Similarly, the living rooms with 'Tin two shafts roofed' and 'Tin four shafts roofed' are mostly possessed by the households fallen under higher land groups of holding. The households of land groups '4-6 acres' and 'above 6 acres' have occupied 42.50 percent and 59.52 percent of the living rooms of 'Tin four shafts roofed'. Here also we observed that the quality of living rooms in terms of roofs is an increasing function of the land holding groups.

**3.2.8** There is no denying that the condition of a living room will be good or bad mostly depends very much on the wall materials. In our sample the walls of the living rooms are mainly made of thatch, jute-sticks, bamboo-work, timber, corrugated tin and bricks. In table 3.6 we have distributed all the living rooms of our sample on the basis of wall materials by villages. It can be seen from this table that more than 24 percent of the living rooms of our sample are constructed with walls made of thatch or jute-sticks and 37.93 percent of the living rooms are constructed with walls made of mainly jute-sticks along with some sort of bamboo-work. We must hasten to add that these living rooms become very indwelling in the rainy season and also in the winter season. Here also the condition of village 1 is comparatively better in respect of wall materials than that of village 2. An analogy of this on the basis of the land holding is given in table 3.7.

**Table 3.6: LIVING ROOMS BY MATERIALS OF WALLS BETWEEN VILLAGES**

| Villages  | Thatch/Jute-Sticks |       | Jute Sticks / Bamboo |       | Wood/ Bamboo |       | Corrugated Tin |       | Cemented |       | Total |     |
|-----------|--------------------|-------|----------------------|-------|--------------|-------|----------------|-------|----------|-------|-------|-----|
|           | No.                | P.C   | No.                  | P.C   | No.          | P.C   | No.            | P.C   | No.      | P.C   | No.   | P.C |
| Village-1 | 308                | 21.63 | 554                  | 38.9  | 241          | 16.92 | 168            | 11.8  | 153      | 10.75 | 1424  | 100 |
| Village-2 | 142                | 33.49 | 147                  | 34.67 | 70           | 16.51 | 36             | 8.49  | 29       | 6.84  | 424   | 100 |
| Total     | 450                | 24.35 | 701                  | 37.93 | 311          | 16.83 | 204            | 11.04 | 182      | 9.85  | 1848  | 100 |

Source: Field Survey, 2008-09

**Table 3.7: LIVING ROOMS BY MATERIALS OF WALLS AMONG LAND GROUPS**

| Land Groups (Acres) |   | Thatch/Jute-Sticks |       | Jute Sticks / Bamboo |       | Wood/ Bamboo |       | Corrugated Tin |       | Cemented |       | Total |     |
|---------------------|---|--------------------|-------|----------------------|-------|--------------|-------|----------------|-------|----------|-------|-------|-----|
|                     |   | No.                | P.C   | No.                  | P.C   | No.          | P.C   | No.            | P.C   | No.      | P.C   | No.   | P.C |
| Landless            | A | Nil                | Nil   | 87                   | 43.28 | 46           | 22.88 | 24             | 11.94 | 44       | 21.89 | 201   | 100 |
|                     | B | 337                | 54.88 | 260                  | 42.36 | Nil          | Nil   | 17             | 2.77  | Nil      | Nil   | 614   | 100 |
| Up to 2 acres       |   | 113                | 23.20 | 211                  | 43.32 | 67           | 13.76 | 44             | 9.03  | 52       | 10.68 | 487   | 100 |
| 2-4 acres           |   | Nil                | Nil   | 117                  | 38.74 | 98           | 32.45 | 53             | 17.55 | 34       | 11.26 | 302   | 100 |
| 4-6 acres           |   | Nil                | Nil   | 18                   | 11.25 | 74           | 46.25 | 38             | 23.75 | 30       | 18.75 | 160   | 100 |
| Above 6 acres       |   | Nil                | Nil   | 8                    | 9.52  | 26           | 30.96 | 28             | 33.33 | 22       | 26.20 | 84    | 100 |
| Total               |   | 450                | 24.35 | 701                  | 37.93 | 311          | 16.83 | 204            | 11.04 | 182      | 9.85  | 1848  | 100 |

Source: Field Survey, 2008-09

One can see from table 3.7 that out 815 living rooms owned by the households of 'landless group', 684 living rooms with walls made of either thatch or jute-sticks and in percentage form it accounts for 83.92 percent. Again 66.52 percent of the living rooms of the households fallen under land group 'up to 2 acres' are also with walls made of mainly thatch or jute-sticks. Obviously, the dwellers of these living rooms become the victim of cold wind, dusty wind and rain water. Similarly, the better quality living rooms in terms of wall materials i.e. walls made of wooden-framed-corrugated tin or cemented bricks are cumulated to the households belonging to the relatively better off households in terms of land holding. Here also we see that the wall quality goes up with the increase in the holding size. Due to the easy availability of bamboo the households of all categories are habituated to use bamboo-work (*hadla*) as wall materials. Not only that some households of village-2 have bamboo garden (*bansbari*) within the periphery of their homestead. This kind of phenomenon is very common among the inhabitants of the Tarai-Duars region.

**3.2.9** Another important indicator in measuring the quality of living is the average number of living rooms possessed by the each household. To test this indicator here we distributed all the households of our sample on the basis of the number of living rooms. This is shown in table 3.8. One can observe from this table that 20.78 percent of the households have only one living room and 46.32 percent of the households have two living rooms to use. These households mainly belong to the land groups of 'landless' (Category B) and 'up to 2 acres'. Only 32.90 percent of the households of our sample have three or more living rooms. Here also we observe that the number of three and more rooms households increases with the increase in the land holding size. But what is alarming in this area economy is that more than 20 percent households have no option but to use a portion of their living room as their kitchen. These households also kept their pet and domestic animals either in a corner of their living room or they use a portion of their veranda as cattle shed. This kind of practice not only pollutes the inner atmosphere of the living room but also enhances the scope of animal transmitted diseases to the inhabitants of these dwelling units. It also hampers the education of the school going children.

**Table 3.8: HOUSEHOLDS BY THE NUMBER OF LIVING ROOMS**

| Land Groups<br>(Acres) | One Room<br>households |       | Two Rooms<br>households |       | Three and<br>more Rooms<br>households |       | Total |     |
|------------------------|------------------------|-------|-------------------------|-------|---------------------------------------|-------|-------|-----|
|                        | No.                    | P.C   | No.                     | P.C   | No.                                   | P.C   | No.   | P.C |
| Landless               | 104                    | 36.49 | 97                      | 34.03 | 84                                    | 29.48 | 285   | 100 |
| Up to 2 acres          | 40                     | 18.87 | 115                     | 54.24 | 57                                    | 26.89 | 212   | 100 |
| 2-4 acres              | Nil                    | Nil   | 66                      | 60.55 | 43                                    | 39.45 | 109   | 100 |
| 4-6 acres              | Nil                    | Nil   | 34                      | 56.67 | 26                                    | 43.33 | 60    | 100 |
| Above 6 Acres          | Nil                    | Nil   | 9                       | 33.33 | 18                                    | 66.67 | 27    | 100 |
| Total                  | 144                    | 20.78 | 321                     | 46.32 | 228                                   | 32.9  | 693   | 100 |

Source: Field Survey, 2008-09

**3.2.10** Researchers of any grass-root area economy also use the concept of size of the room, room per household and room-man ratio in analysing the quality of housing. We also measure here all these for our grass- root rural area economy. This is given in table 3.9. One can observe clearly from this table that on an

average the size of the rooms increases with the increase in the holding size. But there is no such clear-cut relation releases in case of rooms per household. However, the room –man ratio for our sample is positively related with the holding size.

**Table 3.9: AVERAGE SIZE OF LIVING ROOM AND NUMBER OF LIVING ROOMS PER HOUSEHOLD BY LAND GROUPS**

| Land Groups (Acres) | No. of Households | Population | Total No. Rooms | Average size of Rooms (Sq. ft) | Rooms per Household | Room-Man ratio |      |
|---------------------|-------------------|------------|-----------------|--------------------------------|---------------------|----------------|------|
| Landless            | A                 | 67         | 313             | 201                            | 168                 | 3.0            | 0.64 |
|                     | B                 | 218        | 1121            | 614                            | 115                 | 2.81           | 0.54 |
| Up to 2 acres       | 212               | 788        | 487             | 144                            | 2.30                | 0.62           |      |
| 2-4 acres           | 109               | 467        | 302             | 152                            | 2.77                | 0.65           |      |
| 4-6 acres           | 60                | 220        | 160             | 168                            | 2.67                | 0.73           |      |
| Above 6 acres       | 27                | 103        | 84              | 192                            | 3.11                | 0.81           |      |
| Total               | 693               | 3012       | 1848            | 142.54                         | 2.67                | 0.61           |      |

Source: Field Survey, 2008-09

**3.2.11** It is rather convenient in the analysis of housing to incorporate the concept of 'roofed space' (in sq. ft.) per household and per capita. This will add some sort of beauty to bring the picture of housing problem in true sense. To make it more conventional here we incorporate two other spaces such as social group and economic group in our presentation. We gather Information regarding these on the basis of is given in table 3.10 to table 3.12.

**Table 3.10: ROOFED SPACE PER HOUSEHOLD AND PER CAPITA BY LAND GROUPS AND OCCUPATIONAL CATEGORY**

| Land Groups (Acres) | No. of Households | Population | Total space (Sq.ft) | Space per household (Sq.ft) | Space per capita (Sq.ft) |        |
|---------------------|-------------------|------------|---------------------|-----------------------------|--------------------------|--------|
| Landless            | A                 | 67         | 313                 | 33768                       | 504.00                   | 107.88 |
|                     | B                 | 218        | 1121                | 70610                       | 323.89                   | 62.98  |
| Up to 2 acres       | 212               | 788        | 70128               | 330.79                      | 88.99                    |        |
| 2-4 acres           | 109               | 467        | 45904               | 421.13                      | 98.29                    |        |
| 4-6 acres           | 60                | 220        | 26880               | 448.00                      | 122.18                   |        |
| Above 6 acres       | 27                | 103        | 16128               | 597.33                      | 156.58                   |        |
| Total               | 693               | 3012       | 263418              | 380.11                      | 87.45                    |        |

Source: Field Survey, 2008-09

**Table 3.11: ROOFED SPACE PER HOUSEHOLD AND PER CAPITA BY SOCIAL GROUPS**

| Social Groups  | No. of Households | Population | Total space (Sq.ft) | Space per household (Sq.ft.) | Space per capita (Sq.ft.) |
|----------------|-------------------|------------|---------------------|------------------------------|---------------------------|
| Upper Caste    | 417               | 1778       | 165337              | 396.49                       | 92.99                     |
| Schedule Caste | 271               | 1207       | 96476               | 356.00                       | 79.93                     |
| Muslim         | 5                 | 27         | 1605                | 321.00                       | 59.44                     |
| Total          | 693               | 3012       | 263418              | 380.11                       | 87.45                     |

Source: Field Survey, 2008-09

**Table 3.12: ROOFED SPACE PER HOUSEHOLD AND PER CAPITA BY ANNUAL FAMILY INCOME GROUPS**

| Annual Family Income (Rs'000) | No. of Households | Population | Total space (Sq.ft) | Space per household (Sq.ft.) | Space per capita (Sq.ft.) |
|-------------------------------|-------------------|------------|---------------------|------------------------------|---------------------------|
| Up to 50                      | 155               | 698        | 46538               | 300.24                       | 66.67                     |
| 50, - 1,00                    | 176               | 743        | 61234               | 347.92                       | 82.41                     |
| 1,00, - 2,00                  | 201               | 842        | 76523               | 380.71                       | 90.88                     |
| 2,00, - 3,00                  | 113               | 466        | 47108               | 416.88                       | 101.09                    |
| Above 3,00                    | 48                | 263        | 32015               | 666.98                       | 121.73                    |
| Total                         | 693               | 3012       | 263418              | 380.11                       | 87.45                     |

Source: Field Survey, 2008-09

The table 3.12 supports the positive relationship between the annual family income and roofed space per household in the one hand and between the annual family income and roofed space per capita on the other. It is seen from the table that the richest households have been enjoying nearly double roofed spaces both in terms of per household and per capita than the poorest households in our grass-root area economy. This means that the relatively richer households have been enjoying relatively better facilities in terms of living, cooking, animal shedding and education for their children than the poorer households. So, what we have observed in the above few sections and what we will observe in the subsequent sections is nothing but the toss of a same coin that the poor are poor because they are poor.

**3.2.12** We have already categorized all the living rooms of our sample on the basis of the materials of roofs and walls under five broad heads. Now we like to distribute the roofed space per household and per capita of these types of living rooms for every

land group along with occupational category of the households, social groups and economic groups of our sample. These will further enrich us about the exact housing facilities enjoyed by the people of different classes and communities in this grass- root rural area economy. These are given in tables 3.13 to 3.15 below. It can be seen from table 3.13 that by and large roofed space per household and roofed space per capita increases with the increase in the land holding size. This very typical finding more or less remains same if we consider the type of housing in our consideration. But what remains to say or rather one may fall in illusion to see the figures assigned to the landless group (Category A). In many cases, irrespective of housing type this group accounts for a relatively larger figures in comparison to the marginal and small farmers. We have mentioned earlier that this group comprises with the households engaged mainly in services and in some petty businesses.

**Table 3.13: ROOFED SPACE PER HOUSEHOLD AND PER CAPITA BY THEIR TYPES AMONG DIFFERENT LAND GROUPS**

| Land Groups (Acres) |   | Type-I              |                  | Type-II             |                  | Type-III            |                  | Type-IV             |                  | Type-V              |                  | All Type            |                  |
|---------------------|---|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
|                     |   | Space per Household | Space per capita |
| Landless            | A | Nil                 | Nil              | 97.79               | 20.93            | 235.70              | 50.45            | 60.18               | 12.88            | 110.33              | 23.62            | 504.0               | 107.88           |
|                     | B | 126.08              | 24.52            | 136.10              | 26.46            | 52.75               | 10.25            | 8.96                | 1.74             | Nil                 | Nil              | 323.89              | 62.98            |
| Up to 2 acres       |   | 45.51               | 12.24            | 56.37               | 15.17            | 163.69              | 44.04            | 29.88               | 8.04             | 35.32               | 9.50             | 330.79              | 88.99            |
| 2-4 acres           |   | Nil                 | Nil              | 44.62               | 10.41            | 255.19              | 59.56            | 73.90               | 17.25            | 47.41               | 11.06            | 421.13              | 98.29            |
| 4-6 acres           |   | Nil                 | Nil              | Nil                 | Nil              | 257.6               | 70.25            | 106.4               | 29.02            | 84.0                | 22.91            | 448.0               | 122.18           |
| Above 6 acres       |   | Nil                 | Nil              | Nil                 | Nil              | 241.78              | 63.38            | 199.11              | 52.19            | 156.44              | 41.00            | 597.33              | 156.58           |
| Total               |   | 62.94               | 14.48            | 84.74               | 19.49            | 153.03              | 35.21            | 41.96               | 9.65             | 37.43               | 8.61             | 380.11              | 87.45            |

Source: Field Survey, 2008-09

**3.2.13** To see the relative social position of the various social groups of our sample we also distribute all the houses of the study area according to their type on the basis of these social groups. This is given in table 3.14. One can see at a glance that the study area supports the view as depicted by Justice Rajinder Sachar in his report given in the year 2006. If we assume that the space per capita as a measuring rode of good housing, then we see that the Muslims are enjoying 1.56 times less space than the space per capita enjoyed by the upper caste people and 1.34 times less than that of the scheduled caste people in our sample. This phenomenon can also be seen if we consider space per household also. What is important to say here is that not even a single Muslim family owned the house falls in Type V.

**Table 3.14: ROOFED SPACE PER HOUSEHOLD AND PER CAPITA BY THEIR TYPES AMONG DIFFERENT SOCIAL GROUPS**

| Social Groups  | Type-I              |                  | Type-II             |                  | Type-III            |                  | Type-IV             |                  | Type-V              |                  | All Type            |                  |
|----------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
|                | Space per Household | Space per capita |
| Upper Caste    | 45.62               | 10.70            | 74.43               | 17.46            | 145.79              | 34.19            | 63.42               | 14.87            | 67.23               | 15.77            | 396.49              | 92.99            |
| Schedule Caste | 59.49               | 13.35            | 81.15               | 18.23            | 161.34              | 36.23            | 28.51               | 6.40             | 25.51               | 5.72             | 356.00              | 79.93            |
| Muslim         | 69.6                | 12.88            | 100.32              | 18.57            | 132.24              | 24.49            | 18.84               | 3.49             | Nil                 | Nil              | 321.00              | 59.44            |
| Total          | 51.22               | 11.79            | 77.34               | 17.78            | 151.64              | 34.88            | 49.45               | 11.38            | 50.43               | 11.61            | 380.11              | 87.45            |

Source: Field Survey, 2008-09

**Table 3.15: ROOFED SPACE PER HOUSEHOLD AND PER CAPITA BY THEIR TYPES AMONG DIFFERENT ANNUAL FAMILY INCOME GROUPS**

| Annual Family Income (Rs'000) | Type-I              |                  | Type-II             |                  | Type-III            |                  | Type-IV             |                  | Type-V              |                  | All Type            |                  |
|-------------------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
|                               | Space per Household | Space per capita |
| Up to 50                      | 176.24              | 39.13            | 115.32              | 25.61            | Nil                 | Nil              | 8.68                | 1.93             | Nil                 | Nil              | 300.24              | 66.67            |
| 50 - 1,00                     | 43.32               | 10.26            | 149.06              | 35.31            | 148.86              | 35.26            | 6.68                | 1.58             | Nil                 | Nil              | 347.92              | 82.41            |
| 1,00 - 2,00                   | 2.55                | 0.61             | 41.00               | 9.78             | 250.75              | 59.85            | 72.28               | 17.26            | 14.13               | 3.37             | 380.71              | 90.88            |
| 2,00 - 3,00                   | Nil                 | Nil              | 22.68               | 5.50             | 186.53              | 45.24            | 88.98               | 21.58            | 118.69              | 28.78            | 416.88              | 101.09           |
| Above 3,00                    | Nil                 | Nil              | Nil                 | Nil              | 128.23              | 23.4             | 149.33              | 27.25            | 389.41              | 71.07            | 666.98              | 121.73           |
| Total                         | 51.22               | 11.78            | 77.65               | 17.86            | 151.37              | 34.83            | 49.45               | 11.37            | 50.42               | 11.6             | 380.11              | 87.45            |

Source: Field Survey, 2008-09

**3.2.14** To give more beauty about the housing facility enjoyed by the inhabitants under our inspection we also present the roofed space per household and roofed space per capita on the basis of all house type by annual family income groups. Table 3.15 depicts that fact in detail. The findings that have been released from this table are very traditional that simply says that the space per household and space per capita both are the increasing function of income.

### **3.3 SANITATION**

**3.3.1** Sanitation occupies a very important place in any health environment of any economy either local or regional or global. The basic ingredients of sanitation are bathing arrangement, washing arrangement, evacuation arrangement and drainage system. Our traditional villages are in general habituated with the natural drainage system rather than artificial drainage system. This is cent percent true in case of our sample villages. We have seen no artificial drainage system developed either from the initiation of the individual or from the initiation of the local level government at the time of our survey. The rain water in the rainy season normally finds their outlets through the natural slope of the land in the one hand and also through the natural drainage system developed by the nature in the course of time. Similarly, the bathing and cleaning water traditionally moved through earthen drainage system made for that purpose. The incidence of bathroom with cisterns is completely non-existent in our area economy. The households of higher income echelon, mainly the service holders have few numbers of bathrooms. These bath rooms are mainly used by the adult female members only. In some cases, the households of comparatively lower annual family income groups have constructed bathing places, not bathrooms, with walls made with jute- sticks or bamboo- work (*hadla*) and earthen floor. These bathrooms are open sky bathrooms and are used mainly by the female adults. The female members of the poorest households are accustomed to use the tube well or well side as bathing places and the living rooms for changing their wet dresses. On the whole, the other adults and children of most of the families, irrespective of income levels, use open places beside tube wells or wells, community and private ponds, river and even a very small water logged area (*pagar*) in the rainy season for their bathing.

**3.3.2** Besides the bathing place, cleanliness of houses is also very important part of sanitation. Cleanliness claims that the houses must be built with proper ventilation facility and the architecture of the house should be such that it would be free from cold, dusty, wet wind and water. Side by side, the outer space of the houses must also be free from jungles and water logging. There is no denying that cleanliness and consciousness are the two sides of a single coin. Determination and mental maturity of the family member are the two important variables that should be assured this even with the less capability. However, a reasonable percentage of households still remain in some constraints to be competent to do this. Almost all the households of our sample exhibit their nature of cleanliness in a very good manner. Except few, all the households are free from the jungles and water logging. These few households are located in the land relatively lower altitude as compared to other households.

**3.3.3** The arrangement of evacuation, one of the most important ingredients of sanitation, appears to be relatively better in our grass- root rural area economy. This is due to the whole hearted initiatives of Gram Panchayat and Zilla Parishad. They took the programme of ' Total Sanitation Campaign (TSC)' with the aim of making the Banewar Anchal as ' Green Area ' since 2007. As a result of this programme, more than 50 percent of the households have been provided latrines with earthen or cemented ring wells at a very subsidised rates (only Rs. 300 for BPL families and Rs. 1800 for other poorer families) through the initiation of an NGO, named 'Putimari Santi kutir Club'. Only 4.33 percent of the poorest households have latrines with dug wells and 44.73 percent of the households, who are relatively richer, have constructed latrines with earthen or cemented ring wells at their own costs and initiatives. To capture this picture of evacuation we have distributed all the households of our sample by land groups and also by annual family income groups on the basis of the type of latrine. These are given in table 3.16 and table 3.17 respectively.

**3.3.4** It is crystal clear from table 3.16 that our sample villages are green villages in true sense. Not a single household can be identified that has no evacuation facility. Credit goes to the NGO and local level Governments. What is claiming is that only 30 households out of 693 households are being used latrines with dug well

and the rest households constructed their latrines with either earthen or cemented ring wells. In percentage form these two figures stand at 4.33 percent and 95.67 percent respectively. Thus in future these 4.33 percent households should be brought under the complete green area project by providing them ring-well latrine either further subsidised rate or may be at free of cost. If we achieve this in the near future it will keep our sample villages free from the diseases that should be contaminated through the open field excreta. One can see from table 3.17 that all these 30 households belong to the lower income group in the array of our income distribution. So what we said just in the preceding lines should easily be achieved through the income subsidy on the part of the republic.

**Table 3.16: NATURE OF LATRINE BY LAND GROUPS AND OCCUPATIONAL CATEGORY**

| Land Groups (Acres) |   | Latrine with dug well |       | Latrine with earthen or cemented ring well(**) |       | Latrine with earthen or cemented ring well |        | All Types        |        |
|---------------------|---|-----------------------|-------|--|-------|--|--------|------------------|--------|
|                     |   | No. of household      | P.C   | No. of household                               | P.C   | No. of household                           | P.C    | No. of household | P.C    |
| Landless            | A | Nil                   | Nil   | 16   | 23.88 | 51   | 76.12  | 67               | 100.00 |
|                     | B | 23                    | 10.55 | 192  | 88.07 | 03   | 1.38   | 218              | 100.00 |
| Up to 2 acres       |   | 07                    | 3.30  | 138  | 65.09 | 67   | 31.60  | 212              | 100.00 |
| 2-4 acres           |   | Nil                   | Nil   | 07   | 6.42  | 102  | 93.58  | 109              | 100.00 |
| 4-6 acres           |   | Nil                   | Nil   | Nil  | Nil   | 60   | 100.00 | 60               | 100.00 |
| Above 6 acres       |   | Nil                   | Nil   | Nil  | Nil   | 27   | 100.00 | 27               | 100.00 |
| Total               |   | 30                    | 4.33  | 353  | 50.94 | 310  | 44.73  | 693              | 100.00 |

Source: Field Survey, 2008-09; \*\* At Govt. subsidized rates

**Table 3.17: NATURE OF LATRINE BY ANNUAL FAMILY INCOME GROUPS**

| Annual Family Income Groups (Rs.'000) | Latrine with dug Well |       | Latrine with earthen or cemented ring well(**) |       | Latrine with earthen or cemented ring well(*) |        | All Types        |     |
|---------------------------------------|-----------------------|-------|--|-------|---|--------|------------------|-----|
|                                       | No. of household      | P.C   | No. of household                               | P.C   | No. of household                              | P.C    | No. of household | P.C |
| Up to 50                              | 23                    | 14.83 | 132  | 85.17 | Nil   | Nil    | 155              | 100 |
| 50-1,00                               | 7                     | 3.98  | 143  | 81.25 | 26  | 14.77  | 176              | 100 |
| 1,00-2,00                             | Nil                   | Nil   | 78   | 38.8  | 123   | 61.2   | 201              | 100 |
| 2,00-3,00                             | Nil                   | Nil   | Nil  | Nil   | 113   | 100.00 | 113              | 100 |
| Above 3,00                            | Nil                   | Nil   | Nil  | Nil   | 48  | 100.00 | 48               | 100 |
| Total                                 | 30                    | 4.33  | 353  | 50.94 | 310   | 44.73  | 693              | 100 |

Source: Field Survey, 2008-09; \*\* At Govt. subsidized rates

### 3.4 DRINKING WATER

**3.4.1** There is no denying that pure drinking water is a fundamental ingredient of health environment of an economy and it has been recognised as a basic means of expanding the span of human life. Its importance also lies in the fact that an extension of the pure drinking water system will no doubt reduce the occurrence of most of the water- borne diseases that attacked the people of this area usually with a low nutrition status. Although the responsibility of supplying pure drinking water generally fixes upon the Department of Public Health and Engineering (PHE) but the department as has been seen by us has done nothing in this regard for the rural folk of our sample. The activity of the PHE department is centered only in Banerwar village, the heart of the Banerwar Gram Panchayat. So, most of the households of our study area have been collecting their drinking water from hand tube wells or wells owned privately or owned by the community as a whole.

**3.4.2** Another important point to be mentioned here is that the sources of drinking water are also being used as the places of bathing, cleaning of utensils and washing clothes. As a result the surroundings of most of the tube wells and wells become water logged and dirty and enhance the possibility that this contaminated water may be soaked back through the top soil to the water of wells and tube wells and increase the opportunity of water- borne diseases. We have noticed no periodic attempts of purification of these water sources from the part of the individual or from the part of the local authority. Attempts so far has been done are occasional only on the part of the individual.

**Table 3.18: SOURCES OF DRINKING WATER IN SAMPLE VILLAGES**

| Villages  | Deep Tube Wells   |      | Tube Wells        |       | Wells             |      | All Sources       |     |
|-----------|-------------------|------|-------------------|-------|-------------------|------|-------------------|-----|
|           | No. of Households | P.C  | No. of Households | P.C   | No. of Households | P.C  | No. of Households | P.C |
| Village-1 | 13                | 2.43 | 505               | 94.39 | 17                | 3.18 | 535               | 100 |
| Village-2 | 7                 | 4.43 | 142               | 89.87 | 9                 | 5.7  | 158               | 100 |
| Total     | 20                | 2.89 | 647               | 93.37 | 26                | 3.75 | 693               | 100 |

Source: Field Survey, 2008-09

**3.4.3** It can be seen from table 3.18 that most of the households of our sample use hand tube wells as a source of drinking water. Only 2.89 percent of the households

belonging to higher land groups use deep tube well water for drinking purposes. These units are installed mainly for irrigation purposes at the govt. subsidized rate during the 1980s of the last century. Again, 3.75 percent of the households are used open wells water as drinking water, which are mostly made of by earthen ring with a minimum depth about 6 to 7 meters from the ground level. To see the impact of the land holding on the use of drinking water unit we have distributed all the households on the basis of the land holding in table 3.18. What is important to note here is that relatively richer farmers are enjoying the opportunity of the use of the deep tube well as their drinking water unit. Except this the same picture of incidence of drinking water units has come out from our study as like any other grass-root area economy of this locality.

**Table 3.19: SOURCES OF DRINKING WATER BY LAND GROUPS**

| Land Groups<br>(Acres) |   | Deep Tube Wells      |       | Tube Wells           |        | Wells                |       | All Sources          |        |
|------------------------|---|----------------------|-------|----------------------|--------|----------------------|-------|----------------------|--------|
|                        |   | No. of<br>Households | P.C   | No. of<br>Households | P.C    | No. of<br>Households | P.C   | No. of<br>Households | P.C    |
| Landless               | A | Nil                  | Nil   | 67                   | 100.00 | Nil                  | Nil   | 67                   | 100.00 |
|                        | B | Nil                  | Nil   | 214                  | 98.16  | 04                   | 1.84  | 218                  | 100.00 |
| Up to 2 acres          |   | Nil                  | Nil   | 205                  | 96.7   | 07                   | 3.3   | 212                  | 100.00 |
| 2-4 acres              |   | Nil                  | Nil   | 97                   | 89.00  | 12                   | 11.00 | 109                  | 100.00 |
| 4-6 acres              |   | 7                    | 11.67 | 50                   | 83.33  | 03                   | 5.00  | 60                   | 100.00 |
| Above 6 acres          |   | 13                   | 48.15 | 14                   | 51.85  | Nil                  | Nil   | 27                   | 100.00 |
| Total                  |   | 20                   | 2.89  | 647                  | 93.36  | 26                   | 3.75  | 693                  | 100.00 |

Source: Field Survey, 2008-09

### 3.5 NATURE OF HEALTH CARE

**3.5.1** At the time of the initiation of our development planning, the then planners fondly thought that the health care service would be provided by the state at free of cost to the vulnerable people. We have already spent twelve full phased national planning and three annual planning since 1951. During this period except some infrastructural development such as improvement of block and sub divisional health care units and the introduction of multi-purpose health care service under

the initiation of World Health Organisation nothing being done for the people who are in distress. On the other hand, we have seen the several establishments in the name of nursing home in the district and sub divisional headquarters are being developed to provide the health care service for the people who are in higher income echelon under the initiation of private management. These units are generally remaining out of the proximity of the poor people.

**3.5.2** For the sake of simplicity, we present here the health care picture of our sample area from three distinct corners. They are the picture of the nature of treatment by land holding groups, by annual family income and by per capita annual expenditure. All are given in tables 3.19 to 3.21. One can see in table 3.19 that the role of the village quack is very important till now. On the other hand, only one-fourth households of our sample are benefited by the service rendered by the Public Health Centres. What is alarming is that still 26.12 percent households are treated the ails with the help of the qualified private doctors and these qualified doctors are by profession the doctors of the Public Health Centres. Only 2.89 percent households of our sample rendered their faith on super natural power at the time of their sufferings. These households are absolutely poor households. But the relatively affluent households of our sample render their faith fully on the private management.

**Table 3.20: NATURE OF TREATMENT ENJOYED BY THE HOUSEHOLDS UNDER DIFFERENT LAND GROUPS**

| Land Groups (Acres) |   | Village Quacks  |       | Public Health Centre |       | Qualified Private Doctors |       | Super Natural Power |      | Total             |       |
|---------------------|---|-----------------|-------|----------------------|-------|---------------------------|-------|---------------------|------|-------------------|-------|
|                     |   | No. Of Househol | P.C   | No. Of Households    | P.C   | No. Of Households         | P.C   | No. Of Households   | P.C  | No. Of Households | P.C   |
| Landless            | A | 14              | 20.89 | 10                   | 14.93 | 43                        | 64.18 | Nil                 | Nil  | 67                | 100.0 |
|                     | B | 138             | 63.31 | 67                   | 30.73 | Nil                       | Nil   | 13                  | 5.96 | 218               | 100.0 |
| Up to 2 acres       |   | 100             | 47.17 | 68                   | 32.07 | 37                        | 17.45 | 07                  | 3.30 | 212               | 100.0 |
| 2-4 acres           |   | 48              | 44.03 | 24                   | 22.02 | 37                        | 33.94 | Nil                 | Nil  | 109               | 100.0 |
| 4-6 acres           |   | 14              | 23.33 | 09                   | 15.0  | 37                        | 61.67 | Nil                 | Nil  | 60                | 100.0 |
| Above 6 acres       |   | Nil             | Nil   | Nil                  | Nil   | 27                        | 100.0 | Nil                 | Nil  | 27                | 100.0 |
| Total               |   | 314             | 45.31 | 178                  | 25.68 | 181                       | 26.12 | 20                  | 2.89 | 693               | 100.0 |

Source: Field Survey, 2008-09

**3.5.3** To substantiate the above findings we construct table 3.20 on the basis of annual family income. Here also we see the same reflection as we had seen in Table 3.19. But whatever may be the means of representation, we can't deny the role of the

village quack in the rural health care network in our sample area. Another fact that also reveals from our findings is that the dichotomy between the existence of the public health care unit and capability. We see that in spite of the existence of public health care unit with qualified specialist doctors more than 10 percent people of our sample are treated their ails by the qualified private doctors when these doctors render their service in private chambers.

**Table 3.21: NATURE OF TREATMENT ENJOYED BY THE HOUSEHOLDS UNDER DIFFERENT ANNUAL FAMILY INCOME GROUPS**

| Annual Family Inco Income Groups (Rs. '000) | Village Quacks    |       | Public Health Centre |       | Qualified Private Doctors |       | Super Natural Power |      | Total                      |       |
|---|-------------------|-------|----------------------|-------|---------------------------|-------|---------------------|------|----------------------------|-------|
|   | No. Of Households | P.C   | No. Of Households    | P.C   | No. Of Households         | P.C   | No. Of Households   | P.C  | N No. No of No. Households | P.C   |
| Up to 50                                    | 104               | 67.09 | 38                   | 24.52 | Nil                       | Nil   | 13                  | 8.39 | 155                        | 100.0 |
| 50-1,00                                     | 94                | 53.41 | 43                   | 24.43 | 32                        | 18.18 | 07                  | 3.98 | 176                        | 100.0 |
| 1,00-2,00                                   | 78                | 38.81 | 85                   | 42.29 | 38                        | 18.90 | Nil                 | Nil  | 201                        | 100.0 |
| 2,00-3,00                                   | 38                | 33.63 | 12                   | 10.62 | 63                        | 55.75 | Nil                 | Nil  | 130                        | 100.0 |
| Above 3,00                                  | Nil               | Nil   | Nil                  | Nil   | 48                        | 100.0 | Nil                 | Nil  | 48                         | 100.0 |
| Total                                       | 314               | 45.31 | 178                  | 25.68 | 181                       | 26.12 | 20                  | 2.89 | 693                        | 100.0 |

Source: Field Survey, 2008-09

**Table 3.22: PER CAPITA ANNUAL EXPENDITURE ON HEALTH CARE**

| Per capita annual expenditure on health care (Rs.) | No. Of households | Percentage |
|--|-------------------|------------|
| Up to 200  | 231               | 33.33      |
| 201-300  | 184               | 26.55      |
| 301-400  | 118               | 17.03      |
| 401-500  | 97                | 14.00      |
| Above 500  | 63                | 9.09       |
| Total  | 693               | 100.00     |

Source: Field Survey, 2008-09

**3.5.4** At the outset of this section we rather try to remember the fact what we had thought at the time of initiation of our national planning that expenditure on healthcare should be borne by the republic out of its revenue collection. Now the fact that comes out from this study that even at the very beginning decade of the present century on an average per capita annual expenditure stands at Rs.272 for

medical treatment. So, one can raise the question about the justification of indirect subsidy on health ground that provide by the Government out of its tax collection annually.

## Chapter 4

### EXISTING DEMOGRAPHIC CHARACTERISTICS OF LABOUR

#### 4.1 INTRODUCTION

- 4.1.1** We have discussed elaborately about the land and labour endowment of the rural economy under our study in chapter two of this write up. We have further detailed the labour endowment of our sample in the same chapter. According to our calculation the total population of our sample stands at 3012. Out of which, according to our rough calculation, the total employable active labour force becomes 1424 (15 to 65 years). Without going any further detail about population here we concentrate ourselves, as per direction of our chapter title, to the demographic characteristics of the population of the sample.
- 4.1.2** Demographic analysis in any grass-root area economy occupies very important part to know about the biological characteristics of population under any study. It is very important not only for planning but also for the achievement of the production potentiality of any area economy. We know that death of any kind, whatever be the age of the deceased, hinders the working ability of the workforce particularly in the short time span. It has also been seen in some cases that death brings the shutter permanently before the victimized family. This not only hampers the production potentiality of the labour force but also creates some social problems which have a long term effect on the society as a whole. On the other hand, when an economy is over pressured by the population, then an additional birth does not make a couple cheered for the newly born baby.
- 4.1.3** But being students of economics we rather feel some sort of excitement in analyzing the demographic characteristics of the area population on the basis of some socio-economic indicators. These will strengthen our analysis just we made in the preceding chapter. There is no denying that quality of life is a direct upshot of the quality of the living condition in any civil society. What we have seen in the previous chapter and what we will see in the present chapter are complementary in nature rather than competitive. Further, for giving the short and long run planning for the area and at the same time for the areas like our one needs a detail discussion about the birth and death rates of the sample population and other

demographic indicators. We also consider the situation where increase in income (any type) reduces both the birth and death rates of the population. Side by side, in this chapter, we also consider the social factors which are responsible for the variation of different demographic indicators.

## 4.2 DEATH RATES

4.2.1 We have already explicitly indicated in the preceding paragraph that the total number of population of our sample is 3012. However, for the calculation of death rates we simply use the midyear population as per convention. According to our calculation it becomes 2992. The death rate as a whole of our sample is 9.35. It is roughly one and half times more than the state average and 1.28 times more than the national average. Again within the sample villages we also notice some sort of variation.

**Table 4.1: GENERAL DEATH RATES**

| Village   | Midyear population | No. Of Deaths | Death Rate<br>(Per 1000) |
|-----------|--------------------|---------------|--------------------------|
| Village 1 | 2438               | 21            | 8.61                     |
| Village 2 | 554                | 07            | 12.63                    |
| Total     | 2992               | 28            | 9.35                     |

Source: Field Survey, 2008-09

The sample village 2 records nearly one and half times more death rate as compared to the first sample village. It is duties of a grass- root research enterprise to sort out the causes of each death because here the investigator enjoys some sort of privileges which help him to win the confidence of the responder and able to bring out the ground reality of the fact. Here we oblige to express the reasons of high death rates. Out of 7 deaths in the second village one death was caused by pneumonia and the deceased was not able to cross her first birth day. The second death was caused at the time of delivery. The third death happened due to high fever imported from Delhi. Other four deaths were old age deaths.

4.2.2 But what makes us optimist is that the number of incidence of deaths decreases when we move from the higher age group women to lower age group women. This simply means that over time we have succeeded to manage the death rates.

All are given in table 4.2. Here the difference is significant. Another important indicator that we take in our consideration is the incidence of deaths among three younger age groups of our population. This is given in Table 4.3. We just see here that the incidence of deaths is just double when we move from the age group 15-35 to 5-15. We obtain more or less same the picture according to our down-top approach. What comes to very clear from the above analysis is that the number of premature death is rather high in this grass-root area economy

**Table 4.2: DEATH RATES AMONG THE CHILDREN BORN TO MARRIED WOMEN**

| Age Group of Married Women (yrs.) | No. Of children Born so | No. Of children Died | Death rates per born Children |
|-----------------------------------|-------------------------|----------------------|-------------------------------|
| 15- 30                            | 734                     | 73                   | 0.09                          |
| 30-50                             | 1110                    | 153                  | 0.13                          |

Source: Field Survey, 2008-09

**Table 4.3: DEATHS BY THREE YOUNGER GROUPS**

| Age Groups (yrs.) | No. Of Deaths | Percent |
|-------------------|---------------|---------|
| Up to 5           | 07            | 53.85   |
| 5-15              | 04            | 30.77   |
| 15-35             | 02            | 15.38   |
| Total             | 13            | 100.00  |

Source: Field Survey, 2008-09

**4.2.3** It is rather convention to any researcher of social science to find out the variability of different indicators by different social groups. Muslims are minority in number in our sample. Out of 693 households of our sample only six households are Muslims. So it is very difficult to make any conclusion on the basis of this data on deaths. However, we present this to have a smell about the variation in death rates among the social groups. The upper caste households observe relatively lower death rate compared to two other social groups. This finding is rather consistent when we see the same in more or less similar fashion in a study conducted by the supervisor of this research enterprise in the mid 1980s of the last decade in the same district economy. But what is surprising is that after about three decades later the condition of the Muslims remains the same. Same is true for the scheduled caste population too. One can see these rates in table 4.4.

**Table 4.4: DEATHS BY SOCIAL GROUPS**

| Social Groups  | Midyear Population | No. Of Deaths | Death Rate (Per 1000 ) |
|----------------|--------------------|---------------|------------------------|
| Upper caste    | 1768               | 15            | 8.48                   |
| Schedule caste | 1198               | 12            | 10.02                  |
| Muslim         | 26                 | 01            | 38.46                  |
| Total          | 2992               | 28            | 9.35                   |

Source: Field Survey, 2008-09

**4.2.4** In an underdeveloped economy where land is the only means of livelihood of most of the people it is quite obvious that the asset land becomes a good differentiator in analyzing different determining indicators. Our sample area is an underdeveloped area. This will be true for our case also. Here in our sample we see that death rates vary inversely with the increase in the land holding pattern. Although we see a relatively better death rate in the land less group, category A, but the difference is apparent. If we amalgamate these two then we see that the rate becomes 11.24. One can have a glimpse about this from table 4.5. We also try to correlate the deaths with the per capita annual income. We see that these two are negatively correlated. This is given in table 4.6.

**Table 4.5: DEATHS BY LAND GROUPS**

| Land Groups ( in acres) | Midyear Population | No. Of Deaths | Death Rates |
|-------------------------|--------------------|---------------|-------------|
| Landless                | A                  | 312           | 02          |
|                         | B                  | 1112          | 14          |
| Up to 2 Acres           | 782                | 07            | 8.95        |
| 2-4 Acres               | 465                | 04            | 8.60        |
| 4-6 Acres               | 219                | 01            | 4.56        |
| Above 6 Acres           | 102                | 00            | Nil         |
| Total                   | 2992               | 28            | 9.35        |

Source: Field Survey, 2008-09

**Table 4.6: DEATHS BY PER CAPITA ANNUAL INCOME GROUPS**

| Income Groups ( Rs.'000) | Midyear Population | No. Of Deaths in the Last year | Death Rates |
|--------------------------|--------------------|--------------------------------|-------------|
| Up to 20                 | 964                | 13                             | 13.48       |
| 20-30                    | 837                | 09                             | 10.75       |
| 30-50                    | 633                | 04                             | 6.31        |
| Above 50                 | 558                | 02                             | 3.58        |
| Total                    | 2992               | 28                             | 9.35        |

Source: Field Survey, 2008-09

### 4.3 INFANT MORTALITY RATE

4.3.1 Fortunately, the rural economy which we have select for the present study exhibits the infant mortality rate that is lower than the rate that given by the country. These two rates are 44.11 and 55 .00. But if we consider the same rate for the state as a whole then we see that our one is still higher than the rate of the state. The rate for the state in the same reference period is 34.00. This variation in the mortality rate arises mainly by the variation of health amenities in the different area economies. Even in the same area economy we notice again the variation in the mortality rate. If we examine the data revealed from table 4.7 then we also see that the mortality rate differs among the sample villages with a high level of significance apparently as well as statistically.

**Table 4.7: INFANT MORTALITY RATE BY SAMPLE VILLAGES**

| Villages  | No. of live Births during the last year | No. Of Deaths below age one year during the last year | Infant Mortality Rate (Per 1000) |
|-----------|---|---|----------------------------------|
| Village 1 | 52                                      | 02  | 38.46                            |
| Village 2 | 16                                      | 01  | 62.5                             |
| Total     | 68                                      | 03  | 44.11                            |

Source: Field Survey, 2008-09

4.3.2 Again the incidence of infant deaths cumulated mainly in the households of the lower land and income echelon. The number of infant deaths as we observe is 3 only during the last year from the date of our survey. All these deaths are cumulated to the land less group and to the group 'up to 2 acres'. Again if we see the incidence of infant deaths on the basis of the distribution of per capita income then also we see that all deaths are accumulated to two lower per capita income groups. These two evidences are enough to say that the poor of this rural economy are less equipped to cope with the threat of the premature deaths. All are available from tables 4.8 and 4.9. But this does not necessarily mean that the non- poor households are better equipped. Both the poor and non-poor are remaining within the same safety net provided by the republic in the form of health care facilities. But what remains to say is that the poor are always lagging behind to absorb the facility of healthcare safety net provided at free of cost to the people.

**Table 4.8: INFANT MORTALITY RATE BY LAND GROUPS**

| Land Groups (in Acres) |   | No. Of live Births during the last year | No. Of Deaths below age one year during the last year | Infant Mortality Rate (Per 1000) |
|------------------------|---|---|---|----------------------------------|
| Landless               | A | 04                                      | 00  | Nil                              |
|                        | B | 33                                      | 02  | 60.60                            |
| Up to 2 Acres          |   | 19                                      | 01  | 52.63                            |
| 2-4 Acres              |   | 08                                      | 00  | Nil                              |
| 4-6 Acres              |   | 03                                      | 00  | Nil                              |
| Above 6 Acres          |   | 01                                      | 00  | Nil                              |
| Total                  |   | 68                                      | 03  | 44.11                            |

Source: Field Survey, 2008-09

**Table 4.9: INFANT MORTALITY RATE BY PER CAPITA ANNUAL INCOME GROUPS**

| Income Groups (Rs'000.) | No. of live Births during the last year | No. of Deaths below age one year during the last year | Infant Mortality Rate (Per 1000) |
|-------------------------|---|---|----------------------------------|
| Up to 20                | 29                                      | 02  | 68.96                            |
| 20-30                   | 21                                      | 01  | 47.61                            |
| 30-50                   | 13                                      | 00  | Nil                              |
| Above 50                | 05                                      | 00  | Nil                              |
| Total                   | 68                                      | 03  | 44.11                            |

Source: Field Survey, 2008-09

4.3.3 In the preceding sub-section we see that the infant mortality rate varies among the villages within the same area economy. Another kind of variation that we can observe in infant mortality rates among the social groups. The highest incidence of infant mortality rate is recorded by the scheduled caste households of this region. The upper caste households, on the other hand, are recorded relatively lower infant mortality rate like death rate. One important point to be noted here is that no incidence of infant death is found among the Muslims households. This is mainly due to sampling error. The number of Muslim households in our sampling framework is only six and fortunately there was no such incidence occurred among the Muslims. In his study undertaken in mid 80s of the last century the supervisor of this research enterprise observed highest incidence of infant deaths among the Muslim households. This fact, latter on, was supported by the various projects undertaken in the North Bengal region of West Bengal. Thus here this finding is completely due to the sampling error.

**Table 4.10: INFANT MORTALITY RATE BY SOCIAL GROUPS**

| Social Groups  | No. of live Births during the last year | No. of Deaths below age one year during the last year | Infant Mortality Rate (Per 1000) |
|----------------|---|---|----------------------------------|
| Upper Caste    | 36                                      | 01  | 27.77                            |
| Schedule Caste | 30                                      | 02  | 66.66                            |
| Muslim         | 02                                      | 00  | Nil                              |
| Total          | 68                                      | 03  | 44.11                            |

Source: Field Survey, 2008-09

#### 4.4 BIRTH RATE

4.4.1 For the calculation of birth rates we find out the mid-year population like that of the calculation of death rates. The midyear population of our sample is 2992. On the basis of this midyear population we have calculated all the birth rates. In the same time period of our survey the birth rate of our country was 24.1 and that of our state it was 19.1. Our sample birth rate as calculated by us is 22.72. Obviously our one lies between these two rates. However, we observe a bit of variation in the birth rates among the sample villages. Our first village records the rate that stands on 21.32. On the other hand, the same for our second village is 28.88. This is mainly because of the fact that our first village is superior village in all respects as compared to our second village. There is no other locational variation observed by us in the time of survey. One notices all these facts from table 4.11.

**Table 4.11: BIRTH RATES BY VILLAGES**

| Village   | Midyear population | No. of live Births during the last year | Birth Rates (Per 1000) |
|-----------|--------------------|---|------------------------|
| Village 1 | 2438               | 52                                      | 21.32                  |
| Village 2 | 554                | 16                                      | 28.88                  |
| Total     | 2992               | 68                                      | 22.72                  |

Source: Field Survey, 2008-09

4.4.2 Like death rates we also analyze birth rates considering the social and economic indicators. Our table 4.12 provides us information about birth rates on the basis of three social groups. The highest birth rate is recorded by the Muslims and the rate stands at 76.92. On the other hand, the lowest rate is being recorded by the upper caste households. Thus Muslims record nearly four times birth rate than the upper caste population. If we compare the Muslim birth rate with the birth rate observed

by the scheduled caste households then we see that Muslim birth rate records nearly three times more than the birth rate of the scheduled caste households.

**Table 4.12: RATE OF BIRTHS BY SOCIAL GROUPS**

| Social Groups  | Midyear population | No. of live Births during the last year | Birth Rates (Per 1000) |
|----------------|--------------------|---|------------------------|
| Upper Caste    | 1768               | 36                                      | 20.36                  |
| Schedule Caste | 1198               | 30                                      | 25.04                  |
| Muslim         | 26                 | 02                                      | 76.92                  |
| Total          | 2992               | 68                                      | 22.72                  |

Source: Field Survey, 2008-09

**4.4.3** On the other hand, we observe a very fantastic relation between the birth rate and the land holding size. One can notice from table 4.13 that birth rate varies inversely with the increase in the land holding size. One can apparently see that the landless group, category A records lowers birth rate than the first three land groups. But if we combine the two categories of land less group then we see that the new birth rate will be consistently high. This new birth rate as calculated by us is 25.98. Thus what we say in the preceding line is now justified and very clear cut through our additional calculation.

**Table 4.13: RATE OF BIRTHS BY LAND GROUPS**

| Land Groups(Acres) | Midyear population | No. of live Births during the last year | Birth Rates (Per 1000) |
|--------------------|--------------------|---|------------------------|
| Landless           | A                  | 04                                      | 12.82                  |
|                    | B                  | 33                                      | 29.67                  |
| Up to 2 Acres      | 782                | 19                                      | 24.29                  |
| 2-4 Acres          | 465                | 08                                      | 17.20                  |
| 4-6 Acres          | 219                | 03                                      | 13.69                  |
| Above 6 Acres      | 102                | 01                                      | 9.80                   |
| Total              | 2992               | 68                                      | 22.72                  |

Source: Field Survey, 2008-09

**4.4.4** Our economic indicator, the per capita annual income, also provides us a very clear cut relationship between the birth rate and per capita annual income. One sees from table 4.14 that incidence of birth reduces with the increase in the per capita annual income. This, as we think, is a common feature of a depress but resource rich rural economy. We can justify this kind of thinking by adding some

information on birth rates collecting in the mid 80s with a result that birth rate varies inversely with the increase in income (Kar 1993).

**Table 4.14: RATE OF BIRTHS BY PER CAPITA ANNUAL INCOME GROUPS**

| Income Groups<br>(Rs'000.) | Midyear population | No. of live Births<br>during the last year | Birth Rates (Per<br>1000) |
|----------------------------|--------------------|--|---------------------------|
| Up to 20                   | 964                | 29   | 30.08                     |
| 20-30                      | 837                | 21   | 25.08                     |
| 30-50                      | 633                | 13   | 20.53                     |
| Above 50                   | 558                | 05   | 8.96                      |
| Total                      | 2992               | 68   | 22.72                     |

Source: Field Survey, 2008-09

What is interesting here is that the rate of reduction of birth rate is very consistent among the first three income groups of our sample. In each case on an average 0.5 percent reduction is being noticed. Another point that also can be noted here is that the birth rate reduces at a very faster rate after reaching the per capita annual income level of Rs. 50,000. This can be used as a cut-off level of income in reducing the birth rate in this rural area economy.

#### 4.5 ANALYSIS OF FERTILITY

**4.5.1** Analysis of fertility, at the grass-root rural economy, gets its importance for many reasons. We oblige to mention some of them just to make this research work unworkable. Firstly, we can get an idea of the frequency of births through this analysis. Secondly, the idea on gross and net reproduction rate is also very essential to review the future growth probability of population in an area economy. Thirdly, to see the local variation in growth of population through the fertility rates for the future planning of the area economy both in the short run as well as in the long run in relation to production, employment, housing and other requirements of the local economy. It is thus of paramount importance to see the extent of these rates in this area economy.

**4.5.2** We know that the total fertility rate (TFR) is the average number of live births per woman if the women lived to the end of their child bearing age, provided they are subject to the given fertility conditions over the whole of their child bearing period. For our purpose we assume the range of child bearing age at this economy

is 15-49 years. The general fertility rate (GFR) is the ratio of number of live births and mid-year female population in the child bearing ages. On the other hand, the gross reproduction rate (GRR) is the average number of daughters that would be born to a woman during the last year if she survived at least to the age of 49 years. Finally, net reproduction rate (NRR) is the average number of daughters that would be born during the last year to a female if she passed through her life time conforming to the age-specific fertility and mortality rates of a given year.

4.5.3 On the basis of the formula given above we have calculated the four fertility rates of our sample population. These four rates are 77.18, 2.22, 1.08 and 0.92 respectively for the GFR, TFR, GRR and NRR. During the same reference period the first three rates for the state were 71.2, 2.1 and 1.0 for the GFR, TFR and GRR respectively. We do not quarrel with the data returns on fertility rates at this grass-root area economy. But what we like to say that our rates slightly higher than the average rates of the state. The variation so far we observed is due to the choice of small sample and small data. If we would consider the large sample to our context then this gap will be easily fortified. However, we observe some sort of variation in GFR among the social groups of the sample. The highest rate has been recorded by the Muslims and the rate is 222.22. The two other rates for the upper caste and scheduled caste groups are respectively 71.43 and 81.52. All these are given in table 4.15.

4.5.4 If we make a comparison between the GFR of the Muslims and GFR either of the upper caste or of the scheduled caste then we see that the difference is apparent and as well as significant at a very high level of significance. This difference permits us to say that there is a scope within the existing rules of the game to reduce the GFR *ceteris- paribas*. For other three fertility rates we see that the differences are apparent and significant statistically if we consider the Muslims and upper caste group of our sample only. But what makes us optimist despite the depress character of this rural economy is that we have got a clear-cut decreasing tendency of the four fertility rates with the increase in the land holding size.

**Table 4.15: GENERAL FRTILITY RATE, TOTAL FERTILITY RATE, GROSS REPRODUCTION RATE AND NET REPRODUCTION RATE BY SOCIAL GROUPS**

| Social Groups   | General Fertility Rate | Total Fertility Rate | Gross Reproduction Rate | Net Reproduction Rate |
|-----------------|------------------------|----------------------|-------------------------|-----------------------|
| Upper Caste     | 71.43                  | 2.10                 | 0.99                    | 0.83                  |
| Scheduled Caste | 81.52                  | 2.30                 | 1.15                    | 0.99                  |
| Muslims         | 222.22                 | 2.92                 | 1.46                    | 1.25                  |
| Total           | 77.18                  | 2.22                 | 1.08                    | 0.92                  |

Source: Field Survey, 2008-09

**4.5.5** We have stated elsewhere in this write up that land has been emerged as an important income and wealth generating assets in this sample economy. As in the case of births and deaths here also lands play the same role. As one can see in table 4.16, keeping aside the landless group, category A, that GFR decreases at a very consistent rate with every increase in the land holding size. Without going in details of any statistical test we see apparently that this falling tendency is very consistence. The same tendency has been recorded for the other three fertility rates. Despite this data support still we are not in a position to prescribe for the further redistribution of land just to size the fertility rates at this moment due to the small average size of the holding. However, our sample findings support the hypothesis that fertility rates are subject to the variation of above kind if we set up a plan for the grass-root area economies with the revision of the rules of the game. We keep it now as pending for our concluding chapter.

**Table 4.16: GENERAL FRTILITY RATE, TOTAL FERTILITY RATE, GROSS REPRODUCTION RATE AND NET REPRODUCTION RATE BY LAND GROUPS**

| Land Groups(Acres) | General Fertility Rate | Total Fertility Rate | Gross Reproduction Rate | Net Reproduction Rate |
|--------------------|------------------------|----------------------|-------------------------|-----------------------|
| Landless           | A                      | 43.95                | 0.93                    | 0.46                  |
|                    | B                      | 101.85               | 2.97                    | 1.43                  |
| Up to 2 Acres      | 82.61                  | 2.58                 | 1.35                    | 1.19                  |
| 2-4 Acres          | 57.97                  | 1.57                 | 0.78                    | 0.77                  |
| 4-6 Acres          | 44.11                  | 1.36                 | 0.45                    | 0.41                  |
| Above 6 Acres      | 33.33                  | 0.83                 | Nil                     | Nil                   |
| Total              | 77.18                  | 2.22                 | 1.08                    | 0.92                  |

Source: Field Survey, 2008-09

## **4.6 RATE OF GROWTH OF POPULATION**

**4.6.1** We are now in a position to find out the rate of growth of population of this area economy. We consider here the simple rate of growth of population which is nothing but the simple difference of the birth and death rates. The birth rate of our sample is 22.72. On the other hand, the death rate is 9.35. Thus the natural growth

rate of population is 13.37. These are given in tables 4.17 to 4.20. One of the merits of the grass-root study is that we can able to see closely the factors which are responsible for the variation in the growth rates. Our first village records the population growth rate that stands at 12.71. While the same for the second village is 16.25. Thus on an average our second village adds 3.54 unit of more population than our first village. This difference lies mainly of the income and educational spread effect. One can verify these with the help of our table 4.17.

**Table 4.17: RATE OF GROWTH OF POPULATION BY VILLAGES**

| Villages  | Birth Rate (per 1000) | Death Rate (per 1000) | Growth Rate (per 1000) |
|-----------|-----------------------|-----------------------|------------------------|
| Village 1 | 21.32                 | 8.61                  | 12.71                  |
| Village 2 | 28.88                 | 12.63                 | 16.25                  |
| Total     | 22.72                 | 9.35                  | 13.37                  |

Source: Field Survey, 2008-09

**4.6.2** It is rather obvious that the Muslims of this area economy observe definitely the highest growth rate despite their higher births and deaths. The growth account for this group is 38.46. The same for the two other social groups are 11.88 and 15.02 respectively for the upper caste and scheduled caste population. Here also the differences of growth rates of Muslims and upper caste in the one hand and Muslims and scheduled caste on the other hand are both apparent and significant statistically at a very high level of significance. The fact that releases from the above analysis is that Muslims are really in a depress position both socially and economically in this region. They need a special kind of planning or what we may call a big push to come out this social group from the existing low level equilibrium-trap.

**Table 4.18: RATE OF GROWTH OF POPULATION BY SOCIAL GROUPS**

| Social Group   | Birth Rate (per 1000) | Death Rate (per 1000) | Growth Rate (per 1000) |
|----------------|-----------------------|-----------------------|------------------------|
| Upper Caste    | 20.36                 | 8.48                  | 11.88                  |
| Schedule Caste | 25.04                 | 10.02                 | 15.02                  |
| Muslims        | 76.92                 | 38.46                 | 38.46                  |
| Total          | 22.72                 | 9.35                  | 13.37                  |

Source: Field Survey, 2008-09

**4.6.3** Our landless group, category A records lowest growth rate as compared to any other groups of this rural economy. This is mainly because of their sound socio-economic condition that they are enjoying at present as compared to the other groups within the same rural economy. Another reason that operates behind this low growth rate is the free mixing of some of the members of these households with the household members of the upper income echelon of the urban area in the course of their activities. This helps them to realize the utility of the small family. All these households of this group are engaged in non-farm activities. Except this, the growth rate of population decreases at a very lower rate with the increase in the land holding size. Here the differences are apparent only. One can verify this through the table 4.19. However, our division of the population on the basis of the per capita income group releases no significant difference among the growth rates of various income groups except the per capita income group above Rs.50000. This group records very low growth rate in this area economy.

**Table 4.19: RATE OF GROWTH OF POPULATION BY LAND GROUPS**

| Land Groups(Acres) |   | Birth Rate (per 1000) | Death Rate (per 1000) | Growth Rate (per 1000) |
|--------------------|---|-----------------------|-----------------------|------------------------|
| Landless           | A | 12.82                 | 6.41                  | 6.41                   |
|                    | B | 29.67                 | 12.58                 | 17.09                  |
| Up to 2 Acres      |   | 24.29                 | 8.95                  | 15.34                  |
| 2-4 Acres          |   | 17.20                 | 8.60                  | 8.60                   |
| 4-6 Acres          |   | 13.69                 | 4.56                  | 9.13                   |
| Above 6 Acres      |   | 9.80                  | Nil                   | 9.80                   |
| Total              |   | 22.72                 | 9.35                  | 13.37                  |

Source: Field Survey, 2008-09

**Table 4.20: RATE OF GROWTH OF POPULATION BY PER CAPITA ANNUAL INCOME GROUPS**

| Income Groups (Rs'000.) | Birth Rate (per 1000) | Death Rate (per 1000) | Growth Rate (per 1000) |
|-------------------------|-----------------------|-----------------------|------------------------|
| Up to 20                | 30.08                 | 13.48                 | 16.60                  |
| 20-30                   | 25.08                 | 10.75                 | 14.33                  |
| 30-50                   | 20.53                 | 6.31                  | 14.22                  |
| Above 50                | 8.96                  | 3.58                  | 5.38                   |
| Total                   | 22.72                 | 9.35                  | 13.37                  |

Source: Field Survey, 2008-09

## 4.7 POPULATION PROJECTION

4.7.1 Population projection, in general, takes an important part of any demographic analysis of an economy. Its importance lies on the fact when we try to make a study on an area economy. We have stated earlier that the title of this write up is the “Rural Development and Micro Level Planning”. Obviously an analysis on future population gets its height particularly to provide the planning for future both for the short term and for the long term planning period. Population planning, planning on housing, sanitation and health care all are generally made on the basis of the projected population. Planning on agriculture to feed sufficiently to the future population also demands the calculation of projected population. Our educational planning, particularly planning for the children, in the form of the establishment of new institutions also demands for the calculation of exact population in future. Thus as a whole, as per need of the study here we also calculate the future population of our sample as well as of the Baneswar rural economy. For the calculation of the future population we simply assume that the existing rate of growth of population will be continued in the next one or two decades. There will be no migration or emigration of people. Further, we assume that the sample’s age and sex composition of the population is also applicable to the Baneswar rural economy.

**Table 4.21: PROJECTED POPULATION OF OUR SAMPLE ECONOMY AND BANESWAR RURAL ECONOMY**

| Demographic Indicators                  |          | Year | Estimated Population  |                        |
|---|----------|------|-----------------------|------------------------|
|   |          |      | Sample Economy(March) | Baneswar Rural Economy |
| Crude Birth Rate                        | 2.27 P.C | 2011 | 3093                  | 19194                  |
| Crude Death Rate                        | 0.94 P.C | 2016 | 3304                  | 20505                  |
| Annual Rate of Growth                   | 1.33 P.C | 2021 | 3530                  | 21905                  |
| Sample Economy Population(2009)         | 3012     | 2026 | 3772                  | 23401                  |
| Baneswar Rural Economy Population(2009) | 18693    | 2031 | 4029                  | 24999                  |

Source: Field Survey, 2008-09

**Table 4.22: PROJECTED POPULATION OF THE SAMPLE ECONOMY BY AGE AND SEX**

| Age Group | 2011 |        |       | 2021 |        |       | 2031 |        |       |
|-----------|------|--------|-------|------|--------|-------|------|--------|-------|
|           | Male | Female | Total | Male | Female | Total | Male | Female | Total |
| 0-5       | 130  | 124    | 254   | 148  | 142    | 290   | 169  | 162    | 331   |
| 5-10      | 160  | 146    | 306   | 183  | 167    | 350   | 209  | 191    | 400   |
| 10-15     | 153  | 138    | 291   | 175  | 157    | 332   | 200  | 179    | 379   |
| 15-20     | 147  | 138    | 285   | 168  | 157    | 325   | 192  | 179    | 371   |
| 20-45     | 738  | 695    | 1433  | 842  | 793    | 1635  | 961  | 905    | 1866  |
| 45-60     | 182  | 158    | 340   | 208  | 180    | 388   | 237  | 206    | 443   |
| 60+       | 89   | 95     | 184   | 102  | 108    | 210   | 116  | 123    | 239   |
| Total     | 1599 | 1494   | 3093  | 1826 | 1704   | 3530  | 2084 | 1945   | 4029  |

Source: Field Survey, 2008-09

**Table 4.23: PROJECTED POPULATION OF BANESWAR RURAL ECONOMY BY AGE AND SEX**

| Age Group | 2011 |        |       | 2021  |        |       | 2031  |        |       |
|-----------|------|--------|-------|-------|--------|-------|-------|--------|-------|
|           | Male | Female | Total | Male  | Female | Total | Male  | Female | Total |
| 0-5       | 807  | 769    | 1576  | 921   | 878    | 1799  | 1051  | 1002   | 2053  |
| 5-10      | 993  | 906    | 1899  | 1133  | 1034   | 2167  | 1293  | 1180   | 2473  |
| 10-15     | 950  | 856    | 1806  | 1084  | 977    | 2061  | 1237  | 1115   | 2352  |
| 15-20     | 912  | 856    | 1768  | 1041  | 977    | 2018  | 1188  | 1115   | 2303  |
| 20-45     | 4580 | 4313   | 8893  | 5227  | 4922   | 10149 | 5965  | 5618   | 11583 |
| 45-60     | 1129 | 981    | 2110  | 1288  | 1120   | 2408  | 1470  | 1278   | 2748  |
| 60+       | 552  | 590    | 1142  | 630   | 673    | 1303  | 719   | 768    | 1487  |
| Total     | 9923 | 9271   | 19194 | 11324 | 10581  | 21905 | 12923 | 12076  | 24999 |

Source: Field Survey, 2008-09

**4.7.2** The crude birth rate of our sample is 2.27 percent and the death rate is 0.94 percent. Thus the natural growth rate becomes 1.33 percent. The survey year population of the sample is 3012 and the same for Baneswar rural economy is 18693. On the basis of these the projection of populations for the sample as well as for the Baneswar rural economy will be 3093 and 19194 respectively for the year 2011. Similarly the projected population for the year 2021 and 2031 will be 3530 and 4029 respectively for the sample economy. For Baneswar rural economy

the projected population for the same reference periods will be 21905 and 24999 respectively. One can get all these information from table 4.21.

**4.7.3** Age and sex composition of the projected population of the sample as well as of the Baneswar rural economy of the three specified periods is given in tables 4.22 and 4.23. We have considered three census periods to predict about the future population of the sample as well as of the Baneswar rural economy. If we assume that the year 2011 is the base year, then the number of population irrespective of the age group increases more than 30 percent in the year 2031. Thus the decadal increase rate of population will be on an average 15 percent. This simply implies that the area economy will add 15 percent additional labour force in every ten years after. Same will be true in case of school going children. So it will be the need of the area economy to increase the existing infrastructure at the rate of 15 percent per decade. Number of schools, hospitals and employment opportunity will have to be increased maintaining the same rate in the medium and long ranges of planning era.

## Chapter 5

### AGRICULTURAL OUTPUTS AND USE OF INPUTS

#### 5.1 INTRODUCTION

**5.1.1** There is no denying that during the last two decades of our national planning there has been important development happened in the non-agricultural sector of our national economy especially from the point of view of income either in per capita or in per family. It is in order to understand at the outset of this chapter to verify that improvement in the light of two present ratios in comparison to the ratios that had been calculated at the eve of the period of undertaking the New Economic policy in early years of last decade of the last century. Purely from the point of view of the sectoral income, the ratio of income of the agricultural sector to that of non-agricultural sector in our sample in post liberalization period is found to be 1.67:1.00. But if we have a look to the pre liberalization period, then at the same district economy the above ratio was found to be 3.66:1.00 (Kar, 1993). Again, if we examine this improvement of non-agricultural sector during the post globalization period in the light of employment generation capacity of these sectors then also the pre globalization ratio will exceed the post globalization ratio. The ratio of agricultural to non-agricultural employment as has been calculated by us for our sample stands at 1.25:1.00. The same during the pre-globalization period was 3.41:1.00 (Kar, 1993).

**5.1.2** There is no reason to be tempted to conclude that globalization brings rapid changes in the non-agricultural sector. The development of the said sector as we have mentioned in the preceding paragraph, as we think, was happened for several reasons. We obliged to mention some of them here just to make our findings research worthy. Firstly, we have seen that a reasonable number of farmers leased out their land seasonally to other persons in exchange of a fixed amount of money seasonally. These farmers then try to engage themselves in the activities other than agricultural activities. Secondly, some of the agricultural labourers are engaging themselves in the activities which are still non-agricultural in some areas of other states and we have counted those working days as well as income as non-agricultural working days and income at the time of sum up. Thirdly, the increase in wage rate in the non-agricultural sector due to the impact of globalization

exceeds that of the agricultural sector and this allows the workers to move to the non-agricultural sector simply denying the process of development depicted by the developmental economists during 1950s and 1960s. Fourthly, the lower income as well as employment generated in the agricultural sector mainly due to the depressed input and output market in the one hand and due to the attitude of the Government to recognize agricultural sector as unfavoured child during the last two decades of our national planning.

**5.1.3** It is in order to understand at this outset the non-agricultural activities found in our area economy. The non-agricultural activities include weaving, transport operating, activities that include the construction of housing, persons engaged in dehusking of paddy. The other traditional activities include quacks, priests, moulavies, carpenters, cobblers, barbers, blacksmiths and tailors. Village traders including businessmen and shop keepers, bidi workers and service holder are also been included in this group. All the persons who have been engaged in this sector, a few of them also been engaged in the agricultural sector. Further a few of the persons of the non-agricultural sector are operating on own account.

## **5.2 OLD AND NEW PRODUCTIVE ACTIVITIES**

**5.2.1** At the outset of this chapter we first try to make it clear about the term we have used in analyzing the use of land. The first concept is the cultivable area of the area economy. This is simply the total area of the grass-root economy excluding the area meant for homestead, home stead garden, area used as a small and medium pond and the area already been used as roads and lanes. After the calculation the amount stands at 298.22 acres or 85.21 hectares. The second one is the gross cultivable area. If all the farmers of our sample would have been used a plot of land for the production of three crops then the gross cultivable area becomes 894.66 acres or 255.62 hectares. But in actuality this figure is reduced to 849.84 acres or 242.81 hectares because an amount of 44.82 acres or 12.81 hectares have been used for raising two crops only. The latter amount of land is low in character in comparison to the other land amounts of the area economy and being used to produce two crops only in an agricultural crop year. Lastly, we have been used the concept of gross cultivated area. This area is being calculated on the basis

of the land used for the production of various crops in a crop year of the area economy. The amount of land fallen in this group is 646 acres or 184.57 hectares.

**5.2.2** On the basis of the above calculations we can easily find out different percentage figures of land that have been used under different crops during the last year from the date of our survey. This is given in table 5.1. It is very clear from this table that the area economy still remains as a depressed paddy economy. Whatever may be the measuring index used for the purpose of our analysis, paddy ranks itself first. But what is important to note is that though we use the term Aman paddy in our table, actually all the paddy are being raised in this area economy are HYV paddy in origin and purchased from the agricultural input shops but they are produced by using technology of the traditional variety of Aman paddy rather than HYV paddy. This very peculiarity has been seen elsewhere in the lower *Terai Region* of North Bengal Division of West Bengal. This is reflected in the production information of Aman paddy as given in the subsequent tables. On an average the output of Aman paddy per acre in physical term is 13.69 quintal. If this paddy cultivation would be followed the HYV paddy production technology mix, then this amount increases as much as to 26.40 quintal per acre in the same regional rural economy.

**5.2.3** One interesting point that revealed from this study is that the area economy is trying to leave its traditional subsistence character as reflected by the amount of land given in potato cultivation. Here the crop potato is being cultivated completely in commercial manner. Total amount of land given in this crop is 186.47 acres or 28.87 percent of the gross cultivated area. That means nearly one-third of the gross cropped area has been used for the production of this crop. The reasons behind this kind of movement from subsistence farming to commercial farming are rather four. Firstly, the land which is used for the production of Potato will be used for the production of Boro paddy and Jute.

**Table 5.1: AREA UNDER DIFFERENT CROPS**

| Crops         | Area in Acres | P.C to the Gross Cultivable Area | P.C to the Gross Cultivated Area | P.C to the Net Cultivable Area |
|---------------|---------------|----------------------------------|----------------------------------|--------------------------------|
| Aman Paddy    | 298.22        | 35.09                            | 46.16                            | 100.0                          |
| Jute          | 27.99         | 3.29                             | 4.33                             | 9.39                           |
| Aus Paddy     | 16.83         | 1.98                             | 2.61                             | 5.64                           |
| Boro Paddy    | 91.32         | 10.75                            | 14.14                            | 30.62                          |
| Potato        | 186.47        | 21.94                            | 28.87                            | 62.53                          |
| Cabbage       | 12.33         | 1.45                             | 1.91                             | 4.13                           |
| Cauliflower   | 10.17         | 1.10                             | 1.57                             | 3.41                           |
| Ladies Finger | 2.67          | 0.31                             | 0.41                             | 0.90                           |
| Total         | 646.0         | 76.01                            | 100.00                           | 216.62                         |

Source: Field Survey, 2008-09

Potato production needs huge amount of organic and in-organic manure in its process of production which remains in the soil even after the harvest period of potato and land remain almost prepared for the production of the next crop, namely for the production of Boro paddy or Jute. Secondly, the area economy is well organized in terms of input and output markets when we keep in consideration of potato production. We have seen five to six input shops with all amenities in this area economy which provide the farmers different input facilities almost at the door steps. Again, we noticed some local traders who purchased the Potato even in the potato field at a very reasonable price. They supply this purchased Potato to the neighbouring state Assam by exploiting the opportunity of the North Front railway set up. Thirdly, the easy availability of crop loan from the regional rural banks (*Uttar Banga Kshetriya Gramin Bank*) also motivated the cultivators to produce potato. Finally, there is a well equipped cold storage (*Sri Sri Madan Mohan Cold Storage*) situated within three kilometers away from the sample villages. This has given an additional impetus to the farmers to produce this kind of crop.

**5.2.4** Another notable point that also reveals from this study is that, 30.62 percent land out of the total net cultivable land has been used for the production of Boro paddy. In physical term the area stands at 91.32 acres. This amount of land is also used for the production of Boro paddy in commercial attitude rather than traditional. Here also the availability of inputs plays an important role to keep it away this amount of land from traditional track of production. The culture of cultivation of

the other crops like cabbage, cauliflower and Ladies finger are very recent origin and are initiated following the neighbouring villages.

**Table 5.2: VALUE OF OUTPUT RAISED FROM DIFFERENT CROPS**

| Crops         | Value of Total Output (in Rs.) | Percentage |
|---------------|--------------------------------|------------|
| Aman Paddy    | 4613030.9                      | 28.34      |
| Jute          | 398299.65                      | 2.45       |
| Aus Paddy     | 222724.34                      | 1.37       |
| Boro Paddy    | 1638376.6                      | 10.06      |
| Potato        | 8388834.0                      | 51.53      |
| Cabbage       | 482944.64                      | 2.96       |
| Cauliflower   | 465833.9                       | 2.86       |
| Ladies Finger | 69888.16                       | 0.43       |
| Total         | 16279930.0                     | 100.00     |

Source: Field Survey, 2008-09

**Table 5.3: RANKING OF CROPS IN ORDER OF TOTAL AREA GIVEN TO THE CROP**

| Village 1     | Village 2     | Total Sample  |
|---------------|---------------|---------------|
| Aman Paddy    | Aman Paddy    | Aman Paddy    |
| Potato        | Potato        | Potato        |
| Boro Paddy    | Boro Paddy    | Boro Paddy    |
| Jute          | Jute          | Jute          |
| Cabbage       | Aus Paddy     | Aus Paddy     |
| Cauliflower   | Cauliflower   | Cabbage       |
| Aus Paddy     | Cabbage       | Cauliflower   |
| Ladies Finger | Ladies Finger | Ladies Finger |

Source: Field Survey, 2008-09

**Table 5.4: RANKING OF CROPS IN TERMS OF TOTAL VALUE PER ACRE**

| Village 1     | Village 2     | Total Sample  |
|---------------|---------------|---------------|
| Cauliflower   | Potato        | Cauliflower   |
| Potato        | Cauliflower   | Potato        |
| Cabbage       | Cabbage       | Cabbage       |
| Ladies Finger | Ladies Finger | Ladies Finger |
| Boro Paddy    | Boro Paddy    | Boro Paddy    |
| Aman Paddy    | Aman Paddy    | Aman Paddy    |
| Jute          | Jute          | Jute          |
| Aus Paddy     | Aus Paddy     | Aus Paddy     |

Source: Field Survey, 2008-09

**Table 5.5: RANKING OF CROPS IN ORDER OF TOTAL COST PER ACRE**

| Village 1     | Village 2     | Total Sample  |
|---------------|---------------|---------------|
| Potato        | Potato        | Potato        |
| Cauliflower   | Cauliflower   | Cauliflower   |
| Cabbage       | Cabbage       | Cabbage       |
| Ladies Finger | Ladies Finger | Ladies Finger |
| Jute          | Jute          | Jute          |
| Aus Paddy     | Aus Paddy     | Aus Paddy     |
| Boro Paddy    | Boro Paddy    | Boro Paddy    |
| Aman Paddy    | Aman Paddy    | Aman Paddy    |

Source: Field Survey, 2008-09

However, 15.03 percent land out of the net cultivable land is being used in this area economy for the production of Aus paddy and Jute. An analogy of the same is given in tables 5.3 and 5.4 respectively. One can see from table 5.4 that the positions of these two crops just we mention in the preceding lines are last in the array of the crop ranking in value term.

**5.2.5** There is no difference that has been found in the ranking of crops among the sample villages if we have a look on the ranking of crops in terms of cost per acre. This is given in table 5.5. As we have already explained in the preceding paragraphs that the crop potato has been emerged as the main crop in this area economy and our claim for the same is also been established through tables 5.2 to 5.5. This finding will further get a strong shape if we in corroborate the simple input-out tables in our analysis. This will be the task of the subsequent sections of this chapter.

### **5.3 SIMPLE INPUT AND OUTPUT ANALYSIS**

**5.3.1** In the preceding section we have elaborated in detail about the agricultural scenario of this area economy in a very decent manner where we have given in a nutshell area under different crops and their ranking in terms of value and cost per

acre. In this section we try to exhibit the total agricultural activities in the form of simple input-output table for our sample villages and for the total sample. These are given in tables 5.6 and 5.7 respectively. As a whole there is a minor difference, as one can see from table 5.6, in respect of output value in per acre term. The difference is only Rs. 165.86. But in respect of cost difference, our second village enjoys some economy of cost due to the irrigation facility developed by the republic in the course of its development activities. Due to the operation of this state run irrigation enterprise cost benefit per acre stands at worth of Rs. 244.47. This amount comprises about 56 percent of the cost difference enjoyed by the second village. We will see later on the impact of development of irrigational infrastructure on the farm income and yield rates in the subsequent sections. All computational results just we mentioned are calculated on the basis of gross cultivated area. If we explore our agricultural expedition on the basis of the net cultivable area then also we can observe the utility of the public sector enterprises in this grass-root area economy.

**Table 5.6: VALUE OF TOTAL OUTPUT AND INPUTS PER ACRE BY GROSS CULTIVABLE AREA**

SAMPLE VILLAGE-1

| Farm Size<br>(in Acres) | No. Of<br>Farms | Gross<br>Culti-<br>vable Area<br>(in Acres) | Value of<br>Output<br>(in Rs.) | Equipment<br>Deprecia-<br>tion (in Rs.) | Depreciation<br>for Bullock<br>&<br>Plough (in<br>Rs.) | Total Depre-<br>ciation<br>(in Rs.) | Home<br>Labour<br>(in<br>Rs.) | Hired<br>Labour<br>(in Rs.) | Seeds<br>(in Rs.) | Organic<br>Manure<br>(in Rs.) | Inorganic<br>Manure<br>(in Rs.) | Insecti-<br>cides<br>(in Rs.) | Irrigation<br>(in Rs.) | Total<br>Cost<br>(in Rs.) |
|-------------------------|-----------------|---|--------------------------------|---|--|-------------------------------------|-------------------------------|-----------------------------|-------------------|-------------------------------|---------------------------------|-------------------------------|------------------------|---------------------------|
| Up to 2                 | 32              | 98.28                                       | 18063.54                       | 37.36                                   | 1115.68  | 1153.05                             | 2369.71                       | 1465.4                      | 1952.79           | 1423.2                        | 544.52                          | 545.88                        | 440.27                 | 9894.82                   |
| 2-4                     | 15              | 117.9                                       | 20463.32                       | 45.31                                   | 1146.33  | 1191.64                             | 2125.92                       | 2061.48                     | 2000.53           | 1723.35                       | 613.1                           | 741.37                        | 533.77                 | 10991.16                  |
| 4-6                     | 8               | 106.46                                      | 19001.73                       | 42.68                                   | 1138.59  | 1181.27                             | 1394.25                       | 2721.71                     | 1828.25           | 1745.72                       | 602.5                           | 803.44                        | 500.67                 | 10777.81                  |
| Above 6                 | 3               | 56.63                                       | 19238.25                       | 40.89                                   | 1147.68  | 1188.57                             | 976.86                        | 3307.78                     | 2320.59           | 1613.7                        | 494.98                          | 777.85                        | 486.49                 | 11166.82                  |
| Total                   | 58              | 379.27                                      | 19248.28                       | 41.85                                   | 1136.42  | 1178.27                             | 1812.15                       | 2278.43                     | 1987.59           | 1635.48                       | 574.72                          | 713.58                        | 493.19                 | 10673.41                  |

SAMPLE VILLAGE 2

|         |    |        |          |       |         |         |         |         |         |         |        |        |        |          |
|---------|----|--------|----------|-------|---------|---------|---------|---------|---------|---------|--------|--------|--------|----------|
| Up to 2 | 26 | 88.38  | 18269.02 | 43.15 | 1203.84 | 1247.01 | 2631.52 | 1130.46 | 1784.75 | 1431    | 457.56 | 512.82 | 249.5  | 9444.62  |
| 2-4     | 19 | 134.98 | 18908.26 | 42.71 | 1166.87 | 1209.57 | 2336.7  | 1508.3  | 1767.33 | 1635.87 | 522.32 | 639.67 | 260.58 | 9880.34  |
| 4-6     | 12 | 158.72 | 18380.49 | 43.23 | 1159.17 | 1202.4  | 1706.61 | 2191.22 | 1880.03 | 1745.28 | 503.99 | 673.67 | 236.91 | 10140.11 |
| Above 6 | 6  | 88.49  | 21419.48 | 44.75 | 1332.23 | 1376.98 | 1421.17 | 2983.38 | 2474.32 | 1987.7  | 508.24 | 740.06 | 251.05 | 11742.9  |
| Total   | 63 | 470.57 | 19082.42 | 43.35 | 1202.31 | 1245.66 | 2007.38 | 1945.07 | 1941.56 | 1700.45 | 501.33 | 646.19 | 248.72 | 10236.36 |

TOTAL SAMPLE

|         |     |        |          |       |         |         |         |         |         |         |        |        |        |          |
|---------|-----|--------|----------|-------|---------|---------|---------|---------|---------|---------|--------|--------|--------|----------|
| Up to 2 | 58  | 186.66 | 18160.83 | 40.11 | 1157.42 | 1197.53 | 2493.67 | 1306.81 | 1873.22 | 1426.89 | 503.34 | 530.23 | 349.94 | 9681.63  |
| 2-4     | 34  | 252.88 | 19633.28 | 43.92 | 1157.29 | 1201.21 | 2238.43 | 1766.2  | 1876.06 | 1676.66 | 564.65 | 687.08 | 387.95 | 10398.24 |
| 4-6     | 20  | 265.18 | 18629.89 | 43.01 | 1150.91 | 1193.92 | 1581.21 | 2404.2  | 1859.24 | 1745.46 | 543.54 | 725.77 | 342.8  | 10396.14 |
| Above 6 | 9   | 145.12 | 20568.31 | 43.25 | 1260.21 | 1303.46 | 1247.79 | 3109.97 | 2414.33 | 1841.75 | 503.07 | 754.81 | 342.92 | 11518.1  |
| Total   | 121 | 849.84 | 19156.44 | 42.68 | 1172.9  | 1215.58 | 1920.25 | 2093.84 | 1962.1  | 1671.46 | 534.08 | 676.27 | 357.82 | 10431.4  |

Source: Field Survey, 2008-09

Table 5.7: VALUE OF TOTAL OUTPUT AND INPUTS PER ACRE BY NET AREA

SAMPLE VILLAGE -1

| Farm Size (in Acres) | No. of Farms | Net Area Given (in Acres) | Value of Output (in Rs.) | Equipment Depreciation (in Rs.) | Depreciation for Bullock & Plough (in Rs.) | Total Depreciation (in Rs.) | Home Labour (in Rs.) | Hired Labour (in Rs.) | Seeds (in Rs.) | Organic Manure (in Rs.) | Inorganic Manure (in Rs.) | Insecticides (in Rs.) | Irrigation (in Rs.) | Total Cost (in Rs.) |
|----------------------|--------------|---------------------------|--------------------------|---------------------------------|--|-----------------------------|----------------------|-----------------------|----------------|-------------------------|---------------------------|-----------------------|---------------------|---------------------|
| Up to 2              | 32           | 98.28                     | 24534.06                 | 50.75                           | 1515.32                                    | 1566.08                     | 3218.56              | 1990.31               | 2652.29        | 1932.99                 | 739.57                    | 741.42                | 597.98              | 13439.2             |
| 2-4                  | 15           | 89.44                     | 26974.8                  | 59.73                           | 1511.09                                    | 1570.82                     | 2802.39              | 2717.44               | 2637.11        | 2271.73                 | 808.19                    | 977.27                | 703.62              | 14488.57            |
| 4-6                  | 8            | 76.81                     | 26336.72                 | 59.15                           | 1578.11                                    | 1637.26                     | 1932.45              | 3772.33               | 2533.98        | 2419.6                  | 835.07                    | 1113.58               | 595.94              | 14840.21            |
| Above 6              | 3            | 41.64                     | 26163.84                 | 55.62                           | 1560.83                                    | 1616.45                     | 1328.53              | 4498.55               | 3155.98        | 2194.61                 | 673.18                    | 1057.87               | 661.62              | 15186.79            |
| Total                | 58           | 280.25                    | 26049.23                 | 56.64                           | 1537.95                                    | 1594.59                     | 2452.43              | 3083.46               | 2689.86        | 2213.34                 | 777.78                    | 965.72                | 667.45              | 14444.63            |

SAMPLE VILLAGE -2

|         |    |        |          |       |         |         |         |         |         |         |        |        |        |          |
|---------|----|--------|----------|-------|---------|---------|---------|---------|---------|---------|--------|--------|--------|----------|
| Up to 2 | 26 | 69     | 23400.23 | 55.27 | 1541.97 | 1597.25 | 3370.63 | 1447.97 | 2286.03 | 1832.92 | 586.71 | 656.86 | 319.57 | 12097.94 |
| 2-4     | 19 | 104.49 | 24425.66 | 55.17 | 1507.36 | 1562.53 | 3018.54 | 1948.41 | 2283.04 | 2113.22 | 674.74 | 826.32 | 336.61 | 12763.41 |
| 4-6     | 12 | 118.26 | 24668.97 | 58.02 | 1555.75 | 1613.77 | 2290.48 | 2940.9  | 2523.24 | 2342.39 | 676.43 | 904.15 | 317.96 | 13609.32 |
| Above 6 | 6  | 74     | 25613.65 | 53.51 | 1593.09 | 1646.6  | 1699.46 | 3567.56 | 2958.82 | 2376.91 | 607.76 | 884.97 | 300.2  | 14042.28 |
| Total   | 63 | 365.75 | 24551.24 | 65.47 | 1546.88 | 1602.66 | 2582.68 | 2502.5  | 2497.99 | 2187.79 | 645.01 | 831.38 | 320.01 | 13170.02 |

TOTAL SAMPLE

|         |     |        |          |       |         |         |         |         |         |         |        |        |        |          |
|---------|-----|--------|----------|-------|---------|---------|---------|---------|---------|---------|--------|--------|--------|----------|
| Up to 2 | 58  | 141.36 | 23980.62 | 52.96 | 1528.33 | 1581.29 | 3292.79 | 1725.59 | 2473.51 | 1884.15 | 664.64 | 700.14 | 462.09 | 12784.2  |
| 2-4     | 34  | 193.93 | 25601.32 | 57.27 | 1509.08 | 1566.35 | 2918.85 | 2303.09 | 2446.33 | 2186.32 | 736.29 | 895.94 | 505.88 | 13559.05 |
| 4-6     | 20  | 195.07 | 25325.65 | 58.47 | 1564.55 | 1623.02 | 2149.51 | 3268.28 | 2527.47 | 2372.79 | 738.9  | 986.61 | 466.01 | 14132.59 |
| Above 6 | 9   | 115.64 | 25811.76 | 54.27 | 1581.47 | 1635.74 | 1565.89 | 3902.79 | 3029.82 | 2311.27 | 631.31 | 947.23 | 430.34 | 14454.39 |
| Total   | 121 | 646    | 25201.1  | 56.15 | 1543.01 | 1599.16 | 2526.17 | 2754.54 | 2581.23 | 2198.87 | 702.61 | 889.66 | 470.73 | 13722.97 |

Source: Field Survey, 2008-09

**5.3.2** Our tables 5.8 to 5.14 give us a detailed picture of use of inputs and raise of output of the individual crops in this grass-root area economy. One can observe from table 5.8 in raising Aman paddy village-2 is in a little bit better position as compared to the village-1. We can justify this difference with the help of two concepts, namely, the home labour co-efficient and organic manure coefficient. In respect of these two, our second village enjoys some sort of benefits than our first village. These two coefficients are 1.12 and 9.81 respectively in village-2. For village-1, they are 0.87 and 7.43 respectively. But what is interesting is that the calculated input-output ratios for these two villages are 0.47 and 0.46 for village-1 and village-2 respectively. This finding permits us to say that the efficiency of the farmers in a depressed but resource rich area economy of this kind depends on the efficiency of the market management rather than production management. Another important development we observe here is the use of the insecticides in the production process of Aman paddy. This kind of practice was not found even in the last decade of the last century. This is mainly because, as we think, of the use of purchased paddy seeds instead of traditionally preserved own paddy seeds.

**Table 5.8: VALUE OF OUTPUT AND INPUTS PER ACRES OF AMAN PADDY**

SAMPLE VILLAGE -1

| Farm Size<br>(in Acres) | No. of<br>Farms | Net Cultivable Area<br>(in Acres) | Area given<br>to this crop<br>(in Acres) | Value of<br>Output<br>(in Rs.) | Equipment<br>Depreciation<br>(in Rs.) | Depreciation<br>for Bullock &<br>Plough (in Rs.) | Total Depreciation<br>(in Rs.) | Home<br>Labour<br>(in Rs.) | Hired<br>Labour<br>(in Rs.) | Seeds<br>(in Rs.) | Organic<br>Manure<br>(in Rs.) | Inorganic<br>Manure<br>(in Rs.) | Insecticides<br>(in Rs.) | Irrigation<br>(in Rs.) | Total<br>Cost<br>(in Rs.) |
|-------------------------|-----------------|-----------------------------------|--|--------------------------------|---------------------------------------|--|--------------------------------|----------------------------|-----------------------------|-------------------|-------------------------------|---------------------------------|--------------------------|------------------------|---------------------------|
| Up to 2                 | 32              | 32.76                             | 32.76                                    | 15572.25                       | 22.32                                 | 1521.62  | 1543.95                        | 2162.02                    | 788.43                      | 262.86            | 1227.07                       | 151.4                           | 79.06                    | 0                      | 6214.79                   |
| 2-4                     | 15              | 39.3                              | 39.3                                     | 16572.52                       | 33.83                                 | 1535.05  | 1568.88                        | 1792.62                    | 1561.83                     | 247.83            | 1358.77                       | 203.81                          | 292.11                   | 0                      | 7025.85                   |
| 4-6                     | 8               | 36.82                             | 36.82                                    | 13398.96                       | 28.5                                  | 1689.3   | 1717.8                         | 1254.75                    | 2378.25                     | 256.38            | 1214.01                       | 149.05                          | 395.43                   | 0                      | 7365.67                   |
| Above 6                 | 3               | 20.65                             | 20.65                                    | 13374.04                       | 32.2                                  | 1702.18  | 1734.38                        | 982.08                     | 3045.03                     | 240.19            | 980.62                        | 139.46                          | 401.45                   | 0                      | 7523.21                   |
| Total                   | 58              | 129.53                            | 129.53                                   | 14907.64                       | 29.15                                 | 1602.16  | 1631.31                        | 1603.95                    | 1834.71                     | 252.8             | 1224.04                       | 164.73                          | 285.03                   | 0                      | 6996.57                   |

SAMPLE VILLAGE -2

|         |    |        |        |          |       |         |         |         |         |        |         |        |        |   |         |
|---------|----|--------|--------|----------|-------|---------|---------|---------|---------|--------|---------|--------|--------|---|---------|
| Up to 2 | 26 | 29.46  | 29.46  | 16602.48 | 31.49 | 1601.25 | 1632.75 | 2243.4  | 543.32  | 319.44 | 1303.04 | 142.56 | 97.88  | 0 | 6282.39 |
| 2-4     | 19 | 45.66  | 45.66  | 17302.32 | 35.01 | 1562.01 | 1597.02 | 2366.82 | 1000.48 | 256.43 | 1570.3  | 186.78 | 312.44 | 0 | 7290.27 |
| 4-6     | 12 | 54.24  | 54.24  | 15128.2  | 31.41 | 1642.69 | 1674.11 | 1476.4  | 2003.68 | 238.2  | 1594.76 | 157.08 | 371.68 | 0 | 7515.91 |
| Above 6 | 6  | 39.33  | 39.33  | 14806.94 | 34.12 | 1658.02 | 1692.14 | 1157.89 | 2472.41 | 240.02 | 1601.33 | 132.21 | 376.3  | 0 | 7672.3  |
| Total   | 63 | 168.69 | 168.69 | 15899.25 | 33.03 | 1617.19 | 1650.22 | 1777.1  | 1586.39 | 257.74 | 1538.84 | 156.78 | 308.9  | 0 | 7275.97 |

TOTAL SAMPLE

|         |     |        |        |          |       |         |         |         |         |        |         |        |        |   |         |
|---------|-----|--------|--------|----------|-------|---------|---------|---------|---------|--------|---------|--------|--------|---|---------|
| Up to 2 | 58  | 62.22  | 62.22  | 16060.04 | 26.67 | 1559.33 | 1585.99 | 2200.55 | 672.37  | 289.54 | 1263.04 | 147.21 | 87.96  | 0 | 6246.66 |
| 2-4     | 34  | 84.96  | 84.96  | 16964.73 | 34.46 | 1549.54 | 1584    | 2101.21 | 1260.14 | 252.45 | 1472.45 | 194.66 | 304.11 | 0 | 7169.02 |
| 4-6     | 20  | 91.06  | 91.06  | 14428.99 | 30.23 | 1661.54 | 1691.78 | 1386.77 | 2155.06 | 245.55 | 1440.8  | 153.83 | 381.28 | 0 | 7455.07 |
| Above 6 | 9   | 59.98  | 59.98  | 14313.62 | 33.46 | 1673.22 | 1706.68 | 1097.36 | 2669.55 | 240.08 | 1387.96 | 134.71 | 384.96 | 0 | 7621.3  |
| Total   | 121 | 298.22 | 298.22 | 15468.55 | 30.67 | 1610.66 | 1641.33 | 1700.09 | 1694.24 | 255.6  | 1402.11 | 160.24 | 298.53 | 0 | 7152.14 |

Source: Field Survey, 2008-09

**Table 5.9: VALUE OF OUTPUT AND INPUTS PER ACRE OF POTATO**

SAMPLE VILLAGE-1

| Farm Size<br>(in Acres) | No. of<br>Farms | Net Cultivable Area<br>(in Acres) | Area given<br>to this crop<br>(in Acres) | Value of<br>Output<br>(in Rs.) | Equipment<br>Deprecia<br>tion (in Rs.) | Depreciation<br>for Bullock &<br>Plough (in Rs.) | Total Dep-<br>reciation<br>(in Rs.) | Home               | Hired              | Seeds<br>(in Rs.) | Organic<br>Manure<br>(in Rs.) | Inorganic<br>Manure<br>(in Rs.) | Insecti-<br>cides<br>(in Rs.) | Irrigation<br>(in Rs.) | Total<br>Cost<br>(in Rs.) |
|-------------------------|-----------------|-----------------------------------|--|--------------------------------|--|--|-------------------------------------|--------------------|--------------------|-------------------|-------------------------------|---------------------------------|-------------------------------|------------------------|---------------------------|
|                         |                 |                                   |  |                                |  |  |                                     | Labour<br>(in Rs.) | Labour<br>(in Rs.) |                   |                               |                                 |                               |                        |                           |
| Up to 2                 | 32              | 32.76                             | 20.78                                    | 44466                          | 89.31                                  | 1749.28  | 1838.59                             | 4689.12            | 3799.8             | 8492.54           | 3890.76                       | 1471.12                         | 1487                          | 1183.83                | 26852.76                  |
| 2-4                     | 15              | 39.3                              | 25.98                                    | 45468.82                       | 94.07                                  | 1662.82  | 1756.88                             | 3759.81            | 4715.93            | 8263.08           | 4337.95                       | 1345.26                         | 1712.08                       | 1212.47                | 27103.46                  |
| 4-6                     | 8               | 36.82                             | 21.33                                    | 46913.5                        | 94.37                                  | 1506.14  | 1600.51                             | 2390.99            | 5991.56            | 8155.27           | 4389.35                       | 1360.61                         | 1830.28                       | 1251.75                | 26970.32                  |
| Above 6                 | 3               | 20.65                             | 15.33                                    | 47354.21                       | 94                                     | 1502.02  | 1596.02                             | 1831.7             | 6669.27            | 8126.22           | 4383.56                       | 1357.53                         | 1886.82                       | 1252.44                | 27103.56                  |
| Total                   | 58              | 129.53                            | 83.42                                    | 45934.91                       | 92.95                                  | 1614.74  | 1707.69                             | 3286.98            | 5172.86            | 8267.53           | 4248.08                       | 1382.79                         | 1718.36                       | 1222.73                | 27007.02                  |

SAMPLE VILLAGE -2

|         |    |        |        |          |       |         |         |         |         |         |         |         |         |     |          |
|---------|----|--------|--------|----------|-------|---------|---------|---------|---------|---------|---------|---------|---------|-----|----------|
| Up to 2 | 26 | 29.46  | 17.38  | 42612.54 | 86.48 | 1792.52 | 1879    | 4717.78 | 3129.74 | 8110.24 | 3701.26 | 1135.78 | 1329.11 | 675 | 24677.91 |
| 2-4     | 19 | 45.66  | 26.5   | 42941.43 | 88.26 | 1702.34 | 1790.6  | 3818.86 | 4113.96 | 8108.11 | 4166.94 | 1241.54 | 1497.35 | 675 | 25412.36 |
| 4-6     | 12 | 54.24  | 33.67  | 44869.02 | 88.65 | 1642    | 1730.65 | 3026.13 | 4740.71 | 8084.85 | 4282.74 | 1261.65 | 1587.17 | 675 | 25388.9  |
| Above 6 | 6  | 39.33  | 25.5   | 45790.19 | 87.84 | 1632.43 | 1720.27 | 2606.67 | 5357.64 | 8095.41 | 4120    | 1281.29 | 1618.62 | 675 | 25474.9  |
| Total   | 63 | 168.69 | 103.05 | 44220.71 | 87.98 | 1680.53 | 1768.51 | 3411.5  | 4460.5  | 8097.73 | 4114.62 | 1240.12 | 1528.36 | 675 | 25296.34 |

TOTAL SAMPLE

|         |     |        |        |          |       |         |         |         |         |         |         |         |         |        |          |
|---------|-----|--------|--------|----------|-------|---------|---------|---------|---------|---------|---------|---------|---------|--------|----------|
| Up to 2 | 58  | 62.22  | 38.16  | 43621.88 | 88.02 | 1768.97 | 1857    | 4702.17 | 3494.62 | 8318.42 | 3804.45 | 1318.39 | 1415.09 | 952.08 | 25862.22 |
| 2-4     | 34  | 84.96  | 52.48  | 44192.6  | 91.14 | 1682.77 | 1773.91 | 3789.63 | 4411.96 | 8184.83 | 4251.6  | 1292.89 | 1603.65 | 941.07 | 26249.54 |
| 4-6     | 20  | 91.06  | 55     | 45661.91 | 90.87 | 1589.31 | 1680.18 | 2779.81 | 5225.81 | 8112.16 | 4324.09 | 1300.04 | 1681.45 | 898.67 | 26002.21 |
| Above 6 | 9   | 59.98  | 40.83  | 46377.41 | 90.15 | 1583.46 | 1673.62 | 2315.69 | 5850.11 | 8106.98 | 4218.95 | 1309.91 | 1719.32 | 891.8  | 26086.38 |
| Total   | 121 | 298.22 | 186.47 | 44987.58 | 90.21 | 1651.1  | 1741.31 | 3355.79 | 4779.19 | 8173.69 | 4174.33 | 1303.95 | 1613.34 | 920.03 | 26061.63 |

Source: Field Survey, 2008-09

**Table 5.10: VALUE OF OUTPUT AND INPUTS PER ACRE OF BORO PADDY**

SAMPLE VILLAGE -1

| Farm Size<br>(in Acres) | No. of<br>Farms | Net Cultivable Area<br>(in Acres) | Area given<br>to this crop<br>(in Acres) | Value of<br>Output<br>(in Rs.) | Equipment<br>Deprecia<br>tion (in Rs.) | Depreciation<br>for Bullock &<br>Plough (in Rs.) | Total Dep-<br>reciation<br>(In Rs.) | Home<br>Labour<br>(In Rs.) | Hired<br>Labour<br>(In Rs.) | Seeds<br>(InRs.) | Organic<br>Manure<br>(In Rs.) | Inorganic<br>Manure<br>(In Rs.) | Insecti-<br>cides<br>(In Rs.) | Irrigation<br>(In Rs.) | Total<br>Cost<br>(In Rs.) |
|-------------------------|-----------------|-----------------------------------|--|--------------------------------|--|--|-------------------------------------|----------------------------|-----------------------------|------------------|-------------------------------|---------------------------------|-------------------------------|------------------------|---------------------------|
| Up to 2                 | 32              | 32.76                             | 10.98                                    | 18336.06                       | 19.58                                  | 1170.31  | 1189.89                             | 2185.79                    | 1508.1                      | 309.65           | 614.75                        | 748.53                          | 1188.52                       | 1461.74                | 9206.97                   |
| 2-4                     | 15              | 39.3                              | 13                                       | 18506.46                       | 20.15                                  | 1165   | 1185.15                             | 1938.46                    | 1726.15                     | 316.92           | 680.76                        | 742.15                          | 1211.53                       | 1838.48                | 9639.6                    |
| 4-6                     | 8               | 36.82                             | 8.33                                     | 16500.12                       | 18.48                                  | 1183.91  | 1202.4                              | 1512.6                     | 2650.66                     | 338.53           | 846.33                        | 580.14                          | 1332.53                       | 1920.76                | 10383.95                  |
| Above 6                 | 3               | 20.65                             | 4.33                                     | 16106.69                       | 19.39                                  | 1202.07  | 1221.47                             | 997.69                     | 3048.49                     | 341.8            | 762.12                        | 765.58                          | 1420.32                       | 1928.4                 | 10485.87                  |
| Total                   | 58              | 129.53                            | 36.64                                    | 17715.67                       | 19.51                                  | 1175.27  | 1194.78                             | 1804.58                    | 2027.24                     | 322.6            | 708.24                        | 708.36                          | 1256.82                       | 1754.91                | 9777.53                   |

SAMPLE VILLAGE -2

|         |    |        |       |          |       |         |         |         |         |        |        |        |         |     |         |
|---------|----|--------|-------|----------|-------|---------|---------|---------|---------|--------|--------|--------|---------|-----|---------|
| Up to 2 | 26 | 29.46  | 12.33 | 18909.24 | 21.24 | 1230.33 | 1251.58 | 2444.44 | 1204.37 | 321.16 | 973.23 | 741.36 | 1119.22 | 750 | 8805.36 |
| 2-4     | 19 | 45.66  | 20.5  | 18914.2  | 21.65 | 1224.97 | 1246.63 | 1985.36 | 1320    | 316.09 | 943.9  | 835.12 | 1141.46 | 750 | 8538.56 |
| 4-6     | 12 | 54.24  | 15.18 | 16983.66 | 19.89 | 1178.52 | 1198.41 | 1521.73 | 2115.94 | 339.92 | 988.14 | 594.86 | 1205.53 | 750 | 8714.53 |
| Above 6 | 6  | 39.33  | 6.67  | 16577.36 | 19.79 | 1197.9  | 1217.69 | 1319.34 | 2407.79 | 341.82 | 899.55 | 782.6  | 1259.37 | 750 | 8978.16 |
| Total   | 63 | 168.69 | 54.68 | 18092.08 | 20.84 | 1209.99 | 1230.83 | 1878.93 | 1647.59 | 326.99 | 957.39 | 740.87 | 1168.61 | 750 | 8701.21 |

TOTAL SAMPLE

|         |     |        |       |          |       |         |         |         |         |        |        |        |         |         |         |
|---------|-----|--------|-------|----------|-------|---------|---------|---------|---------|--------|--------|--------|---------|---------|---------|
| Up to 2 | 58  | 62.22  | 23.31 | 18639.25 | 20.46 | 1202.06 | 1222.52 | 2322.6  | 1347.4  | 315.74 | 804.37 | 742.17 | 1151.86 | 1085.26 | 8991.92 |
| 2-4     | 34  | 84.96  | 33.5  | 18755.97 | 21.07 | 1201.7  | 1222.77 | 1967.16 | 1477.61 | 316.41 | 841.79 | 799.04 | 1168.65 | 1172.38 | 8965.81 |
| 4-6     | 20  | 91.06  | 23.51 | 16812.33 | 19.39 | 1180.43 | 1199.82 | 1518.5  | 2305.4  | 339.43 | 937.89 | 589.64 | 1250.53 | 1164.82 | 9306.03 |
| Above 6 | 9   | 59.98  | 11    | 16392.09 | 16.63 | 1199.54 | 1219.18 | 1192.72 | 2572.72 | 341.81 | 845.45 | 775.9  | 1322.72 | 1213.86 | 9484.36 |
| Total   | 121 | 298.22 | 91.32 | 17941.05 | 20.31 | 1196.06 | 1216.37 | 1849.1  | 1789.4  | 325.23 | 857.42 | 727.83 | 1204.01 | 1153.2  | 9122.56 |

Source: Field Survey, 2008-09

**Table 5.11: VALUE OF OUTPUT AND INPUTS PER ACRE OF JUTE**

SAMPLE VILLAGE -1

| Farm Size<br>(in Acres) | No. of<br>Farms | Net Cultivable Area<br>(in Acres) | Area given<br>to this crop<br>(in Acres) | Value of<br>Output<br>(in Rs.) | Equipment<br>Deprecia<br>tion (in Rs.) | Depreciation<br>for Bullock &<br>Plough (in Rs.) | Total Depreciation<br>(in Rs.) | Home<br>Labour<br>(in Rs.) | Hired<br>Labour<br>(in Rs.) | Seeds<br>(in<br>Rs.) | Organic<br>Manure<br>(in Rs.) | Inorganic<br>Manure<br>(in Rs.) | Insecti-<br>cides<br>(in<br>Rs.) | Irrigation<br>(in Rs.) | Total<br>Cost<br>(in Rs.) |
|-------------------------|-----------------|-----------------------------------|--|--------------------------------|--|--|--------------------------------|----------------------------|-----------------------------|----------------------|-------------------------------|---------------------------------|----------------------------------|------------------------|---------------------------|
| Up to 2                 | 32              | 32.76                             | 3.5                                      | 13410.57                       | 86.28                                  | 1125.14  | 1211.42                        | 5760                       | 2605.71                     | 325.71               | 571.42                        | 600                             | 600                              | 0                      | 11674.26                  |
| 2-4                     | 15              | 39.3                              | 4  | 14201.25                       | 86.5                                   | 1152.5   | 1239                           | 5760                       | 2670                        | 360                  | 737.5                         | 612                             | 525                              | 0                      | 11903.5                   |
| 4-6                     | 8               | 36.82                             | 2.33                                     | 13822.96                       | 89.27                                  | 1186.26  | 1275.53                        | 3862.66                    | 4841.2                      | 326.18               | 572.53                        | 749.78                          | 430.04                           | 0                      | 12057.92                  |
| Above 6                 | 3               | 20.65                             | 1.33                                     | 13238                          | 94.73                                  | 1212.03  | 1306.76                        | 1984.96                    | 6766.91                     | 300.75               | 476.69                        | 770.8                           | 515.03                           | 0                      | 12121.9                   |
| Total                   | 58              | 129.53                            | 11.16                                    | 13759.59                       | 87.99                                  | 1158.06  | 1246.05                        | 4913.97                    | 3591.39                     | 335.13               | 619.89                        | 655.92                          | 527.51                           | 0                      | 11889.86                  |

SAMPLE VILLAGE -2

|         |    |        |       |          |       |         |         |         |         |        |        |        |        |   |          |
|---------|----|--------|-------|----------|-------|---------|---------|---------|---------|--------|--------|--------|--------|---|----------|
| Up to 2 | 26 | 29.46  | 4.33  | 14160.5  | 88.22 | 1145.03 | 1233.25 | 5741.33 | 1752.88 | 323.32 | 700.69 | 539.72 | 372.72 | 0 | 10663.91 |
| 2-4     | 19 | 45.66  | 5.33  | 15144.23 | 88.18 | 1168.1  | 1256.28 | 5737.33 | 1919.32 | 322.7  | 726.25 | 564.54 | 384.99 | 0 | 10911.41 |
| 4-6     | 12 | 54.24  | 4.67  | 14534.53 | 92.07 | 1211.99 | 1304.06 | 4145.61 | 3533.19 | 334.04 | 732.25 | 676.23 | 395.71 | 0 | 11121.09 |
| Above 6 | 6  | 39.33  | 2.5   | 13933    | 98.4  | 1224.8  | 1323.2  | 1980    | 5632    | 320    | 740.54 | 752.56 | 405.25 | 0 | 11153.55 |
| Total   | 63 | 168.69 | 16.83 | 14542.04 | 90.79 | 1182.76 | 1273.55 | 4738.56 | 3326.8  | 325.61 | 723.47 | 617.08 | 387.82 | 0 | 11392.89 |

TOTALSAMPLE

|         |     |        |       |          |       |         |         |         |         |        |        |        |        |   |          |
|---------|-----|--------|-------|----------|-------|---------|---------|---------|---------|--------|--------|--------|--------|---|----------|
| Up to 2 | 58  | 62.22  | 7.83  | 13825.28 | 87.35 | 1136.14 | 1223.49 | 5749.68 | 2134.09 | 324.39 | 642.91 | 566.66 | 474.31 | 0 | 11115.53 |
| 2-4     | 34  | 84.96  | 9.33  | 14739.95 | 87.45 | 1161.41 | 1248.86 | 5747.05 | 2241.15 | 338.69 | 731.07 | 584.88 | 445.01 | 0 | 11336.71 |
| 4-6     | 20  | 91.06  | 7     | 14297.67 | 91.14 | 1203.42 | 1294.56 | 4051.42 | 3968.57 | 331.42 | 679.08 | 700.71 | 407.14 | 0 | 11432.9  |
| Above 6 | 9   | 59.98  | 3.83  | 13691.9  | 97.12 | 1220.36 | 1317.48 | 1981.72 | 6026.11 | 313.31 | 648.92 | 758.89 | 443.37 | 0 | 11489.8  |
| Total   | 121 | 298.22 | 27.99 | 14230.07 | 89.67 | 1172.45 | 1262.12 | 4808.5  | 3432.3  | 329.41 | 682.17 | 632.57 | 443.52 | 0 | 11591.04 |

Source: Field Survey, 2008-09

**Table 5.12: VALUE OF OUTPUT AND INPUTS PER ACRE OF AUS PADDY**

SAMPLE VILLAGE -1

| Farm Size<br>(in Acres) | No. of<br>Farms | Net Cultivable Area<br>(in Acres) | Area given<br>to this crop<br>(in Acres) | Value of<br>Output<br>(in Rs.) | Equipment<br>Deprecia<br>tion (in Rs.) | Depreciation<br>for Bullock &<br>Plough (in Rs.) | Total Dep-<br>reciation<br>(in Rs.) | Home<br>Labour<br>(in Rs.) | Hired<br>Labour<br>(in Rs.) | Seeds<br>(in Rs.) | Organic<br>Manure<br>(in Rs.) | Inorganic<br>Manure<br>(in Rs.) | Insecti-<br>cides<br>(in Rs.) | Irrigation<br>(in Rs.) | Total<br>Cost<br>(in Rs.) |
|-------------------------|-----------------|-----------------------------------|--|--------------------------------|--|--|-------------------------------------|----------------------------|-----------------------------|-------------------|-------------------------------|---------------------------------|-------------------------------|------------------------|---------------------------|
| Up to 2                 | 32              | 32.76                             | 2  | 11730                          | 123.42                                 | 1240.34  | 1363.76                             | 4200                       | 3000                        | 288               | 462.5                         | 380                             | 352.6                         | 0                      | 10046.86                  |
| 2-4                     | 15              | 39.3                              | 1.33                                     | 10960                          | 112.5                                  | 1190.08  | 1302.58                             | 3600                       | 3820                        | 272               | 412.86                        | 432                             | 282.96                        | 0                      | 10122.4                   |
| 4-6                     | 8               | 36.82                             | 0  | 0                              | 0                                      | 0  | 0                                   | 0                          | 0                           | 0                 | 0                             | 0                               | 0                             | 0                      | 0                         |
| Above 6                 | 3               | 20.65                             | 0  | 0                              | 0                                      | 0  | 0                                   | 0                          | 0                           | 0                 | 0                             | 0                               | 0                             | 0                      | 0                         |
| Total                   | 58              | 129.53                            | 3.33                                     | 11422.46                       | 119.06                                 | 1220.27  | 1339.33                             | 3960.36                    | 3327.5                      | 281.81            | 442.67                        | 400.76                          | 324.78                        | 0                      | 10077.21                  |

SAMPLE VILLAGE-2

|         |    |        |      |          |        |         |         |         |         |        |        |        |        |   |          |
|---------|----|--------|------|----------|--------|---------|---------|---------|---------|--------|--------|--------|--------|---|----------|
| Up to 2 | 26 | 29.46  | 4.5  | 14280    | 132.5  | 1364.5  | 1497    | 5400    | 800     | 296.5  | 1050   | 396.5  | 432.32 | 0 | 9872.32  |
| 2-4     | 19 | 45.66  | 3.67 | 13640.52 | 132.12 | 1260.42 | 1392.54 | 4680    | 2200    | 282.32 | 975    | 472.62 | 436.96 | 0 | 10439.44 |
| 4-6     | 12 | 54.24  | 5.33 | 13202.04 | 126.82 | 1252.96 | 1379.78 | 3424.78 | 3612.52 | 288.48 | 962.5  | 512.12 | 452.12 | 0 | 10632.3  |
| Above 6 | 6  | 39.33  | 0    | 0        | 0      | 0       | 0       | 0       | 0       | 0      | 0      | 0      | 0      | 0 | 0        |
| Total   | 63 | 168.69 | 13.5 | 13680.56 | 130.15 | 1292.17 | 1422.32 | 4424.42 | 2290.81 | 289.47 | 995.06 | 462.84 | 441.4  | 0 | 10326.32 |

TOTAL SAMPLE

|         |     |        |       |          |        |         |         |         |         |        |        |        |        |   |          |
|---------|-----|--------|-------|----------|--------|---------|---------|---------|---------|--------|--------|--------|--------|---|----------|
| Up to 2 | 58  | 62.22  | 6.5   | 13495.38 | 129.71 | 1326.3  | 1456.01 | 5030.76 | 1476.92 | 293.88 | 869.23 | 391.42 | 407.79 | 0 | 9926.01  |
| 2-4     | 34  | 84.96  | 5     | 12927.5  | 126.9  | 1241.71 | 1368.61 | 4392.72 | 2630.92 | 279.57 | 825.47 | 461.81 | 395.99 | 0 | 10355.09 |
| 4-6     | 20  | 91.06  | 5.33  | 13202.04 | 126.82 | 1252.96 | 1379.78 | 3424.78 | 3612.52 | 288.48 | 962.5  | 512.12 | 452.12 | 0 | 10632.3  |
| Above 6 | 9   | 59.98  | 0     | 0        | 0      | 0       | 0       | 0       | 0       | 0      | 0      | 0      | 0      | 0 | 0        |
| Total   | 121 | 298.22 | 16.83 | 13233.77 | 127.95 | 1277.94 | 1405.89 | 4332.6  | 2495.93 | 287.95 | 885.76 | 450.55 | 418.33 | 0 | 10277.01 |

Source: Field Survey, 2008-09

**Table 5.13: VALUE OF OUTPUT AND INPUTS PER ACRE OF CABBAGE**

SAMPLE VILLAGE-1

| Farm Size<br>(in Acres) | No. of<br>Farms | Net Culti-<br>vable Area<br>(in Acres) | Area given<br>to this crop<br>(in Acres) | Value of<br>Output<br>(in Rs.) | Equipment<br>Deprecia-<br>tion (in Rs.) | Depreciation<br>for Bullock &<br>Plough (in<br>Rs.) | Total Dep-<br>reciation<br>(in Rs.) | Home<br>Labour<br>(in Rs.) | Hired<br>Labour<br>(in Rs.) | Seeds<br>(in<br>Rs.) | Organic<br>Manure<br>(in Rs.) | Inorganic<br>Manure<br>(in Rs.) | Insecti-<br>cides<br>(in<br>Rs.) | Irrigation<br>(in Rs.) | Total<br>Cost<br>(in Rs.) |
|-------------------------|-----------------|--|--|--------------------------------|---|---|-------------------------------------|----------------------------|-----------------------------|----------------------|-------------------------------|---------------------------------|----------------------------------|------------------------|---------------------------|
| Up to 2                 | 32              | 32.76                                  | 0.67                                     | 38350.5                        | 123.5                                   | 1752.56   | 1876.06                             | 5482.54                    | 2624.28                     | 880                  | 3690.56                       | 2240.25                         | 1487.5                           | 1240.58                | 19521.77                  |
| 2-4                     | 15              | 39.3                                   | 3.5                                      | 41412.25                       | 128                                     | 1764.5  | 1892.5                              | 4658.12                    | 3458.26                     | 880                  | 4258.12                       | 2456.24                         | 1584.26                          | 1182.26                | 20369.76                  |
| 4-6                     | 8               | 36.82                                  | 4.33                                     | 42154.26                       | 132.56                                  | 1782.86   | 1915.42                             | 3245.36                    | 5128.24                     | 880                  | 4892.58                       | 2488.56                         | 1654.28                          | 1158.19                | 21362.63                  |
| Above 6                 | 3               | 20.65                                  | 0  | 0                              | 0                                       | 0   | 0                                   | 0                          | 0                           | 0                    | 0                             | 0                               | 0                                | 0                      | 0                         |
| Total                   | 58              | 129.53                                 | 8.5                                      | 41548.89                       | 129.96                                  | 1758.48   | 1888.44                             | 4003.43                    | 4243.23                     | 880                  | 4536.58                       | 2455.67                         | 1612.3                           | 1174.59                | 20794.24                  |

SAMPLE VILLAGE-2

|         |    |        |      |          |        |         |         |         |         |     |         |         |         |     |          |
|---------|----|--------|------|----------|--------|---------|---------|---------|---------|-----|---------|---------|---------|-----|----------|
| Up to 2 | 26 | 29.46  | 0    | 0        | 0      | 0       | 0       | 0       | 0       | 0   | 0       | 0       | 0       | 0   | 0        |
| 2-4     | 19 | 45.66  | 1.33 | 32088.52 | 136.5  | 1804.5  | 1941    | 6248.54 | 1245.25 | 880 | 4200.5  | 2212.26 | 1024.5  | 675 | 18427.05 |
| 4-6     | 12 | 54.24  | 2.5  | 34840.56 | 142.85 | 1812.12 | 1954.97 | 5452.45 | 2246.92 | 880 | 4454.26 | 2428.76 | 1256.12 | 675 | 19348.48 |
| Above 6 | 6  | 39.33  | 0    | 0        | 0      | 0       | 0       | 0       | 0       | 0   | 0       | 0       | 0       | 0   | 0        |
| Total   | 63 | 168.69 | 3.83 | 33884.89 | 140.64 | 1809.47 | 1950.11 | 5728.89 | 1899.08 | 880 | 4366.14 | 2353.57 | 1175.68 | 675 | 19028.47 |

TOTAL SAMPLE

|         |     |        |       |          |        |         |         |         |         |     |         |         |         |         |          |
|---------|-----|--------|-------|----------|--------|---------|---------|---------|---------|-----|---------|---------|---------|---------|----------|
| Up to 2 | 58  | 62.22  | 0.67  | 38350.5  | 123.5  | 1752.56 | 1876.06 | 5482.54 | 2624.28 | 880 | 3690.56 | 2240.25 | 1487.5  | 1240.58 | 19521.77 |
| 2-4     | 34  | 84.96  | 4.83  | 38844.84 | 130.34 | 1775.51 | 1905.85 | 5096.06 | 2848.88 | 880 | 4242.25 | 2389.06 | 1430.12 | 1042.57 | 19834.79 |
| 4-6     | 20  | 91.06  | 6.83  | 39477.21 | 136.32 | 1793.57 | 1929.89 | 4053.23 | 4073.58 | 880 | 4732.14 | 2466.67 | 1508.54 | 981.32  | 20625.37 |
| Above 6 | 9   | 59.98  | 0     | 0        | 0      | 0       | 0       | 0       | 0       | 0   | 0       | 0       | 0       | 0       | 0        |
| Total   | 121 | 298.22 | 12.33 | 39168.26 | 133.27 | 1774.32 | 1907.59 | 4539.4  | 3515.08 | 880 | 4483.64 | 2423.95 | 1476.67 | 1019.4  | 20245.73 |

Source: Field Survey, 2008-09

Table 5.14: VALUE OF OUTPUT AND INPUTS PER ACRE OF CAULIFLOWER

SAMPLE VILLAGE-1

| Farm Size (in Acres) | No. Of Farms | Net Cultivable Area (in Acres) | Area given to this crop (in Acres) | Value of Output (in Rs.) | Equipment Depreciation(in Rs.) | Depreciation for Bullock & Plough (in Rs.) | Total Dep- (in Rs.) | Home Labour (in Rs.) | Hired Labour (in Rs.) | Seeds (in Rs.) | Organic Manure (in Rs.) | Inorganic Manure (in Rs.) | Insecticides (in Rs.) | Irrigation (in Rs.) | Total Cost (in Rs.) |
|----------------------|--------------|--------------------------------|------------------------------------|--------------------------|--------------------------------|--|---------------------|----------------------|-----------------------|----------------|-------------------------|---------------------------|-----------------------|---------------------|---------------------|
| Up to 2              | 32           | 32.76                          | 0                                  | 0                        | 0                              | 0  | 0                   | 0                    | 0                     | 0              | 0                       | 0                         | 0                     | 0                   | 0                   |
| 2-4                  | 15           | 39.3                           | 2.33                               | 52848.58                 | 156                            | 1764.5                                     | 1920.5              | 5658.62              | 3458.26               | 1050           | 4258.12                 | 3458.36                   | 3294.55               | 1456.5              | 24554.91            |
| 4-6                  | 8            | 36.82                          | 3.67                               | 48154.64                 | 148.52                         | 1782.86                                    | 1931.38             | 4245.12              | 5128.24               | 1050           | 4892.58                 | 3345.25                   | 3452.21               | 1522.2              | 25566.98            |
| Above 6              | 3            | 20.65                          | 0                                  | 0                        | 0                              | 0  | 0                   | 0                    | 0                     | 0              | 0                       | 0                         | 0                     | 0                   | 0                   |
| Total                | 58           | 129.53                         | 6                                  | 49977.45                 | 151.42                         | 1775.73                                    | 1927.15             | 4794.03              | 4479.73               | 1050           | 4646.19                 | 3389.17                   | 3390.98               | 1496.68             | 25173.93            |

SAMPLE VILLAGE-2

|         |    |        |      |          |        |         |         |         |         |      |         |         |         |     |          |
|---------|----|--------|------|----------|--------|---------|---------|---------|---------|------|---------|---------|---------|-----|----------|
| Up to 2 | 26 | 29.46  | 0    | 0        | 0      | 0       | 0       | 0       | 0       | 0    | 0       | 0       | 0       | 0   | 0        |
| 2-4     | 19 | 45.66  | 1.5  | 42044.5  | 164.5  | 1804.5  | 1969    | 6248.54 | 1245.25 | 1050 | 4200.5  | 2845.5  | 2652.28 | 675 | 20886.07 |
| 4-6     | 12 | 54.24  | 2.67 | 38540.26 | 152.85 | 1812.12 | 1964.97 | 5452.45 | 2246.92 | 1050 | 4354.22 | 2998.23 | 2856.45 | 675 | 21598.24 |
| Above 6 | 6  | 39.33  | 0    | 0        | 0      | 0       | 0       | 0       | 0       | 0    | 0       | 0       | 0       | 0   |          |
| Total   | 63 | 168.69 | 4.17 | 39800.78 | 157.04 | 1809.38 | 1966.42 | 5738.81 | 1886.6  | 1050 | 4298.93 | 2943.29 | 2783.01 | 675 | 21342.06 |

TOTAL SAMPLE

|         |     |        |       |          |        |         |         |         |         |      |         |         |         |         |          |
|---------|-----|--------|-------|----------|--------|---------|---------|---------|---------|------|---------|---------|---------|---------|----------|
| Up to 2 | 58  | 62.22  | 0     | 0        | 0      | 0       | 0       | 0       | 0       | 0    | 0       | 0       | 0       | 0       | 0        |
| 2-4     | 34  | 84.96  | 3.83  | 48617.22 | 159.33 | 1780.16 | 1939.49 | 5889.65 | 2591.55 | 1050 | 4235.55 | 3218.34 | 3043.01 | 1150.42 | 23118.01 |
| 4-6     | 20  | 91.06  | 6.34  | 44105.68 | 150.34 | 1795.18 | 1945.52 | 4753.57 | 3914.81 | 1050 | 4665.85 | 3199.11 | 3201.31 | 1165.41 | 23895.58 |
| Above 6 | 9   | 59.98  | 0     | 0        | 0      | 0       | 0       | 0       | 0       | 0    | 0       | 0       | 0       | 0       | 0        |
| Total   | 121 | 298.22 | 10.17 | 45804.71 | 153.72 | 1789.52 | 1943.24 | 5181.42 | 3416.47 | 1050 | 4503.8  | 3206.35 | 3141.69 | 1159.77 | 23602.74 |

Source: Field Survey, 2008-09

**5.3.3** What we observe in the preceding section in case of raising of Aman paddy is now becomes opposite in case of raising Potato. Here village-1 is slightly better-off than village-2. Value of potato output per acre in village-1 is Rs. 45934.91, while the same in village-2 is Rs. 44220.71. Thus the difference is Rs.1714.20 only per acre. One important point is that the farmers of village -1 bear nearly double irrigation cost as compared to the farmers of village-2. This is because of the fact that the farmers of village-2 successfully captured the benefit of irrigation network as developed by the Government, while the entire irrigation net-work of village-1 is privately managed. If, however, we provide the irrigation facility at per what the farmers of village-2 enjoy in village-1 then the above difference in value of output per acre increases to Rs. 2261.93. Another point to be considered here is that the land that has been used for potato production in village-1 is relatively high in altitude than village-2 and due to this reason the history of Potato production is older in village-1 than in village-2. Further, the Potato production in village-1 has been matured earlier as compared to village-2. As a result, the farmers of village-1 enjoy the production price benefit in selling their potato what the farmers of village-2 are not enjoyed. All are given in table 5.9.

**5.3.4** Simple input-output analysis of Boro paddy, another recently adopted crop in this regional economy, is given in table 5.10. Here the production benefit that has been enjoyed by the farmers of village II in raising Boro paddy is rather for two reasons. Firstly, the altitude of land of village-2 is relatively low as compared to village-1 which provides the farmers of village-2 to bring more land under this crop production and obviously enjoy some sort of scale benefit. Secondly, the home labour co-efficient is consistently high in village-2. This satisfies the condition of high care and higher production theorem. Further, the reflection of the above two has been clearly visualized through the input-output ratio. We see that the ratio for village-2 is 0.48 as compared to village-1 where it is 0.55.

**5.3.5** The two other traditional crops namely Jute and Aus paddy are being produced in a very small scale. The amounts of land given to these two are 28 acres and 16.83 acres respectively. The two input-output ratios for the production of Jute and Aus are 0.81 and 0.78. Both are very high if we compare them with other crops. This means that these two crops are produced mainly to maintain the crop rotation

rather than production gain. But one interesting point is that home labour coefficient for both these two crops is consistently high in comparison to other crops of this area economy. This kind of production behaviour further establishes the depressional character of production activity of this area economy. The details of these two crops are given in tables 5.11 and 5.12. Further, the three other *Rabi crops* namely Cabbage, Cauliflower and Ladies finger are being produced in a tiny amount of land which simply means that their adoption in the production network is rather recent. All are given in tables 5.13 and 5.14. However, nearness of the eastern states and their growing demand for vegetables release a hope in the future development of vegetable production in this area economy. We also justify the statement that we made just in the preceding section with the help of amount of land medium in altitude and very useful for the production of vegetables. In percentage form the amount stands at about 70 percent. We will elaborate in detail about our future production plan in the subsequent chapter.

#### **5.4 FARM INCOME UNDER DIFFERENT CROP ACTIVITIES**

**5.4.1** It is rather convention in analyzing any kind of production is to find out the income of the concern activities. In the preceding section we have elaborated the input and out analysis in a very crude manner. One interesting thing that we like to mention here that one can easily find out the nature of farm income enjoyed by any area economy from these simple input- output tables. We know very well that farm income of any agricultural activity or of all activities is the difference between the value of output and value of cost incurred to raise the crops. If we consider the measurement in per acre term then it will be the difference between the value of output per acre and amount of cost incurred per acre to raise the crops.

**5.4.2** For the sake of simplicity we consider here three types of cost. They are Cost-A, Cost-B and Cost -C.

We may define them as:

Cost -A: This cost includes all the costs on fixed and variable inputs except the cost of home labour.

Cost-B: This cost includes all the costs incurred on fixed and variable inputs.

Cost-C: This cost includes in addition to the costs on fixed and variable inputs plus the amount of interest that should be incurred for the use of investible funds in an agricultural crop year. Thus our Cost-B becomes Cost-A plus cost on home labour and our Cost-C becomes Cost-B plus amount of interest incurred for using of investible funds. On the basis of this cost differentiation we have calculated all of these for total output and also for each of the individual crops. One can see these in tables 5.15 to 5.23.

**5.4.3** Here also we use both the gross and net concept of land for the calculation of farm income and yield rates. The annual farm income per acre for our area economy stands at Rs. 7994.84 if we measure it on the basis of gross cropped area. This amount increases to Rs.10517.52 if we measure the same on the basis of the net cultivable area. Both these farm incomes are being calculated on the basis of Cost-C, the cost which includes the cost on home labour and interest on investible funds. If we ignore the opportunity cost of home labour and interest bears for investible capital then the two farm incomes become Rs.10645.29 and Rs. 14004.30 respectively. Even we ignore the interest on investible capital the later figures still remain in a luminous position picturing out the significance of home labour in the farming activities in the area economy. Our calculated home labour coefficients are cooperated with this fact.

**Table 5.15: INCOME AND YIELD (TOTAL OUTPUT) PER ACRE BY NET AREA**

SAMPLE VILLAGE-1

| Farm Size<br>(in Acres) | Receipts<br>(in Rs.) | Cost-A<br>(in Rs.) | Cost-B<br>(in Rs.) | Cost-C<br>(in Rs.) | Farm Income-<br>A<br>(in Rs.) | Farm Income-<br>B<br>(in Rs.) | Farm Income-<br>C<br>(in Rs.) | Yield Rate-A | Yield Rate-B | Yield Rate-C |
|-------------------------|----------------------|--------------------|--------------------|--------------------|-------------------------------|-------------------------------|-------------------------------|--------------|--------------|--------------|
| 1                       | 2                    | 3                  | 4                  | 5                  | 6                             | 7                             | 8                             | 9            | 10           | 11           |
| Up to 2                 | 24534.06             | 10220.64           | 13439.2            | 14379.94           | 14313.42                      | 11094.86                      | 10154.12                      | 2.40         | 1.83         | 1.71         |
| 2-4                     | 26974.80             | 11686.18           | 14488.57           | 15502.77           | 15288.62                      | 12486.23                      | 11472.03                      | 2.31         | 1.86         | 1.74         |
| 4-6                     | 26336.72             | 12907.76           | 14840.21           | 15879.02           | 13428.96                      | 11496.51                      | 10457.70                      | 2.04         | 1.77         | 1.66         |
| Above 6                 | 26163.84             | 13858.26           | 15186.79           | 16249.87           | 12305.58                      | 10977.05                      | 9913.97                       | 1.89         | 1.72         | 1.61         |
| Total                   | 26049.23             | 11992.20           | 14444.63           | 15455.75           | 14057.03                      | 11604.60                      | 10593.48                      | 2.17         | 1.80         | 1.69         |

SAMPLE VILLAGE -2

|         |          |          |          |          |          |          |          |      |      |      |
|---------|----------|----------|----------|----------|----------|----------|----------|------|------|------|
| Up to 2 | 23400.23 | 8727.31  | 12097.94 | 12944.80 | 14672.92 | 11302.29 | 10455.43 | 2.68 | 1.93 | 1.81 |
| 2-4     | 24425.66 | 9744.87  | 12763.41 | 13656.85 | 14680.79 | 11662.25 | 10768.81 | 2.51 | 1.91 | 1.79 |
| 4-6     | 24668.97 | 11318.84 | 13609.32 | 14561.97 | 13350.13 | 11059.65 | 10107.00 | 2.18 | 1.81 | 1.69 |
| Above 6 | 25613.65 | 12342.82 | 14042.28 | 15025.24 | 13270.83 | 11571.37 | 10588.41 | 2.08 | 1.82 | 1.70 |
| Total   | 24551.24 | 10587.34 | 13170.02 | 14091.92 | 13963.90 | 11381.22 | 10459.32 | 2.32 | 1.86 | 1.74 |

TOTAL SAMPLE

|         |          |          |          |          |          |          |          |      |      |      |
|---------|----------|----------|----------|----------|----------|----------|----------|------|------|------|
| Up to 2 | 23980.62 | 9491.41  | 12784.2  | 13679.09 | 14489.21 | 11196.42 | 10301.53 | 2.53 | 1.88 | 1.75 |
| 2-4     | 25601.32 | 10640.2  | 13559.05 | 14508.18 | 14961.12 | 12042.27 | 11093.14 | 2.41 | 1.89 | 1.76 |
| 4-6     | 25325.65 | 11983.08 | 14132.59 | 15121.87 | 13342.57 | 11193.06 | 10203.78 | 2.11 | 1.79 | 1.67 |
| Above 6 | 25811.76 | 12888.5  | 14454.39 | 15466.20 | 12923.26 | 11357.37 | 10345.56 | 2.00 | 1.79 | 1.67 |
| Total   | 25201.10 | 11196.80 | 13722.97 | 14683.58 | 14004.30 | 11478.13 | 10517.52 | 2.25 | 1.84 | 1.72 |

Source: Field Survey, 2008-09

**Table 5.16: INCOME AND YIELD (TOTAL OUTPUT) PER ACRE BY GROSS AREA**

SAMPLE VILLAGE-1

| Farm Size<br>(in Acres) | Receipts<br>(in Rs.) | Cost-A<br>(in Rs.) | Cost-B<br>(in Rs.) | Cost-C<br>(in Rs.) | Farm<br>Income-A<br>(in Rs.) | Farm<br>Income-B<br>(in Rs.) | Farm ome-<br>C<br>(in Rs.) | Yield Rate- | Yield Rate-B | Yield Rate-C |
|-------------------------|----------------------|--------------------|--------------------|--------------------|------------------------------|------------------------------|----------------------------|-------------|--------------|--------------|
| 1                       | 2                    | 3                  | 4                  | 5                  | 6                            | 7                            | 8                          | 9           | 10           | 11           |
| Up to 2                 | 18063.54             | 7525.11            | 9894.82            | 10587.46           | 10538.43                     | 8168.72                      | 7476.08                    | 2.4         | 1.83         | 1.71         |
| 2-4                     | 20463.32             | 8865.24            | 10991.16           | 11760.54           | 11598.08                     | 9472.16                      | 8702.78                    | 2.31        | 1.86         | 1.74         |
| 4-6                     | 19001.73             | 9383.56            | 10777.81           | 11532.26           | 9618.17                      | 8223.92                      | 7469.47                    | 2.03        | 1.76         | 1.65         |
| Above 6                 | 19238.25             | 10189.96           | 11166.82           | 11948.5            | 9048.29                      | 8071.43                      | 7289.75                    | 1.89        | 1.72         | 1.61         |
| Total                   | 19248.28             | 8861.26            | 10673.41           | 11420.55           | 10387.02                     | 8574.87                      | 7827.73                    | 2.17        | 1.80         | 1.69         |

SAMPLE AGE -2

|         |          |          |          |          |          |         |         |      |      |      |
|---------|----------|----------|----------|----------|----------|---------|---------|------|------|------|
| Up to 2 | 18269.02 | 6813.1   | 9444.62  | 10105.74 | 11455.92 | 8824.4  | 8163.28 | 2.68 | 1.93 | 1.81 |
| 2-4     | 18908.26 | 7543.64  | 9880.34  | 10571.96 | 11364.62 | 9027.92 | 8336.3  | 2.51 | 1.91 | 1.79 |
| 4-6     | 18380.49 | 8433.5   | 10140.11 | 10849.92 | 9946.99  | 8240.38 | 7530.57 | 2.18 | 1.81 | 1.69 |
| Above 6 | 21419.48 | 10321.73 | 11742.9  | 12564.9  | 11097.75 | 9676.58 | 8854.58 | 2.08 | 1.82 | 1.70 |
| Total   | 19082.42 | 8228.98  | 10236.36 | 10952.91 | 10853.44 | 8846.06 | 8129.51 | 2.32 | 1.86 | 1.74 |

TOTAL SAMPLE

|         |          |          |          |          |          |         |         |      |      |      |
|---------|----------|----------|----------|----------|----------|---------|---------|------|------|------|
| Up to 2 | 18160.83 | 7187.96  | 9681.63  | 10359.34 | 10972.87 | 8479.2  | 7801.49 | 2.53 | 1.88 | 1.75 |
| 2-4     | 19633.28 | 8159.81  | 10398.24 | 11126.12 | 11473.47 | 9235.04 | 8507.16 | 2.41 | 1.89 | 1.76 |
| 4-6     | 18629.89 | 8814.93  | 10396.14 | 11123.87 | 9814.96  | 8233.75 | 7506.02 | 2.11 | 1.79 | 1.67 |
| Above 6 | 20568.31 | 10270.31 | 11518.1  | 12324.37 | 10298    | 9050.21 | 8243.94 | 2.00 | 1.79 | 1.67 |
| Total   | 19156.44 | 8511.15  | 10431.4  | 11161.6  | 10645.29 | 8725.04 | 7994.84 | 2.25 | 1.84 | 1.72 |

Source: Field Survey, 2008-09

**5.4.4** If we have a look for each of the individual crop then we see that the crop potato emerges as the highest farm income giving crop irrespective of cost differentiation. The two lowest income giving crops of this area economy are Jute and Aus paddy. We have already mentioned in the previous section of this chapter that home labour coefficients for the crops Jute and Aus paddy are consistently very high in comparison to other crop activities in this rural economy. The reflection of this high home labour coefficient is very clearly reflected in the farm income of these two crops. Now the question arises obviously that why the people of this area economy use a reasonable amount of land for the production of Jute and Aus paddy in spite of low farm income? Being a researcher of an area economy we can justify the production of Jute on the ground that the use of the by-product of Jute is manifold. This is used as a kitchen fuel, as a wall material (given in chapter 3) and also as a fencing for vegetable gardens. These uses of by-product of Jute make it popular among the farmers despite its down income. On the other hand, as we see, the production practice of Aus paddy is taken place just to cover the crop rotation in an agricultural crop year.

## **5.5 YIELD RATES OF INVESTIBLE FUNDS**

**5.5.1** Another crude measure to appraise the farm activity of an area economy is the use of the concept yield rate. Yield rate is nothing but a ratio between the values of farm income and cost or we may call it as income-input ratio in value term. We have three kinds of farm income and three types of costs. Obviously we get three yield rates for the sample as a whole and as well as for each of the individual crops. These are given in tables 5.15 to 5.23.

**Table 5.17: INCOME AND YIELD RATE PER ACRE OF AMAN PADDY**

SAMPLE VILLAGE -1

| Farm Size<br>(in Acres) | Receipts<br>(In Rs.) | Cost A<br>(In Rs.) | Cost B<br>(In Rs.) | Cost C<br>(In Rs.) | Farm<br>Income-A (in Rs.) | Farm<br>Income-B (in Rs.) | Farm<br>Income-C (in Rs.) | Yield Rate -A | Yield Rate-B | Yield Rate-C |
|-------------------------|----------------------|--------------------|--------------------|--------------------|---------------------------|---------------------------|---------------------------|---------------|--------------|--------------|
| 1                       | 2                    | 3                  | 4                  | 5                  | 6                         | 7                         | 8                         | 9             | 10           | 11           |
| Up to 2                 | 15572.25             | 4052.77            | 6214.79            | 6359.8             | 11519.48                  | 9357.46                   | 9212.45                   | 3.84          | 2.51         | 2.45         |
| 2-4                     | 16572.52             | 5233.23            | 7025.85            | 7189.78            | 11339.29                  | 9546.67                   | 9382.74                   | 3.17          | 2.36         | 2.3          |
| 4-6                     | 13398.96             | 6110.92            | 7365.67            | 7537.54            | 7288.04                   | 6033.29                   | 5861.42                   | 2.19          | 1.82         | 1.78         |
| Above 6                 | 13374.04             | 6541.13            | 7523.21            | 7698.75            | 6832.91                   | 5850.83                   | 5675.29                   | 2.04          | 1.78         | 1.74         |
| Total                   | 14907.64             | 5392.62            | 6996.57            | 7159.82            | 9515.02                   | 7911.07                   | 7747.82                   | 2.76          | 2.13         | 2.08         |

SAMPLE VILLAGE -2

|         |          |         |         |         |          |          |         |      |      |      |
|---------|----------|---------|---------|---------|----------|----------|---------|------|------|------|
| Up to 2 | 16602.48 | 4038.99 | 6282.39 | 6428.98 | 12563.49 | 10320.09 | 10173.5 | 4.11 | 2.64 | 2.58 |
| 2-4     | 17302.32 | 4923.45 | 7290.27 | 7460.38 | 12378.87 | 10012.05 | 9841.94 | 3.51 | 2.37 | 2.32 |
| 4-6     | 15128.2  | 6039.51 | 7515.91 | 7691.28 | 9088.69  | 7612.29  | 7436.92 | 2.5  | 2.01 | 1.97 |
| Above 6 | 14806.94 | 6514.41 | 7672.3  | 7851.32 | 8292.53  | 7134.64  | 6955.62 | 2.27 | 1.93 | 1.89 |
| Total   | 15899.25 | 5498.87 | 7275.97 | 7445.74 | 10400.38 | 8623.28  | 8453.51 | 2.89 | 2.18 | 2.14 |

TOTAL SAMPLE

|         |          |         |         |         |          |         |         |      |      |      |
|---------|----------|---------|---------|---------|----------|---------|---------|------|------|------|
| Up to 2 | 16060.04 | 4046.11 | 6246.66 | 6392.42 | 12013.93 | 9813.38 | 9667.62 | 3.97 | 2.57 | 2.51 |
| 2-4     | 16964.73 | 5067.81 | 7169.02 | 7336.3  | 11896.92 | 9795.71 | 9628.43 | 3.35 | 2.37 | 2.31 |
| 4-6     | 14428.99 | 6068.3  | 7455.07 | 7629.02 | 8360.69  | 6973.92 | 6799.97 | 2.38 | 1.94 | 1.89 |
| Above 6 | 14313.62 | 6523.94 | 7621.3  | 7799.13 | 7789.68  | 6692.32 | 6514.49 | 2.19 | 1.88 | 1.84 |
| Total   | 15468.55 | 5452.05 | 7152.14 | 7319.02 | 10016.5  | 8316.41 | 8149.53 | 2.84 | 2.16 | 2.11 |

Source: Field Survey, 2008-09

**Table 5.18: INCOME AND YIELD PER ACRE OF POTATO**

SAMPLE VILLAGE-I

| Farm Size | Receipts<br>(In Rs.) | Cost A<br>(In Rs.) | Cost B<br>(In Rs.) | Cost C<br>(In Rs.) | Farm<br>Income-A (in<br>Rs.) | Farm<br>Income-B (in<br>Rs.) | Farm<br>Income-C (in<br>Rs.) | Yield<br>Rate -A | Yield<br>Rate-B | Yield<br>Rate-C |
|-----------|----------------------|--------------------|--------------------|--------------------|------------------------------|------------------------------|------------------------------|------------------|-----------------|-----------------|
| 1         | 2                    | 3                  | 4                  | 5                  | 6                            | 7                            | 8                            | 9                | 10              | 11              |
| Up to 2   | 44466                | 22163.64           | 26852.76           | 27322.68           | 22302.36                     | 17613.24                     | 17143.32                     | 2.01             | 1.65            | 1.63            |
| 2-4       | 45468.82             | 23343.65           | 27103.46           | 27577.77           | 22125.17                     | 18365.36                     | 17891.05                     | 1.94             | 1.68            | 1.65            |
| 4-6       | 46913.5              | 24579.33           | 26970.32           | 27442.3            | 22334.17                     | 19943.18                     | 19471.2                      | 1.91             | 1.74            | 1.71            |
| Above 6   | 47354.21             | 25271.86           | 27103.56           | 27577.87           | 22082.35                     | 20250.65                     | 19776.34                     | 1.87             | 1.75            | 1.72            |
| Total     | 45934.91             | 23720.04           | 27007.02           | 27479.64           | 22214.87                     | 18927.89                     | 18455.27                     | 1.94             | 1.7             | 1.67            |

SAMPLE VILLAGE -2

|         |          |          |          |          |          |          |          |      |      |      |
|---------|----------|----------|----------|----------|----------|----------|----------|------|------|------|
| Up to 2 | 42612.54 | 19960.13 | 24677.91 | 25109.77 | 22652.41 | 17934.63 | 17502.77 | 2.13 | 1.73 | 1.7  |
| 2-4     | 42941.43 | 21593.5  | 25412.36 | 25857.08 | 21347.93 | 17529.07 | 17084.35 | 1.99 | 1.69 | 1.66 |
| 4-6     | 44869.02 | 22362.77 | 25388.9  | 25833.2  | 22506.25 | 19480.12 | 19035.82 | 2.01 | 1.77 | 1.74 |
| Above 6 | 45790.19 | 22868.23 | 25474.9  | 25920.71 | 22921.96 | 20315.29 | 19869.48 | 2    | 1.8  | 1.77 |
| Total   | 44220.71 | 21884.84 | 25296.34 | 25739.02 | 22335.87 | 18924.37 | 18481.69 | 2.02 | 1.75 | 1.72 |

TOTAL SAMPLE

|         |          |          |          |          |          |          |          |      |      |      |
|---------|----------|----------|----------|----------|----------|----------|----------|------|------|------|
| Up to 2 | 43621.88 | 21160.05 | 25862.22 | 26314.81 | 22461.83 | 17759.66 | 17307.07 | 2.06 | 1.69 | 1.66 |
| 2-4     | 44192.6  | 22459.91 | 26249.54 | 26708.9  | 21732.69 | 17943.06 | 17483.7  | 1.97 | 1.68 | 1.65 |
| 4-6     | 45661.91 | 23222.4  | 26002.21 | 26457.25 | 22439.51 | 19659.7  | 19204.66 | 1.97 | 1.75 | 1.72 |
| Above 6 | 46377.41 | 23770.69 | 26086.38 | 26542.89 | 22606.72 | 20291.03 | 19834.52 | 1.95 | 1.78 | 1.75 |
| Total   | 44987.58 | 22705.84 | 26061.63 | 26517.71 | 22281.74 | 18925.95 | 18469.87 | 1.98 | 1.73 | 1.7  |

Source: Field Survey, 2008-09

**Table 5.19: INCOME AND YIELD PER ACRE OF BORO PADDY**

SAMPLE VILLAGE -1

| Farm Size<br>(in Acres) | Receipts<br>(In Rs.) | Cost A<br>(In Rs.) | Cost B<br>(In Rs.) | Cost C<br>(In Rs.) | Farm<br>Income-A (in Rs.) | Farm<br>Income-B (in Rs.) | Farm<br>Income-C (in Rs.) | Yield Rate -A | Yield Rate-B | Yield Rate-C |
|-------------------------|----------------------|--------------------|--------------------|--------------------|---------------------------|---------------------------|---------------------------|---------------|--------------|--------------|
| 1                       | 2                    | 3                  | 4                  | 5                  | 6                         | 7                         | 8                         | 9             | 10           | 11           |
| Up to 2                 | 18336.06             | 7021.18            | 9206.97            | 9421.80            | 11314.88                  | 9129.09                   | 8914.26                   | 2.61          | 1.99         | 1.95         |
| 2-4                     | 18506.46             | 7701.14            | 9639.6             | 9864.52            | 10805.32                  | 8866.86                   | 8641.94                   | 2.40          | 1.92         | 1.88         |
| 4-6                     | 16500.12             | 8871.35            | 10383.95           | 10626.24           | 7628.77                   | 6116.17                   | 5873.88                   | 1.86          | 1.59         | 1.55         |
| Above 6                 | 16106.69             | 9488.18            | 10485.87           | 10730.54           | 6618.51                   | 5620.82                   | 5376.15                   | 1.70          | 1.54         | 1.50         |
| Total                   | 17715.67             | 7972.95            | 9777.53            | 10005.67           | 9742.72                   | 7938.14                   | 7710.0                    | 2.22          | 1.81         | 1.77         |

SAMPLE VILLAGE -2

|         |          |         |         |         |          |          |          |      |      |      |
|---------|----------|---------|---------|---------|----------|----------|----------|------|------|------|
| Up to 2 | 18909.24 | 6360.92 | 8805.36 | 9010.82 | 12548.32 | 10103.88 | 9898.42  | 2.97 | 2.15 | 2.10 |
| 2-4     | 18914.2  | 6553.2  | 8538.56 | 8737.79 | 12361.0  | 10375.64 | 10176.41 | 2.88 | 2.21 | 2.16 |
| 4-6     | 16983.66 | 7192.59 | 8714.53 | 8917.87 | 9791.07  | 8269.13  | 8065.79  | 2.36 | 1.95 | 1.90 |
| Above 6 | 16577.36 | 7658.82 | 8978.16 | 9187.65 | 8918.54  | 7599.2   | 7389.71  | 2.16 | 1.85 | 1.80 |
| Total   | 18092.08 | 6822.28 | 8701.21 | 8904.24 | 11269.8  | 9390.87  | 9187.84  | 2.65 | 2.08 | 2.03 |

TOTAL SAMPLE

|         |          |         |         |         |          |         |         |      |      |      |
|---------|----------|---------|---------|---------|----------|---------|---------|------|------|------|
| Up to 2 | 18639.25 | 6669.32 | 8991.92 | 9201.73 | 11969.93 | 9701.33 | 9437.52 | 2.79 | 2.07 | 2.03 |
| 2-4     | 18755.97 | 6998.65 | 8965.81 | 9175.01 | 11757.32 | 9790.16 | 9580.96 | 2.68 | 2.09 | 2.04 |
| 4-6     | 16812.33 | 7787.53 | 9306.03 | 9523.17 | 9024.8   | 7506.3  | 7289.16 | 2.16 | 1.81 | 1.76 |
| Above 6 | 16392.09 | 8291.64 | 9484.36 | 9705.66 | 8100.45  | 6907.73 | 6686.43 | 1.98 | 1.73 | 1.69 |
| Total   | 17941.05 | 7273.46 | 9122.56 | 9335.42 | 10667.59 | 8818.49 | 8605.63 | 2.47 | 1.97 | 1.92 |

Source: Field Survey, 2008-09

**Table 5.20: INCOME AND YIELD PER ACRE OF JUTE**

SAMPLE VILLAGE-1

| Farm Size<br>(in Acres) | Receipts<br>(in Rs.) | Cost-A<br>(in Rs.) | Cost-B<br>(in Rs.) | Cost-C<br>(in Rs.) | Farm<br>Income-A (in Rs.) | Farm<br>Income-B(in Rs.) | Farm<br>Income-C(in Rs.) | Yield Rate-A | Yield Rate-B | Yield Rate-C |
|-------------------------|----------------------|--------------------|--------------------|--------------------|---------------------------|--------------------------|--------------------------|--------------|--------------|--------------|
| 1                       | 2                    | 3                  | 4                  | 5                  | 6                         | 7                        | 8                        | 9            | 10           | 11           |
| Up to 2                 | 13410.57             | 5914.26            | 11674.26           | 11946.66           | 7496.31                   | 1736.31                  | 1463.91                  | 2.27         | 1.14         | 1.12         |
| 2-4                     | 14201.25             | 6143.5             | 11903.5            | 12181.25           | 8057.75                   | 2297.75                  | 2020.00                  | 2.31         | 1.19         | 1.17         |
| 4-6                     | 13822.96             | 8195.26            | 12057.92           | 12339.27           | 5627.7                    | 1765.04                  | 1483.69                  | 1.69         | 1.15         | 1.12         |
| Above 6                 | 13238                | 10136.94           | 12121.9            | 12404.74           | 3101.06                   | 1116.1                   | 833.26                   | 1.31         | 1.09         | 1.07         |
| Total                   | 13759.59             | 6975.89            | 11889.86           | 12167.29           | 6783.7                    | 1869.73                  | 1592.30                  | 1.97         | 1.16         | 1.13         |

SAMPLE VILLAGE -2

|         |          |         |          |          |         |         |         |      |      |      |
|---------|----------|---------|----------|----------|---------|---------|---------|------|------|------|
| Up to 2 | 14160.5  | 4922.58 | 10663.91 | 10912.73 | 9237.92 | 3496.59 | 3247.77 | 2.88 | 1.33 | 1.30 |
| 2-4     | 15144.23 | 5174.08 | 10911.41 | 11166.01 | 9970.15 | 4232.82 | 3978.22 | 2.93 | 1.39 | 1.36 |
| 4-6     | 14534.53 | 6975.48 | 11121.09 | 11380.58 | 7559.05 | 3413.44 | 3153.95 | 2.08 | 1.31 | 1.28 |
| Above 6 | 13933    | 9173.55 | 11153.55 | 11413.80 | 4759.45 | 2779.45 | 2519.20 | 1.52 | 1.25 | 1.22 |
| Total   | 14542.04 | 6654.33 | 11392.89 | 11658.72 | 7887.71 | 3149.15 | 2883.32 | 2.19 | 1.28 | 1.25 |

TOTAL SAMPLE

|         |          |         |          |          |         |         |         |      |      |      |
|---------|----------|---------|----------|----------|---------|---------|---------|------|------|------|
| Up to 2 | 13825.28 | 5365.85 | 11115.53 | 11374.89 | 8459.43 | 2709.75 | 2450.39 | 2.58 | 1.24 | 1.22 |
| 2-4     | 14739.95 | 5589.66 | 11336.71 | 11601.23 | 9150.29 | 3403.24 | 3138.72 | 2.64 | 1.30 | 1.27 |
| 4-6     | 14297.67 | 7381.48 | 11432.9  | 11699.67 | 6916.19 | 2864.77 | 2598.00 | 1.94 | 1.25 | 1.22 |
| Above 6 | 13691.9  | 9508.08 | 11489.8  | 11757.90 | 4183.82 | 2202.1  | 1934.00 | 1.44 | 1.19 | 1.16 |
| Total   | 14230.07 | 6782.54 | 11591.04 | 11861.50 | 7447.53 | 2639.03 | 2368.57 | 2.10 | 1.23 | 1.20 |

Source: Field Survey, 2008-09

**Table 5.21: INCOME AND YIELD PER ACRE OF AUS PADDY**

SAMPLE VILLAGE-1

| Farm Size<br>(in Acres) | Receipts<br>(in Rs.) | Cost-A<br>(in Rs.) | Cost-B<br>(in Rs.) | Cost-C<br>(in Rs.) | Farm<br>Income-A (in Rs.) | Farm<br>Income-B(in Rs.) | Farm<br>Income-C(in Rs.) | Yield Rate-A | Yield Rate-B | Yield Rate-C |
|-------------------------|----------------------|--------------------|--------------------|--------------------|---------------------------|--------------------------|--------------------------|--------------|--------------|--------------|
| 1                       | 2                    | 3                  | 4                  | 5                  | 6                         | 7                        | 8                        | 9            | 10           | 11           |
| Up to 2                 | 11730                | 5846.86            | 10046.86           | 10281.29           | 5883.14                   | 1683.14                  | 1448.71                  | 2.01         | 1.17         | 1.14         |
| 2-4                     | 10960                | 6522.4             | 10122.4            | 10358.59           | 4437.6                    | 837.6                    | 601.41                   | 1.68         | 1.08         | 1.06         |
| 4-6                     | 00                   | 00                 | 00                 | 0.00               | 00                        | 00                       | 0.00                     | 0.00         | 0.00         | 0.00         |
| Above 6                 | 00                   | 00                 | 00                 | 0.00               | 00                        | 00                       | 0.00                     | 0.00         | 0.00         | 0.00         |
| Total                   | 11422.46             | 6116.85            | 10077.21           | 10312.34           | 5305.61                   | 1345.25                  | 1110.12                  | 1.87         | 1.13         | 1.11         |

SAMPLE VILLAGE -2

|         |          |         |          |          |         |         |         |      |      |      |
|---------|----------|---------|----------|----------|---------|---------|---------|------|------|------|
| Up to 2 | 14280    | 4472.32 | 9872.32  | 10102.67 | 9807.68 | 4407.68 | 4177.33 | 3.19 | 1.45 | 1.41 |
| 2-4     | 13640.52 | 5759.44 | 10439.44 | 10683.03 | 7881.08 | 3201.08 | 2957.49 | 2.37 | 1.31 | 1.28 |
| 4-6     | 13202.04 | 7207.52 | 10632.3  | 10880.39 | 5994.52 | 2569.74 | 2321.65 | 1.83 | 1.24 | 1.21 |
| Above 6 | 00       | 00      | 00       | 0.00     | 00      | 00      | 0.00    | 0.00 | 0.00 | 0.00 |
| Total   | 13680.56 | 5901.9  | 10326.32 | 10567.27 | 7778.66 | 3354.24 | 3113.29 | 2.32 | 1.32 | 1.29 |

TOTAL SAMPLE

|         |          |         |          |          |         |         |         |      |      |      |
|---------|----------|---------|----------|----------|---------|---------|---------|------|------|------|
| Up to 2 | 13495.38 | 4895.25 | 9926.01  | 10157.62 | 8600.13 | 3569.37 | 3337.76 | 2.76 | 1.36 | 1.33 |
| 2-4     | 12927.5  | 5962.37 | 10355.09 | 10596.71 | 6965.13 | 2572.41 | 2330.79 | 2.17 | 1.25 | 1.22 |
| 4-6     | 13202.04 | 7207.52 | 10632.3  | 10880.39 | 5994.52 | 2569.74 | 2321.65 | 1.83 | 1.24 | 1.21 |
| Above 6 | 00       | 00      | 00       | 0.00     | 00      | 00      | 0.00    | 0.00 | 0.00 | 0.00 |
| Total   | 13233.77 | 5944.41 | 10277.01 | 10516.81 | 7289.36 | 2956.76 | 2716.96 | 2.23 | 1.29 | 1.26 |

Source: Field Survey, 2008-09

**Table 5.22: INCOME AND YIELD PER ACRE OF CABBAGE**

SAMPLE VILLAGE-1

| Farm Size<br>(in Acres) | Receipts<br>(in Rs.) | Cost-A<br>(in Rs.) | Cost-B<br>(in Rs.) | Cost-C<br>(in Rs.) | Farm<br>Income-A (in Rs.) | Farm<br>Income-B(in Rs.) | Farm<br>Income-C(in Rs.) | Yield Rate-A | Yield Rate-B | Yield Rate-C |
|-------------------------|----------------------|--------------------|--------------------|--------------------|---------------------------|--------------------------|--------------------------|--------------|--------------|--------------|
| 1                       | 2                    | 3                  | 4                  | 5                  | 6                         | 7                        | 8                        | 9            | 10           | 11           |
| Up to 2                 | 38350.5              | 14039.23           | 19521.77           | 19863.40           | 24311.27                  | 18828.73                 | 18487.10                 | 2.73         | 1.96         | 1.93         |
| 2-4                     | 41412.25             | 15711.64           | 20369.76           | 20726.23           | 25700.61                  | 21042.49                 | 20686.02                 | 2.64         | 2.03         | 2.00         |
| 4-6                     | 42154.26             | 18117.27           | 21362.63           | 21736.48           | 24036.99                  | 20791.63                 | 20417.78                 | 2.33         | 1.97         | 1.94         |
| Above 6                 | 00                   | 00                 | 00                 | 0.00               | 00                        | 00                       | 0.00                     | 00           | 00           | 00           |
| Total                   | 41548.89             | 16790.81           | 20794.24           | 21158.14           | 24758.08                  | 20754.65                 | 20390.75                 | 2.47         | 2.00         | 1.96         |

SAMPLE VILLAGE-2

|         |          |          |          |          |          |          |          |      |      |      |
|---------|----------|----------|----------|----------|----------|----------|----------|------|------|------|
| Up to 2 | 00       | 00       | 00       | 0.00     | 00       | 00       | 0.00     | 00   | 00   | 00   |
| 2-4     | 32088.52 | 12178.51 | 18427.05 | 18749.52 | 19910.01 | 13661.47 | 13339.00 | 2.63 | 1.74 | 1.71 |
| 4-6     | 34840.56 | 13896.03 | 19348.48 | 19687.08 | 20944.53 | 15492.08 | 15153.48 | 2.51 | 1.80 | 1.77 |
| Above 6 | 00       | 00       | 00       | 0.00     | 00       | 00       | 0.00     | 00   | 00   | 00   |
| Total   | 33884.89 | 13299.58 | 19028.47 | 19361.47 | 20585.31 | 14856.42 | 14523.42 | 2.55 | 1.78 | 1.75 |

TOTAL SAMPLE

|         |          |          |          |          |          |          |          |      |      |      |
|---------|----------|----------|----------|----------|----------|----------|----------|------|------|------|
| Up to 2 | 38350.5  | 14039.23 | 19521.77 | 19863.40 | 24311.27 | 18828.73 | 18487.10 | 2.73 | 1.96 | 1.93 |
| 2-4     | 38844.84 | 14738.73 | 19834.79 | 20181.90 | 24106.11 | 19010.05 | 18662.94 | 2.64 | 1.96 | 1.92 |
| 4-6     | 39477.21 | 16572.14 | 20625.37 | 20986.31 | 22905.07 | 18851.84 | 18490.90 | 2.38 | 1.91 | 1.88 |
| Above 6 | 00       | 00       | 00       | 0.00     | 00       | 00       | 0.00     | 00   | 00   | 00   |
| Total   | 39168.26 | 15706.33 | 20245.73 | 20600.03 | 23461.93 | 18922.53 | 18568.23 | 2.49 | 1.93 | 1.90 |

Source: Field Survey, 2008-09

**Table 5.23: INCOME AND YIELD PER ACRE OF CAULIFLOWER**

SAMPLE VILLAGE-1

| Farm Size<br>(in Acres) | Receipts<br>(in Rs.) | Cost-A<br>(in Rs.) | Cost-B<br>(in Rs.) | Cost-C<br>(in Rs.) | Farm<br>Income-A (in Rs.) | Farm<br>Income-B(in Rs.) | Farm<br>Income-C(in Rs.) | Yield Rate-A | Yield Rate-B | Yield Rate-C |
|-------------------------|----------------------|--------------------|--------------------|--------------------|---------------------------|--------------------------|--------------------------|--------------|--------------|--------------|
| 1                       | 2                    | 3                  | 4                  | 5                  | 6                         | 7                        | 8                        | 9            | 10           | 11           |
| Up to 2                 | 00                   | 00                 | 00                 | 00                 | 00                        | 00                       | 0.00                     | 0.00         | 0.00         | 0.00         |
| 2-4                     | 52848.58             | 24554.91           | 24554.91           | 24984.62           | 28293.67                  | 28293.67                 | 27863.96                 | 2.15         | 2.15         | 2.12         |
| 4-6                     | 48154.64             | 25566.98           | 25566.98           | 26014.40           | 22587.66                  | 22587.66                 | 22140.24                 | 1.88         | 1.88         | 1.85         |
| Above 6                 | 00                   | 00                 | 00                 | 0.00               | 00                        | 00                       | 0.00                     | 0.00         | 0.00         | 0.00         |
| Total                   | 49977.45             | 25173.93           | 25173.93           | 25614.47           | 24803.52                  | 24803.52                 | 24362.98                 | 1.99         | 1.99         | 1.95         |

SAMPLE VILLAGE-2

|         |          |          |          |          |          |          |          |      |      |      |
|---------|----------|----------|----------|----------|----------|----------|----------|------|------|------|
| Up to 2 | 00       | 00       | 00       | 0.00     | 00       | 00       | 0.00     | 0.00 | 0.00 | 0.00 |
| 2-4     | 42044.5  | 20886.07 | 20886.07 | 21251.58 | 21158.43 | 21158.43 | 20792.92 | 2.01 | 2.01 | 1.98 |
| 4-6     | 38540.26 | 21598.24 | 21598.24 | 21976.21 | 16942.02 | 16942.02 | 16564.05 | 1.78 | 1.78 | 1.75 |
| Above 6 | 00       | 00       | 00       | 0.00     | 00       | 00       | 0.00     | 0.00 | 0.00 | 0.00 |
| Total   | 39800.78 | 21342.06 | 21342.06 | 21715.55 | 18458.72 | 18458.72 | 18085.23 | 1.86 | 1.86 | 1.83 |

TOTAL SAMPLE

|         |          |          |          |          |          |          |          |      |      |      |
|---------|----------|----------|----------|----------|----------|----------|----------|------|------|------|
| Up to 2 | 00       | 00       | 00       | 0.00     | 00       | 00       | 0.00     | 0.00 | 0.00 | 0.00 |
| 2-4     | 48617.22 | 23118.01 | 23118.01 | 23522.58 | 25499.21 | 25499.21 | 25094.64 | 2.10 | 2.10 | 2.07 |
| 4-6     | 44105.68 | 23895.58 | 23895.58 | 24313.75 | 20210.1  | 20210.1  | 19791.93 | 1.85 | 1.85 | 1.81 |
| Above 6 | 00       | 00       | 00       | 0.00     | 00       | 00       | 0.00     | 0.00 | 0.00 | 0.00 |
| Total   | 45804.71 | 23602.74 | 23602.74 | 24015.79 | 22201.97 | 22201.97 | 21788.92 | 1.94 | 1.94 | 1.91 |

Source: Field Survey, 2008-09

- 5.5.2** We have seen that our second village enjoys some sort of infrastructural advantage in the course of its farming activities. A clear-cut reflection is revealed from the yield rates that have been calculated on the basis of different costs and farm incomes. Both in the gross and net concept of use of farm land the yield rates that have been enjoyed by our second village are consistently higher than the yield rates of our first village. Thus the outcome of a rupee invested in the farm activities is rather good in our second village as compared to first one. On the whole, the output-input ratio of our rural economy stands at 1.72 (yield rate-c).
- 5.5.3** If we compare this with the same yield rate that had been enjoyed by an another rural economy of the same district economy, then it reveals that the 23 years old yield still exceeds the existing one. The old yield rate was 2.11 (Kar, 1992). One can justify this yield difference by put forward the argument of high cost theorem that the farmers of the grass-root area economies have been suffering since after the period of green revolution mainly because if the inactiveness of the republic. This suffering has been aggravated further since the adoption of new economic policy at the beginning of the last decade of the last century. Another cause that also demands for interpretation is the existence of weak base of the output market particularly in the rural belt of any area economy. We have argued elsewhere about this painstaking output market infrastructure. It is our demand that the output market should be such that none one of our farmer remains in the market with his produce at the end of the market period. If only the above two conditions are being fulfilled then the existing yield rate will be many-fold even in the existing agricultural setup at the grass-root area.
- 5.5.4** As a whole, as one sees from these tables that the farmers of village -2 use their investible funds more efficiently as compared to the farmers of village -1. So the farms of village -2 are better managed farms than village-1. Another crystal clear interesting points comes from these Tables is that irrespective of all crops the farmers of relatively lower land groups use their investible funds more economically than the other farmers as revealed by the yield rates.

## 5.6 FARM SIZE AND PRODUCTIVITY

**5.6.1** In the preceding sections of this chapter we have tried to explain the relation between output and different inputs for each crop in a broad manner. In the analysis of agricultural activities in any area economy it is also convention to explain the relation between farm size and productivity. In this section we try to discuss the relation between farm size and productivity within the existing set up of our rural area economy. The relation between farm size and productivity in our grass-root rural area economy is not uniform. In case of Aman Paddy, Aus Paddy and Boro Paddy the said relation is negative but the relation is positive in case of potato, Jute, cabbage, etc. The main reasons are mainly three. **First**, the farmers having small size of holdings use the traditional inputs more intensively to produce the traditional crops but the farmers with higher size of farms are not interested very much in traditional crops and they concentrate themselves and hence preserve all traditional inputs for the production of potato, Jute and cabbage to earn more money income. **Second**, the agricultural activities in case of small farms mostly operated by home labour whereas hired labour is an integral part of agricultural activities in case of larger farms. The use of more home labour guarantees the agricultural activities more carefully. **Third**, the small farmers can't bear the huge cost for producing cash earning crops due to their poverty but the same is within the reach of the farmers having medium and large size of holdings. Moreover, the farmers having larger size of holdings are capable

**Table 5.24: SIZE- OUTPUT REGRESSION (LINEAR)**

| Crops        | Regression Co-efficient | R <sup>2</sup> | Level at which t is statistically significant |
|--------------|-------------------------|----------------|---|
| Total Output | + 260.89                | 0.668          | 18.2%   |
| Aman Paddy   | -454.36                 | 0.606          | 22.2%   |
| Potato       | +510.01                 | 0.939          | 15%   |
| Boro Paddy   | -503.55                 | 0.834          | 8.7%  |
| Jute         | +385.04                 | 0.585          | 23.5%   |
| Aus Paddy    | -73.36                  | 0.267          | 65.5%   |
| Cabbage      | +281.68                 | 0.995          | 4.5%  |
| Cauliflower  | -2255.77                | 0.990          | 5%  |

Source: Field Survey, 2008-09

of using proper irrigation water, which is very important for more cash earning crops, out of their own sources which are beyond the capacity of the farmers with

small size of holdings. One can see all these relations between farm size and output of different crops from tables 5.8 to 5.14. The results of the fitted linear regression between farm size and output for each crop is also shown in table 5.24 in support of our analysis.

**5.6.2** One interesting point revealed from our analysis is that in almost all crops the farm size "2-4 acres" is appeared as more productive in comparison to other farm sizes. This is mainly because of appropriate and careful utilization of fixed inputs and also of variable inputs like home labour, organic manures and irrigation water etc. by the farmers of this farm size. In case of smaller farm sizes the fixed inputs remain underutilized and the proper use of inorganic manures, insecticides and irrigation water for agricultural activities is beyond their reach due to acute poverty. Again the agricultural activity of larger farms mainly depends on hired labour and for these careful agricultural activities is not always possible. Besides, they can't maintain proper combination of organic and inorganic manures always due to acute shortage of organic manures. Thus the farm size "2-4 acres" has been regarded as the manageable and the most suitable farm size in our grass-root rural area economy for profitable agricultural activities within the existing set up.

## Chapter-6

### PRODUCTION FUNCTIONS

#### 6.1 INTRODUCTION

**6.1.1** There is no denying that any kind of study on grass-root rural area economy of our Indian type requires a threat bear analysis on each and every aspect of its economic activities. If we try to expose specially the agricultural scenario of an area economy then it is necessary to give importance on the analysis of production function along with the analysis of simple input-output analysis. In the preceding chapter we have discussed in detail the input-output responses on different crops that have been raised in the grass-root rural economy, rather in a simple way. In this chapter we use mathematical production functions to see how agricultural inputs have been responded to raise the level of agricultural production in each crop in a specialised manner. To do this we have used both the Linear and Log Linear production functions of the following types:

$Y_i = A + bX_i$  as linear form and

$\text{Log } Y = \text{Log } A + \alpha_1 \text{Log } X_1 + \alpha_2 \text{Log } X_2 + \dots$  as Log linear form

Here,  
Y = Dependent variable showing the production total as well as individual  
 $X_i$  = Inputs  
 $\alpha_i$  = Constants

**6.1.2** We have used total output for combined crops and total output for individual crops as dependent variables. The independent variables, we have used in our production functions are of following types:

VATD= Value of Total Depreciation

VAHOL= Value of Home Labour-days

VAHIL= Value of Hired Labour-days

VAS= Value of Seeds

VAORM = Value of Organic Manures

VAINM= Value of Inorganic Manures

VINS= Value of Insecticides

VAIR= Value of Irrigation

All the variables are measured in value terms and also in per acre.

**6.1.3** The estimation of the production functions reflect also the skill and knowledge of the farmers as well as the availability of infrastructural facilities including broad available services which have not been used as regressors. Given the quality of responses of the households, these factors are most important in considering the estimated production functions. The actual regression co-efficient which we obtain in the fitted production functions in no way points out to the absolute productivity of the respective inputs. We merely see how the villagers have reached to the type of setting in which they are placed. This setting includes their beings of underdeveloped state.

## **6.2 FITTED PRODUCTION FUNCTIONS**

**6.2.1** At the outset of this section we like to divulge the fact that for the use of mathematical production functions we have rather confined our study on 200 sample households taking 100 households from each sample village instead of 693 households. Selection of these 200 sample households has been done for mathematical study on input used and output raised in this sample economy on the basis of stratified sampling taking farm size as strata. Out of these 200 households 121 are farm households covering all the households. Again, out of these 121 farm households 58 farm households belong to Ichhamari village and the rest belong to Borokhata village. All the information use in the fitted production functions have been covered the agricultural year 2008-09.

**6.2.2** As we have explained in the previous sections of this chapter about the nature and extend of production function in detail, in this section we try to produce the quantitative aspect of the production functions of both linear and log-linear form that we have been used in this chapter. For unnecessary exaggeration we have not mentioned here the village-wise pictures in table forms but we have tried to, produce the information of individual villages regarding their input-output response in our write up. Tables 6.1 & 6.1(a) to 6.9 & 6.9(a) exhibit the information of the input output responses of this grass-root rural area economy.

**6.2.3** Tables representing linear and log-linear production functions show that all the regression co-efficient are not significant. This is obvious. But in a very simple approach we might say, and as has been seen in various grass-root studies, that if

one regression co-efficient is significant, the whole regression is significant. Though the fitting of the production functions (linear and log-linear) shown in tables 6.1 and 6.1(a) are not good enough, most regression co-efficient excepting VATD, VAHOL and VAS are positive. In all the fitted production functions the values of  $R^2$  are significant and the values of  $R^2$  are more than 0.9 in case of Boro paddy, Aus paddy and cauliflower (tables 6.6, 6.8 and 6.9). This is true also for their respective Cobb-Douglas production functions [tables 6.6(a), 6.8(a) & 6.9(a)].

**6.2.4** We can justify this good  $R^2$  values in this rural area economy just keeping into account of spreading up of infrastructural facilities and the wider use of irrigation facilities and that of the application of HYV seeds, chemical and organic fertilizers, pesticides and insecticides in a very significant manner. But this does not necessarily mean that there is no further scope for enhancing agricultural production in this area economy. The area economy still lacks infrastructural facilities such as storage and marketing networks. We can also say that not all the farmers are capable of using of conscious and calculated use of all the inputs. These will certainly hinder the prospect of the growth of the farm community and of the area economy in near future.

**6.2.5** The high negative co-efficient of seeds as revealed in table 6.1 and in table 6.1(a) is highly indicative of an absence of organised seed market for the farmers of the village to take benefit from. At the same time, it is equally important to point out here is that the required type of extension in respect of better seeds is not being provided by official development agency in the grass- roots.

**Table 6.1: LINEAR PRODUCTION FUNCTION  
FOR TOTAL OUTPUT (PER ACRE)**

| Variables | Regression Co-efficient | T with D. F.=120 |
|-----------|-------------------------|------------------|
| Constant  | 18158.255               | 3.911            |
| VATD      | -0.530                  | -.483            |
| VAHOL     | -0.101                  | -.116            |
| VAHIL     | 0.035                   | .054             |
| VAS       | -0.029                  | -.057            |
| VAORM     | 1.725                   | 2.682            |
| VAINM     | 1.097                   | .883             |
| VINS      | 2.389                   | 2.025            |
| VAIR      | 3.087                   | 2.901            |

$R^2 = 0.74$       D.W = 1.86

**Table 6.1(a): PRODUCTION FUNCTION OF COBB-DOUGLAS TYPE  
FOR TOTAL OUTPUT (PER ACRE)**

| Variables | Marginal Productivity | Regression Co-efficient | T with D.<br>F.=120 |
|-----------|-----------------------|-------------------------|---------------------|
| Constant  | 8.287                 | ----                    | 9.097               |
| VATD      | -.028                 | -.021                   | -.393               |
| VAHOL     | -.007                 | -.032                   | -.172               |
| VAHIL     | .014                  | .089                    | .368                |
| VAS       | -.007                 | -.013                   | -.142               |
| VAORM     | .126                  | .261                    | 2.026               |
| VAINM     | .039                  | .103                    | 1.069               |
| VINS      | .078                  | .265                    | 2.035               |
| VAIR      | .050                  | .348                    | 3.364               |

$R^2 = .723$       D.W = 1.79

**6.2.6** The low regression co-efficient of the home labour may point to the indifference or lack of skill of farmers home labour as the proper setting for farmers' have not been laid down in the local level economy here. Another reason behind this low regression coefficient of the home labour in the grass-root area economy probably is that the farmers of this depressed agricultural area are still lagging behind the process of proper estimation of opportunity cost of use of labour power mainly due to seasonal fluctuation of use of the labour power. Frankly speaking, most of the family labourers use their labour power in their family farm in a very less professional manner. The positive regression co-efficient in case of hired labour in the same periphery justifies that.

**6.2.7** On the other hand, consistently very good values of VINS for the total output as well as for the individual outputs permit us to say that insecticides have been used to deal with verities of hoppers that infested the total output and also for HYV paddy plants of the kharif season. Needless to say that they have contributed to the raising of the level of production of this area economy. Similarly, the most importantly productive inputs of organic manures and irrigation water have been found productive here also. The elasticity of production of these two inputs are also very impressive, as given in table 6.1(a). Particularly, the want of supply of organic manure is what table 6.1 reveals about organic manures.

**Table 6.2: LINEAR PRODUCTION FUNCTION  
FOR TOTAL OUTPUT (PER ACRE): VILLAGE-1**

| Variables | Regression Co-efficient | T with D. F.=57 |
|-----------|-------------------------|-----------------|
| Constant  | 867.548                 | .126            |
| VATD      | -0.199                  | -.125           |
| VAHOL     | 2.787                   | 2.251           |
| VAHIL     | 1.935                   | 2.014           |
| VAS       | 0.498                   | .475            |
| VAORM     | 1.562                   | 1.279           |
| VAINM     | 1.958                   | 1.048           |
| VINS      | 3.363                   | 2.126           |
| VAIR      | 4.881                   | 2.155           |

$R^2 = 0.77$  D.W= 2.018

**Table 6.2(a): PRODUCTION FUNCTION OF COBB-DOUGLAS TYPE  
FOR TOTAL OUTPUT (PER ACRE): VILLAGE-1**

| Variables | Marginal Productivity | Regression Co-efficient | T with D. F.=57 |
|-----------|-----------------------|-------------------------|-----------------|
| Constant  | 4.326                 | ---                     | 2.645           |
| VATD      | -.013                 | -.011                   | -.137           |
| VAHOL     | .158                  | .805                    | 2.704           |
| VAHIL     | .140                  | .801                    | 2.359           |
| VAS       | .139                  | .139                    | 1.207           |
| VAORM     | .107                  | .214                    | 1.070           |
| VAINM     | .053                  | .093                    | .936            |
| VINS      | .113                  | .415                    | 2.228           |
| VAIR      | .084                  | .151                    | 1.480           |

$R^2 = 0.77$  D.W= 2.06

**Table 6.3: LINEAR PRODUCTION FUNCTION  
FOR TOTAL OUTPUT (PER ACRE): VILLAGE-2**

| Variables | Regression Co-efficient | T with D. F.=62 |
|-----------|-------------------------|-----------------|
| Constant  | 36163.212               | 4.921           |
| VATD      | -1.428                  | -1.008          |
| VAHOL     | -2.836                  | -2.303          |
| VAHIL     | -1.221                  | -1.411          |
| VAS       | -0.807                  | -.880           |
| VAORM     | 0.271                   | .252            |
| VAINM     | 2.247                   | 1.195           |
| VINS      | 0.347                   | .191            |
| VAIR      | 2.235                   | .934            |

$R^2 = 0.61$  D.W= 2.068

**Table 6.3(a): PRODUCTION FUNCTION OF COBB-DOUGLAS TYPE FOR TOTAL OUTPUT (PER ACRE): VILLAGE-2**

| Variables | Marginal Productivity | Regression Co-efficient | T with D. F.=62 |
|-----------|-----------------------|-------------------------|-----------------|
| Constant  | 13.881                | ---                     | 7.945           |
| VATD      | -.061                 | -.058                   | -.684           |
| VAHOL     | -.291                 | -1.735                  | -3.341          |
| VAHIL     | -.093                 | -.830                   | -1.807          |
| VAS       | -.216                 | -.498                   | -2.105          |
| VAORM     | .046                  | .138                    | .541            |
| VAINM     | .092                  | .230                    | 1.950           |
| VINS      | .025                  | .100                    | .467            |
| VAIR      | .043                  | .121                    | 1.400           |

$R^2 = .64$       D.W = 2.08

**6.2.8** But what is interesting is that, within the sample area variation is being revealed in case of use of productive inputs among the sample villages. The low regression co-efficient of the home labour in sample village-2 further may point to the indifference or lack of skills of farmers' home labour as the proper setting for farmers have not been laid down in the local level economy. Again the low regression co-efficient of the hired labour permits us to draw the same conclusion just we have made in the preceding line. But what remains to say here, seeing the value of VAS, is that the farmers of our second village really suffer from the absence of organised seed market and at the same time fro official assistance.

**Table 6.4: LINEAR PRODUCTION FUNCTION FOR OUTPUT OF AMAN PADDY (PER ACRE): SAMPLE ECONOMY**

Dependent Variable = Total Output

| Variables | Regression Co-efficient | T with D. F.=120 |
|-----------|-------------------------|------------------|
| Constant  | 9250.114                | 3.557            |
| VATD      | 0.809                   | 1.045            |
| VAHOL     | 0.551                   | .863             |
| VAHIL     | -1.151                  | -1.967           |
| VAS       | 5.062                   | 1.554            |
| VAORM     | 1.187                   | 2.521            |
| VAINM     | 13.012                  | 4.243            |
| VINS      | 2.880                   | 1.784            |

$R^2 = 0.69$       D.W = 1.637

**Table 6.4(a): PRODUCTION FUNCTION OF COBB-DOUGLAS TYPE FOR OUTPUT OF AMAN PADDY (PER ACRE): SAMPLE ECONOMY**

**Dependent Variable = Total Output**

| Variables | Marginal Productivity | Regression Co-efficient | T with D. F.=120 |
|-----------|-----------------------|-------------------------|------------------|
| Constant  | 4.605                 | ----                    | 5.236            |
| VATD      | .083                  | .069                    | 1.082            |
| VAHOL     | .313                  | 1.027                   | 6.098            |
| VAHIL     | .045                  | .345                    | 1.743            |
| VAS       | .151                  | .209                    | 2.711            |
| VAORM     | .082                  | .147                    | 2.120            |
| VAINM     | .052                  | .111                    | 1.379            |
| VINS      | .015                  | .133                    | 1.134            |

$R^2=0.70$  D.W=1.54

**Table 6.5: LINEAR PRODUCTION FUNCTION FOR OUTPUT OF POTATO (PER ACRE): SAMPLE ECONOMY**

**Dependent Variable = Total Output**

| Variables | Regression Co-efficient | T with D. F.=52 |
|-----------|-------------------------|-----------------|
| Constant  | 33289.001               | 3.531           |
| VATD      | 2.687                   | 1.431           |
| VAHOL     | -1.014                  | -1.259          |
| VAHIL     | 0.303                   | .412            |
| VAS       | 0.796                   | .802            |
| VAORM     | -1.281                  | -1.697          |
| VAINM     | 1.086                   | .818            |
| VINS      | 3.004                   | 1.210           |
| VAIR      | 1.668                   | 1.352           |

$R^2=0.87$  D.W= 1.846

**Table 6.5(a): PRODUCTION FUNCTION OF COBB-DOUGLAS TYPE FOR OUTPUT OF POTATO (PER ACRE): SAMPLE ECONOMY**

**Dependent Variable = Total Output**

| Variables | Marginal Productivity | Regression Co-efficient | T with D. F.=52 |
|-----------|-----------------------|-------------------------|-----------------|
| Constant  | 8.792                 | ---                     | 5.357           |
| VATD      | .097                  | .158                    | 1.307           |
| VAHOL     | -.023                 | -.189                   | -.670           |
| VAHIL     | .106                  | .670                    | 1.738           |
| VAS       | .083                  | .052                    | .441            |
| VAORM     | -.165                 | -.303                   | -1.899          |
| VAINM     | .007                  | .018                    | .155            |
| VINS      | .120                  | .370                    | 1.419           |
| VAIR      | .026                  | .224                    | 1.547           |

$R^2=0.87$  D.W= 1.831

**Table 6.6: LINEAR PRODUCTION FUNCTION FOR OUTPUT OF BORO PADDY (PER ACRE): SAMPLE ECONOMY**

**Dependent Variable = Total Output**

| Variables | Regression Co-efficient | T with D. F.=33 |
|-----------|-------------------------|-----------------|
| Constant  | 20355.453               | 7.321           |
| VATD      | -1.773                  | -1.188          |
| VAHOL     | -0.292                  | -.808           |
| VAHIL     | -2.239                  | -5.568          |
| VAS       | -6.057                  | -.990           |
| VAORM     | 2.378                   | 3.835           |
| VAINM     | 2.080                   | 2.808           |
| VINS      | 1.426                   | 1.388           |
| VAIR      | 0.873                   | 4.422           |

$R^2 = 0.962$     D.W= 2.091

**Table 6.6(a): PRODUCTION FUNCTION OF COBB-DOUGLAS TYPE FOR OUTPUT OF BORO PADDY (PER ACRE): SAMPLE ECONOMY**

**Dependent Variable = Total Output**

| Variables | Marginal Productivity | Regression Co-efficient | T with D. F.=33 |
|-----------|-----------------------|-------------------------|-----------------|
| Constant  | 12.423                | ---                     | 8.214           |
| VATD      | -.248                 | -.136                   | -2.040          |
| VAHOL     | .017                  | .068                    | .294            |
| VAHIL     | -.159                 | -.808                   | -2.696          |
| VAS       | -.240                 | -.166                   | -1.834          |
| VAORM     | .089                  | .259                    | 2.300           |
| VAINM     | .088                  | .196                    | 1.929           |
| VINS      | .019                  | .023                    | .240            |
| VAIR      | .037                  | .254                    | 2.247           |

$R^2=0.94$     D.W= 2.1

**Table 6.7: LINEAR PRODUCTION FUNCTION FOR OUTPUT OF JUTE (PER ACRE): SAMPLE ECONOMY**

**Dependent Variable = Total Output**

| Variables | Regression Co-efficient | T with D. F.=37 |
|-----------|-------------------------|-----------------|
| Constant  | 14841.063               | 3.225           |
| VATD      | -1.670                  | -.786           |
| VAHOL     | -0.086                  | -.372           |
| VAHIL     | -0.011                  | -.051           |
| VAS       | -0.780                  | -.142           |
| VAORM     | 5.045                   | 3.803           |
| VAINM     | 1.388                   | .675            |
| VINS      | -2.327                  | -1.770          |

$R^2 = 0.67$     D.W= 2.108

**Table 6.7(a): PRODUCTION FUNCTION OF COBB-DOUGLAS TYPE FOR OUTPUT OF JUTE (PER ACRE): SAMPLE ECONOMY**

**Dependent Variable = Total Output**

| Variables | Marginal Productivity | Regression Co-efficient | T with D. F.=37 |
|-----------|-----------------------|-------------------------|-----------------|
| Constant  | 10.103                | ---                     | 4.375           |
| VATD      | -.210                 | -.112                   | -.748           |
| VAHOL     | -.009                 | -.068                   | -.218           |
| VAHIL     | .007                  | .061                    | .189            |
| VAS       | -.014                 | -.015                   | -.104           |
| VAORM     | .305                  | .705                    | 3.632           |
| VAINM     | .064                  | .079                    | .506            |
| VINS      | -.195                 | -.300                   | -2.000          |

$R^2 = 0.65$  D.W= 2.092

**Table 6.8: LINEAR PRODUCTION FUNCTION FOR OUTPUT OF AUS PADDY (PER ACRE): SAMPLE ECONOMY**

**Dependent Variable = Total Output**

| Variables | Regression Co-efficient | T with D. F.=25 |
|-----------|-------------------------|-----------------|
| Constant  | 7898.135                | 1.916           |
| VATD      | 1.470                   | .734            |
| VAHOL     | 0.090                   | .258            |
| VAHIL     | -0.406                  | -1.296          |
| VAS       | -3.072                  | -.389           |
| VAORM     | 1.525                   | 2.178           |
| VAINM     | 3.467                   | 1.483           |
| VINS      | 4.437                   | 1.388           |

$R^2 = 0.925$  D.W= 2.04

**Table 6.8(a): PRODUCTION FUNCTION OF COBB-DOUGLAS TYPE FOR OUTPUT OF AUS PADDY (PER ACRE): SAMPLE ECONOMY**

**Dependent Variable = Total Output**

| Variables | Marginal Productivity | Regression Co-efficient | T with D. F.=25 |
|-----------|-----------------------|-------------------------|-----------------|
| Constant  | 6.520                 | ---                     | 3.442           |
| VATD      | .173                  | .095                    | .873            |
| VAHOL     | .075                  | .136                    | .937            |
| VAHIL     | -.029                 | -.206                   | -1.094          |
| VAS       | -.124                 | -.064                   | -.723           |
| VAORM     | .110                  | .450                    | 2.777           |
| VAINM     | .061                  | .086                    | 1.000           |
| VINS      | .149                  | .249                    | 1.711           |

$R^2 = 0.94$  D.W = 2.063

**Table 6.9: LINEAR PRODUCTION FUNCTION  
FOR OUTPUT OF CAULIFLOWER (PER ACRE): SAMPLE ECONOMY  
Dependent Variable = Total Output**

| Variables | Regression Co-efficient | T with D. F.=24 |
|-----------|-------------------------|-----------------|
| Constant  | 48074.820               | 1.306           |
| VATD      | -3.864                  | -.508           |
| VAHOL     | 4.806                   | .950            |
| VAHIL     | 3.913                   | 1.601           |
| VAS       | -10.112                 | -.923           |
| VAORM     | -2.837                  | -1.109          |
| VAINM     | 0.419                   | .072            |
| VINS      | -7.985                  | -2.592          |
| VAIR      | 12.166                  | 2.510           |

$R^2 = 0.915$        $D.W = 1.490$

**Table 6.9(a): PRODUCTION FUNCTION OF COBB-DOUGLAS TYPE  
FOR OUTPUT OF CAULIFLOWER (PER ACRE): SAMPLE ECONOMY  
Dependent Variable = Total Output**

| Variables | Marginal Productivity | Regression Co-efficient | T with D. F.=24 |
|-----------|-----------------------|-------------------------|-----------------|
| Constant  | 15.546                | ---                     | 2.015           |
| VATD      | -.045                 | -.014                   | -.138           |
| VAHOL     | .028                  | .021                    | .047            |
| VAHIL     | .032                  | .110                    | .162            |
| VAS       | -.281                 | -.084                   | -1.044          |
| VAORM     | -.225                 | -.095                   | -.817           |
| VAINM     | -.689                 | -.592                   | -2.844          |
| VINS      | .414                  | 1.316                   | 2.603           |
| VAIR      | .190                  | .114                    | .432            |

$R^2 = 0.907$        $D.W = 1.244$

**6.2.9** There is a common finding in all grass-root economies of good rainfall area that the marginal productivity of organic manure is positive. In our present study the same finding has been seen in case of total output and other individual outputs except potato and cauliflower. The negative marginal productivities of organic manures in raising potato and cauliflower arise mainly due to the lack of development of proper organic base and on the other hand due to the ignorance of the farmer about use of the proper organic-inorganic mix in the production process.

## Chapter 7

### FARM EFFICIENCY

#### 7.1 INTRODUCTION

**7.1.1** In our fifth chapter we have given a detail account of input use and output raised in our sample economy in a very simple manner. In that chapter we have used the concepts like output-input ratio, home labour co-efficient, various yield rates, farm-size productivity, etc. to measure input use efficiency in a very crude aggregate manner. In the sixth chapter we have used both the Linear and Log-linear regression functions to clarify the input responses on output of total as well as individual crops. Both the attempts are in aggregative in nature and they did not provide any information about the farm efficiency at individual level. In this chapter we like to test the farm efficiency at individual level by using the **Data Envelopment Analysis (DEA) Technique**, occasionally called the **Frontier Analysis**.

**7.1.2** It is, in order in analyzing relative efficiency, to mention the names of the authors like Debreu (1951), Koopmans (1951) and Farrell (1957, models for evaluating productivity) who for the first time understood and elaborated the concept of relative efficiency. However, as a mathematical programming DEA technique, although based on earlier work of Ferrell, has been used by the researchers in a number of fields since its inception in the year 1978 by Charnes , Cooper and Rhodes (CCR) ) and further generalized by Banker, Charnes, and Cooper (BCC) (1984). It is an important non-parametric method of evaluation. Using a sample of actually observed input-output data, it derives a benchmark output quantity with which the actual output of an individual firm can be compared for efficiency measurement. In their originating article Charnes, Cooper and Rhodes (CCR) described DEA as a “mathematical programming model applied to observational data (that) provides a new way of obtaining empirical estimates of relations- such as the production functions and/or efficient production possibility surfaces- that are cornerstones of modern economics”. DEA is a methodology directed to frontiers rather than central tendencies as in the case of regression.

**7.1.3** To test the relative efficiency of the farms of our sample villages we have made some modifications according to our object and according to our data. We have also made some assumptions to justify our findings. They are:

- the farmers will use their land throughout the agricultural year;
- they will produce three crops viz. Aman paddy, Potato and Boro paddy;
- existing technology mix will be used in the production process;
- there will be no input market and output market constraints;
- agricultural crop year should be a normal crop year;
- agricultural production will be indifferent of size of the farms;
- farms that will produce three above mentioned crops be termed as objective farms.
- farms are relatively efficient when they are able to use the appropriate combinations of different inputs for producing the required amount of output.

**7.1.4** There are 33 farms out of 121 farms that have successfully raised three crops namely Aman paddy, Potato and Boro paddy during the last agricultural year. Thus according to our apparent measure these 33 farms are objective farms. Now we are in a position to make a comparative performance assessment among the farms by using the DEA technique. Under this technique each of the 33 farms are regarded as the 33 Decision Making Units (DMUs) and we measure the relative efficiency of each DMU within the sample. In order to calculate the efficiency of a particular DMU we have used mathematical programming techniques to determine the relative value of the various outputs and inputs that maximizes a specific DMU's efficiency score with the assumption that a particular DMU may utilize any combination of inputs and outputs in order to maximize its own efficiency score subject to the constraint that all other DMU's efficiency scores using the particular DMU's weights are less than or equal to one. It is important to note that DEA models produce only relative efficiency scores in comparison to all other DMUs

## **7.2 EFFICIENT AND INEFFICIENT FARMS IN USING INPUT COMBINATIONS**

**7.2.1** According to our measure, a DMU is said to be relatively efficient when it is able to use the appropriate combination of different inputs for raising the required level

of output of a particular crop and its efficiency score will be 1. It simply means that the input combinations are properly utilized to raise the required level of output by that particular DMU. Thus in case of efficient DMUs, the differences between the amount of input actually used (**Score Data**) and the required amount (**Projection**) will be zero for all the inputs. On the other hand, the inefficient DMUs are those who fail to use their input combinations appropriately in raising the required level of output and the efficiency scores for them will be less than 1. For the relatively inefficient DMUs, the differences between the score data and projected data for all/some inputs will be either positive or negative. In this way we have measured farm's relative efficiency for the above mentioned crops.

**Table 7.1: INPUT USE EFFICIENCY**

| Crops      | Total DMUs | Efficient DMUs |            | Inefficient DMUs |            |
|------------|------------|----------------|------------|------------------|------------|
|            |            | Number         | Percentage | Number           | Percentage |
| Aman Paddy | 33         | 21             | 63.6       | 12               | 36.4       |
| Potato     | 33         | 18             | 54.5       | 15               | 45.5       |
| Boro Paddy | 33         | 26             | 78.8       | 07               | 21.2       |

**7.2.2** Apparently one can have an idea about the DMU's relative efficiency and inefficiency from table 7.1. It appears from this table that DMUs of this area economy are mostly efficient in Boro paddy production. On the other hand, DMUs are least efficient in the production of potato. We have taken the farm data for a particular agricultural year. This kind of cross-sectional data often tempered by the input and output market shocks. Normally, the farmers of this grass-root area are very much efficient in potato production. This relative inefficiency may be due to the so called Cob-Web that exists in the agricultural price-output conjecture. Another important cause of this type of relative inefficiency in case of potato production is the unavailability of good quality seeds in this grass-root economy. Again, in case of Aman Paddy the farmers of this region are efficient by tradition as it is the main agricultural crop of this region.

### 7.3 EFFICIENCY SCORES AND RANKS OF THE DMUs FOR DIFFERENT CROPS

7.3.1 We have an opportunity to exhibit the efficient DMUs according to their ranks in case of Aman paddy. We ranked the DMUs in bottom-top approach. So the DMU named as  $V_1$  is relatively lower farm in our farm ranking. According to our programming result, the 30<sup>th</sup> DMU has been appeared as the most efficient DMU in case of Aman paddy production. Although we have chosen the DMUs haphazardly among the farms, but what remains to say is that the DMUs of the relatively lower land Group are most efficient as they occupied the ranks 2<sup>nd</sup> to 8<sup>th</sup> in the ranking table. On the other hand, ranking of the inefficient DMUs is given in table 7.3. In comparison of tables 7.2 and 7.3 we can simply say that the relatively smaller farms are efficient and relatively bigger farms are inefficient in this sample economy.

**Table 7.2: EFFICIENT DMUs BY RANKS (AMAN PADDY)**

| Rank                  | DMU      | Score |
|-----------------------|----------|-------|
| 1 (1 <sup>st</sup> )  | $V_{30}$ | 1     |
| 1 (2 <sup>nd</sup> )  | $V_1$    | 1     |
| 1 (3 <sup>rd</sup> )  | $V_2$    | 1     |
| 1 (4 <sup>th</sup> )  | $V_3$    | 1     |
| 1 (5 <sup>th</sup> )  | $V_4$    | 1     |
| 1 (6 <sup>th</sup> )  | $V_5$    | 1     |
| 1 (7 <sup>th</sup> )  | $V_6$    | 1     |
| 1 (8 <sup>th</sup> )  | $V_7$    | 1     |
| 1 (9 <sup>th</sup> )  | $V_{25}$ | 1     |
| 1 (10 <sup>th</sup> ) | $V_{21}$ | 1     |
| 1 (11 <sup>th</sup> ) | $V_{10}$ | 1     |
| 1 (12 <sup>th</sup> ) | $V_{11}$ | 1     |
| 1 (13 <sup>th</sup> ) | $V_{20}$ | 1     |
| 1 (14 <sup>th</sup> ) | $V_{13}$ | 1     |
| 1 (15 <sup>th</sup> ) | $V_{14}$ | 1     |
| 1 (16 <sup>th</sup> ) | $V_{19}$ | 1     |
| 1 (17 <sup>th</sup> ) | $V_{16}$ | 1     |
| 1 (18 <sup>th</sup> ) | $V_{17}$ | 1     |
| 1 (19 <sup>th</sup> ) | $V_{24}$ | 1     |
| 1 (20 <sup>th</sup> ) | $V_{33}$ | 1     |
| 1 (21 <sup>st</sup> ) | $V_{32}$ | 1     |

**Table 7.3: INEFFICIENT DMUs BY RANKS (AMAN PADDY)**

| Rank | DMU             | Score    |
|------|-----------------|----------|
| 22   | V <sub>15</sub> | 0.998358 |
| 23   | V <sub>22</sub> | 0.998045 |
| 24   | V <sub>9</sub>  | 0.99534  |
| 25   | V <sub>28</sub> | 0.990175 |
| 26   | V <sub>12</sub> | 0.985795 |
| 27   | V <sub>26</sub> | 0.984847 |
| 28   | V <sub>31</sub> | 0.974961 |
| 29   | V <sub>18</sub> | 0.967736 |
| 30   | V <sub>8</sub>  | 0.963531 |
| 31   | V <sub>29</sub> | 0.952446 |
| 32   | V <sub>27</sub> | 0.93982  |
| 33   | V <sub>23</sub> | 0.909862 |

7.3.2. We have also constructed table 7.4 where the reasons of inefficiency are self explanatory. But what remains to say is that out of 12 inefficient DMUs, 5 DMUs can be converted into efficient DMUs if these DMUs can use their home labour, organic manure and insecticides in a little bit efficient manner. If this is so then the number of relatively efficient DMUs becomes 26 out of 33 DMUs. Thus the manner of management of inputs at this grass-root level economy appears as an important factor subject to the fulfillment of other assumptions.

**Table 7.4: INEFFICIENT DMUs WITH REASONS (AMAN PADDY)**

| DMU             | Score | Excess DEP<br>S-(1) | Excess HOMLA<br>S-(2) | Excess HILA<br>S-(3) | Excess SEE<br>S-(4) | Excess ORGM<br>S-(5) | Excess INORGM<br>S-(6) | Excess INSEC<br>S-(7) |
|-----------------|-------|---------------------|-----------------------|----------------------|---------------------|----------------------|------------------------|-----------------------|
| V <sub>8</sub>  | 0.963 | 0                   | 0                     | 0                    | 0                   | 0                    | 3.669                  | 19.252                |
| V <sub>9</sub>  | 0.995 | 85.196              | 105.057               | 0                    | 17.740              | 0                    | 21.558                 | 41.545                |
| V <sub>12</sub> | 0.985 | 8.621               | 55.911                | 19.315               | 0                   | 0                    | 0                      | 1.402                 |
| V <sub>15</sub> | 0.999 | 0                   | 0                     | 0                    | 0                   | 31.583               | 0                      | 32.423                |
| V <sub>18</sub> | 0.967 | 0                   | 0                     | 112.200              | 7.421               | 116.744              | 9.137                  | 76.847                |
| V <sub>22</sub> | 0.998 | 0                   | 118.014               | 8.553                | 0                   | 0                    | 0                      | 35.516                |
| V <sub>23</sub> | 0.909 | 157.406             | 0                     | 0                    | 13.901              | 0                    | 0                      | 68.129                |
| V <sub>26</sub> | 0.984 | 15.962              | 0                     | 0                    | 12.862              | 0                    | 11.235                 | 39.277                |
| V <sub>27</sub> | 0.939 | 77.778              | 0                     | 90.449               | 0                   | 168.367              | 0                      | 33.245                |
| V <sub>28</sub> | 0.990 | 0                   | 0                     | 0                    | 0                   | 33.712               | 0                      | 57.870                |
| V <sub>29</sub> | 0.952 | 0                   | 0                     | 284.198              | 0                   | 203.367              | 0                      | 61.855                |
| V <sub>31</sub> | 0.974 | 0                   | 0                     | 47.865               | 0                   | 17.173               | 0                      | 19.758                |

**7.3.3** It will be in order if we consider the relative efficiency of the DMUs in case of potato production, the second crop of our efficiency parameter. Here, what we have seen in case of Aman paddy, we have obtained a rather opposite picture of DMU efficiency. In case of potato production, the DMUs of the relatively higher land group rank in a better position in comparison to the DMUs of the lower land holding group. This has become possible simply due to their relatively higher educational knowledge and economic capacity of providing the good quality inputs in time. However, four DMUs of the land group “up to 2 Acres” and four DMUs of the middle land group have succeeded to register themselves in efficiency table. Our special studies of farms reveal that out of these 8 DMUs, the owners of 5 DMUs are engaged in service, the owners 2 DMUs are engaged in business and have their own deep tube-wells for irrigation. So, the tale of success of these DMUs is remaining the same.

**Table 7.5: EFFICIENT DMUs BY RANKS (POTATO)**

| Rank                  | DMU             | Score |
|-----------------------|-----------------|-------|
| 1 (1 <sup>st</sup> )  | V <sub>33</sub> | 1     |
| 1 (2 <sup>nd</sup> )  | V <sub>32</sub> | 1     |
| 1 (3 <sup>rd</sup> )  | V <sub>31</sub> | 1     |
| 1 (4 <sup>th</sup> )  | V <sub>3</sub>  | 1     |
| 1 (5 <sup>th</sup> )  | V <sub>30</sub> | 1     |
| 1 (6 <sup>th</sup> )  | V <sub>28</sub> | 1     |
| 1 (7 <sup>th</sup> )  | V <sub>6</sub>  | 1     |
| 1 (8 <sup>th</sup> )  | V <sub>7</sub>  | 1     |
| 1 (9 <sup>th</sup> )  | V <sub>24</sub> | 1     |
| 1 (10 <sup>th</sup> ) | V <sub>9</sub>  | 1     |
| 1 (11 <sup>th</sup> ) | V <sub>10</sub> | 1     |
| 1 (12 <sup>th</sup> ) | V <sub>11</sub> | 1     |
| 1 (13 <sup>th</sup> ) | V <sub>23</sub> | 1     |
| 1 (14 <sup>th</sup> ) | V <sub>22</sub> | 1     |
| 1 (15 <sup>th</sup> ) | V <sub>26</sub> | 1     |
| 1 (16 <sup>th</sup> ) | V <sub>27</sub> | 1     |
| 1 (17 <sup>th</sup> ) | V <sub>29</sub> | 1     |
| 1 (18 <sup>th</sup> ) | V <sub>13</sub> | 1     |

**TABLE 7.6: INEFFICIENT DMUs BY RANKS (POTATO)**

| Rank | DMU             | Score    |
|------|-----------------|----------|
| 19   | V <sub>5</sub>  | 0.997517 |
| 20   | V <sub>14</sub> | 0.996106 |
| 21   | V <sub>8</sub>  | 0.992154 |
| 22   | V <sub>1</sub>  | 0.986051 |
| 23   | V <sub>2</sub>  | 0.985333 |
| 24   | V <sub>4</sub>  | 0.984336 |
| 25   | V <sub>17</sub> | 0.981542 |
| 26   | V <sub>20</sub> | 0.980515 |
| 27   | V <sub>25</sub> | 0.978133 |
| 28   | V <sub>15</sub> | 0.968134 |
| 29   | V <sub>21</sub> | 0.965826 |
| 30   | V <sub>16</sub> | 0.965151 |
| 31   | V <sub>12</sub> | 0.964509 |
| 32   | V <sub>18</sub> | 0.96114  |
| 33   | V <sub>19</sub> | 0.958373 |

**Table 7.7: INEFFICIENT DMUs WITH REASONS (POTATO)**

| DMU             | Score | Excess       | Excess          | Excess         | Excess       | Excess        | Excess          | Excess         | Excess          |
|-----------------|-------|--------------|-----------------|----------------|--------------|---------------|-----------------|----------------|-----------------|
|                 |       | DEP<br>S-(1) | HOM LA<br>S-(2) | HI LA<br>S-(3) | SEE<br>S-(4) | ORGM<br>S-(5) | INORGM<br>S-(6) | INSEC<br>S-(7) | IRRGWA<br>S-(8) |
| V <sub>1</sub>  | 0.986 | 0            | 3.292           | 40.065         | 0            | 0             | 199.724         | 44.462         | 253.187         |
| V <sub>2</sub>  | 0.985 | 0            | 242.337         | 0              | 0            | 86.482        | 112.303         | 0              | 164.035         |
| V <sub>4</sub>  | 0.984 | 0            | 0               | 0              | 122.242      | 0             | 58.026          | 49.132         | 219.841         |
| V <sub>5</sub>  | 0.997 | 22.302       | 6.739           | 0              | 0            | 0             | 40.063          | 59.864         | 0.387           |
| V <sub>8</sub>  | 0.992 | 90.783       | 64.094          | 0              | 181.072      | 83.362        | 91.587          | 0              | 11.904          |
| V <sub>12</sub> | 0.964 | 4.833        | 104.075         | 0              | 0            | 230.763       | 56.542          | 58.861         | 217.051         |
| V <sub>14</sub> | 0.996 | 0            | 538.084         | 0              | 114.091      | 0             | 47.691          | 67.412         | 282.675         |
| V <sub>15</sub> | 0.968 | 5.325        | 96.491          | 0              | 95.866       | 363.966       | 66.721          | 30.226         | 0               |
| V <sub>16</sub> | 0.965 | 0            | 71.979          | 0              | 94.853       | 201.965       | 37.670          | 11.625         | 0               |
| V <sub>17</sub> | 0.982 | 38.172       | 101.739         | 0              | 0            | 274.059       | 93.471          | 36.095         | 0               |
| V <sub>18</sub> | 0.961 | 0            | 214.051         | 0              | 50.105       | 119.505       | 47.177          | 0              | 0               |
| V <sub>19</sub> | 0.958 | 33.363       | 127.256         | 0              | 0            | 377.361       | 0               | 32.223         | 0               |
| V <sub>20</sub> | 0.981 | 0            | 343.626         | 0              | 105.155      | 127.029       | 1.345           | 0              | 0               |
| V <sub>21</sub> | 0.965 | 0.841        | 17.398          | 0              | 0            | 217.520       | 81.816          | 21.232         | 0               |
| V <sub>25</sub> | 0.978 | 10.709       | 0               | 107.935        | 105.052      | 141.699       | 90.319          | 37.479         | 5.182           |

**7.3.4** One notices from table 7.6 that in case of raising potato the DMUs of the middle land group are mostly inefficient because they have failed to use the two most inexpensive inputs namely home labour and organic manure wisely in comparison to other DMUs. In an overall inspection it is apparently clear that all most all the DMUs in case of potato production used their home labour callously. One reason that might be justified this callous composition of input use is the absent of other competitive crops that would be raised in the same agricultural monsoon. One may also in temptation put forward the argument of lower opportunity cost of home labour.

**7.3.5** One important point we like to mention here is that when at the time of investigation of completion of M. Phil Dissertation the investigator of this research enterprise accounted the existence of tobacco production in these two sample villages during the late 80s of the last century. But in the course of time and in the course of revisit the villages for Ph. D. Thesis the investigator surprisingly observes the absence of tobacco production and instead of tobacco the farmers of these sample villages have been inclined in the production of Boro paddy. This kind of shifting no doubt exhibits the positive outlook of the DMUs as of the illusory advantage of tobacco production ( Sarkar and Kar, 1990).

**7.3.6** Thus it will be interesting if we concentrate our looking in the relative efficiency of the DMUs in Boro paddy production. This is given in table 7.8. What we have noted in the preceding paragraph that can be justified through this table. Here out of 33 DMUs, 26 DMUs have been appeared as relatively efficient DMUs. But what is important to note here is that irrespective of farm size the DMUs are efficient in raising the Boro paddy in this area economy. This outcome, in a large extent can express the reason of disappearance of tobacco cultivation in this area economy.

**TABLE 7.8: EFFICIENT DMUs BY RANKS (BORO PADDY)**

| Rank                  | DMU             | Score |
|-----------------------|-----------------|-------|
| 1 (1 <sup>st</sup> )  | V <sub>33</sub> | 1     |
| 1 (2 <sup>nd</sup> )  | V <sub>1</sub>  | 1     |
| 1 (3 <sup>rd</sup> )  | V <sub>2</sub>  | 1     |
| 1 (4 <sup>th</sup> )  | V <sub>3</sub>  | 1     |
| 1 (5 <sup>th</sup> )  | V <sub>32</sub> | 1     |
| 1 (6 <sup>th</sup> )  | V <sub>5</sub>  | 1     |
| 1 (7 <sup>th</sup> )  | V <sub>31</sub> | 1     |
| 1 (8 <sup>th</sup> )  | V <sub>7</sub>  | 1     |
| 1 (9 <sup>th</sup> )  | V <sub>8</sub>  | 1     |
| 1 (10 <sup>th</sup> ) | V <sub>9</sub>  | 1     |
| 1 (11 <sup>th</sup> ) | V <sub>10</sub> | 1     |
| 1 (12 <sup>th</sup> ) | V <sub>11</sub> | 1     |
| 1 (13 <sup>th</sup> ) | V <sub>12</sub> | 1     |
| 1 (14 <sup>th</sup> ) | V <sub>13</sub> | 1     |
| 1 (15 <sup>th</sup> ) | V <sub>14</sub> | 1     |
| 1 (16 <sup>th</sup> ) | V <sub>30</sub> | 1     |
| 1 (17 <sup>th</sup> ) | V <sub>16</sub> | 1     |
| 1 (18 <sup>th</sup> ) | V <sub>28</sub> | 1     |
| 1 (19 <sup>th</sup> ) | V <sub>18</sub> | 1     |
| 1 (20 <sup>th</sup> ) | V <sub>19</sub> | 1     |
| 1 (21 <sup>st</sup> ) | V <sub>20</sub> | 1     |
| 1 (22 <sup>nd</sup> ) | V <sub>21</sub> | 1     |
| 1 (23 <sup>rd</sup> ) | V <sub>22</sub> | 1     |
| 1 (24 <sup>th</sup> ) | V <sub>23</sub> | 1     |
| 1 (25 <sup>th</sup> ) | V <sub>26</sub> | 1     |
| 1 (26 <sup>th</sup> ) | V <sub>25</sub> | 1     |

**Table 7.9: INEFFICIENT DMUs BY RANKS (BORO PADDY)**

| Rank | DMU             | Score    |
|------|-----------------|----------|
| 27   | V <sub>27</sub> | 0.997531 |
| 28   | V <sub>4</sub>  | 0.996607 |
| 29   | V <sub>6</sub>  | 0.984669 |
| 30   | V <sub>15</sub> | 0.978445 |
| 31   | V <sub>29</sub> | 0.976736 |
| 32   | V <sub>17</sub> | 0.974601 |
| 33   | V <sub>24</sub> | 0.967014 |

**Table 7.10: INEFFICIENT DMUs WITH REASONS (BORO PADDY)**

| DMU             | Score | Excess<br>DEP<br>S-(1) | Excess<br>HOMLA<br>S-(2) | Excess<br>HI LA<br>S-(3) | Excess<br>SEE<br>S-(4) | Excess<br>ORGM<br>S-(5) | Excess<br>INORGM<br>S-(6) | Excess<br>INSEC<br>S-(7) | Excess<br>IRRGWA<br>S-(8) |
|-----------------|-------|------------------------|--------------------------|--------------------------|------------------------|-------------------------|---------------------------|--------------------------|---------------------------|
| V <sub>4</sub>  | 0.996 | 0                      | 34.662                   | 0                        | 7.897                  | 0                       | 5.219                     | 17.661                   | 26.084                    |
| V <sub>6</sub>  | 0.984 | 0                      | 0                        | 24.170                   | 14.105                 | 0                       | 0                         | 0                        | 0                         |
| V <sub>15</sub> | 0.978 | 83.637                 | 29.097                   | 66.156                   | 0                      | 0                       | 6.935                     | 8.241                    | 0                         |
| V <sub>17</sub> | 0.974 | 0                      | 0                        | 76.046                   | 18.764                 | 0                       | 0                         | 0                        | 0                         |
| V <sub>24</sub> | 0.967 | 0                      | 0                        | 152.468                  | 1.887                  | 0                       | 0                         | 11.643                   | 89.962                    |
| V <sub>27</sub> | 0.997 | 55.274                 | 0                        | 55.893                   | 7.399                  | 26.799                  | 0                         | 49.621                   | 1.596                     |
| V <sub>29</sub> | 0.976 | 51.423                 | 0                        | 32.607                   | 0                      | 0                       | 0                         | 6.842                    | 0                         |

**7.3.7** The vertical size of the inefficient table bearing No. 7.9 tells us the tale of Boro paddy production in a very significant manner. If we have a look on the same table then we see that out of 7 inefficient DMUs, three DMUs can be converted into efficient DMUs just a little bit wise use of inputs as revealed from table 7.10.

**7.3.8** The most interesting point to be mentioned here is that there are some common DMUs in different land groups (V<sub>3</sub>, V<sub>7</sub> in the land group “up to 2 Acres”; V<sub>10</sub>, V<sub>11</sub>, V<sub>13</sub> in the land group “2-4 Acres” and V<sub>30</sub>, V<sub>31</sub>, V<sub>32</sub>, V<sub>33</sub> in the land group “4 + Acres”) which are equally efficient in producing all these three crops in comparison to other DMUs in our sample economy. Our observation during the field survey reveals that the farmers of these common efficient DMUs possess the required minimum educational and technical knowledge for agricultural activities and they have the capacity of using good quality inputs required for a particular crop in time. Thus to make this grass-root economy efficient in all agricultural activities, particularly in case of Ravi Crops, the Official Agencies at the Block or District level should arrange proper seasonal training with the farmers regarding better and appropriate input combinations and at the same time easy and cheap credit facility should be extended to them.

## Chapter 8

### EXTENT OF USE OF LAND AND LABOUR

#### 8.1 INTRODUCTION

8.1.1 The basic problem of any agro-based area economy is the problem of existence of chronic underemployment rather than unemployment. We see elsewhere in our several studies that a remarkable portion of our rural employable labour force, with a positive attitude to work, is not in a position to use their labour power intensively throughout the agricultural year (Kar 1993). We have also observed that a large proportion of gainfully employed adults remain unemployed in some seasons of the agricultural year, while at the same time we have also observed that there is an acute shortage of labour in the periods of peak agricultural activities in a complete crop year. This type of dichotomy motivates some sort of migration of adult labour force from our area economy to the area economy of the other state in our country. We have seen that a considerable amount of employable adults who left their birthplace just to find gainful employment in other states like Delhi, Karnataka and Punjab and have returned to their homestead after spending some periods with a bitter work experience. But they again try to get ready to go to those places as because they have failed to find any productive job at their own places of residence throughout the year. This tradition is going on since the late 1980s with a tragedian fact that the same decade had been experienced some sort of better growth rate as compared to the other decades of our national planning era.

8.1.2 There is no denying the fact that during the last decades of our national planning era India has appeared as or has thrown off portents to appear as a major agricultural power of the World. But what is unfortunate is that after knowing efficiently the production know-how we have still confined ourselves only to some selected regions of our country in raising of the agricultural products. We have already spent a lot of money for the development of this sector in the different planning periods but the ground reality is rather half hearted. As in the case of agriculture, so in the case of employment, our Government has already spent huge amount of money for the eradication of unemployment and underemployment through the various schemes since the publication of the report

of Bhagawati Committee in the year 1973, but these high ambitious schemes ended to some extent at to frustration and became the matter of theoretical jugglery among the academicians and political stalwarts. Our area economy is not remained outside of the fold of failure that we try to exhibit in this section.

**8.1.3** On the other hand, another nationally cheap input land is also remained in the fold of underutilisation since the very beginning of our planning exercise. Two main factors are generally responsible for this underutilisation. One is the chronic negligence of our planners in developing the sound input and output market in such a manner that each and every one of our farmer can able to get the necessary inputs as and when they require and at the same time none one of our producer left in the output market with their produce at the end of the day. Second one is the lack of development of the agricultural infrastructure on the part of the Republic particularly the development of irrigational infrastructure and organic base of the rural economy. We have adopted the new production technology at the time of the initiation of what we have called the Green Revolution blindly without knowing the potentiality of the agrarian area of the country and just only relied on the political agenda of the strong farmer lobby operated the then political scenario. As a result, the vast area of our national economy remains outside the proximity of the agricultural development agenda of the Republic. One important upshot of this motivated negligence that has come out in the form of lower intensity value of use of land. Our area economy is also remained in the proximity of the neglected zone.

**8.1.4** So, the main task of this chapter is to divulge the ground reality of the extent of use of land and labour in this grass-root rural area economy. We try to do this by finding out of different occupational distributions of the employable adults of the area, by good and bad employment and especially through our two calculated intensity index measures.

## **8.2 WORK PARTICIPATION RATE**

**8.2.1** By work participation rate we simply mean the ratio between the working populations to total population during the reference period. Thus it is very necessary to define the worker during the period under our consideration. The

UNDP defines labour force as the number of population aged 15 years and above available to supply power for the production of goods and services. There is a convention among the researchers to consider the persons as workers who have been employed at least for a day against remuneration in a year. However, in census enumeration, we have generally seen a distinction between the workers on the basis of the number of employment days. They are the main workers and the marginal workers. According to their definition the main workers are those who have been employed for more than 183 days in an agricultural year. On the other hand, who have been employed less than 183 days during the same reference period are termed as marginal labour. But we do not believe, being the surveyor of the rural economy, that it is possible for the census enumerator to find out the number of actual working days in a single sitting with the respondents of any of the family member. We know very well that the receipt of correct returns on employment days of a particular worker depends on a great deal of indirect questions and on number of sittings with same worker. Eventually we have got a different result between the fact what we interact with the villagers and the fact that we had obtained from the census report. We just bypass this fact to keep our research product unwieldy and left it to the follower researchers.

**8.2.2** However, we have treated the sum of the main and marginal workers of the census enumeration as equivalent to our number of workers who have worked at least for a day during the last year from the date of our enumeration. On the basis of this definition we have calculated the work participation rate of our sample as given in the following table.

**Table 8.1: WORK PARTICIPATION RATE**

| Area                    | Work Participation Rate |        |       |
|-------------------------|-------------------------|--------|-------|
|                         | Male                    | Female | Total |
| India(Rural): 2001      | 52.11                   | 30.79  | 41.75 |
| W.B (Rural): 2001       | 54.0                    | 26.4   | 36.8  |
| Cooch Behar: 2001       | 55.14                   | 23.28  | 39.64 |
| Sample Economy: 2008-09 | 55.07                   | 29.98  | 42.96 |

Field Survey: 2008-09 & Census of India: 2001 & 2011

To make it more comparable we have used two sets of data of two census years of the country as a whole, for our state and for some districts including our one also. All are given in table 8.1.

### **8.3 ACTIVE LABOUR FORCE AND RATE OF EMPLOYMENT**

**8.3.1** It is rather convenient to calculate the active labour force of an area economy to find out the employment and unemployment situation in the existing rules of game. Further, its importance lies also in the fact that we can find out the good and bad employment on the basis of this active labour force. In calculating the active labour force in our sample we have excluded simply: a) the children up to 15 years of age, b) the children above 15 years of age who engaged fully in their studies, c) people above 15 years of age but found sick or lived on social charity, d) people above 65 years of age, e) people engaged active politics and f) adult female members who are fully engaged in house work. On the basis of our calculation, total employable labour force in our grass- root economy stands at 1424 or 47.28 percent out of which 255 or 8.47 percent are female. Out of this employable labour force the 1294 were actually employed if by employment we mean employment for a day or more during the last year from the date of our survey.

**8.3.2** Thus we are now in a position to find out the employment and unemployment rate of this area economy. On the basis of our calculation the unemployment rate is 9.13 percent. All these figures are given in table 8.2. In spite of our assumption as given in the preceding paragraph the unemployment rate among the women is very high in our sample villages. Further, within the existing rules of the game variation has been found among the sample villages. The two unemployment rates of the two villages are 8.38 and 12.55 respectively. Here the difference is significant apparently. If, however, we widen our concept of unemployment by including those adults who employed for less than 150 days in a year, then the rate of unemployment will increase as much as to 21.02 in our rural economy. But, if we concentrate ourselves to employment means employment for a day or more, the rate of employment will be 90.87.

**Table 8.2: ACTIVE LABOUR FORCE AND THE RATE OF EMPLOYMENT**

| Category   | Village<br>1 | Village<br>2 | Total<br>Sample |
|--|--------------|--------------|-----------------|
| 1.Total Population:  | 2454         | 558          | 3012            |
| 2.People not included in the labour force:                         |              |              |                 |
| a) Population up to 15 yrs.of age:                                 | 671          | 150          | 821             |
| b) Students above 15 yrs. of age and fully engaged in studies:     | 116          | 29           | 145             |
| c) People above 15 yrs. and found sick or lived on Social Charity: | 05           | 02           | 07              |
| d)People above 65 yrs. of age:                                     | 47           | 13           | 60              |
| e) People engaged in active Politics:                              | 13           | 07           | 20              |
| f)Adult female members fully engaged in House Works:               | 433          | 102          | 535             |
| 3.Items 2(a) + 2(b) + 2(c) +2(d) +2(e) + 2(f):                     | 1285         | 303          | 1588            |
| 4. Employable labour force ( Col.1 – Col.3 )                       | 1169         | 255          | 1424            |
| 5.Number of employed labour force:                                 | 1071         | 223          | 1294            |
| 6. Percentage of workers to Employable labour force:               | 91.62        | 87.45        | 90.87           |
| 7. Percentage of Unemployed labour force                           | 8.38         | 12.55        | 9.13            |

Source: Field Survey, 2008-09

## 8.4 EMPLOYMENT IN DIFFERENT OCCUPATIONS

8.4.1 In the previous section we simply provide the information of employment and unemployment rate of this area economy. Now we like to represent the actual employment scenario of this area economy on the basis of the occupations enjoyed by the employed labour force. In order to do this we have categorised all the employed adults of our sample in eight broad occupational groups as given below.

- a) Farmers, who are engaged in farming in their own land (any amount) as well as land taken on lease;
- b) Tenant farmers, who are engaged in farming on wholly tenancy land;
- c) Agricultural labourers, who are engaged in agricultural activities on others land;
- d) Non- agricultural labourers, those who are engaged mainly in Fishing, Weaving, Transport Operating, house and building making and those who are engaged in dehusking of paddy;
- e) Service holders, including Teachers (secondary, primary, MSK, SSK), Anganwadi Workers, Multipurpose Workers and Government Officials;
- f) Village Artisans, including Quacks, Priests, Moulavies, Carpenters, Cobblers, Barbers, Blacksmiths and Tailors;

- g) Village Traders, including Businessmen and Shop Keepers; and
- h) Bidi Workers.

To make the analysis more convenient we further assemble these eight categories of occupations into two broad groups. These are the *farming group* and the *non-farming group*. The first three occupations constitute our *farming group* while the rest five occupations constitute the *non-farming group*.

**8.4.2** We have calculated earlier that the total number of employed labour force is 1294. These 1294 employed labour forces have been distributed by their main occupations under eight occupational groups. This has been given in table 8.3. One can see from this table that the agricultural labourer group appears as the single biggest occupational group in the area economy followed by the farmers. Tenancy farming is rather non-existent in this area economy. Only 5 households do their farming activities in leased in land amounting to be 3 acres and this tiny amount of land had been obtained by these 5 households as a result of Operation Barga in late 70s of the last century. Another important fact that also appears from this table is that the role of artisans in the rural economy is rather reducing. That means people prefer to collect their agricultural and other related equipments from the local hats instead from the village artisans. The other occupational groups' viz. Service holders and village traders are as usual as they revealed in our table.

**Table 8.3: EMPLOYMENT ENJOYED IN THE MAIN OCCUPATION**

| Occupation Groups             | Labour force Employed in Main occupations |              | Mean Employment through Main Occupation | Total Employment through Main occupation |              |
|-------------------------------|---|--------------|---|--|--------------|
|                               | Number                                    | P.C to Total |   | Number                                   | P.C to Total |
| 1.Farmers                     | 456                                       | 35.24        | 209.04                                  | 95322                                    | 35.33        |
| 2.Tenant Farmers              | 05  | 0.39         | 192.2                                   | 961                                      | 0.36         |
| 3.Agricultural labourers      | 470                                       | 36.32        | 185.89                                  | 87368                                    | 32.38        |
| 4.Non- Agricultural labourers | 170                                       | 13.14        | 212.5                                   | 36125                                    | 13.39        |
| 5.Service Holders             | 54  | 4.17         | 282.33                                  | 15246                                    | 5.65         |
| 6.Village Artisans            | 32  | 2.47         | 228.52                                  | 7313                                     | 2.71         |
| 7.Village Traders             | 95  | 7.34         | 268.39                                  | 25497                                    | 9.45         |
| 8.Bidi Workers                | 12  | 0.93         | 164.79                                  | 1977                                     | 0.73         |
| Total                         | 1294                                      | 100          | 208.51                                  | 269809                                   | 100          |

Source: Field Survey, 2008-09

**8.4.3** One can also see from the same table that the mean employment of this area economy is about 209. This means that in term of existing employment days it is not possible to provide the full employment man days to the employed adults of

this sample. According to our definition 330 man-days is full employment. Thus to ushering full employment 121 man-days per capita per annum will be needed either within the existing rules of game or in the revision of the rules of the game. However, within the existing set-up the highest mean has been enjoyed by the service holder group. One thing that should be mentioned here is that in calculating the mean man days of employment we have ignored the Sundays and other holidays from their employment day's basket.

**8.4.4** It will be in order if we verify the mean man days of employment on the basis of our two broad occupational groups. This is given in table 8.4. The two mean employment days are 197.26 and 237.34 for the farming and non-farming groups respectively. Thus the non-farming and farming ratio in terms of mean man days becomes 1:0.83 in our sample economy. But in terms of employment days the above ratio becomes about 1:2. This simply means that our area economy is nothing but a subsistence economy. On the other hand, if we consider the employment days of subsidiary occupations in our calculation then the two mean employment days become 227.06 and 246.57 for the farming and non-farming groups respectively. In spite of rigidity of the non-farming group to add additional man-days in their employment basket in the subsistence economy like ours' one till the farming group unable to cross the employment days limit of the non-farming group. This means that the employment generation capacity of the farming sector is far from satisfactory.

**Table 8.4: EMPLOYMENT ENJOYED BY TWO BROAD GROUPS IN THE MAIN OCCUPATIONS**

| Occupation Groups     | Labour force Employed in Main occupations |              | Mean Employment through Main occupations | Total Employment through Main occupations |              |
|-----------------------|---|--------------|--|---|--------------|
|                       | Number                                    | P.C to Total |  | Number                                    | P.C to Total |
| 1.Farming Group:      | 931                                       | 71.95        | 197.26                                   | 183651                                    | 68.07        |
| 2.Non- Farming Group: | 363                                       | 28.05        | 237.34                                   | 86158                                     | 31.93        |
| Total                 | 1294                                      | 100          | 208.51                                   | 269809                                    | 100          |

Source: Field Survey, 2008-09

**8.4.5** In an economy where agricultural employment plays a very crucial role in supplying the man days of employment in the employment basket of the employed or employable labour force, it is equally of paramount importance to see the role of subsidiary occupations in adding the number of man days in addition to the total man-days in the same basket in an area economy. Although the role of subsidiary employment at present is rather low in this area economy till it enhances the scope to increase the income level of the employed persons and also pave the path of future planning to usher in full employment within the existing socio-economic structure. If we provide at least a handy amount of additional man days through subsidiary employment, no doubt this will increase the intensity of land use and hence labour use in terms of extra investment in agricultural activities. We present the pictures of subsidiary occupation in tables 8.5 and 8.6. On an average subsidiary occupation provides 24 man-days per capita per annum in this area economy. In value term these additional man days become Rs. 2880 per capita per annum.

#### **8.5: EMPLOYMENT ENJOYED IN THE SUBSIDIARY OCCUPATIONS**

| Occupation Groups<br>(Status by Primary Occupations) | Labour force Employed in Subsidiary occupations |                | Mean Employment through Subsidiary occupations | Total Employment through the Subsidiary occupations |              |
|--|---|----------------|--|---|--------------|
|  | Number  | P.C to \ Total |  | Number  | P.C to Total |
| 1.Farmers  | 207   | 55.2           | 86.89  | 17986   | 57.85        |
| 2.Tenant Farmers                                     | 02  | 0.53           | 58.39  | 117   | 0.38         |
| 3.Agricultural labourers                             | 114   | 30.4           | 84.55  | 9639  | 31.01        |
| 4.Non- Agricultural labourers                        | 29  | 7.73           | 66.55  | 1930  | 6.21         |
| 5.Service Holders                                    | 03  | 0.8            | 58.19  | 175   | 0.56         |
| 6.Village Artisans                                   | 01  | 0.27           | 54.28  | 54  | 0.17         |
| 7.Village Traders                                    | 17  | 4.54           | 60.0   | 1020  | 3.28         |
| 8.Bidi Workers                                       | 02  | 0.53           | 84.15  | 168   | 0.54         |
| Total  | 375   | 100            | 82.90  | 31089   | 100          |

Source: Field Survey, 2008-09

**Table 8.6: EMPLOYMENT ENJOYED BY TWO BROAD GROUPS IN THE  
SUBSIDIARY OCCUPATIONS**

| Occupation Groups     | Labour force Employed in the Subsidiary occupations |              | Mean Employment through Subsidiary occupations | Total Employment through Subsidiary occupations |              |
|-----------------------|---|--------------|--|---|--------------|
|                       | Number  | P.C to Total |  | Number  | P.C to Total |
| 1.Farming Group:      | 323   | 86.13        | 85.89  | 27742   | 89.23        |
| 2.Non- Farming Group: | 52  | 13.87        | 64.36  | 3347  | 10.77        |
| Total                 | 375   | 100          | 82.90  | 31089   | 100          |

Source: Field Survey, 2008-09

**8.4.6** What we have calculated in the preceding paragraphs is the figures on employment through main occupation and employment on subsidiary occupation. Now we present the employment figures combining both the main and subsidiary occupations. The mean employment as has been calculated on the basis of the main occupation is 208.51 man days during the last year from the date of our survey. The mean employment on the basis of the subsidiary employment is 82.90, while the combine mean as has been calculated by us is only 232.53. The reason for the lower value of the combine mean is that only 29 percent employed adult of this sample have been succeeded to manage some subsidiary employment days along with their main employment. One may, with temptation, define this rural economy as a backward economy on the basis of this lower mean value of the subsidiary occupation. We may add another point to support this is the lower contribution of the non-agricultural sector in terms of employment days in the total employment basket. Further, we try to provide more information in this context in the subsequent section of this write up. However, our tables 8.7 to 8.10 give us the detail information about the combined occupations of the sample economy.

**Table 8.7: EMPLOYMENT ENJOYED THROUGH ALL OCCUPATIONS**

| Occupation Groups             | Labour force Employed through all occupations |              | Mean Employment through all occupations | Total Employment through all occupations |              |
|-------------------------------|---|--------------|---|--|--------------|
|                               | Number  | P.C to Total |   | Number                                   | P.C to Total |
| 1.Farmers                     | 456   | 35.24        | 248.48                                  | 113308                                   | 37.66        |
| 2.Tenant Farmers              | 05  | 0.39         | 215.6                                   | 1078                                     | 0.36         |
| 3.Agricultural labourers      | 470   | 36.32        | 206.40                                  | 97007                                    | 32.24        |
| 4.Non- Agricultural labourers | 170   | 13.14        | 223.85                                  | 38055                                    | 12.65        |
| 5.Service Holders             | 54  | 4.17         | 285.57                                  | 15421                                    | 5.12         |
| 6.Village Artisans            | 32  | 2.47         | 230.22                                  | 7367                                     | 2.45         |
| 7.Village Traders             | 95  | 7.34         | 279.13                                  | 26517                                    | 8.81         |
| 8.Bidi Workers                | 12  | 0.93         | 178.75                                  | 2145                                     | 0.71         |
| Total                         | 1294  | 100          | 232.53                                  | 300898                                   | 100          |

Source: Field Survey, 2008-09

**Table 8.8: EMPLOYMENT ENJOYED BY TWO BROAD GROUPS THROUGH ALL OCCUPATIONS**

| Occupation Groups  | Labour force Employed through all occupations |              | Mean Employment through all occupations | Total Employment through all occupations |              |
|--------------------|---|--------------|---|--|--------------|
|                    | Number  | P.C to Total |   | Number                                   | P.C to Total |
| 1.Farming Group:   | 931   | 86.13        | 227.06                                  | 211393                                   | 70.25        |
| 2.Non-Farming Gr.: | 363   | 13.87        | 246.57                                  | 89505                                    | 29.75        |
| Total              | 1294  | 100          | 232.53                                  | 300898                                   | 100          |

Source: Field Survey, 2008-09

**Table 8.9: SHARE OF PRIMARY AND SUBSIDIARY OCCUPATION IN EMPLOYMENT**

| Occupation Groups             | 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                     | 84.13  | 15.87   | 100   |
| 2.Tenant Farmers              | 89.15  | 10.85   | 100   |
| 3.Agricultural labourers      | 90.06  | 9.94  | 100   |
| 4.Non- Agricultural labourers | 94.93  | 5.07  | 100   |
| 5.Service Holders             | 98.87  | 1.13  | 100   |
| 6.Village Artisans            | 99.27  | 0.73  | 100   |
| 7.Village Traders             | 96.15  | 3.85  | 100   |
| 8.Bidi Workers                | 92.17  | 7.83  | 100   |
| Total                         | 89.67  | 10.33   | 100   |

Source: Field Survey, 2008-09

**Table 8.10: SHARE OF PRIMARY AND SUBSIDIARY OCCUPATION OF TWO BROAD GROUPS IN EMPLOYMENT**

| Occupation Groups   | 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.Farming Group:    | 86.88  | 13.12   | 100   |
| 2.Non- Farming Gr.: | 96.26  | 3.74  | 100   |
| Total               | 89.67  | 10.33   | 100   |

Source: Field Survey, 2008-09

## 8.5 GOOD AND BAD EMPLOYMENT

**8.5.1** It is rather convenient to present the good and bad employment on the basis of the employment days enjoyed by the employed adults of this rural economy. Elsewhere we have been defined good employment as an employment for 150 and more and bad employment as employment less than 150 days ( Sarkar & Kar 1990,1991,1993). On the basis of this definition, we have distributed all the employed adults of our sample as given in table 8.11. In this section we have given a clear picture of employment situation of this sample dividing all the employed adults in employed male adults and employed female adults. As a whole, nearly 80 percent of the employed adults have been succeeded to manage more than 150 man-days of employment during the last year. But what is unfortunate is that the female adults are mostly lying in the bad employment bracket. We have seen a little bit difference in the percentage figures of the female adults who are in good employment bracket among the sample villages, but this difference is apparent and not significant statistically. This simply means that the employment opportunities throws open by this rural economy is not fit for the women properly. Although the rural economy under our study tries to come out from the level of subsistence economy till it needs a proper planning to open the employment opportunity that should be accepted by the all.

**Table 8.11: PERCENTAGE OF LABOUR FORCE IN GOOD AND BAD EMPLOYMENT BY VILLAGE**

| Villages  | Male Adults     |                | Female Adults   |                | All Adults      |                |
|-----------|-----------------|----------------|-----------------|----------------|-----------------|----------------|
|           | Good Employment | Bad Employment | Good Employment | Bad Employment | Good Employment | Bad Employment |
| Village-1 | 87.95           | 12.05          | 38.86           | 61.14          | 79.93           | 20.07          |
| Village-2 | 84.92           | 15.08          | 31.82           | 68.18          | 74.44           | 25.56          |
| Total     | 87.44           | 12.56          | 37.44           | 62.56          | 78.98           | 21.02          |

Source: Field Survey, 2008-09

**8.5.2** We have also calculated the incidences of good employment and bad employment for the employed adults engaged in different occupations. These are shown in tables 8.12 and 8.13 respectively. It is rather obvious that the incidence of good employment be high in the *non-farming group* than that of *farming group* as shown in Table 8.13. Our sample economy satisfies this fact. But what is interesting is that here the difference is narrow than the difference as had been identified in the late 80's of last century (Kar, 1993).

**Table 8.12: PERCENTAGE OF LABOUR FORCE IN GOOD AND BAD EMPLOYMENT IN MAIN OCCUPATION**

| Occupational Group/<br>Employment<br>Category | Percentage of Labour<br>force with Good Employment | Percentage of<br>Labour force<br>with Bad<br>Employment | Total |
|---|--|---|-------|
| 1.Farmers                                     | 75.44  | 24.56   | 100   |
| 2.Tenant Farmers                              | 80.00  | 20.00   | 100   |
| 3.Agricultural<br>labourers                   | 78.94  | 21.06   | 100   |
| 4.Non- Agricultural<br>labourers              | 80.59  | 19.41   | 100   |
| 5.Service Holders                             | 100  | 00  | 100   |
| 6.Village Artisans                            | 71.87  | 28.13   | 100   |
| 7.Village Traders                             | 86.32  | 13.68   | 100   |
| 8.Bidi Workers                                | 58.33  | 41.67   | 100   |
| Total   | 78.98  | 21.02   | 100   |

Source: Field Survey, 2008-09

**Table 8.13: PERCENTAGE OF LABOUR FORCE IN GOOD AND BAD EMPLOYMENT IN MAIN OCCUPATION BY TWO BROAD CATEGORIES**

| Occupational Group/<br>Employment Category | Percentage of Labour<br>force with Good Employment | Percentage of Labour<br>force with Bad<br>Employment | Total |
|--|--|--|-------|
| 1.Farming Group:                           | 77.23  | 22.77  | 100   |
| 2.Non- Farming Group:                      | 83.47  | 16.53  | 100   |
| Total                                      | 78.98  | 21.02  | 100   |

Source: Field Survey, 2008-09

## **8.6 MEASURES OF INTENSITY OF USE OF LAND**

**8.6.1** We have adopted three methods to measure the intensity of land use in our sample economy. The first is the ratio of number of days the plot was put to use to the total number of days in an agricultural year. So, on the basis of existing technology mix available in our area economy if the lands are used for 365 days

including thrashing and storing, the intensity is given as 1.00. If the plot of land is used for Aman paddy (150 days or more), intensity is calculated at 0.42. Similarly, if the plots of land are used for both Aman paddy and Ravi crops (240 days and more), the intensity value is calculated at 0.67, if the plots of land are used for Aman paddy, Ravi crops and Boro paddy (350 days or more), the intensity value is 0.96. However, if the said lands are used for Aman paddy, Ravi crops and Aus paddy/ Jute then the calculated intensity value will be 1.00. The second method is a traditional one and used by The Agricultural Department of our country. According to this method, intensity of use of land is simply the ratio of the Gross Cropped Area to Net Cultivable Area. If a plot of land has been used for the raising of two crops then the intensity value will be 2.00 and so on. In order to measure the intensity of land use of third kind, we simply assume three HYV crops and a quick yielding vegetable are raised in a plot of land throughout the year. Therefore, according to this method, intensity of land use is the ratio of number of crops raised actually in a plot of land during the agricultural year to the total number of crops could be raised during the same year. Using these methods, we have calculated three land use intensity indices by farm sizes for sample village-1, sample village-2 and total sample. All are displayed in tables 8.14 to 8.16.

**8.6.2** We can see from the tables 8.14 and 8.15 that sample village-2 is in better position in case of intensity indices of land use in comparison to sample village-1. The three land use intensities for sample village-1 are 0.866, 2.58 and 0.723 respectively and for sample village-2, the said intensities are 0.875, 2.63 and 0.755 respectively. This is mainly due to cheap irrigation facilities (River Lift Irrigation facility) in the village, small sizes of operational holdings and less scope of subsidiary occupations of the employed adults.

**8.6.3** If the intensity rates would stand at 1.00 according to our first and third methods, we could say that there is no slack in respect of use of land at the level of present technology mix. As our calculated rates are less than 1 in both the sample villages, the slack in respect of land use is rather vast. Again the land use intensity indices, according to our second method, for sample village-1, sample village-2 and total sample economy are 2.58, 2.63 and 2.59 respectively.

## 8.7 SIZE OF FARMS AND INTENSITY OF USE OF LAND

**8.7.1** Again tables 8.14 to 8.16 reveal clearly the inverse relationship between the farm size and the intensity of land use as a general phenomenon in this grass-root rural area economy. This means that the farmers of relatively smaller farms use their lands more intensively than the farmers of the relatively larger farms. So, our present findings further strengthen the earlier inference that smaller farms are better in respect of use of reproducible resources and output per acre (Sarkar and Kar 1986). The important factors which lead the smaller farms to use their lands more intensively are rather two. The **first** factor is the scarcity of land and the **second** is the crisis of existence. However, some other factors like easy access of crop loans, Mini-kits, home labour, scope of irrigation from traditional sources, etc. have also facilitated the small farmers to use their lands more intensively. Relatively larger farms, on the other hand, face the acute problems of getting better inputs at reasonable prices due to non-availability of established markets for inputs, required hired labour at reasonable wages during busy agricultural season, etc. in our grass-root rural area economy. But the most important factor is that they are not assured the opportunity of selling all their marketable output at fixed fair price. All these factors are responsible for less intensity of land use in case of relatively larger farms in our sample economy.

**Table 8.14: INTENSITY OF LAND USE OF VILLAGE- 1 BY FARM SIZE**

| Operational Holding ( Acres) | Amount of Net Cultivable Area (Acres) | Intensity Index- I | Intensity Index- II | Intensity Index- III |
|------------------------------|---------------------------------------|--------------------|---------------------|----------------------|
| Up to 2                      | 113.58                                | 0.947              | 2.81                | 0.835                |
| 2-4                          | 136.45                                | 0.914              | 2.71                | 0.731                |
| 4-6                          | 127.67                                | 0.807              | 2.43                | 0.672                |
| Above 6                      | 71.59                                 | 0.753              | 2.21                | 0.618                |
| Total                        | 449.29                                | 0.866              | 2.58                | 0.723                |

Source: Field Survey, 2008-09

**Table 8.15: INTENSITY OF LAND USE OF VILLAGE- 2 BY FARM SIZE**

| Operational Holdings ( Acres) | Amount of Net Cultivable Area (Acres) | Intensity Index- I | Intensity Index- II | Intensity Index- III |
|-------------------------------|---------------------------------------|--------------------|---------------------|----------------------|
| Up to 2                       | 33.52                                 | 0.967              | 2.92                | 0.855                |
| 2-4                           | 49.65                                 | 0.915              | 2.74                | 0.804                |
| 4-6                           | 58.25                                 | 0.852              | 2.58                | 0.713                |
| Above 6                       | 42.84                                 | 0.789              | 2.33                | 0.679                |
| Total                         | 184.26                                | 0.875              | 2.63                | 0.755                |

Source: Field Survey, 2008-09

**Table 8.16: INTENSITY OF LAND USE OF TOTAL SAMPLE BY FARM SIZE**

| Operational Holding (Acres) | Amount of Net Cultivable Area (Acres) | Intensity Index- I | Intensity Index- II | Intensity Index- III |
|-----------------------------|---------------------------------------|--------------------|---------------------|----------------------|
| Up to 2                     | 147.10                                | 0.952              | 2.84                | 0.839                |
| 2-4                         | 186.10                                | 0.914              | 2.72                | 0.750                |
| 4-6                         | 185.92                                | 0.821              | 2.48                | 0.685                |
| Above 6                     | 114.43                                | 0.766              | 2.25                | 0.641                |
| Total                       | 633.55                                | 0.868              | 2.59                | 0.732                |

Source: Field Survey, 2008-09

## 8.8 MEASURE OF INTENSITY OF USE OF LABOUR POWER

**8.8.1** Our agricultural activities by and large depend on the doldrums of the monsoon. For this reason the farmers, in most cases, cannot continue agricultural activities throughout the year though they have the will. This generates the problem of lower intensity value of land and hence the problem of unemployment and underemployment in a rural agricultural economy. Our sample economy is not free from such kind of problem. A large proportion of gainfully employed active labour force remained underemployed during different agricultural slack seasons in our rural economy. Again the rural economy witnesses the acute shortage of labour problem during the periods of peak agricultural activities when normally inactive persons such as house-wives, students, etc. have also taken active part in some agricultural activities. Thus it will be in order if we calculate the labour use intensity value to divulge the myth and realities of the unemployment and underemployment problem of this sample economy.

**8.8.2** To calculate the labour use intensity we consider 330 man days of employment as full employment (Sarkar and Kar, 1990). Thus the intensity value for 330 days of employment per annum is given as 1.00. Similarly, the intensity value for 100 days of employment is calculated at 0.30, for 150 days of employment is at 0.45, for 200 days of employment is at 0.61, and so on. On the basis of this measurement, we have calculated the intensity of labour use for the employed adults, the employed male adults and the employed female adults of our sample. All these figures are displayed in tables 8.17 to 8.19.

**8.8.3** One can see from table 8.17 that the percentage of employed adults who succeeded to make use more than 60 percent of their labour power is nearly 56.5.

The corresponding percentages for the employed male adults and female adults, shown in tables 8.20 to 8.22, are 65.3 and only 13.24 respectively. Similarly, the percentage of employed adults who succeeded to make use more than 76 percent of their labour power is nearly 24.5. The corresponding percentages for the employed male adults and female adults are 28.28 and only 6.39 respectively. Again the corresponding percentages for employed male adults and female adults using more than 91 percent of labour power are 8.84 and 3.20 respectively. Thus we can conclude that most of the employed female adults use their labour power up to 60 percent. The reasons are rather two. **Firstly**, they get works only in the busy agricultural seasons, and **secondly**, the minimum scope of subsidiary occupations at the grass-root level. Only the female adults engaged in teaching, Anganwadi and Multipurpose works are succeeded to use more than 76 percent their labour power in our grass-root rural economy.

**Table 8.17: LABOUR USE INDEX OF EMPLOYED ADULTS IN TOTAL SAMPLE**

| Percentage of Employed Adults | Intensity of Use of Labour Power<br>(Less than ) |
|-------------------------------|--|
| 8.73                          | 0.30   |
| 21.02                         | 0.45   |
| 43.51                         | 0.61   |
| 75.42                         | 0.76   |
| 92.12                         | 0.91   |
| 100.00                        | 1.00   |

Source: Field Survey, 2008-09

**Table 8.18: LABOUR USE INDEX OF EMPLOYED MALE ADULTS IN TOTAL SAMPLE**

| Percentage of Employed Male Adults | Intensity of Use of Labour Power<br>(Less than ) |
|------------------------------------|--|
| 2.60                               | 0.30   |
| 12.56                              | 0.45   |
| 34.70                              | 0.61   |
| 71.72                              | 0.76   |
| 91.16                              | 0.91   |
| 100.00                             | 1.00   |

Source: Field Survey, 2008-09

**Table 8.19: LABOUR USE INDEX OF EMPLOYED FEMALE ADULTS IN TOTAL SAMPLE**

| Percentage of Employed Female Adults | Intensity of Use of Labour Power (Less than ) |
|--------------------------------------|---|
| 38.81                                | 0.30  |
| 62.56                                | 0.45  |
| 86.76                                | 0.61  |
| 93.61                                | 0.76  |
| 96.80                                | 0.91  |
| 100.00                               | 1.00  |

Source: Field Survey, 2008-09

Fig. 8.1

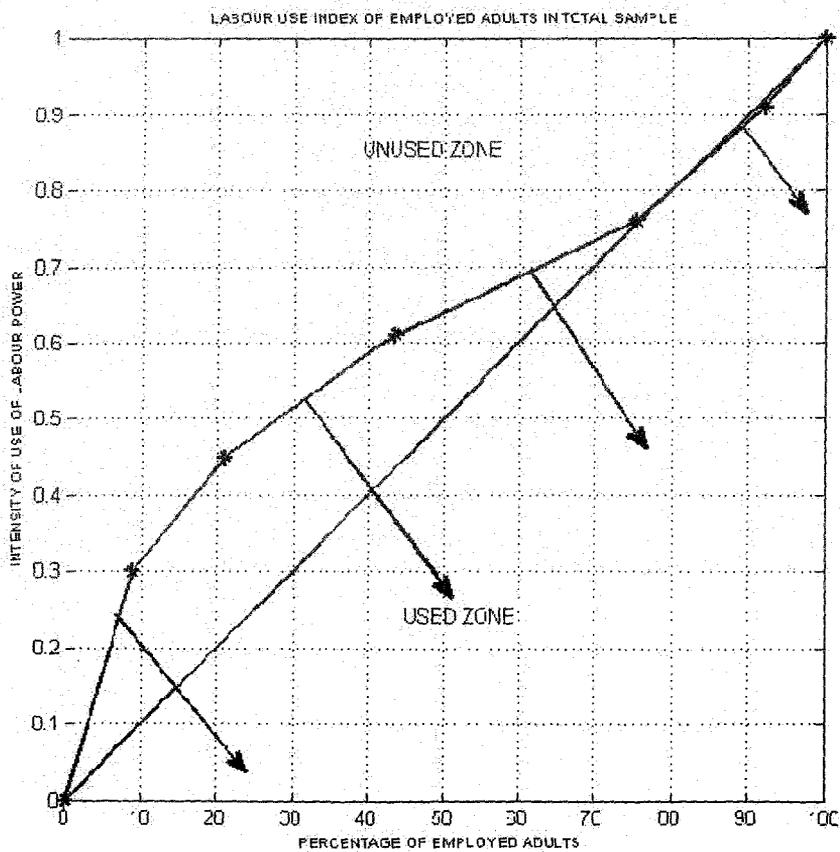


Fig. 8.2

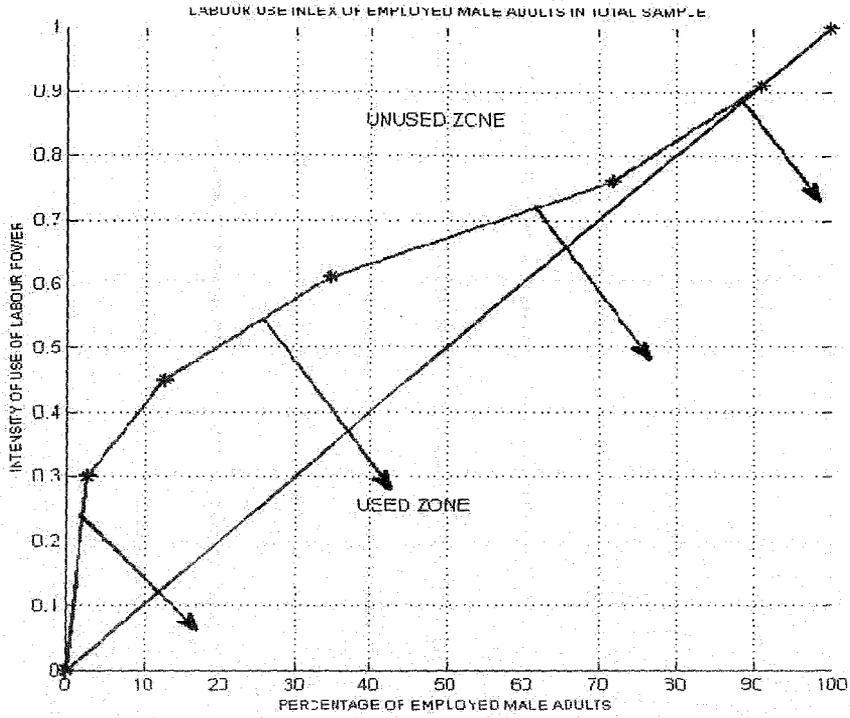
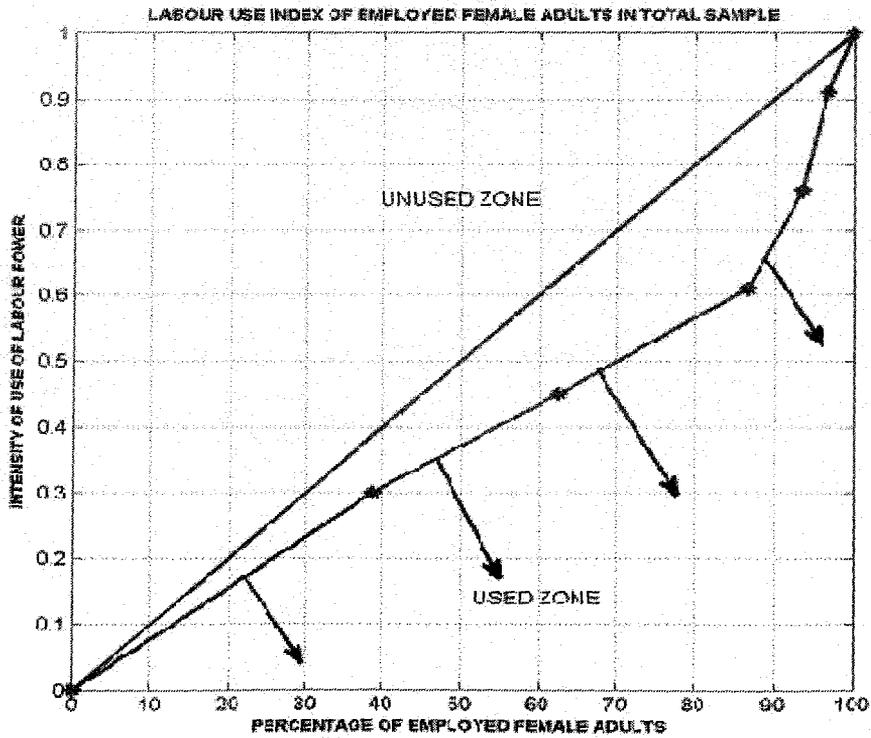


Fig. 8.3



**Table 8.20: PERCENTAGES OF EMPLOYED MALE ADULTS AND EMPLOYED FEMALE ADULTS USING MORE THAN 60% OF LABOUR POWER IN TOTAL SAMPLE**

| Category of Employed Adults | Percentages of Employed Adults Using More than 60% of labour power |
|-----------------------------|--|
| Employed Male Adults        | 65.30  |
| Employed Female Adults      | 13.24  |

Source: Field Survey, 2008-09

**Table 8.21: PERCENTAGES OF EMPLOYED MALE ADULTS AND EMPLOYED FEMALE ADULTS USING MORE THAN 76% OF LABOUR POWER IN TOTAL SAMPLE**

| Category of Employed Adults | Percentages of Employed Adults Using More than 76% of labour power |
|-----------------------------|--|
| Employed Male Adults        | 28.28  |
| Employed Female Adults      | 6.39   |

Source: Field Survey, 2008-09

**Table 8.22: PERCENTAGES OF EMPLOYED MALE ADULTS AND EMPLOYED FEMALE ADULTS USING MORE THAN 91% OF LABOUR POWER IN TOTAL SAMPLE**

| Category of Employed Adults | Percentages of Employed Adults Using More than 91% of labour power |
|-----------------------------|--|
| Employed Male Adults        | 8.84   |
| Employed Female Adults      | 3.20   |

Source: Field Survey, 2008-09

**8.8.4** We have also calculated labour use indices of employed adults, employed male adults and employed female adults for sample village-1 and sample village-2 respectively using the same method as before. All these have been displayed in tables 8.23 to 8.28. . The comparisons of use of labour power between the two sample villages will be clearer from tables 8.29 to 8.34. It is clear from these tables that in all cases sample village-2 are in better position in comparison to sample village-1, except employed female adults using labour power more than 61 percent and more than 76 percent. This is mainly due to intensive cultivation throughout the year for cheap irrigational facilities in sample village-2.

**Table 8.23: LABOUR USE INDEX OF EMPLOYED ADULTS IN VILLAGE-1**

| Percentage of Employed Adults | Intensity of Use of Labour Power (Less than ) |
|-------------------------------|---|
| 8.40                          | 0.30  |
| 20.07                         | 0.45  |
| 43.79                         | 0.61  |
| 75.35                         | 0.76  |
| 93.00                         | 0.91  |
| 100.00                        | 1.00  |

Source: Field Survey, 2008-09

**Table 8.24: LABOUR USE INDEX OF EMPLOYED MALE ADULTS IN VILLAGE-1**

| Percentage of Employed Male Adults | Intensity of Use of Labour Power<br>(Less than ) |
|------------------------------------|--|
| 2.68                               | 0.30   |
| 12.05                              | 0.45   |
| 35.49                              | 0.61   |
| 71.87                              | 0.76   |
| 92.19                              | 0.91   |
| 100.00                             | 1.00   |

Source: Field Survey, 2008-09\

**Table 8.25: LABOUR USE INDEX OF EMPLOYED FEMALE ADULTS IN VILLAGE-1**

| Percentage of Employed Female Adults | Intensity of Use of Labour Power<br>(Less than ) |
|--------------------------------------|--|
| 37.71                                | 0.30   |
| 61.14                                | 0.45   |
| 86.29                                | 0.61   |
| 93.14                                | 0.76   |
| 97.14                                | 0.91   |
| 100.00                               | 1.00   |

Source: Field Survey, 2008-09

Fig. 8.4

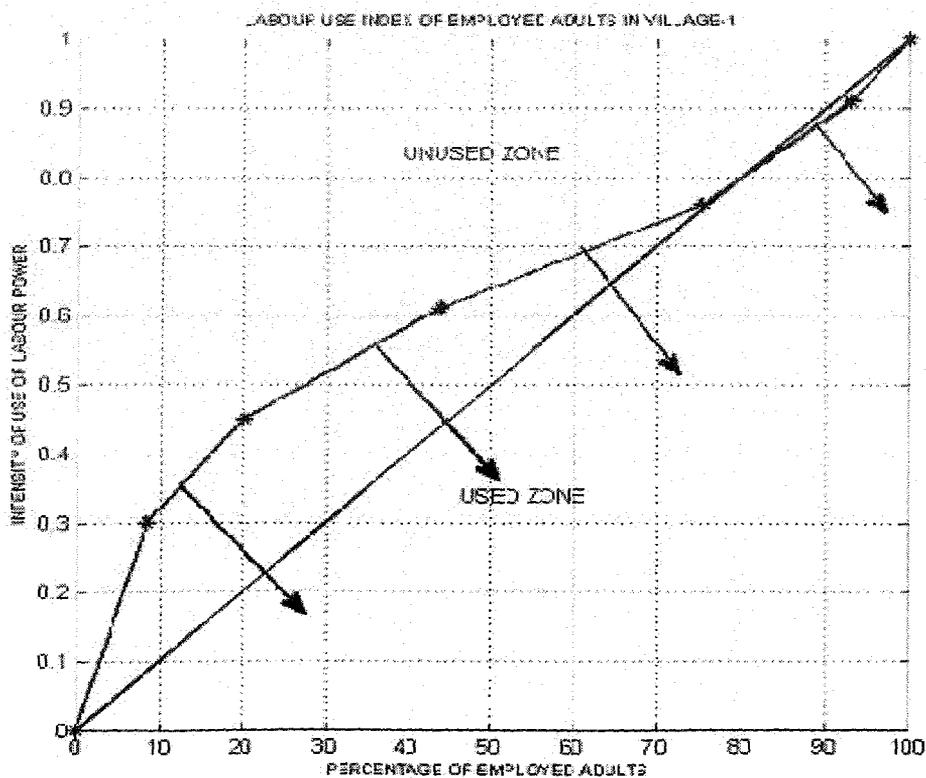


Fig. 8.5

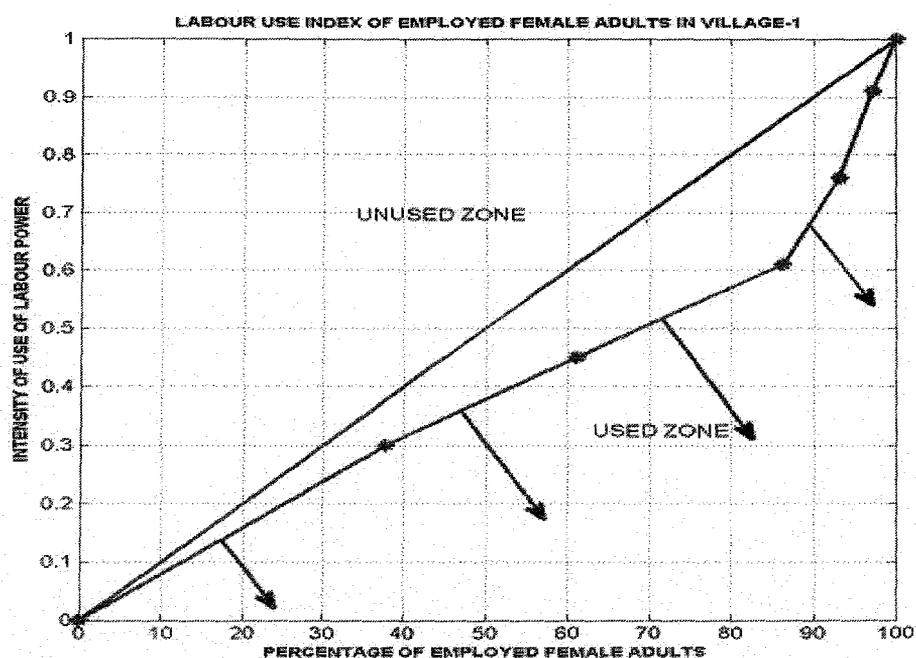


Table 8.26: LABOUR USE INDEX OF EMPLOYED ADULTS IN VILLAGE-2

| Percentage of Employed Adults | Intensity of Use of Labour Power<br>(Less than ) |
|-------------------------------|--|
| 10.31                         | 0.30   |
| 25.56                         | 0.45   |
| 42.15                         | 0.61   |
| 75.78                         | 0.76   |
| 87.89                         | 0.91   |
| 100.00                        | 1.00   |

Source: Field Survey, 2008-09

Table 8.27: LABOUR USE INDEX OF EMPLOYED MALE ADULTS IN VILLAGE-2

| Percentage of Employed Male Adults | Intensity of Use of Labour Power<br>(Less than ) |
|------------------------------------|--|
| 2.23                               | 0.30   |
| 15.08                              | 0.45   |
| 30.72                              | 0.61   |
| 70.95                              | 0.76   |
| 86.03                              | 0.91   |
| 100.00                             | 1.00   |

Source: Field Survey, 2008-0

**Table 8.28: LABOUR USE INDEX OF EMPLOYED FEMALE ADULTS IN VILLAGE-2**

| Percentage of Employed Female Adults | Intensity of Use of Labour Power<br>(Less than ) |
|--------------------------------------|--|
| 43.18                                | 0.30   |
| 68.18                                | 0.45   |
| 88.63                                | 0.61   |
| 95.45                                | 0.76   |
| 95.45                                | 0.91   |
| 100.00                               | 1.00   |

Source: Field Survey, 2008-09

Fig 8.6

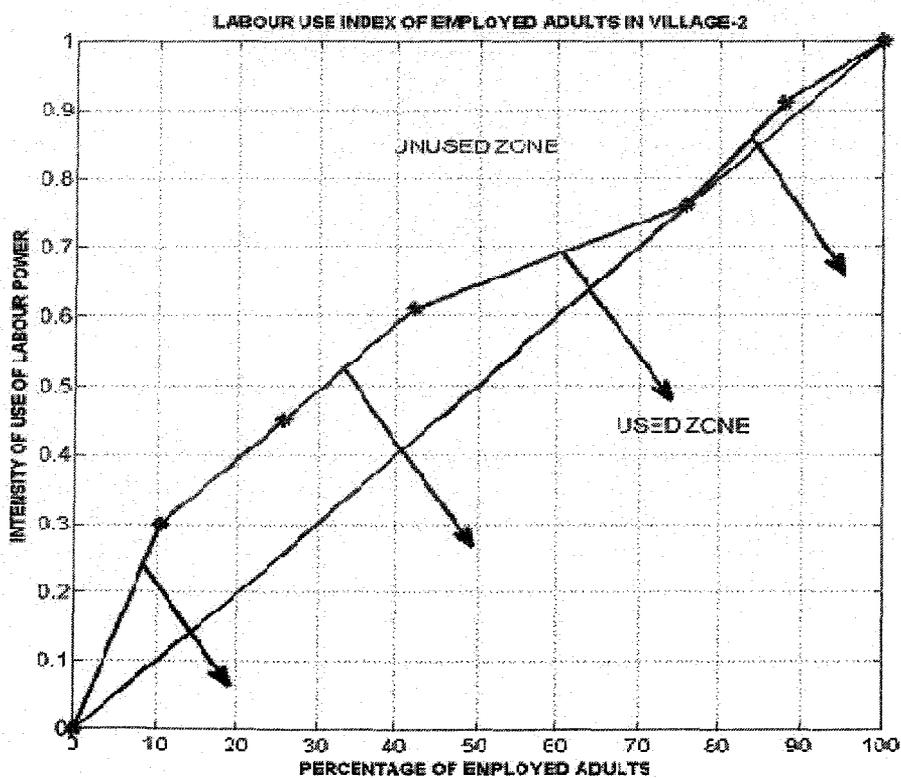


Fig.8.7

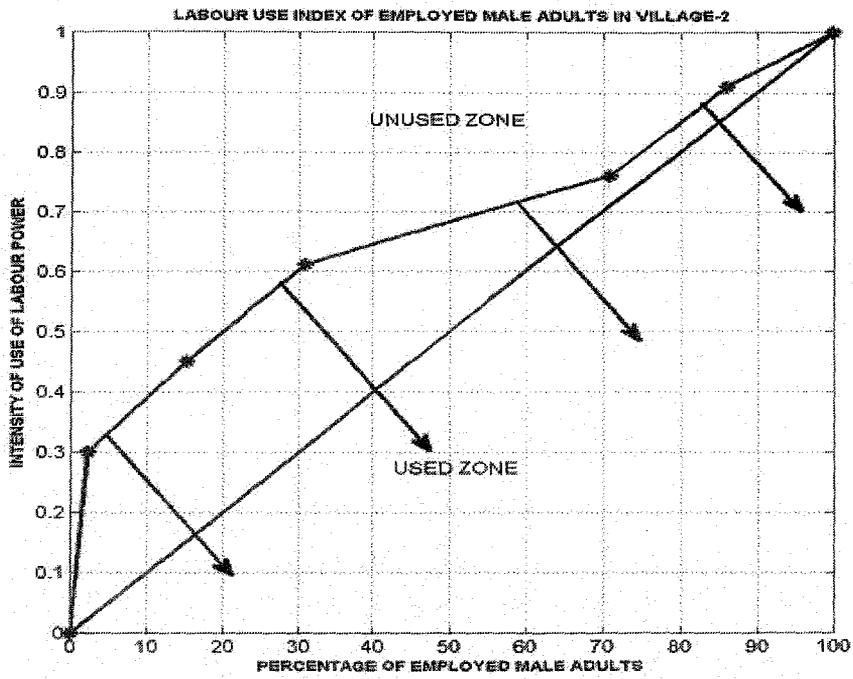
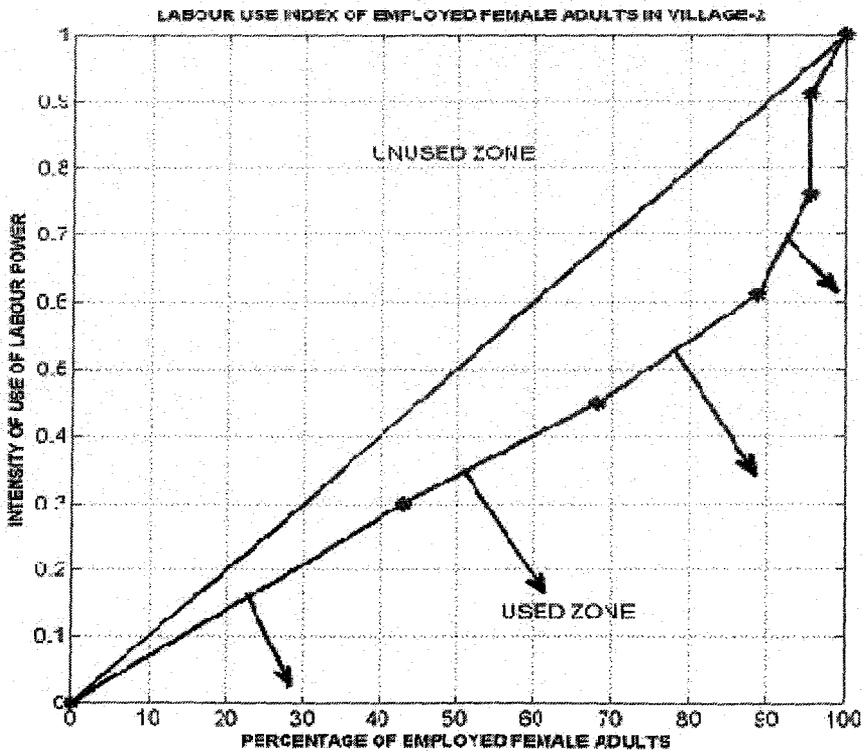


Fig. 8.8



**Table 8.29: PERCENTAGE OF EMPLOYED MALE ADULTS USING MORE THAN 61% OF LABOUR POWER IN SAMPLE VILLAGE-1 AND SAMPLE VILLAGE-2**

| Sample villages | % of Employed Male Adults Using more than 61% of labour power |
|-----------------|---|
| Village-1       | 64.51   |
| Village-2       | 69.28   |

Source: Field Survey, 2008-09

**Table 8.30: PERCENTAGE OF EMPLOYED MALE ADULTS USING MORE THAN 76% OF LABOUR POWER IN SAMPLE VILLAGE-1 AND SAMPLE VILLAGE-2**

| Sample villages | % of Employed Male Adults Using more than 76% of labour power |
|-----------------|---|
| Village-1       | 28.13   |
| Village-2       | 29.05   |

Source: Field Survey, 2008-09

**Table 8.31: PERCENTAGE OF EMPLOYED MALE ADULTS USING MORE THAN 91% OF LABOUR POWER IN SAMPLE VILLAGE-1 AND SAMPLE VILLAGE-2**

| Sample villages | % of Employed Male Adults Using more than 91% of labour power |
|-----------------|---|
| Village-1       | 7.81  |
| Village-2       | 13.97   |

Source: Field Survey, 2008-09

**Table 8.32: PERCENTAGE OF EMPLOYED FEMALE ADULTS USING MORE THAN 61% OF LABOUR POWER IN SAMPLE VILLAGE-1 AND SAMPLE VILLAGE-2**

| Sample villages | % of Employed Female Adults Using more than 61% of labour power |
|-----------------|---|
| Village-1       | 13.71   |
| Village-2       | 11.37   |

Source: Field Survey, 2008-09

**Table 8.33: PERCENTAGE OF EMPLOYED FEMALE ADULTS USING MORE THAN 76% OF LABOUR POWER IN SAMPLE VILLAGE-1 AND SAMPLE VILLAGE-2**

| Sample villages | % of Employed Female Adults Using more than 76% of labour power |
|-----------------|---|
| Village-1       | 6.86  |
| Village-2       | 4.55  |

Source: Field Survey, 2008-09

**Table 8.34: PERCENTAGE OF EMPLOYED FEMALE ADULTS USING MORE THAN 91% OF LABOUR POWER IN SAMPLE VILLAGE-1 AND SAMPLE VILLAGE-2**

| Sample villages | % of Employed Female Adults Using more than 91% of labour power |
|-----------------|---|
| Village-1       | 2.86  |
| Village-2       | 4.55  |

Source: Field Survey, 2008-09

## 8.9 IRRIGATION AND USE OF LABOUR POWER

8.9.1 Traditionally irrigation plays the most important role in raising the productivity of land and as well as of the labour power. Its importance further increases in modern agricultural sector when agricultural activities welcome the so called "New Agricultural Strategy". In this section, we will examine the impact of irrigation upon the intensity of labour use in our area economy. We have already mentioned that farmers of our sample village-2 have enjoyed the "River Lift Irrigation" facility in the process of their agricultural activities. This river lift irrigation project has been established under the initiation of the Government. As a result the farmers of our second village have been enjoying some sort of cost-benefit in using the irrigation water in their agriculture. On the other hand, irrigation enterprises in our first village have been privately managed and obviously charged high price in comparison to the second village.

8.9.2 In order to examine the impact of irrigation upon the intensity of labour use, we have calculated the labour use indices of employed adults, employed male adults and employed female adults separately for sample village-1 and sample village-2 respectively for the **Farming Group** only. All these calculated figures have been displayed in tables 8.35 to 8.43. The comparisons of use of labour power between the two sample villages due to availability of cheap and costly irrigational facilities will be clearer from tables 8.44 to 8.51. It is clear from these tables that in all cases sample village-2 are in better position in comparison to sample village-1. This is mainly due to intensive cultivation throughout the year for cheap irrigational facilities in sample village-2. The farmers of sample village-2 have the scope of using their lands more intensively throughout the year which generates more employment opportunities in the agricultural fields. But differences in cases of employed male and female adults using more than 61 percent, 76 percent and 91 percent of labour power between the two sample villages are highly significant. The difference in case of employed female adults using more than 45 percent of labour power is also statistically significant. This at least points out that the employed adults in the **Farming Group** in sample village-2 are interested to use their labour power cent percent. So appropriate planning for extending irrigational

facilities at the initiative of the Government is suggested for using the labour inputs more efficiently at the grass-root level.

**Table 8.35: LABOUR USE INDEX OF EMPLOYED ADULTS IN TOTAL SAMPLE (FARMING GROUP)**

| Percentage of Employed Adults | Intensity of Use of Labour Power<br>(Less than ) |
|-------------------------------|--|
| 6.12                          | 0.30   |
| 25.24                         | 0.45   |
| 50.48                         | 0.61   |
| 83.14                         | 0.76   |
| 95.49                         | 0.91   |
| 100.00                        | 1.00   |

Source: Field Survey, 2008-09

**Table 8.36: LABOUR USE INDEX OF EMPLOYED MALE ADULTS IN TOTAL SAMPLE (FARMING GROUP)**

| Percentage of Employed Adults | Intensity of Use of Labour Power<br>(Less than ) |
|-------------------------------|--|
| 2.86                          | 0.30   |
| 16.36                         | 0.45   |
| 43.25                         | 0.61   |
| 79.74                         | 0.76   |
| 94.68                         | 0.91   |
| 100.00                        | 1.00   |

Source: Field Survey, 2008-09

**Table 8.37: LABOUR USE INDEX OF EMPLOYED FEMALE ADULTS IN TOTAL SAMPLE (FARMING GROUP)**

| Percentage of Employed Adults | Intensity of Use of Labour Power<br>(Less than ) |
|-------------------------------|--|
| 21.74                         | 0.30   |
| 67.70                         | 0.45   |
| 85.09                         | 0.61   |
| 99.38                         | 0.76   |
| 99.38                         | 0.91   |
| 100.0                         | 1.00   |

Source: Field Survey, 2008-09

Fig. 8.9

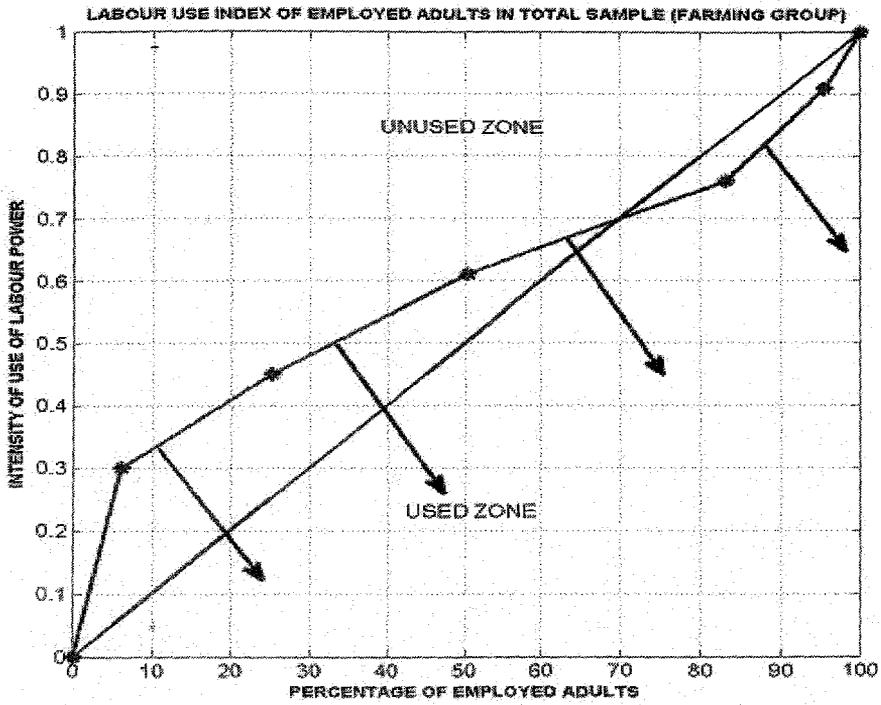


Fig. 8.10

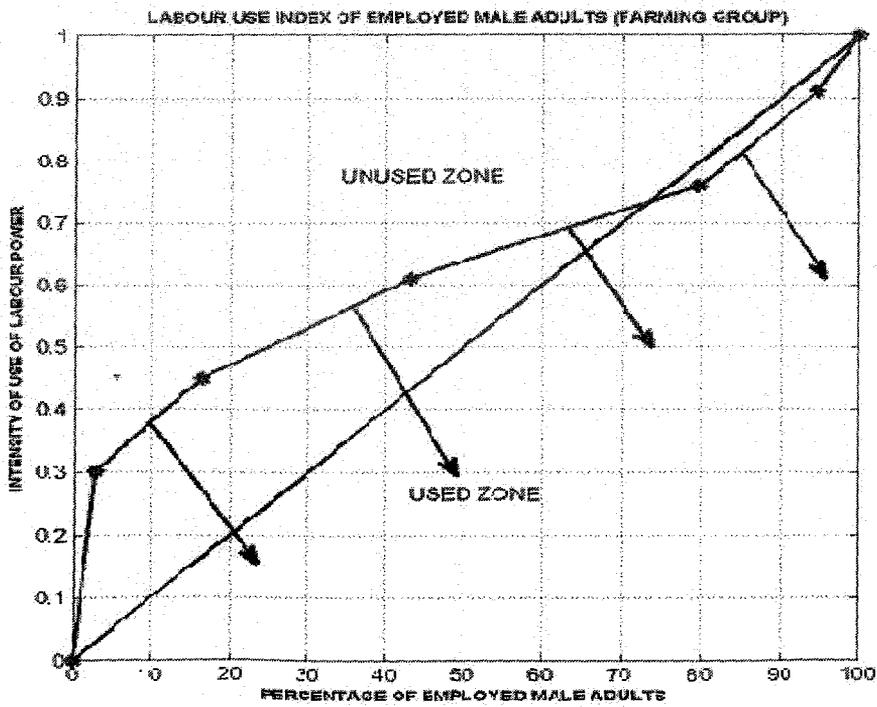
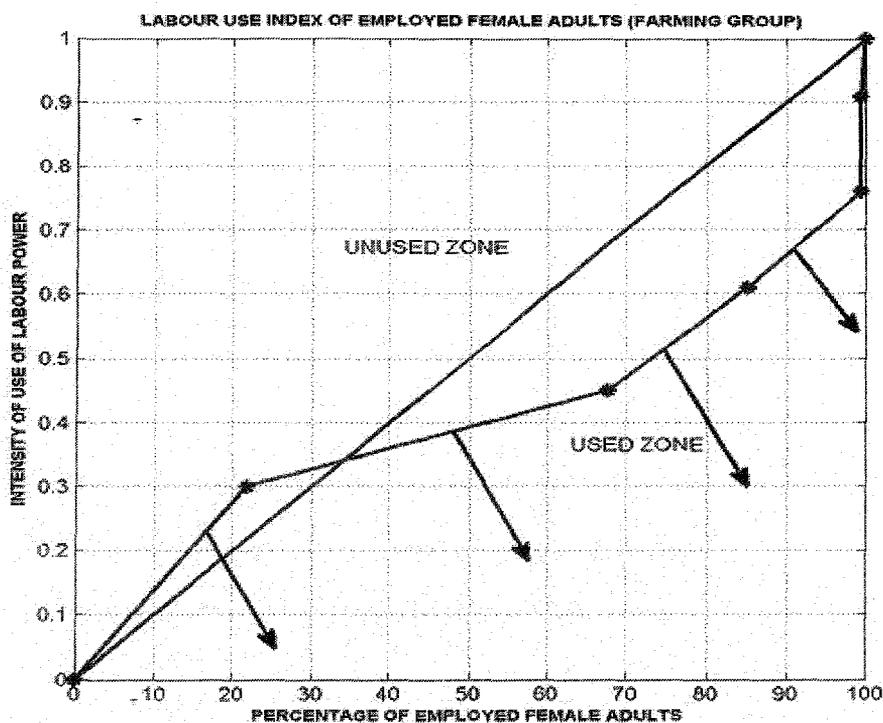


Fig. 8.11



**Table 8.38: LABOUR USE INDEX OF EMPLOYED ADULTS IN SAMPLE VILLAGE-1 (FARMING GROUP)**

| Percentage of Employed Adults | Intensity of Use of Labour Power (Less than ) |
|-------------------------------|---|
| 6.56                          | 0.30  |
| 25.46                         | 0.45  |
| 51.57                         | 0.61  |
| 85.17                         | 0.76  |
| 96.19                         | 0.91  |
| 100.00                        | 1.00  |

Source: Field Survey, 2008-09

**Table 8.39: LABOUR USE INDEX OF EMPLOYED MALE ADULTS IN SAMPLE VILLAGE-1 (FARMING GROUP)**

| Percentage of Employed Adults | Intensity of Use of Labour Power (Less than ) |
|-------------------------------|---|
| 2.82                          | 0.30  |
| 16.61                         | 0.45  |
| 44.36                         | 0.61  |
| 82.29                         | 0.76  |
| 95.45                         | 0.91  |
| 100.00                        | 1.00  |

Source: Field Survey, 2008-09

**Table 8.40: LABOUR USE INDEX OF EMPLOYED FEMALE ADULTS IN SAMPLE VILLAGE-1 (FARMING GROUP)**

| Percentage of Employed Adults | Intensity of Use of Labour Power<br>(Less than ) |
|-------------------------------|--|
| 25.81                         | 0.30   |
| 70.97                         | 0.45   |
| 88.71                         | 0.61   |
| 100.00                        | 0.76   |
| 100.00                        | 0.91   |
| 100.0                         | 1.00   |

Source: Field Survey, 2008-09

Fig. 8.12

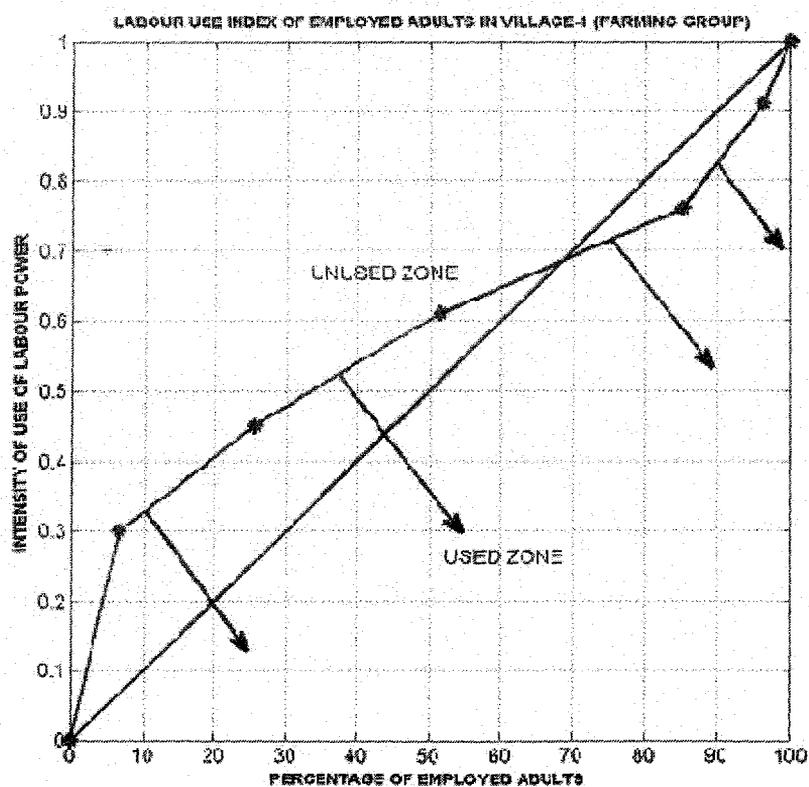


Fig. 8.13

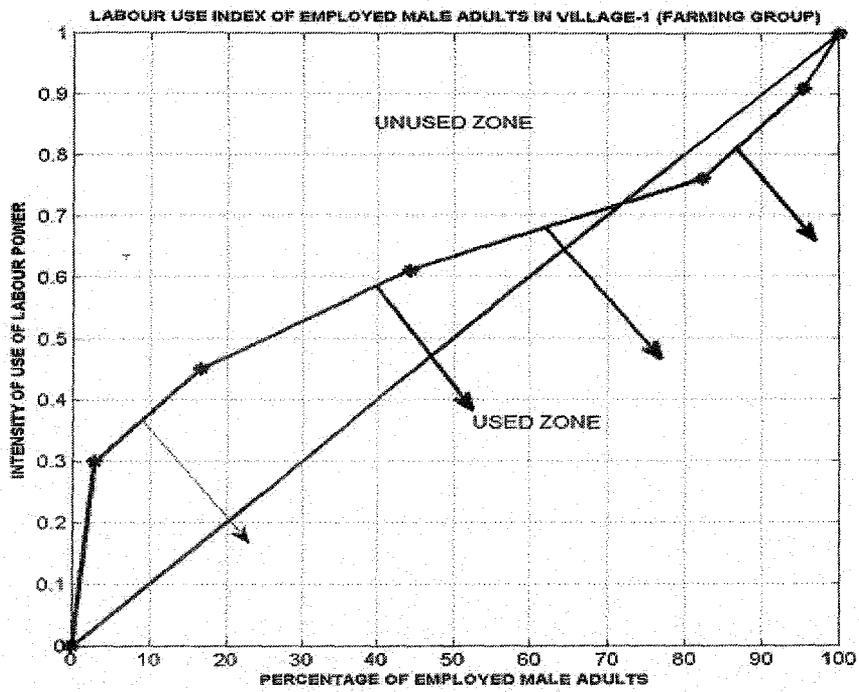
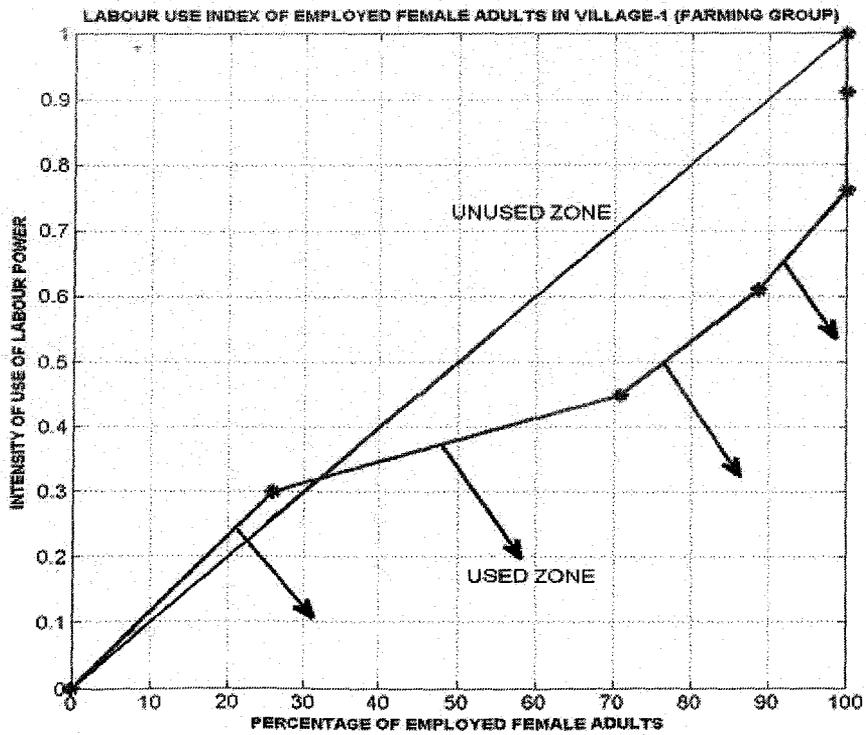


Fig. 8.14



**Table 8.41: LABOUR USE INDEX OF EMPLOYED ADULTS IN SAMPLE VILLAGE-2 (FARMING GROUP)**

| Percentage of Employed Adults | Intensity of Use of Labour Power<br>(Less than ) |
|-------------------------------|--|
| 4.14                          | 0.30   |
| 24.26                         | 0.45   |
| 45.56                         | 0.61   |
| 73.96                         | 0.76   |
| 92.31                         | 0.91   |
| 100.00                        | 1.00   |

Source: Field Survey, 2008-09

**Table 8.42: LABOUR USE INDEX OF EMPLOYED MALE ADULTS IN SAMPLE VILLAGE-2 (FARMING GROUP)**

| Percentage of Employed Adults | Intensity of Use of Labour Power<br>(Less than ) |
|-------------------------------|--|
| 3.03                          | 0.30   |
| 15.15                         | 0.45   |
| 37.88                         | 0.61   |
| 67.42                         | 0.76   |
| 90.91                         | 0.91   |
| 100.00                        | 1.00   |

Source: Field Survey, 2008-09

**Table 8.43: LABOUR USE INDEX OF EMPLOYED FEMALE ADULTS IN SAMPLE VILLAGE-2 (FARMING GROUP)**

| Percentage of Employed Adults | Intensity of Use of Labour Power<br>(Less than ) |
|-------------------------------|--|
| 8.11                          | 0.30   |
| 56.76                         | 0.45   |
| 72.97                         | 0.61   |
| 97.30                         | 0.76   |
| 97.30                         | 0.91   |
| 100.00                        | 1.00   |

Source: Field Survey, 2008-09

Fig. 8.15

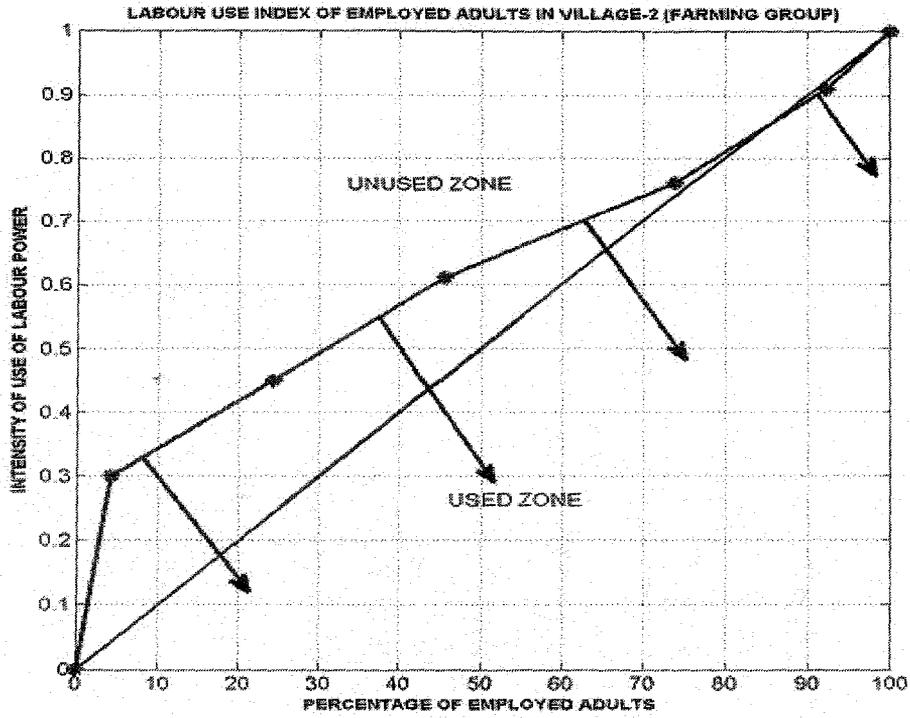


Fig. 8.16

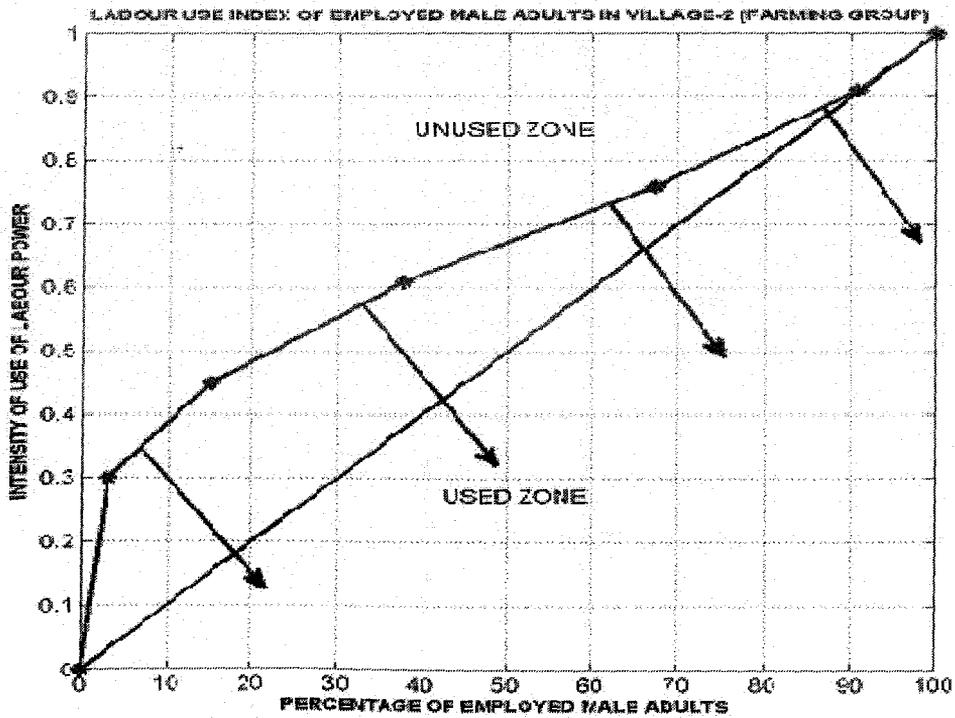
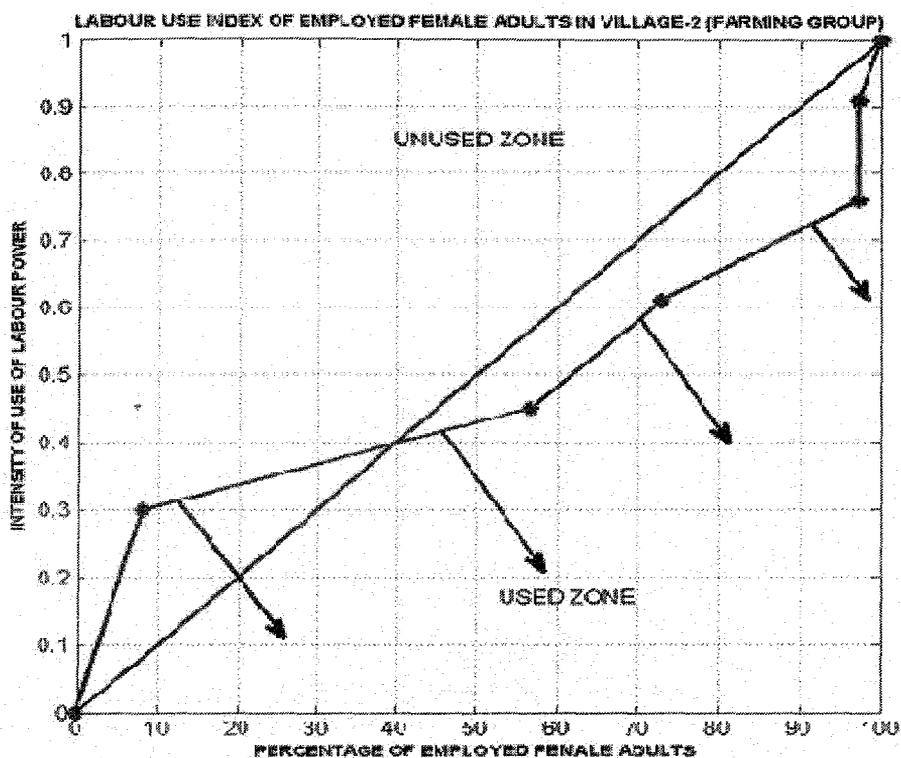


Fig. 8.17



**Table 8.44: PERCENTAGE OF EMPLOYED MALE ADULTS USING MORE THAN 45% OF LABOUR POWER IN SAMPLE VILLAGE-1 AND SAMPLE VILLAGE-2(FARMING GROUP)**

| Sample villages | % of Employed Male Adults Using more than 45% of labour power |
|-----------------|---|
| Village-1       | 83.39   |
| Village-2       | 84.85   |

Source: Field Survey, 2008-09

**Table 8.45: PERCENTAGE OF EMPLOYED MALE ADULTS USING MORE THAN 61% OF LABOURPOWER IN SAMPLE VILLAGE-1 AND SAMPLE VILLAGE-2(FARMING GROUP)**

| Sample villages | % of Employed Male Adults Using more than 61% of labour power |
|-----------------|---|
| Village-1       | 55.64   |
| Village-2       | 62.12   |

Source: Field Survey, 2008-09

**Table 8.46: PERCENTAGE OF EMPLOYED MALE ADULTS USING MORE THAN 76% OF LABOUR POWER IN SAMPLE VILLAGE-1 AND SAMPLE VILLAGE-2 (FARMING GROUP)**

| Sample villages | % of Employed Male Adults Using more than 76% of labour power |
|-----------------|---|
| Village-1       | 17.71   |
| Village-2       | 32.58   |

Source: Field Survey, 2008-09

**Table 8.47: PERCENTAGE OF EMPLOYED MALE ADULTS USING MORE THAN 91% OF LABOUR POWER IN SAMPLE VILLAGE-1 AND SAMPLE VILLAGE-2(FARMING GROUP)**

| Sample villages | % of Employed Male Adults Using more than 91% of labour power |
|-----------------|---|
| Village-1       | 4.55  |
| Village-2       | 9.09  |

Source: Field Survey, 2008-09

**Table 8.48: PERCENTAGE OF EMPLOYED FEMALE ADULTS USING MORE THAN 45% OF LABOURPOWER IN SAMPLE VILLAGE-1 AND SAMPLE VILLAGE-2(FARMING GROUP)**

| Sample villages | % of Employed Female Adults Using more than 45% of labour power |
|-----------------|---|
| Village-1       | 29.03   |
| Village-2       | 43.24   |

Source: Field Survey, 2008-09

**Table 8.49: PERCENTAGE OF EMPLOYED FEMALE ADULTS USING MORE THAN 61% OF LABOUR POWER IN SAMPLE VILLAGE-1 AND SAMPLE VILLAGE-2(FARMING GROUP)**

| Sample villages | % of Employed Female Adults Using more than 61% of labour power |
|-----------------|---|
| Village-1       | 11.29   |
| Village-2       | 27.03   |

Source: Field Survey, 2008-09

**Table 8.50: PERCENTAGE OF EMPLOYED FEMALE ADULTS USING MORE THAN 76% OF LABOUR POWER IN SAMPLE VILLAGE-1 AND SAMPLE VILLAGE-2 (FARMING GROUP)**

| Sample villages | % of Employed Female Adults Using more than 76% of labour power |
|-----------------|---|
| Village-1       | 00  |
| Village-2       | 2.70  |

Source: Field Survey, 2008-09

**Table 8.51: PERCENTAGE OF EMPLOYED FEMALE ADULTS USING MORE THAN 91% OF LABOUR POWER IN SAMPLE VILLAGE-1 AND SAMPLE VILLAGE-2 (FARMING GROUP)**

| Sample villages | % of Employed Female Adults Using more than 91% of labour power |
|-----------------|---|
| Village-1       | 00  |
| Village-2       | 2.70  |

Source: Field Survey, 2008-09

**8.9.2** In order to examine the impact of irrigational facilities on the intensities of labour power more clearly between the two sample villages we have also calculated mean values and standard deviations of man-days employed in the **Farming Group** (Main Occupations) between the sample villages in case of the three categories: the employed adults, employed male adults and employed female adults. This is shown in table 8.52.

**Table 8.52: MEAN AND STANDARD DEVIATION OF MAN-DAYS EMPLOYED (MAIN OCCUPATIONS) IN SAMPLE VILLAGES (FARMING GROUP)**

| Type of persons Employed | Mean of Man-days Employed |                  |             | S.D of Man-days Employed |                  |              |
|--------------------------|---------------------------|------------------|-------------|--------------------------|------------------|--------------|
|                          | Sample village-1          | Sample village-2 | Total ample | Sample village-1         | Sample village-2 | Total sample |
| Employed Adults          | 196.14                    | 202.29           | 197.26      | 52.23                    | 58.09            | 53.39        |
| Employed Male Adults     | 210.10                    | 214.89           | 210.92      | 44.04                    | 48.99            | 44.96        |
| Employed Female Adults   | 124.31                    | 157.35           | 131.90      | 60.01                    | 61.03            | 61.83        |

Source: Field Survey, 2008-09

**8.9.3** One can see from the table that the mean values of man-days employed of all three categories viz. Employed Adults, Employed Male Adults and Employed Female Adults are 202.29, 214.89 and 157.35 respectively in sample village-2 which are higher than those of sample village-1. In case of sample village-1 the said three values are 196.14, 210.10 and 124.31 respectively. A relatively higher means values of man-days employed in sample village-2 allows us to conclude that irrigation has some positive effect on employment. Again the co-efficient of variations in sample village-1 and sample village-2 in case of Employed Adults, Employed Male Adults and Employed Female Adults are 26.63 and 28.72; 20.96 and 22.80; and 48.27 and 38.77 respectively. These permit us to say that there is greater variability of man-days employment in case of individual workers in sample village-2 than sample village-1, except the case of Employed Female Adults. This is due to non-availability of irrigation water uniformly in all areas of sample village-2.

## 8.10 EDUCATION AND INTENSITY OF USE OF LABOUR POWER IN THE FARMING GROUP

8.10.1 There is no denying that there is a positive correlation between education and agricultural activities particularly when agricultural strategy has gone through a higher degree of variation over the years. The New Agricultural Strategy of 60's of the last century is now under on a crucial question particularly in terms of sustainability of the fertility of soil. Further, rigorous use of pesticides and insecticides helps to disappear the eco-friendly insects and brings agriculture under severe threat. A proper knowledge of use of inorganic and organic manure in an optimum ratio requires proper education and training. Further, crop pattern and crop rotation also require proper education and knowledge. If the farmers are educated properly, this will no doubt increase the intensity of land use and obviously the intensity of labour use

8.10.2 Thus to examine the impact of education on the intensity of use of labour power in our rural area economy, we have calculated the intensity of labour use indices of the employed male adults of the *Farming Group* considering male adults who have completed education of 5 years or more and the male adults whose education are less than 5 years. We have considered only the employed male adults because they are the decision makers in agricultural activities. These have been displayed in tables 8.53 and 8.54 respectively. It is clear from these tables that the employed male adults with education of 5 years or more are using their labour power more intensively in the agricultural sector than those employed male adults with education of less than 5 years. This has become possible due to use of their land more intensively throughout the year by using the modern technology.

**Table 8.53: LABOUR USE INDEX OF EMPLOYED MALE ADULTS WHOHAVE COMPLETED EDUCATION OF 5 YEARS OR MORE (FARMING GROUP)**

| Percentage of Employed Male Adults | Intensity of Use of Labour Power<br>(Less than ) |
|------------------------------------|--|
| 0.55                               | 0.30   |
| 4.43                               | 0.45   |
| 16.89                              | 0.61   |
| 63.99                              | 0.76   |
| 90.58                              | 0.91   |
| 100.00                             | 1.00   |

Source: Field Survey, 2008-09

**Table 8.54: LABOUR USE INDEX OF EMPLOYED MALE ADULTS WHO HAVE COMPLETED EDUCATION OF LESS THAN 5 YEARS (FARMING GROUP)**

| Percentage of Employed Male Adults | Intensity of Use of Labour Power<br>(Less than ) |
|------------------------------------|--|
| 4.89                               | 0.30   |
| 26.89                              | 0.45   |
| 66.50                              | 0.61   |
| 93.64                              | 0.76   |
| 98.29                              | 0.91   |
| 100.00                             | 1.00   |

Source: Field Survey, 2008-09

Fig. 8.18

LABOUR USE INDEX OF EMPLOYED MALE ADULTS WHO HAVE COMPLETED EDUCATION OF 5 YEARS OR MORE (FARMING GROUP)

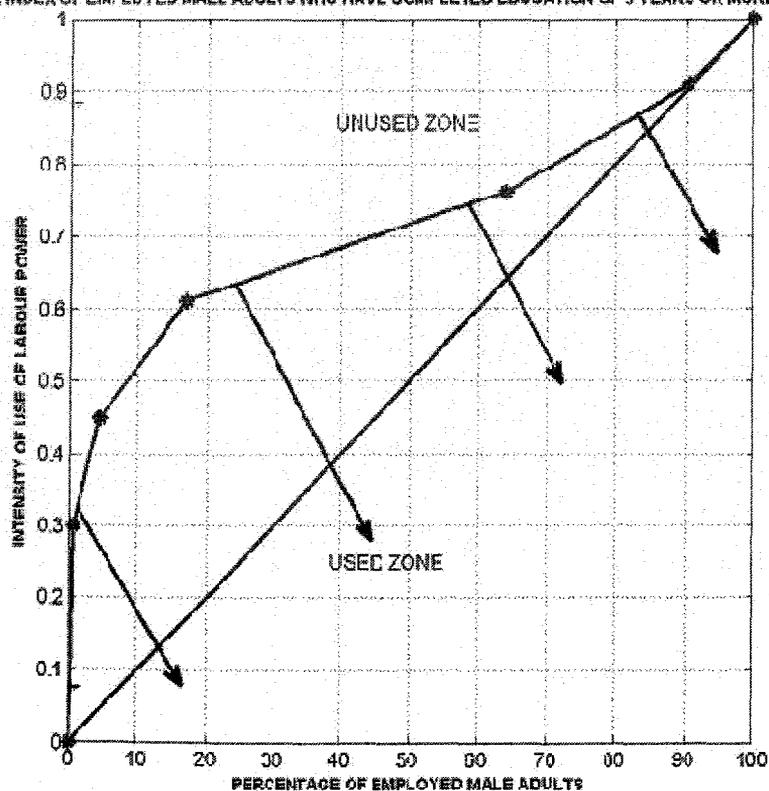
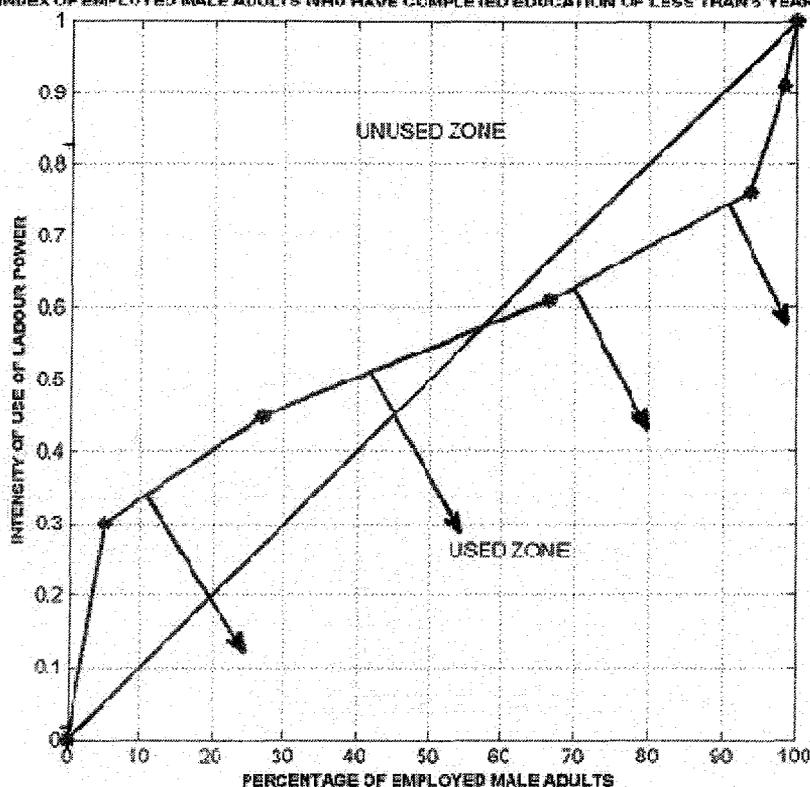


Fig. 8.19

LABOUR USE INDEX OF EMPLOYED MALE ADULTS WHO HAVE COMPLETED EDUCATION OF LESS THAN 5 YEARS (FARMING GROUP)



**Table 8.55: PERCENTAGE OF EMPLOYED MALE ADULTS USING MORE THAN 45% OF LABOUR POWER IN OUR AREA ECONOMY (FARMING GROUP)**

| Category of Employed Male Adults                                       | % of Employed Male Adults Using more than 45% of labour power |
|--|---|
| Employed Male Adults who have completed Education of 5 years or more   | 95.57   |
| Employed Male Adults who have completed Education of less than 5 years | 73.11   |

Source: Field Survey, 2008-09

**Table 8.56: PERCENTAGE OF EMPLOYED MALE ADULTS USING MORE THAN 61% OF LABOUR POWER IN OUR AREA ECONOMY (FARMING GROUP)**

| Category of Employed Male Adults                                       | % of Employed Male Adults Using more than 61% of labour power |
|--|---|
| Employed Male Adults who have completed Education of 5 years or more   | 83.11   |
| Employed Male Adults who have completed Education of less than 5 years | 33.5  |

Source: Field Survey, 2008-09

**Table 8.57: PERCENTAGE OF EMPLOYED MALE ADULTS USING MORE THAN 76% OF LABOUR POWER IN OUR AREA ECONOMY (FARMING GROUP)**

| Category of Employed Male Adults                                       | % of Employed Male Adults Using more than 76% of labour power |
|--|---|
| Employed Male Adults who have completed Education of 5 years or more   | 36.01   |
| Employed Male Adults who have completed Education of less than 5 years | 6.36  |

Source: Field Survey, 2008-09

**Table 8.58: PERCENTAGE OF EMPLOYED MALE ADULTS USING MORE THAN 91% OF LABOUR POWER IN OUR AREA ECONOMY (FARMING GROUP)**

| Category of Employed Male Adults                                       | % of Employed Male Adults Using more than 91% of labour power |
|--|---|
| Employed Male Adults who have completed Education of 5 years or more   | 9.42  |
| Employed Male Adults who have completed Education of less than 5 years | 1.71  |

Source: Field Survey, 2008-09

8.9.3 One can see from tables 8.55 to 8.58, derived from Tables 8.53 and 8.54 that, in all cases, the employed male adults who completed education of 5 years or more are succeeded to use their labour power more intensively than those employed male adults with education of less than 5 years. Again the differences in proportions shown in tables 8.55 to 8.58 are statistically significant. So we can conclude that basic education is necessary for increasing the intensity of labour power in the agricultural sector too and the Government either at the state level or at the local level should take the initiative for proper training of the illiterate farmers at the grass-root level.

## Chapter-9

### CONCLUSIONS

#### 9.1 SOME IMPORTANT FINDINGS

9.1.1 At the outset of this conclusion we like to divulge that our study has brought into the open important points about the use of basic resources like land and labour at the area economy of Banewar. From the point of view of land use intensity it has been seen that a reasonable amount of land remains outside of the proximity of cultivation. Land intensity values according to our three methods justify this. All are given in table 8.16 in chapter 8. At the same time, as per the title of our write-up we suggest for grass-root planning, the land reserve available for further planning makes up as much as 40 per cent of the gross cultivable land. This amount of land can be used for further use in the course of future plan. Again from the point of view of labour use intensity one can notice from table 8.17 that the existing utilisation of labour power is far off from the optimum utilisation. What is seriously bound us to think that the adult women are far from the employment operational network at this grass-root area economy. Nearly 40 percent employed female adults have been succeeded to make use their labour power for 100 days and less only in an agricultural year. This simply permits us to say that the nature of activities throw open by this area economy is not suitable for the female workers.

9.1.2 The existing agricultural infrastructure available is far-off ~~the~~ from the level that has been required for smooth development of an agricultural sector. We mention here especially the case of irrigational facility. It is revealed very clearly from our study that due to inadequate irrigational infrastructure the farmers of this area economy are rather failed to introduce multiple cropping practice even after the call for a second green revolution in eastern and north eastern area of our national economy. Not only that the public irrigational enterprises, so far have been developed in some areas, releases cost benefit in a very significant manner, as has been shown in chapter 5. Public enterprise for irrigation operates in village 2 and the per acre irrigation cost is Rs. 248.72, while in village 1 this cost amount increases as much as to Rs. 493.19 and here entire irrigational network is privately managed. Obviously the cost difference is nearly double.

**9.1.3** One interesting point that revealed from this study that the area economy under our preview is trying to leave its traditional subsistence character. This has been reflected through the amount of land given in potato cultivation. One-fourth of the gross cultivated area was given to this potato cultivation during the last agricultural crop-year. This kind of crop diversion no doubt releases the signal of farm efficiency at the grass-root level. If we make a comparison among the farm income obtained from different crops then we also see that the crop potato emerges as the highest farm-income giving crop irrespective of cost differences as determined by us. On the other hand the two lowest farm-income giving crops of this region are Aus paddy and Jute, although the home labour co-efficients for these two crops are consistently very high.

**9.1.4** We can easily strengthen our finding that we have made in the preceding paragraph by put forward the figures of yield rates of our sample economy. The yield rates are very low in our sample economy. This may be due to high-cost theorem (input market shocks) facing by the decision making units because of the high input-values or may be due to output market shocks. So it should be the compulsory duty of the republic to assure the farmers that they have been obtained the necessary inputs as and when it required in the production process at a fair price as determine by the Republic. On the other hand, output market of agricultural product should be such that none of our farmer left in the market with their produce at the end of the market tenure. So our short term plan as well as our long term plan depends very much on the guarantee of fulfilment of the above stated two conditions.

**9.1.5** This study has revealed beyond doubt, as follows from chapter 6 that irrigation water and organic manures are being appeared as most important agents of additional production in agricultural sector. Although the value of the marginal productivity in case of inorganic manure is being positive but the entire credit has been hijacked by the potato production itself. Thus overall performance in raising crops is still lagging behind the two production agents just we mention in the previous sentence. But what is most important to be noted here is that farmers of this grass-root area economy have been failed to use properly their family labour in the proecess of production. The negative value of the marginal productivity of

home labour permits us say that the home labours are disguisedly unemployed or rather irrationally used in the process of production. On the other hand, the negative co-efficient value of seeds is highly indicative and intimates us about the absence of organised seed market in the one hand and low quality seed variety used in the production process on the other hand.

**9.1.6** Another interesting point releases from our study is that the easy and cheap availability of production agents does not guaranteed to be appeared as an important production agent. The availability of irrigation water in village 2 is easy and cheap but the marginal productivity of irrigation water is consistently high in village 1 rather than village 2. In comparison between tables 6.2(a) and 6.3(a) one can easily come to the conclusion that a good organic base along with the irrigation base can overruled the illusory advantage of inorganic manure in the production process.

**9.1.7** Although as per our assumptions we have taken only 33 farms to test the efficiency of the decision making units at the individual level, still this efficiency analysis releases some important signals for future planning in a decentralised manner. One can receive some signals from table 7.1 where the percentage of efficient DMUs is consistently high in all the three crops under our purview. But what is interesting is that and whatever may be the reasons, in the course of time farmers of our sample economy make them free from the illusion of toxic tobacco production. Further, the efficacy of the farmers of this area economy can easily be increased simply by using two production agents namely home labour and organic manure in a little bit managerial manner instead of traditional manner.

## **9.2 RECOMENDATIONS**

**9.2.1** We recommend for the set-up of organic base for this area economy and also for other like area economies. The reasons behind this recommendation are, in the first place, it is cheap and easy available. In the second place, its mode of supply is being controlled by the decision making units itself and finally, it is not harmful to land fertility. Further, the concept of one straw revolution of Masanabu Fuzuaka, the ultimate destination of our future agricultural production, can also be

justified with the development of organic base at the each and every grass-root area economy.

**9.2.2** Our recommendation highly highlighted about the formation of proper input and output market complex in such a manner that in the input market each and every decision making unit can able to purchase any amount of their reproducible agent freely at a fair price and none of our production unit can stay in the output market with their produce in unsold condition at the end of the market. Both the markets should be regulated in such a manner that unethical exploitation that exists at present in both markets in different forms should be removed.

**9.2.3** There is no denying that inorganic manure is an important production agent in our agricultural process irrespective of its regression co-efficient and marginal productivity. It has been injected in mind of our farmer's chemical fertilizer boost-up agricultural production. Under this circumstance we recommend here for a regular and rigorous training of the farmers about the proper organic and inorganic mix that should be used in the process of production. Further, proper training should also be needed to aware the farmers about the use of proper dose of growth promoters and use of other insecticides and pesticides.

**9.2.4** The river Ghargharia goes through the north-east side of our sample village 2 by creating a natural boundary. This river has huge riverbed remained dry during the months November to June. This huge riverbed area can be used for the production of watermelon. We recommend for this crop production for two reasons. Firstly, the production period of watermelon is such that it can cover the traditional gestational period of traditional agriculture by providing some amount of employment days to the labour folk who remain unemployed during that period. Secondly, the home labour co-efficient is substantially high in watermelon production (Kar, 2013). Further, the farm income in watermelon production is also very high in comparison to any traditional crop of this area economy.

**9.2.5** We also prescribe for the strawberry production to boost-up agricultural income of the farmers of this area economy. Though strawberry production, at present,

remains in nebulous form but we are in hope that in the coming future it will be an important alternative in our agricultural crop content.

**9.2.6** If the proper execution of the plan is being made as per our prescription, we hope that agricultural production, particularly vegetable production, will increase at least three fold in forthcoming future. Thus we recommend for the establishment of food processing unit at this grass-root level to release both the employment and income facilities in the one hand and to absorb the additional vegetable production to cope with the threat of price falling.

## DIFFERENT FORMULA WE HAVE USED IN DIFFERENT CHAPTERS

### Chapter-4

1. Mid-year population = Population— $1/2$ (Total Births—Total Deaths)
2. Death Rate =  $(D/P) \times 1000$ ;  
Where D = No. of deaths during the last year  
P = Mid-year Population
3. Birth Rate =  $(B/P) \times 1000$ ;  
Where B = No. of births during the last year  
P = Mid-year Population
4. Infant Mortality Rate =  $(D_0/B) \times 1000$ ;  
where  $D_0$  = No. of deaths below age 1 year during the last year  
B = No. of live births during the last year
5. General Fertility Rate =  $(B/P_i) \times 1000$ ;  
Where B = No. of live births during the last year  
 $P_i$  = Mid-year population of women between the age group 15-50
6. Gross Reproduction Rate =  $(B_i/P_i) \times 1000$ ;  
Where  $B_i$  = No. of live births of mothers in the i-th age group  
 $P_i$  = Mid-year population of women between the age group 15-50
7. Net Reproduction Rate = GRR  $\times$  Surviving Rate;  
Where GRR = Gross Reproduction Rate  
Surviving Rate = (No. of surviving children/ No. of children ever born to married women)

### Chapter-5

1. a) Cost A = This cost includes all the costs on fixed and variable inputs except the cost of home labour.  
b) Cost-B = Cost A + cost on home labour  
c) Cost-C = Cost B + the amount of interest incurred for using of investible funds in an agricultural crop year.
2. a) Farm Income-A = Farm's Receipts per Acre – Cost-A  
b) Farm Income-B = Farm's Receipts per Acre – Cost-B  
c) Farm Income-C = Farm's Receipts per Acre – Cost-C
3. a) Yield Rate-A = Farm's Receipts per Acre  $\div$  Cost-A

b) Yield Rate-B = Farm's Receipts per Acre  $\div$  Cost-B

c) Yield Rate-C = Farm's Receipts per Acre  $\div$  Cost-C

### Chapter-8

1. Work Participation Rate = Ratio between the working populations to total population during the reference period.

2. a) Land Intensity Index-I = Ratio of no. of days the plot was put to use to the total no. of days in an agricultural year.

b) Land Intensity Index-II = Ratio of Gross Cropped Area to Net Cultivable Area.

c) Land Intensity Index-III = Ratio of no. of crops raised actually in a plot of land during the agricultural year to the total no. of crops could be raised during the same year.

3. Labour Use Index = No. of days a labour is employed in a year  $\div$  330

Where, 330 man-days of employment in a year is considered as full employment.

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