IMPACT OF BANK FINANCE ON INCOME AND EMPLOYMENT OF PIGGERY FARMERS IN NAGALAND

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CERTIFICATE

This is to certify that the thesis entitled ‘‘IMPACT OF BANK FINANCE ON INCOME AND EMPLOYMENT OF PIGGERY FARMERS IN NAGALAND’’ Submitted by Mr. Likhase L.T. Sangtam to the School of Agricultural Sciences & Rural Development (SASRD), Nagaland University for the degree of DOCTOR OF PHILOSOPHY in AGRICULTURAL ECONOMICS. The thesis embodies the original record of investigation carried out by him under my Supervision & Guidance.

All help received by him have been duly acknowledged. No part of the thesis has been submitted elsewhere for any degree or diploma.

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DECLARATION

I, LIKHASE L. T. SANGTAM, hereby declare that the subject matter of this thesis is the record of the work done by me, that the contents of this thesis did not form basis of the award of any previous degree to me or to the best of my knowledge to anybody else; and that the thesis has not been submitted by me for any research degree in any other University / Institute.

This is being submitted to Nagaland University for the degree of Doctor of Philosophy in Agricultural Economics.

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(LIKHASE L.T. SANGTAM)

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ACRONYMS

%	:	Percentage
@	:	At the rate of
^{0}c	:	Degree Centigrade
A.D.	:	Anno Domini
AIDIS	:	All India Debt and Investment Survey
Anon.	:	Anonymous
ASL	:	Above Sea Level
Av.	:	Average
B.C.	:	Benefit Cost
DAO	:	District Agriculture Officer
Etc.	:	Ectera
Fig.	:	Figure
GB	:	Grameen Bank
GDP	:	Gross Domestic Product
Ha	:	Hectare
i.e.	:	That is
IEGA	:	Income and Employment Generating Activities
IRDP	:	Integrated Rural Development Programme
IRR	:	Internal Rate of Return
Kg	:	Kilogram
MT	:	Metric Tonne
MVP	:	Marginal Value Product
MYRADA	:	Mysore Resettlement and Development Agency
NCUI	:	National Co-operative Union of India

NER	:	North Eastern Region
NGO	:	Non-Governmental Organisation
NPV	:	Net Present Value
NRCM	:	National Research Centre for Mithun
NSS	:	National Sample Survey
Obs.	:	Observations
OLS	:	Ordinary Least Square
p.a	:	Per Annum
PACS	:	Primary Agricultural Credit Society
PH	:	Hydrogen Ion Concentration
q	:	Quintal
RBI	:	Reserve Bank of India
Reg.	:	Regression
Rs.	:	Rupees
SASRD	:	School of Agricultural Sciences and Rural Development
SDO (C)	:	Sub-Divisional Officer (Civil)
SGSY	:	Swarnjayanti Gram Swarojgar Yojana
SHG	:	Self Help Group
Sq.Km	:	Square Kilometer
TRC	:	Terrace Rice Cultivation
U.P.	:	Uttar Pradesh
Viz	:	Namely
WTO	:	World Trade Organisation

CHAPTER I

INTRODUCTION

Chapter I

INTRODUCTION

Agriculture is the lifeblood of Indian economy and economic growth is substantially influenced by growth of agriculture sector. Agriculture may be means of earning livelihood elsewhere but in India it has been a way of life. For centuries our culture, festivals, traditions and even trade and business were linked to agriculture. Even today it is common saying that the real India lives in villages. In ancient time, agriculture was considered as a pride, notable and honourable occupation (Jayaraj, 2009).

Agriculture is the mainstay of Indian economy not only in terms of contribution to gross domestic product but also the number of people dependent upon it. A high level growth of agriculture is essential both for achieving the objective of food security at macro and micro levels and also to alleviate poverty in India, while approximately 18.00 per cent (at current price) of the GDP is contributed by agriculture sector almost 54.00 per cent of the country's population is dependent on this sector and accounts for about 12.00 per cent share of the country's exports (Bhaskaran, 2008).

In the last few years, the Indian economy has emerged as one of the fastest growing economies in the world. However, the vulnerability of the

Indian economy with respect to the performance of the agricultural sector despite other macroeconomic indicators and sectors gaining in strength is well known. Many economists and policy-makers increasingly believe that the future growth of the domestic economy, to a large extent, will depend on the robust performance of the agricultural and rural sector (Chatterjee, 2009).

The manufacturing and service sectors cannot sustain the economy's growth if the rural sector underperforms. The contribution of the banking and financial sector to the current economic growth of the Indian economy is very significant. This is reflected in the growth in aggregate deposits and advances for scheduled commercial banks, which stood at 21.90 per cent and 25.30 per cent during 2008-2009 (Gaur, 2009).

However, the access of banking services to the rural, agriculture and the common man in general is not as promising. As Mr. V. Leeladhar (Deputy Governor, RBI, on the occasion of the Commemorative lecture at the Fedbank Hormis Memorial Foundation, Ernakulam) said "Despite making significant improvements in all the areas relating to financial viability, profitability and competitiveness, there are concerns that banks have not been able to include a vast segment of the population, especially the underprivileged sections of the society, into the fold of basic banking services" (Kareemulla, 2007). The focus of Indian banks on financial

inclusion i.e. delivery of banking services at an affordable cost of the low-income groups has been dismal. In India, the focus of the financial inclusion at present is more or less confined to ensuring a bare minimum access to a savings bank account without frills to all. Having a current account / savings account on its own, cannot be regarded as an accurate indicator of financial inclusion (Karmakar, 2008).

The rural population in India suffers from a great deal of indebtedness and is subject to exploitation in the credit market due to high interest rates and the lack of convenient access to credit. Rural households need credit for investing in agriculture and smoothening out seasonal fluctuations in earnings. Since cash flows and savings in rural areas for the majority of households are small, rural households typically tend to rely on credit for other consumption needs like education, food, housing, household functions, etc. Rural households need access to financial institutions that can provide them with credit at lower rates and at reasonable terms than the traditional money-lender and thereby help them avoid debt-traps that are common in rural India (Kavathalkar *et al.* 2007).

The 2001 census reveals the low level of banking usage among Indian households in general (35.50 per cent) and rural households in particular (30.10 per cent). This reflects on the latent demand for general banking needs in rural as well as urban segments. The debt profile of rural

households indicates that the major source of credit to rural households, particularly poor income working households, has been informal sector loans like money-lenders, which are usually at very high rates of interest. The terms and conditions attached to these loans impact the poor adversely (Goel and Kaur, 2008).

Micro finance is a broad term that includes deposits, loans, payment services and insurances to poor. The concept of micro finance and micro credit are used interchangeably. But micro credit does not include savings; hence micro finance is more appropriate term (Manimekalai, 2004). The concept is understood as providing poor families with very small loans to help them engage in productive activities or grow their tiny businesses. A success indicator of micro finance lies in a ‘ credit-plus’ approach, where the focus has not only been on providing credit, but to integrate it with other development activities. Today micro finance is very much in the agenda of public policy and it has been increasingly used as a vehicle for reaching the otherwise unreachable poor in the country (Vishwanatha, 2007; Vasimalai and Narender, 2007).

The economy of India is a rural based with more than 67.00 per cent of the population depends directly or indirectly on agriculture and its allied enterprises for their livelihood. India owns one of the largest livestock populations in the world. The animal husbandry sectors have been projected

Table 1.1 Livestock Population in India in the year 1997-98 and 2003-04

(in numbers)

Sl. No.	Different Types of Livestock	Livestock Population		% increase (+) / decrease (-)
		1997-98	2003-04	
1.	Crossbred cattle	2,00,99,000	2,46,86,000	(+) 22.82
2.	Indigenous cattle	17,87,82,000	16,04,95,000	(-) 10.23
Total cattle		19,88,81,000	18,51,81,000	(-) 6.89
3.	Buffaloes	8,99,18,000	9,79,22,000	(+) 8.90
4.	Yaks	59,000	65,000	(+) 10.17
5.	Mithun	1,77,000	2,78,000	(+) 57.06
6.	Total Bovines	28,90,35,000	28,34,46,000	(-) 1.93
7.	Sheep	5,74,94,000	6,14,69,000	(+) 6.91
8.	Goats	12,27,21,000	12,43,58,000	(+) 1.33
9.	Pigs	1,32,91,000	1,35,19,000	(+) 1.72
10.	Horses and Ponies	8,27,000	7,51,000	(-) 9.19
11.	Mules	2,21,000	1,76,000	(-) 20.36
12.	Donkeys	8,82,000	6,50,000	(-) 26.30
13.	Camels	9,12,000	6,32,000	(-) 30.70
Total Livestock		48,53,85,000	48,50,02,000	(-) 0.085

(Source: Anon, 2011)

as the subsidiary source of income and employment generation using the limited resources. Therefore, it has a tremendous scope to contribute towards the socioeconomic aspect of the rural farmers.

The challenges faced by our country in securing the food as well as nutritional security to fast growing population need an integrated approach for livestock farming. Among the various livestock species, piggery is most potential source of meat production and more efficient feed converters after the broiler. Apart from providing meat, it is also a source of bristles and manure. Pig farming will provide employment opportunities to seasonally employed rural farmers and supplementary income to improve their living standards.

As per the 17th livestock census, crossbred cattle constitute 13.30 per cent of the total cattle and 86.70 per cent are indigenous cattle. Out of total livestock in the country, around 38.20 per cent are cattle, 20.20 per cent are buffaloes, 12.70 per cent are sheep, 25.60 per cent are goats and only 2.80 per cent are pigs. All other animals are less than 0.50 per cent of the total livestock (Varma and Naidu, 2009).

In view of the importance of pig farming in terms of its contribution to rural poor and possible potentials for pig rearing in our country, Government of India has initiated measures to promote the pig farming on

Table 1.2 Livestock Population in Nagaland during 1997-98 to 2003-04

(in numbers)

Sl. No.	Different Types of Livestock	Livestock Population		% increase (+) / decrease (-)
		1997-98	2003-04	
1.	Crossbred cattle	1,54,000	2,43,000	(+) 57.79
2.	Indigenous cattle	2,30,000	2,08,000	(-) 9.57
Total cattle		3,84,000	4,51,000	(+) 17.45
3.	Buffaloes	36,000	34,000	(-) 5.56
4.	Mithun	33,000	40,000	(+) 21.21
5.	Total Bovines	4,53,000	5,25,000	(+) 15.89
6.	Sheep	2,000	4,000	(+) 100.00
7.	Goats	1,61,000	1,75,000	(+) 58.70
8.	Pigs	5,71,000	6,44,000	(+) 12.78
9.	Others	1,000	1,000	(=) 0.00
Total Livestock		11,88,000	13,49,000	(+) 13.55

(Source: Anon, 2011)

scientific lines under its five year plans. The first step towards this direction is establishment of eight bacon factories and organization of pig production in rural areas attached to bacon factories. In order to make available good foundation stock, regional pig breeding stations were established for each bacon factory. Further expansion of pig breeding programmes paved the way for establishment of 115 numbers of Pig Breeding Farms (1992-93) throughout the country (Vyas and Patil, 2000).

As per the 17th livestock census, the state of Nagaland had 0.24 per cent of Cattle, 0.03 per cent of buffaloes, 0.14 per cent of goats and 4.77 per cent of pig population of the country. A total of 14.56 per cent of Mithun population is in the state. The poultry population is 0.57 per cent of the Country's total poultry population (Anon. 2011).

In Nagaland, the crossbred cattle increased by 57.80 per cent, but indigenous cattle has decreased by 9.60 per cent during the period between 16th and 17th census showing an increase of 17.50 per cent in total cattle population during the inter-censual period. The buffalo population has decreased by 5.60 per cent. The sheep, goats and pigs showed increase of around 100.00 per cent, 8.70 per cent and 12.80 per cent respectively. The mithuns have also showed an increase of 21.00 per cent, the total livestock in the state has increased from 1.188 million to 1.349 million between these two censuses showing an overall increase of 13.60 per cent (Anon. 2011).

Pigs can be raised in a backyard setting. Pigs can be fed grain and food waste, and be allowed to forage for supplemental food. Pig manure can be used as compost. Pigs are usually slaughtered for food at the age of a few months to a year old. After that, the pig tends to put on only fat weight, making it more of a financial burden.

The advantages of the pig farming are:

1. The pig has got highest feed conversion efficiency i. e; they produce more live weight gain from a given weight of feed than any other class of meat producing animals except broilers.
2. The pig can utilize wide variety of feed stuffs viz. grains, forages, damaged feeds and garbage and convert them into valuable nutritious meat. However, feeding of damaged grains, garbage and other unbalanced rations may result in lower feed efficiency.
3. They are prolific with shorter generation interval. A sow can be bred as early as 8 to 9 months of age and can farrow twice in a year. They produce 6 to 12 piglets in each farrowing.
4. Pig farming requires small investment on buildings and equipment's.
5. Pigs are known for their meat yield, which in terms of dressing percentage ranges from 65 to 80 in comparison to other livestock species whose dressing yields may not exceed 65.00 per cent.

6. Pork is most nutritious with high fat and low water content and has got better energy value than that of other meats. It is rich in vitamins like thiamin, Niacin and riboflavin.
7. Pigs manure is widely used as fertilizer for agriculture farms and fish ponds.
8. Pigs store fat rapidly for which there is an increasing demand from poultry feed, soap, paints and other chemical industries.
9. Pig farming provides quick returns since the marketable weight of fatteners can be achieved with in a period of 6 to 8 months.
10. There is good demand from domestic as well as export market for pig products such as pork, bacon, ham, sausages, lard etc.

Pig production is considered as one of the most important activities of animal husbandry especially for the improvement of economic status in the tribal areas and north-east-states. Pork is consumed by majority of the population in tribal areas and almost all section of the population in the north-east. To meet the growing demands, pork production is essential. It has both market and price and can be reared in a diversified climatic condition. The pig production business is mainly in the hands of small and marginal farmers and agricultural labourers who maintain as a means to meet the part of their family food requirement and to earn supplementary income. Pig rearing also fits, well with mixed farming and can also be complementary to extensive crop production operations. It is an excellent

Table 1.3 State wise identified high Potential Districts for Pig rearing

Sl. No.	State	High Potential Districts
1.	Andhra Pradesh	Guntur, Nalgonda and West Godawari.
2.	Arunachal Pradesh	Lohit, Lower Subansiri and West Siang.
3.	Assam	Barpeta, Bongaigaon, Cachar, Dar- rang, Dhamaji, Dubri, Goalpara and Golaghat.
4.	Bihar	Gaya.
5.	Chattisgarh	Dantawada and Jogdalpur.
6.	Jharkand	Dumka and Ranchi.
7.	Kerela	Pattanamthitta.
8.	Manipur	Bhisnupur, Chendel, Churachundpur, Imphal East and Imphal West.
9.	Meghalaya	East Garo Hills, East Khasi Hills, Ri Bhoi and South Garo Hills.
10.	Mizoram	Aizwal, Champai, Kolasib and Lun- glei
11.	Nagaland	Dimapur, Kiphire, Kohima, Longleng and Mokokchung.
12.	Odisha	Kendrapara.
13.	Tripura	Dhalai, North Tripura, South Tripura and West Tripura.
14.	Uttar Pradesh	Basti, Muzzafarnagar and Pilibit.
15.	West Bengal	Bankura, Burdwan, Darjeeling and Midnapore (West)

(Source: Anon. 2011)

source of protein, vitamins, minerals and other nutrients to the human diet by providing a good source of essential nutrients.

Pig production is emerging as a Sunrise Industry and acknowledge as the major transformation in bringing about the socio-economic transformation of rural poor. To meet the challenges ahead, great emphasis needs to be placed on the facilities especially financing where most of the farmers want to take up the venture lack it. With the nationalization of banks in 1969, the bank has been an instrument in the development of integrated piggery projects involving rearing pigs for parent stock, production for marketing and research purposes and for other meat processing activities. The emphasis on credit has continued to be on progressive institutionalization for providing timely and adequate credit to farmers for increasing production and productivity. The banks had been providing favourable climate for the farmers to generate employment and to increase the growing population demand for meat. Providing better access to institutional credit for small and marginal farmers and other weaker sections to enable them to adopt modern technology and unproved practices has been one of the major objectives of the country's policy.

The pig farming constitutes the livelihood of rural poor belonging to the lowest socio-economic strata and they have no means to undertake scientific pig farming with improved foundation stock, proper housing,

feeding and management. Therefore, suitable schemes to popularize the scientific pig breeding cum rearing of meat producing animals with adequate financial provisions are necessary to modernize the Indian pig industry and to improve the productivity of small sized rural pig farms.

The role of banks in rural upliftment especially piggery development, and the effectiveness of commercial banks as a tool for socio-economic, and over all development of the rural people consists of a broad spectrum and considerable works have been done. There is still much scope for the study of role of banks and institutional finances in rural development. The major constrain for pig production is lack of capital. Therefore, the success or failures of any enterprises including piggery depends to a large extend on availability of finance.

Piggery industry has been playing a very significant role in various socio-economic development programmes by way of providing self-employment, supplementary income and also protective food for all sections of the people of Nagaland. Such studies will help to bring out hindrances and bottlenecks and recommending a suitable institutional framework for providing adequate and timely finance to the rural poor, whereas the monitoring will be used in a way that leads to meaning development. But till today no concrete research has been carried out in Nagaland to investigate and find out the credit needs for piggery farming.

The present study was conducted with a view that its result may be useful to the researcher, planners, co-operative bank personnel's, administrators and extension workers who are engaged in generating and disseminating credit schemes for upliftment of the farmers of all groups in general and marginal farmers in specific.

An attempt was made in this study to analyzed these factors, which would affect the availing, utilization and repayment of agriculture credit by farmers and to suggest measures to formulate strategies to increase the utility of agriculture credit.

Considering the broad based impact of credit on production potential and all-round development of rural people, the present study has been proposed on burning problem entitled, "Impact of Bank Finance on Income and Employment of the Piggery Farmers in Nagaland" with the following specific objectives-

1. To study the adequacy of bank finance for piggery
2. To study the utilization pattern of bank finance for piggery
3. To study the repayment performance of borrowers
4. To study the feasibility of investment in piggery
5. To study the impact of bank finance on borrowers income and employment.

Hypothesis

1. Ho: Bank finance is not adequate for piggery enterprise beneficiaries,
2. Ho: The repaying capacity of borrowers failure, and
3. Ho: Bank finance has no impact on income and employment for piggery enterprise.

Description of Chapters

The entire study is presented in six chapters. The Chapter 1 gives introductory note highlighting the rationale of the study, specific objectives and hypotheses, while Chapter 2 represents the reviews of the studies made in the past that are relevant to the objectives of the present investigation. Chapter 3 explains the methodology adopted in the study, including the delineation, nature and sources of data, analytical tools and techniques used. Chapter 4 gives the socio economics features / description of the study area. The results and discussion of the study are presented in Chapter 5 and the summary and policy implications are given in Chapter 6.

Limitations of the study

- The major limitation of the present study was with regards to the time, study area and other research facilities usually faced by a single researcher.
- The present study was confined to one district of Nagaland. The selection of the district was purposive hence scope of generalizations with respect to Agricultural credit and its impact on overall development of borrowers in other districts as is limited. Hence, the study does not claim to generalize the findings on large scale.
- Study is based on individual's perception and expressed opinion. Although all attempts had been made to extract information from the respondents nearest to the truth but there had been always possibility that information provided by some respondents might not have been hundred per cent correct as there was no written record maintained by the respondents, therefore they had to rely on the recall memory.
- Most of the utilized variables were measured at nominal and/ or ordinal levels not permitting the use of parametric statistical tests extensively. The basis for statistical tests primarily was frequency distribution and percentages.

CHAPTER II

REVIEW OF LITERATURE

Chapter II

REVIEW OF LITERATURE

The banking sector has witnessed a fast rapid growth in the recent years. However, despite such a growth, the credit flow by banks to the rural and agricultural sectors remains dismal, which, more or less, has resulted in financial exclusion of the rural masses. A comprehensive review of literature is an integral part of any investigation, as it not only gives an idea of the work done in the past and assists in delineation of problem area, but also provides basis for interpretation and discussion of findings. Available literature on the subject is briefly presented in chronological order in five sub headings as follows:

1. Adequacy of bank finance for piggery:

Agarwal and Kumawat (1974) in their study on potential of increasing farm income through credit stated that introduction of technology without comparable credit facilities cannot be expected to have any significant impact on farm income. So, efforts should be made to extend credit facilities along with other input facilities.

Batra (1977) reported that though the rural banks are conceived as agencies for opening alternative sources of credit for developmental needs in the rural areas of India, it is argued that credit will not automatically reach the weakest and the most deserving sections of the community. For this, special efforts will have to be made in co-ordination with other credit institutions and proper vigilance exercised.

Galgalikar and Gadre (1977) examined the structure of rural credit in Akola district of Maharastra. The study reported misappropriation of borrowed amount which had a declining trend with the increase in the size of holding. This was highest to extent of 62.50 per cent in marginal farmers.

Nicholson (1983) reported that, "credit shall educate, discipline and guide the borrower. It should be granted to only those who have learned to think, plan, to save and utilize it".

Gajanana and Sharma (1990) reported that on optimization, both returns and employment prospects improved substantially with the provision of unlimited availability of capital (credit), further it was recommended that technology has a profound influence on returns and employment. The effect of recommended technology was more pronounced when it was associated with adequate capital.

Joshi (1997) stated after evaluating the strengths and weaknesses of the country's rural credit structure that non-institutional agencies continued to dominate most of the rural areas. The village money-lender was still strong.

Patel (1997) reported that during the last fifty years the country's rural Banking System witnessed spectacular growth within the number of rural credit outlets crossing the Rs 1,50,000.00/- mark. The credit disbursement has also increased tremendously. At the same time, several unhealthy trends have also set in this sector.

Jain and Pandey (2000) revealed economic analysis of pig rearing for three categories of farmer's viz. small, medium and large farms for economic analysis. They collected primary data on herd strength, production parameters, capital investment, cost and return etc. they revealed that feed cost constitutes the lions share.

Ray (2007) in his study based on survey data collected from a sample of 160 farm households in West Bengal, India, this study reveals that credit availability from both institutional and non-institutional sources has a significant contribution to change in cropping pattern. But the impact of credit availability on cropping pattern change is more significant in the case of smaller-sized land holdings. Again, the profitability is also higher in the

case of small and marginal farmers. The closer supervision of cultivation, availability of credit and the exclusion of costs of family inputs (e.g. family labour) are the factors behind this higher profitability. Despite this higher profitability, however, factors like food security, higher cost of cultivation, non-availability of credit at the right time and in right amount, and the practice of mixed crop-livestock farming are hindering the wholesale shift of cropping pattern towards non-food grain cultivation.

Sharma *et al*. (2007) in his study examined the access to credit which includes pattern of borrowing, overdues and determinants of borrowing behavior. The study was conducted in Himachal Pradesh, sub divided into four agro-climatic zones, viz. Zone I - Sub Mountain Low Hills, Zone II - Mid-Hill High Humid, Zone III - High Hills Temperate wet and Zone IV - High Hills Temperate. In each zone, two blocks were randomly selected from four villages and in all 360 farmers were selected for detailed analysis. The results revealed that more than 70.00 per cent of the borrowings were from the institutional sources. In each block 45 farmers were selected with at least 10 farmers. The contribution of banks was found to be 68.00 per cent. It was the highest in zone I and minimum in zone IV. The overdues from the institutional agencies can be reduced through better facilities in terms of minimizing codal formalities and improving infrastructural facilities, optimum availability and credit supervision in the area. The results have shown different determinants for borrowing behavior in different zones

of the state. It is, therefore, suggested that financial institutions should be given a free hand to some extent to tackle the lending at their own level. Emphasis needs to be given to "number of borrowers" rather than "amount of lending" which may help the small and marginal farmers to a large extent. Thus, there is need to develop the multi-functioning cooperatives which should not only provide good quality and adequate inputs but also sufficient credit to the farmers.

Tangthurasunan (2007) highlighted the importance of microfinance for the development of small scale aquaculture and fisheries in the Asia-Pacific region. In this region, fishing is a priority sector, but the availability of financing for the sector is limited due to the high risks involved. Also, industry structure is geared towards small-scale family enterprises. Most governments do not directly lend to fishing companies; this leaves banks and other financial institutions as potential lenders. Thiraphong Tangthirasunan has outlined the fisheries policy settings of Cambodia, India, Thailand, Philippines and Indonesia. In this regard, microfinance is viewed as a practical solution to the growing demand for financial services by the poor. There is now evidence of certain banks' shift in business culture to attune their services toward low-income rural households and small enterprises. Likewise, there is empirical evidence that microfinance, provided by various types of banks, enables the poor to better manage their consumption and their business risk, gradually build their assets, develop

their enterprises, enhance their income capacity and generally improve their quality of life.

Meetei (2008) studied the article and examines how far the members of the self-help groups (SHG) in Manipur, India, have understood the impetus and imperatives of SHG's; if the present trend of SHGs will continue in the right direction; and the strategic steps to promote the operational efficiency of the SHG. Some SHG members [unspecified number] from the National Cooperative Union of India (NCUI)-Women Cooperative Education project in the Imphal East District of Manipur, were interviewed. Relevant literature was reviewed. Results show that the project was launched to empower women to access micro-credit through group efforts under the SHGs. Up to the end of 2003; the project covered 1520 needy women, 103 of whom received skills development training and credit linkages with the Manipur Rural Bank. Some of the rest are under training. The total number of SHG's rose from 76 in 2003 to 349 in 2006-07. Working hours increased from zero or two hours to 4.5 to 6.5 hours after joining the SHG. The mean monthly income of those engaged in agarbati making, for instance, rose by 187.19 per cent. The highest record income change is in shoe making i.e.; by 700.00 per cent. The loan recovery rate ranges from 90.00 to 100.00 per cent.

Anon. (2008) examined the constraints of the loan waiver scheme in rural India. Rural India needs a strategy that strengthens the credit structure, increases the number of bank branches and establishes sound relationship banking. Even as banks are encouraged to increase their rural commitments, an essential aspect of the incentive structure for the banking system should be an assured recovery process. A socio-political environment that nurtures expectations of a loan waiver is not conducive for building a healthy financial system, particularly in rural areas where borrowers have weak bargaining power and bank officials are known to be reluctant to lend at the smallest sign of a poor recovery.

Patil (2008) suggested that rural / farm indebtedness, an obstacle for development requires in-depth study so as to address the problems in all its dimensions. Highlighting the inadequacies in rural access to finance in India, pointed out that improvement in credit delivery would help, but a correction in planning strategy is more important. Among the various suggestions given in this paper, the most important steps would be the one-time settlement / compromise for non-wilful defaulters, improvement in risk mitigation arrangements, constitution of the agriculture relief fund, improving the functioning of the agricultural credit societies, protecting farmers from distress sale, and implementation of liberal debt redemption schemes.

Sinha and Sinha (2008) pointed out that adoption of new farm technology has enhanced the requirements of short-term credit of Indian farmers. The savings and investments of the tribal farmers are low in comparison to other farmers. They lack financial resource to adopt the modern farming system. The present study was undertaken to assess the credit requirements of a sample of tribal farmers selected from tribal dominated block of Ranchi district under two situations of existing and recommended level of technology and irrigated and unirrigated situations. Results indicate that small and medium category tribal farmers have deficit of capital to adopt the recommended technology or even improve their own production plan on profit maximization line. There existed immense scope of enhancing income on tribal farmers of all size classes. Results suggest that by adopting the recommended level of technology, the income of tribal farmers can be increased sustainability if required capital for adoption of the improved technology is made available to them.

Umdor (2008) investigated the nature and extent of demand and use of credit by rural households in the uplands of NER and examines the importance and uses of the different sources of credit. A survey was conducted in 2001-02 on 816 rural households in districts of Manipur and Meghalaya, India. The loan amounts supplied by the informal source tend to be relatively smaller compared to the formal source. Loans from formal

sources are used for productive purposes and loans from informal sources are used for consumption purposes.

Kumar *et al*. (2010) studied the institutional credit has been conceived to play a pivotal role in the agricultural development of India. A large number of institutional agencies are involved in the disbursement of credit to agriculture. However, the persistence of money lenders in the rural credit market is still a major concern. In this backdrop, the study has examined the performance of agricultural credit flow and has identified the determinants of increased use of institutional credit at the farm household level in India. The study based on the secondary data compiled from several sources, has revealed that the institutional credit to agriculture in real terms has increased tremendously during the past four decades. The structure of credit outlets has witnessed a significant change and commercial banks have emerged as the major source of institutional credit in recent years. But, the declining share of investment credit in the total credit may constrain the sustainable agricultural growth. The quantum of institutional credit availed by the farming households is affected by a number of socio-demographic factors which include education, farm size, family size, caste, gender, occupation of household, etc. The study has suggested simplification of the procedure for a better access to agricultural credit of smallholders and less-educated / illiterate farmers.

2. Utilization pattern of bank finance for piggery:

Guruswami (1976) conducted a field study on the utilization of farm finance advanced by nationalized bank. His study identifies that about 18.68 per cent of the respondents diverted the loans because of non-availability of finance for consumption purposes, diversion of this sort negatively influenced the repaying capacity of the borrowers since the credit sanctioned were not improving the economic status of the borrowers and in a way creates obstacles to the other intended beneficiaries.

Patnaik and Misra (1991) reported that the borrowers' unwillingness to come forward to clear the institutional dues might be due to indifferent attitude of the bank personal. They hardly meet the borrowers to induce them to repay the loan. It is observed that the officials of the lending institutions did not meet the borrowers to persuade them for the purpose of repayment of loan.

Jayasheela and Birdar (2000) in their study revealed that loans were being diverted for other purposes. This misutilization of loans increased the burden on the borrowers because they were not in a position to generate enough income to repay the loans borrowed from the bank.

Sanjay and Gill (2006) studied the economic viability of important agriculture based enterprises for women in Punjab. Researchers found

marketing, lack of capital problems of being the women and technical deficiency have been identified as the major problems faced by the women entrepreneurs. Hence, researchers suggested that there is a need of subsidy on the purchase of inputs, reduction in formalities for getting credit from institutional sources.

Chaudhari *et al.* (2007) studied cotton growers' crop loan utilization and repayment patterns in Akola district, Maharashtra, India. Data were collected from a sample of 150 farmers drawn from 15 primary agricultural credit societies. It is revealed that the recovery of crop loans by the cooperative sector is low because majority of the cotton growers do not utilize the crop loans for productive purposes. This implies that there is a need to monitor the utilization of crop loans by the cotton growers.

Kumar *et al*. (2007) assessed the performance of rural credit flow in India, and identifies the factors that influence the choice of credit outlet and the possession of Kisan Credit Cards by rural households. Using NSS data for the years 1991-92 and 2002-03, it is shown that access and distribution of rural credit, in general, increased but is skewed in favour of more developed states and within these towards better-off households. The poorer households are more dependent on non-institutional sources of finance. The use of Kisan Credit Card is encouraging and its distribution is less skewed. Age, male-headed households, household size, farm size, level of education,

and self-employment in agriculture appear as significant variables positively determining the choice of institutional sources of credit and possession of Kisan Credit Cards.

Shukla and Shukla (2007) examined the scope of crop diversification in India for maximizing farm income and identified the constraints restricting crop diversification. The experimental data of cropping systems operating in various states was collected from the Annual Progress Reports of during the year 2001 to 2004 All India Coordinated Research Project on Cropping Systems. The constraints are technological, infrastructural, socioeconomic and institutional. Government support for developing roads, transportations, irrigation, marketing infrastructure and regular power supply is essential. Establishing food and milk processing units, cooperative societies and making institutional credit system more effective by the government are equally important for the successful implementation of crop diversification programmes.

Vasimalai and Narender (2007) studied the Kalanjiam Community Banking Programme in India is a unique credit programme that goes beyond the narrow "financial delivery" approach. As this article explains, initiatives under this programme are flexible and tailored to the needs of the poor; the attempt is also to address existing "leakages" in the earlier system of moneylending so as to improve the borrowing capability of the poor.

Working through self-help groups, the kalanjiam way also seeks to instill democracy by encouraging a grassroots leadership to emerge and ensuring the community ownership of public works.

Moodie (2008) studied the micro-credit programs for women have been concerned with the relationship between borrowers and men outside microcredit groups, such as husbands and moneylenders. In this article, I focus on the relationships forged between women within micro-credit groups in a small village in Rajasthan, India. I argue that, rather than representing a new paradigm for women's empowerment, micro-credit has become one of several possible platforms from which rural Rajasthani women articulate their concerns about caste, poverty, and the burden of raising daughters. Thus, micro-credit is not a foreign economic form that is subsequently culturally inflected, nor does it represent the instrumentalization of culture; rather, micro-credit, like other local frameworks such as evil eye, feminist organizing, and personal history, produces cultural possibility.

Singh *et al.* (2008) assessed the overall debt position of farmers in Punjab (India) and identifies the factors affecting their indebtedness. The analysis is based on survey data for the agricultural year 2005-06, collected from 600 farmers. It was revealed that 89.00 per cent of farm households in Punjab are indebted. Dairy income, off-farm income and education had an

inverse relationship with the magnitude of debt, whereas expenditure on social festivities is directly associated with the amount of debt. The important policy recommendations that emerge are the need to improve the institutional agricultural credit system, to regularize and continuously monitor the functioning of non-institutional sources of finance, to reduce farmers' fixed costs in heavy machinery and equipment for which loans should also be based strictly on economic feasibility, to strengthen the dairy sector and create off-farm employment opportunities, and to launch a mass campaign against intoxicants and extravagant expenditure on social festivities.

Chatterjee (2009) evaluated the expansion of institutional rural credit in the district of West Bengal, India, since bank nationalization. The study relied on secondary sources of data for the period 1972-73 to 2005-06. The study reveals that the rural credit deposit ratio, ratio of agricultural credit to total credit by commercial banks and total loans outstanding (at constant prices) by the primary agricultural credit societies have shown improvement in 2005-06, the overall performance of institutional credit agencies are dissatisfactory. The state of West Bengal as well as the districts witnessed a significant expansion of banking network, particularly in the rural areas, in the period following the nationalization of the banks. The district level data reveal that the performance of institutional agencies supplying credit in rural West Bengal has deteriorated since the 1990's.

Rawat *et al*. (2009) conducted a study in Chamba block of Tehri Garhwal district and Takula block of Almora district in Uttarakhand based on data collected from 130 farmers for the agricultural year 2000-01 to 2005-06. The study aims at examining the extent of non-participation of farmers in formal agricultural credit and insurance programmes. Extent of non-participation in credit programme in Garhwal region (63.14 per cent) was found to be lower than in Kumaon region (70.37 per cent). Overall 67.00 per cent farmers were still out of fold of institutional credit programme. In the Garhwal region, around 50.00 per cent farmers were without any insurance while in Takula region this percentage was 46.15 per cent. Lack of awareness, complicated procedure, untimely assistance, improper input supply system and risk are reported to be major reasons for non-participation in institutional agricultural credit and insurance programmes.

Singh (2009) studied the patterns of utilization of agricultural credit. A survey was conducted on 100 borrower-farmers representing marginal, small, medium and large farmers from five villages of the Revatipur block of the Ghazipur district in Eastern Uttar Pradesh, India. Findings showed that commercial banks financed most of the loans. Loans were used for crops, tractors and other agricultural requirements.

3. Repayment performance of borrowers:

Pandey *et al*. (1984) studied and reported that amount of loan due for repayment during exceeded the repaying capacity of small and medium farmers which revealed that the small and medium farmers accumulated more debts than their normal repaying capacity. They concluded that causes of such poor recovery being political interference, prevalence of wilful default, excess debt burden, issue loans, misutilization of loans, over estimation of repaying capacity generated from proposed investment etc.

Suryanarayana and Chiranjeevulu (1985) pointed out that repayment performance of farmers was positively related to productive utilization of credit. Because of proper utilization of credit, the numbers of defaulter were less. The total share of institutional credit on the total credit goes highest to small followed by medium and large.

Ganguar and Aggarwal (1988) study specified certain causes of non-recovery of loan, political interference, problem relating to the farm input, causes of wilful default, fiction loans and farmers caught into the credit trap due to their repaying capacity fell short of the loan amount sanctioned.

Gupta (1988) examined repayment performance of the advanced agricultural loan and observed that the repayment of the term loan was found comparatively better than the crop loan. The recovery of overdue was

found associated with size of holdings, irrigated area, cropping intensity and per capita income.

Awasthi (2007) estimated that from 1981-82 to 2000-01 in India; an average 1 per cent decline in the ratio of investment credit to production credit caused value of agricultural output per unit of production credit to fall by 2.50 per cent. It was estimated that the ideal range of investment credit is around two-thirds to three-fourths of the production credit. The paper demonstrated that substantial downward deviation from the ideal range beyond 1995-96 significantly decelerated growth of capital formation and adversely impacted growth rate in the Ninth Plan period. A more systematic approach of agricultural lending is advocated.

Chavan (2007) examined the degree of access to formal credit of rural dalit households, using data from the 1992 and 2002 rounds of the All India Debt and Investment Survey (AIDIS). The available data show increasing exclusion of rural dalits since the early 1990's with respect to access to affordable credit from commercial banks. The data also show a decline in the proportion of bank credit flowing to rural areas in general and agriculture in particular, since the early 1990's till the early 2000's.

Deorukhakar *et al.* (2007) conducted study on Impact of institutional finance on farmers' economy in North Konkan region of Maharashtra. A

sample of 120 each borrowers and non-borrowers were selected randomly from twelve villages of four selected tehsils of Thane and Raigad districts of North Konkan region. The analysis revealed that cropping intensity on beneficiary farm category was higher than non-beneficiaries. Area under irrigation was also more (1.06 ha) on beneficiary farms than those of non-beneficiaries (0.39 ha), the borrower farmers availed loan to the extent of Rs. 10,076.18/- per farm (Rs 5,503.00/- per ha). Per farm amount of loan increased with an increase in the size of holding. Regarding size group wise disbursement, it was observed that maximum crop loan was taken by large size group (Rs 6,075.00/-) followed by medium (Rs 5,440.00/-) and small group (Rs 2,450.00/-). Similar trend was observed for other purpose of loan, per farm income and profit on beneficiary farms was higher than non-beneficiary farms, per farm gross return from beneficiary farm was Rs 99,288.00/- as against Rs 32,889.00/- from non-beneficiary farm. This indicated that gross income on beneficiary farm was approximately three times higher than non-beneficiary farms. The farm business income, which represents the profit for direct cost for beneficiary farmers, was four times more than that of non-beneficiary farmers. The output-input ratio at cost on beneficiary and non-beneficiary farm was 1.10 and 0.95, respectively. This showed that crop production was profitable on beneficiary farms. The effect of short-term loan in production process was found significant on all size groups. The value of regression coefficient indicated that with increase of

one rupee short-term loan, gross income of small farmers increased by Rs 5.03/-, medium farmers by Rs 1.25/- and large farmer by Rs 2.93/-. The results have clearly demonstrated that there is positive impact of agricultural credit on per hectare yield of different crops. Thus, the flow of farm credit has resulted in improving the economy of the borrower farmers.

Sahu (2007) examined the extent of inter-state variations in the supply of institutional credit for agriculture in India using data for the period 1981 to 2000. The analysis is confined to 14 major states. It was revealed that the growth rate of agricultural credit was higher during the pre-reform period compared to the reform period in most of the states. It was also observed that the growth rate of agricultural credit was uneven during the sub-periods as well as across the states. The proportion of irrigated area to gross cropped area and the density of bank branches per 1,000 farmers are identified as the most important factors influencing the supply of agricultural credit across states. An increase in credit-deposit ratio need not necessarily ensure more supply of credit to the agricultural sector.

Shah (2007) evaluated the rural credit scenario of Maharashtra, India, with emphasis on the credit delivery system through primary agricultural credit societies (PACS) and other apex institutions in the state. It then presents a region-wise synthesis of credit delivery through PACS over time (1980-81 to 2002-03), with an evaluation of the influence of various factors

on the outstanding loans of these credit institutions. Credit cooperatives in Maharashtra have not only shown slower growth in their institutional finance coupled with much slower growth in their membership but also faster growth in outstanding loans as against their loan advances during the reform period (1991-2000), which indicates the problem of overdues.

Harshitha *et al.* (2008) studied the farm credit is a strategic input. Among the various financial institutions, the cooperatives have emerged as a major source of farm credit. This study was undertaken to analyse the growth in the performance indicators of DCC Bank, Shimoga, Karnataka, India. The study used secondary data collected for the period 1990-91 to 2005-06 from various sources along with primary data relating to income level, experience and number of trainings attended collected from the selected officials and non-officials of the bank to assess their impact on overall performance of the bank. The result for the Head Office revealed that the number of deposit accounts showed the maximum growth of approximately 8.00 per cent, followed by the number of employees (6.00 per cent) and the number of members (3.00 per cent), among others. All the financial indicators for the Head Office showed high positive growth, the highest in respect of advances (36.00 per cent). Similar trends were observed for branches. The overall performance of the bank depended mainly on the training and experience of chairman and managing director.

Pujari *et al.* (2008) studied the cooperative institutions network in Karnataka state to study pattern of credit advancement of Primary Agricultural Cooperative Societies (PACS), to examine recovery performance of societies and to work out credit delinquency rate of PACS. Based on 10 years (1996-97 to 2005-06) published secondary data, the study revealed that the share of agricultural credit covered more than 69.71 per cent of total credit advanced. Among the total amount of agricultural credit advanced, short term credit constituted about 81.70 to 91.00 per cent. In purpose-wise classification of agricultural credit advanced by PACS, the share of APS credit was highest in total credit advanced. Out of the APS credit, CPGS occupied maximum share of 86.67 to 96.19 per cent of total amount of credit advanced. The mounting amount of overdues indicated the weakness of PACS in the state. The positive values of delinquency rate indicated that the amount of credit recovered was less than the credit outstanding. The majority of credit overdues were within one year or less from the due date. The PACS should initiate concrete steps to convince the rural people for deposit mobilization. Suitable measures should be adopted for timely recovery of credit and reduce amount of overdues. Credit should be properly utilized for productive purpose.

4. Feasibility of investment in piggery:

Misra and Pandey (1986) analysed dairy financing scheme for small and marginal farmers and agricultural laborers under IRDP in Basthi district of UP and reported that the net present value of investment was positive, Benefit-Cost ratio was more than unity and payback period fell within the prescribed period of loan repayment. They were of the view that the scheme was economically feasible based on their research findings.

Shanmugan (1991) evaluated capital investment in dairy farming and reported that the NPV and B: C ratio in case of crossbreed cow's project was Rs 55,576.70/- and 1.24 respectively. The NPV and B: C ratio in case of graded buffalo's project was found to be Rs 17,842.85/- and 1.09 respectively.

Singh *et al.* (1995) conducted a study on Watershed approach for improving the socio-economic status of tribal area. The study reported that the watershed management programme had not only increased the crop yield, but also allowed for the development of fodder resources in the area. Per capita income has gone up from Rs 598.00/- to Rs 1,739.00/- and the average Benefit-Cost Ratio (1.76: 1) indicated the economic feasibility of the watershed management programme for improving the socioeconomic status of farmers residing in the tribal areas.

Pawar (1996) conducted a study on economic analysis of dairying in assured rainfall zone of Maharashtra. It was found that the Benefit Cost Ratio was comparatively with 2.03 in small followed by 1.92 and 1.83 in landless and large farm dairy units respectively. Net Present Value was as high as Rs 274.57/- in large farm followed by Rs 21,486.00/- and Rs 11,413.00/- in small farm and landless dairy unit respectively. Payback period was least (1.99 years) in small farm whereas prolonged to 2.10 and 2.21 years in landless and large farm units respectively. The Internal Rate of Return was highest at 45.00 per cent in small farm followed by 42.00 per cent and 39.00 per cent in landless and large farm dairy units respectively.

Sharma and Singh (1996) in their study on economic evaluation of Hill Cattle Development Programme in Himachal Pradesh found that the Benefit Cost Ratio was 12.4 at 11.00 per cent, 10.72 at 12.50 per cent and 9.40 per cent at 14.00 per cent interest rate and Net Present Worth of the programme was Rs 29.06 million at 11.00 per cent, Rs 20.87 million at 12.50 per cent and Rs 15.15 million at 14.00 per cent discount rate. The Internal Rate of Return was found to be very high (40.60 per cent). It could be inferred from the study that programme is economically viable. Thus, the cattle improvement programmes which have high returns to investment, as revealed by this study, should be introduced on extensive scale to increase milk production and ameliorate the socio-economic conditions of the rural poor living in these areas.

Bijai *et al.* (1997) conducted a study on economic feasibility of dairy financing under IRDP for weaker section in Azamgarh district (UP). In their study all borrower households were stratified into two strata viz. landless labourers and marginal farmers. The analysis was done separately for defaulter and non-defaulter households. The findings of the study revealed that the average net return per buffalo per annum was found to be Rs 1,084.00/- for defaulters and Rs 976.00/- for non-defaulter groups of landless labour. In case of marginal farmers, net return was Rs 1,150.00/- and Rs 879.00/- for non-defaulter and defaulter group respectively. Net Present Value was positive in all cases. Benefit Cost Ratio was also more than one and payback period was in favorable situation for non-defaulters of both categories where repayment was scheduled for three years.

Bharadwaj *et al.* (2006) conducted a study on economics of buffalo milk production in Hissar district of Haryana State. The study revealed that the average number of milch buffaloes on small, medium and large units (farm) were 1.38, 3.18 and 5.36 respectively. The value of average daily milk production was 5.88, 6.07 and 6.20 litres / buffalo / day. The average sale prices of milk received by different categories of respondents were Rs 65.00/-, Rs 11.70/- and Rs 11.80/- respectively. The corresponding figures for net maintenance cost were Rs 57.00/-, Rs 63.80/- and Rs 64.30/-. The gross returns were Rs 65.80/-, Rs 71.02/- and Rs 73.16/-. The net profit per day per buffalo was Rs 11.50/-, Rs 7.22/- and Rs 8.86/-, respectively. The

break even outputs for milk production were 5.00, 5.56 and 5.56 litres per day on small, medium and large categories of respondents, respectively. The break-even output was achieved earlier on small herd size compared to medium and large size farms.

Sanjay and Gill (2006) conducted a study on economic viability of important agriculture based enterprises for women in Punjab. The study was conducted with a total sample of 100 women entrepreneurs for the year 2004-05. The study has revealed that the net returns to dairy women entrepreneurs were Rs 4,878.00/- per cow and Rs 7,498.00/- per buffalo per annum. Total profits per entrepreneur shot sharply when the cost of the fodder and family labour was not included.

Singh *et al.* (2006) conducted a study on economic analysis of milk production in tribal area of Udaipur (Rajasthan). It was found that the average daily milk yields of milch local cow and buffalo were 1.46 litres and 2.38 litres, respectively. The average net maintenance costs per day for local cow and buffalo were estimated to be Rs 21.24/- and Rs 29.96/-, respectively. The net returns were positive for buffaloes, whereas it was negative for local cow across all the categories of households. Concentrate input turned out to be a significant variable influencing milk production positively both in local cows and buffaloes. It was suggested that there was a

scope of increasing milk production by enhancing the quantity of concentrate.

Chalam and Prasad (2007) examined the factors behind the changing profitability and financial condition of Primary Agriculture Cooperative Societies (PACSs) in Andhra Pradesh, India. Financial analysis was conducted on data from nine selected PACSs for a 10-year period starting from 1994-95 and 2003-04 in order to evaluate the liquidity, operational, productivity and profitability ratios. The PACSs are highly liquid due to high ratios of cash to deposits, investment to deposits and credit to deposit and low cost of management; liquidity is stymied by low spread to total assets and high net worth to fixed assets. Operational efficiency should be improved. Though the ratio of interest earned to total income and ratio of total income to working capital is high and satisfactory, respectively, the ratios of interest paid to total income, expenditure to total income and establishment expenditure to total expenditure are high. Productivity should be improved. The PACSs are lending much more than the deposits they are receiving from employees. There is overall increase in the per employee income but per employee expenditure and per employee establishment expenditure are high and per employee spread and per employee profit are low. Profitability should be improved due to inconsistent net profit to total income and total deposit of selected societies, low average return of assets and insignificant return on equity of selected societies. In conclusion, with

high liquidity but improvement needed in operational efficiency, productivity and profitability, the financial performance of the cooperative societies should be improved. It is suggested that they should strike a balance between liquidity and profitability because this high ratio of cash to deposit, for instance, hampers profitability. To improve operational efficiency, they should reduce the ratio of interest paid to total income and establishment expenditure. To improve productivity, mobilization of deposits and profitable deployment of funds are suggested. To improve profitability, increasing the return on equity to at least a minimum of 10 per cent is suggested.

Deorukhakar *et al*. (2007) undertook a study to know the impact of institutional credit on cost, returns on profitability in the north Konkan region of Maharashtra state, India. Credit enables farmers to use various input to the recommended levels and thereby increase agricultural production through increased employment opportunities. A sample of 120 borrowers and 120 non-borrowers was selected randomly from twelve villages of four selected tehsils of Thane and Raigad district of North Konkan region. The analysis revealed that cropping intensity on beneficiary farm category was higher than non-beneficiaries. Area under irrigation was also more (1.06 ha) on beneficiary farms than non-beneficiaries (0.39 ha), the borrower farmers availed loan to the extent of Rs 10,076.18/- per farm (Rs 5,503.00/- per ha). Per farm amount of loan increased with an increase

in the size of holding. Regarding size group wise disbursement, it was observed that maximum crop loan was taken by large size group (Rs 6,075.00/-) followed by medium (Rs 5,440.00/-) and small group (Rs 2450.00/-). Similar trend was observed for other purpose of loan. Per farm income and profit on beneficiary farms was higher than non-beneficiary farms, as per farm gross return from beneficiary farm was Rs 99,288.00/- as against Rs 32,889.00/- from non-beneficiary farm. This indicated that gross income on beneficiary farm was approximately three times higher than non-beneficiary farms. The farm business income, which represents the profit for direct cost for beneficiary farmers, was four times more than that of non-beneficiary farms. The output-input ratio at cost on beneficiary and non-beneficiary farm was 1.10 and 0.95, respectively. This showed that crop production was profitable on beneficiary farms. The effect of short-term loan in production process was found significant on all size groups. The value of regression coefficient indicated that with increase of one rupee short-term loan, gross income of small farmers increased by Rs. 5.03, medium farmers by Rs 1.25/- and large farmer by Rs 2.93/-. The results have clearly demonstrated that there is positive impact of agricultural credit on per hectare yield of different crops. Thus, the flow of farm credit has resulted in improving the economy of the borrower farmers.

Fernandez (2007) studied the Mysore Resettlement and Development Agency (MYRADA) has tried to work towards developing a different kind

of micro-finance institution (Sanghamithra Financial Services) that is committed to strengthening self-help groups. MYRADA believes that while provisioning of credit through the micro-finance institution is important, credit can be productively absorbed only when it is enmeshed with other development interventions. This paper shows that the absorption and use of credit can be made more effective if the micro-finance institutions are linked with self-help groups. Emphasizing partnerships, the paper shows how multiple agencies could work together, each playing a unique role in poverty alleviation. Hence, it is argued that Sanghamithra need not become a single window for all financial services to the poor.

Kareemulla (2007) analyzed the flow of credit to agriculture in Uttar Pradesh, India and the nature and cause of farmers' indebtedness. A survey was conducted on 80 rural households in the Jhansi district. Findings show that although the per hectare credit flow is increasing in Uttar Pradesh and India as a whole, the level of credit in the state is lower at three-fourths that of the country. This is partially attributable to lower banking network and higher indebtedness in Uttar Pradesh.

Ramakumar and Chavan (2007) examined credit to agriculture provided by the commercial banks in rural India, including regional rural banks and analyzed the claim that the slowdown in the supply of agricultural credit has been reversed after 2004. Secondary data on banking from 1975-

2006 from different publications of the Reserve Bank of India have been used. Contrary to the general perception that the credit revival began in 2004, the actual revival started after 2000. In 2004, the government announced its intent to double the flow of credit to agriculture over a period of three years. The increase in credit was to a large extent the result of a growing share of indirect finance, which in turn, has been broadened in scope to cover many new kinds of farm lending. Moreover, even as direct lending to agriculture has also grown, there has been a sharp increase in the share of large-sized advances for financing agri-business-oriented enterprises, rather than for the small and marginal farmers.

Swaminathan (2007) studied that the micro-credit has been receiving a significant amount of attention all over the world, especially in developing countries. It is felt that by providing micro-credit to the "poorest of the poor", the gap in the formal rural credit sector can be filled. A majority of such projects are now being controlled by non-governmental organizations in the hope that they will be able to overcome the weaknesses in the banking system. However, while small-scale rural credit is necessary, it is argued that overall credit policy must be built on the strengths of the banking system in India as its mainstay.

Vishwanatha (2007) in his study examined the compound growth rates of agricultural credit in India provided by different institutions during

the pre-reform period, reform period I, whole reform period and reform period II and total period. The study depended on secondary data collected from various issues of the RBI reports on currency and finance pertaining to the period from 1980-81 and 1999-2000. The overall analysis indicates that the flow of institutional credit to agriculture during the post WTO period is not positive.

Kumar and Dixit (2008) suggested that the lack of sufficient credit is one of the serious inhibiting factors in the modernization of the traditional agriculture in the tribal areas. A total of 140 households spread over 8 villages in 4 development blocks of Ranchi district, Bihar state, India, were interviewed. As the study was divided in less developed and developed regions, 70 respondents were taken from each region. A regression equation was fitted to know the influence of each selected variables on the credit requirement of the tribal farmers of three groups in the two regions. Farm borrowing in the case of "all farmers" in the less developed region is significantly sensitive to fixed capital expenditure, expenditure on consumption and non-farm activities. Variations in farm borrowing can also be explained to some extent by working capital expenditure, expenditure on fertilizers and outstanding loans. Thus, across the two regions there are differences in the factors affecting farm borrowings and there are also differences in the extent of influence of these explanatory variables.

Selvi (2008) examined the financial performance of the Kanyakumari District Central Cooperatives Bank (KDCCB) in Tamil Nadu, India, from 1999 to 2006. Under this period, the profitability position of the KDCCB was highly fluctuating. During the years 2000-01 and 2005-06, the bank suffered losses. The overall growth rate of loan disbursements on short-term credit shows a positive growth of 25.00 per cent. The credit facilities extended by the KDCCB are high for services, medium for industries and low for agriculture. The debt recovery position of KDCCB is dissatisfactory during the period under study since the bank was not able to recover its debts on time. The amount of disbursement is high for short-term loan, moderate for medium-term loans and low for long-term loans. The trend on non-performing assets (NPA) is increasing to as much as 105.00 per cent. On the average, the NPA in the agricultural sector is 38.00 per cent; 25.00 per cent in the service sector; 20.00 per cent in the industry sector and 17.00 per cent in the priority sector. In conclusion, the overall performance of the KDCB is good.

Shukla *et al.* (2008) studied the status and prospects of agricultural credit in Kumaon Region, Uttarakhand, India. It was established that the commercial banks' agricultural credit in Kumaon Region, Uttarakhand, is characterized by low per hectare credit flow, very low share of indirect finance, low C: D ratio, and wide inter-district disparities. There is an urgent need to increase the C: D ratio in the region to improve the productivity,

profitability, sustainability, reduce poverty, and strengthen livelihood sources. It is suggested that technological, institutional and infrastructural interventions must be geared up to enhance the credit absorption capacity of the farmers. At the same time, banks must make their credit delivery system more accessible to farmers.

Thamilarasan (2009) assessed the impact of institutional credit on farmers who have availed of credit from cooperatives especially for production purposes. The impacts of institutional credit provided by cooperative banks are studied in terms of employment generation, creation of assets, income and occupation of the farmers in Dharmapuri district, Tamil Nadu, India. Data pertaining to the year 2003-04 were collected from a sample of 300 farmers. The study showed that the financial assistance from the banking institutions for agricultural operations has created significant impact on the level of income and employment (in terms of number of man-days both for land owners and agricultural coolies), and thereby in the formation of assets. However, the study proved that the impact is little and limited when it comes to improvement in the extent of land-holding or the value of lands. Similarly, no improvement has been shown in the occupational status of the borrowers.

5. Impact of bank finance on borrowers' income and employment:

Shahidur *et al.* (1998) conducted a study on income and employment effects of micro-credit programmes in Bangladesh. The article has attempted to quantify the village level impacts of the three most important micro-credit programmes of Bangladesh, namely Grameen Bank, Bangladesh Rural Advancement Committee (BRAC), and Bangladesh Rural Development Board's (BRDB) RD-12 project. Descriptive and econometric analyses showed that these programmes had a positive impact on income, production, and employment, particularly in the rural non-farm sector. Also, growth in self-employment was achieved at the expense of wage employment, which implied an increase in rural wages.

Singh (1999) conducted a study on economic analysis of dairy financing under IRDP in Haryana. The study revealed that buffalo scheme of IRDP was more remunerative than cross bred cow scheme. The repayment capacity of beneficiaries was Rs 10,145.00/- which was significantly greater than Rs 5,949.00/- of non-beneficiaries. The gain in income due to credit advanced was highest in case of landless beneficiaries (80.18 per cent) and least in marginal farmers (12.27 per cent). Overall gain was 34.78 per cent and that in employment generated was 38.39 per cent.

Puhazhendhi and Jayaraman (1999) in their study on document and evaluated the performance of informal groups in Chitradurga district of Karnataka and Periyar district of Tamil Nadu. It was found that members taking up more than one activity increased from about 30.00 per cent during pre-group formation to 53.00 per cent during post group formation situation. They also reported that the average annual net income per member during pre-group formation ranged from Rs 6,763.00/- to Rs 9,157.00/- while the average net income per member during post-group formation had ranged from Rs 10,531.00/- and Rs 12,762.00/-. The increase in net incremental income was reported to be 68.00 per cent of new groups, whereas it was 100.00 per cent in stabilizing and stabilized groups.

Alagumani and Anjugam (2000) in their study on impact of dairy enterprise on income and employment in Madhurai district of Tamil Nadu found that about 57.00 per cent of the farm households were engaged in dairy enterprises and 43.00 per cent of them were having both crop and livestock enterprise. Additional income and employment generated per household were Rs 4,900.00/- and 365 mandays, respectively.

Manimekalai (2004) conducted a study on impact of various forms of micro financing on women at Tiruchirapalli, Tanjavur, Karur, Perambalur and Pudukotti districts in Tamil Nadu and found that post SHG average increase in income was only approximately 10.00 per cent. The incremental

income in post SHG for the self, other members and household was reported to be Rs 110.00/-, Rs 643.00/- per month respectively. It was revealed that the consumption pattern of food measured in terms of number of times cooked increased to twice or thrice and 41.00 per cent women attribute this to having become members of SHG's. Similar trend could be observed in case of clothing was due to membership in SHGs. Only 5.00 per cent increase was observed in case of expenditure on education of children in post-SHG period and only 18.20 per cent women think it is due to SHG. Another interesting finding is that there is decline of 23.00 per cent in celebration of festival in 'simple manner. Nearly 43.71 per cent of women considered that consumption pattern improved due to SHG and incremental income realized. Increase in asset holding is small as they have not gone for activities where higher profit can be realized quickly. The borrowing of total women members have almost doubled in post SHG period.

Gangaiah *et al.* (2006) studied the impact of Self Help Groups on income and employment in Chitoor district of Andhra Pradesh. Totally 202 members from 17 SHG's were randomly selected for their study. It was reported that on an average the loans received generated 184 days of employment per house hold and income on an average Rs 19,578.00/- per family which was sufficient to bring the poor families above the poverty line. The opinions of sample respondents revealed that they productively made use the income generated after receiving the loans. Its was found that

39.11 per cent of respondents reinvested their income on agriculture, 20.34 per cent of them revealed that part of the income generated was utilized for educating their children and 15.84 per cent of them spent on health.

Jayachandra and Naidu (2006) conducted a study on impact of dairy co-operatives on income, employment and creation of assets of marginal and small farmers. The study revealed that the increase in income from dairying was Rs 850.00/- (25.50 per cent) in the case of marginal farmers and Rs 1,480.00/- (22.98 per cent) in the case of small farmers per annum. More idle women in the families of both the categories of farmers have taken up dairying as a part time and full time employment. The value of asset has increased 15.00 per cent in the case of marginal farmers and 12.50 per cent in the case of small farmers. Hence researchers concluded that dairying is an appropriate and beneficial occupation to increase the purchasing power of rural farmers.

Josily (2006) conducted a study on women empowerment through micro finance in Dindigul district of Tamil Nadu and found that the percentage change in income (45.99 per cent), investment (20.09 per cent), assets (53.43 per cent), consumption (25.85 per cent), employment days (112.48 per cent) and savings (264.70 per cent) of the SHG's after joining SHG. The t-value calculated for the above were found significant at 1 per cent level.

Mavi *et al.* (2006) conducted a study on impact of self-employment programme on dairy farming in Fatehgarh Sahib district of Punjab. The study revealed a significant increase in total income (Rs 1,09,751.00/- to Rs 1,88,011.00/-), dairy income (Rs 23,434.00/- to Rs 1,03,948.00/-), herd size (4.4 to 15.5), milk production (19.60 to 79.50 litres), milk consumption (5.80 to 7.90 litres), milk sale (13.60 to 71.60 litres) of the farmers after participation in the programme.

Ramakrishnappa and Jagannath (2006) conducted a study on emerging microfinance issues in dairy development in Karnataka. In their study an attempt was made to analyse the different aspects of micro-finance scheme (New Swarnima) implemented by KBCDC. The implementation of New Swarnima Scheme, one of the most popular microfinance schemes in the state to promote dairy among backward communities, was assessed at micro level by selecting 18 beneficiaries belonging to landless labourers, marginal and small farmers in Kolar district in Karnataka state. The study found that the microfinance scheme has positive impact on income and employment generation and has improved the natural resource management options.

Singh and Kumawat (2006) conducted a study on impact of Swarnajayanti Gram Swarojgar Yojana (SGSY) in Jhunjhunu (Rajasthan). The study revealed that small farmers who were provided assistance under

SGSY for buffalo rearing increased their annual income by Rs 15,310.00/- - over and above Rs 14,170.00/- earned by the non- swarojgari families. This was inferred that about 108 per cent higher than that of non-swarojgari families. The study also inferred that the buffalo rearing activity helped to increase employment by 92 man days (52.79 per cent) for small farmers and 72 man days (46.15 per cent) for marginal farmers.

Babu *et al*. (2007) conducted a study to explore the scenario of rural credit in Kanpur Dehat District, Uttar Pradesh, India. A total of nine banks in the whole district, including commercial, cooperative and regional rural banks, were selected. Nine villages in Maitha block of this district and 70 borrowers from these nine villages were selected randomly. The Swarnajayant Gram Swarozgar Yojana credit played a major role in improving the farmers' standard of living. The findings indicated that the average gross income and net income of farms in post-borrowing situation were Rs 21,665.51/- and Rs 8,559.03/- when compared to pre-borrowing situation of only Rs 14,763.80/- and Rs 3,770.15/-, respectively.

Devi *et al*. (2007) studied the impact of training on women Self Help Groups in Cuddalore district of Tamil Nadu, India. It was found that commercial banks, NGOs and government agencies were had imparted training to the members. The technological training programmes attended by the members of women SHGs resulted in the incremental increase in their

employment pattern and asset position. The SHGs have helped the respondents to be more gainfully employed in the non-farm activities. It was emphasized that policy planners might think of launching evaluation studies of such programmes on a continuous basis, so as to understand and undertake efforts for the success of SHGs. Efforts may be initiated to impart the required training to the members on the identified new ventures.

Natarajan, (2007) focused on the areas where primary agricultural credit societies (PACSs) or service cooperative banks (SCBs) are failing in Kerala, India. These problem areas are: (i) poor funds management practices; (ii) lack of creativity in schemes; (iii) failure to create awareness; (iv) lack of additional and newer services; (v) poor performance of non-banking activities; (vi) low amount of loan per borrower; and (vii) overdue loans. Opportunities through which the SCBs can attain a profitable position are also discussed.

Rais *et al*. (2007) studied the impact of dairy farming on livelihood of participating women under Grameen Bank (GB) in selected villages of Rangpur District in Bangladesh. The study revealed that increase in income from dairy sector was the highest. In general the average per family total income increased by 87.51 per cent. It was indicated that the households gained remarkable increase in rented-in land (113.33 per cent) after being a member of Grameen Bank (GB) with a dairy cow.

Singh *et al*. (2007) analyzed the credit disbursement pattern in rural areas under various schemes / programmes, and the impact of these schemes on poverty alleviation. A survey was conducted on 150 respondents in two blocks of Hisar district, viz. Hisar I and Hisar II - of Haryana during the five-year period of 1999-2004. Findings show that the number of borrowers as well as amount of loan disbursed had been decreasing in both blocks during all the years except in the year 2000-01. About 24.00 and 29.00 per cent of rural poor in Hisar-I and Hisar-II blocks could comfortably cross the poverty line. Credit disbursement has declined over the years and nearly 50.00 per cent of the beneficiaries are yet to cross the poverty line even after the use of credit for a few years. Among different schemes, the percentage of beneficiaries who could comfortably cross the poverty line had been found to be highest (66.67 per cent) in sheep and bullock cart / camel cart / khachar rehra activity in Hisar-I and Hisar-II blocks, respectively. A lot more effort is needed to improve the economic performance of the rural poor in the two blocks studied.

Fan *et al*. (2008) reviewed the trends in government subsidies and investments in and for Indian agriculture; developed a conceptual framework and a model to assess the impact of various subsidies and investments on agricultural growth and poverty reduction; and presents reform options with regard to re-prioritizing government spending. Subsidies in credit, fertilizer, and irrigation have been crucial for small

farmers to adopt new technologies particularly during the initial stage of the green revolution in the late 1960s and 1970s. But it is now investments in agricultural research, education, and rural roads that are the three most effective public spending items in promoting agricultural growth and reducing poverty.

Sharma (2008) examined the impact of the group lending programme on the rural poor using field data from Himachal Pradesh. Easy and timely access to credit made a perceptible impact on income and employment levels of those who joined the group lending scheme. However the poor were excluded in the process of group formation due to their low and vulnerable economic position. It was concluded that although easy and timely access to credit makes a significant impact on the economic status of the beneficiaries, credit alone is not sufficient to secure large and sustained increases in their income and employment. Its delivery must be accomplished by the provision of complimentary inputs and services to make it an effective instrument of combating rural poverty on a more enduring basis.

Singh *et al*. (2008) analyzed farming systems identification and resource productivities of households in western Uttar Pradesh, India, were analysed based on a sample of 197 farmers. It was found that the sugarcane based farming systems were predominant in the study area. Farmers earned

a net income of Rs 63,496.00/- per hectare from livestock and crop combinations. The farmers were using surplus fertilizer and chemicals resulting in negative marginal value productivity (MVP). The MVP of credit was found very attractive indicating very good scope to financing agencies to supply agricultural credit to the farmers of the area. The number of dairy animals was found nearly to the optimum (approximately 3 animals / farm). The farmers employed excess labour approximately 1,300 man days / ha as against the optimum requirement of approximately 500 man days / ha and there is a large scope to reduce the labour cost in existing farming systems.

Subodha *et al*. (2008) studied on income and employment status among the SHG members in dairy husbandry in Bareilly district of UP. The study revealed that majority of the SHG members (44.00 per cent) fell to medium income category i. e; Rs 22,000.00/- to Rs 28,000.00/- year and employment status between 400 to 500 man equivalent days per year. Land size material possession family education status and employment status were found to be positively and significantly correlated with the annual income. The employment status of SHG members was found to be positive and highly significantly correlated with land size.

CHAPTER III

METHODOLOGY

Chapter III

RESEARCH METHODOLOGY

How much effective in any investigations turn out depends upon the methodological approach followed, the reliability of methodology followed is reflected as the accuracy within the investigation.

The plan of research study is very important for the conduct of any research work. Without an intelligent planning, the difficulties to be uncounted during the process of work, cannot be anticipated and solved because planning includes the possibility of better performance in all jobs. Methodology in fact has the idea of the whole work or the blue print of the study.

Methodology refers for advance planning of the methods to be adopted for collecting the relevant data and the techniques to be used in the analysis, keeping in the view the objectives of the research and the availability of resources, preparation of methodology should be done with a great care as any error in it may upset the entire project. Methodology, in fact has a great bearing on the reliability of the results arrived at the end and as such constitutes the firm foundation of the entire edifice of the research work.

Methodology refers to providing information regarding decisions of what, where, when, how much and by what means the study was carried out.

For the sake of convenience, methods adopted in the course of investigation of this study have been summarized under the following heads.

i. Research design

ii. Sampling procedure

iii. Techniques of data collection and period of inquiry

iv. Analytical Techniques and Tools

v. Selection and operationalization of the variables

RESEARCH DESIGN

Design is to plan and the process of making decision, which is to be carried out according to the situation as arises for implementation. It is a process of deliberate anticipation directed towards solution of expected situations.

The present study is based on the “descriptive” type of research design in which “Ex-post facto” planning stage and specific objectives were set for the inquiry. In the light of the objectives, the technique of the investigation to be adopted, tools to be used and the pattern of statistical

analysis to be followed were decided. Further, the scheme of the presentation of the study was developed and given a definite shape to match with the outline of the study. The study was conducted in the light of the set objectives and under framework of the adopted outline.

In order to understand the findings of the study in the wider context and to evaluate their relevance in the light of available knowledge on the subject, an effort has been made through review of the proper and relevant literature related to the previous researches, which have been conducted in this field. To provide scientific basis to the study, a proper hypothetical framework was also developed, which provided a definite direction and specific scope to the investigation. The findings of the study have been properly discussed in the light of available research material on the subject and subsequently summarized in the light of all the proper aspects covered within the scope of the study.

SAMPLING PROCEDURE

Based upon the objectives of the study the beneficiaries (farmers) who had taken loan / credit from bank(s) were considered for the present study. The present study is confined to the Nagaland, selected purposively. The Nagaland State consists of eleven (11) districts, basically there is no standard division of the state, and broadly it has been divided into two

segments that is the hill and plain areas. So, Dimapur district was selected purposively keeping on the view that investigator is well familiar about the area, dialect, people and means of communication.

The sampling process in this study consists of two stages viz. selection of blocks and selection of respondents.

Selection of Blocks

Out of four (4) blocks of Dimapur district; two blocks i. e. Chumukedima and Medziphema both were selected by random sampling method in the first stage.

Selection of the respondents

Out of the 160 numbers of total borrowers 120 numbers of beneficiaries respondents / families from both blocks were selected by following the stratified random sampling technique and also 40 numbers of non-beneficiaries were selected, thus to make total sample of 160.

TECHNIQUES OF DATA COLLECTION AND PERIOD OF INQUIRY

The present study was conducted in the Dimapur district of Nagaland which comprises of Chumukedima and Medziphema blocks.

A total of 120 borrowers and 40 non-borrowers were selected for the present study by applying stratified multi-stage random sampling method /

procedure and further it were classified on the basis of semi intensive system (10 sows + 1 boar). The study was based on both primary and secondary data. The primary data were collected by using personal interview method with the help of pre-tested schedules and questionnaire, and the secondary data were collected from financial institutions, Directorate of Economic & Statistics, Directorate of Agriculture, Directorate of Animal Husbandry and Veterinary, DAO office, Block Offices, District Statistical Office and other related offices. Besides these data on demographic features, population, land use planning, climate, livestock population etc. were also collected to enlighten the socio-economic of the study areas.

The present study is based on the secondary data related to situational background of the whole district, amount of loan advances to the selected borrowers and the primary data of the selected farmers. The primary data were collected with the help of well-structured interview schedule and some open questions developed for the purpose. Informal interviews were also made for making further probes into the questionnaire data as and where required to ascertain the facts from the respondents and other concerned. The interview schedules were pre-tested from a sample of population of the study and was modified and corrected according to the requirement of the situation.

Although the schedule was originally developed in English, yet in field situation it was applied in its translated form into simple Nagamese

dialect. Whenever any difficulty arises in making a particular question understandable to the respondents, it was ensured that such respondents fully understand the question. However, specific care was taken in such situation not to allow the communication taking a biased shape from any end. In many cases, questions were repeated and read out to them to obtain their accurate response.

The usual precautions for interviewing the farmers were carefully observed by establishing rapports with them for attaining correct and factual information.

The primary data in this study related to the agriculture year 2009-11.

Processing and Analysis of Data

After completion of the field survey a systematic editing of the filled up schedules and questionnaires was done to remove the arbitration committed (if any). After editing, the answers were classified into some useful categories and gave suitable titles.

The data thus, collected were compiled and tabulated systematically. In most of the cases simple tabular analysis was followed. The statistical method and tests used in the present study were percentage, mean, standard deviation, rank order, paired ‘t’ test, co-relation co-efficient and regression analysis.

Variable and empirical measurement

The following procedure will be followed for the selection of each variables and their measurements The variable along with the instruments used for measuring them are given below.

Variables	Measurement
Independent variables:	
• Age	Schedule developed for this study
• Education	Trivedi (1963) scale was used with minor modification
• Occupation	Trivedi scale (1963) was used with certain minor modification
• Annual income	Schedule was developed
• Material possession	Schedule was developed
• Constraints faced	Schedule was developed by the farmers
Dependent variables:	
• Knowledge	Knowledge test scale developed by Singh (1981) was used with minor modification.
• Risk orientation	Schedule was developed
• Awareness	Schedule was developed
• Level of aspiration	Schedule was developed
• Economic motivation	Schedule was developed

OPERATIONALIZATION OF VARIABLES

The variables (dependent and independent) are presented below with their operational definition.

Age

It refers to the chronological age of the respondents at the time of investigation and was determined by asking them-ended questions.

Education

Education was operationalized as the number of years of formal education in school by the respondents. The scoring system followed by Trivedi (1963) in his socio-economic status scale was followed to quantify the educational status of the farmer.

Farm size

The farmers were stratified / grouped according to their farm size holding as given under:

Beneficiaries / Respondents	**Land Holding Size**
Group I (Small farmers)	1 to 11 numbers
Group II (Medium Farmers)	12 to 12 numbers
Group III (Large farmers)	23 and above

Occupation:

Major and subsidiary occupation, in this study, referred to the nature of activity that the respondents had adopted for earning their livelihood. The decision of the major occupation was taken on the basis of the annual income earned from the major source of earning (50.00 per cent or more) by the respondent.

Land Utilization Pattern:

The purpose by which land is utilized for cultivation of different crops for different purpose whether as owned, rented-in and rented-out and their frequencies of their usage for each respondents will be categorically examined.

Cropping Pattern:

Cropping system followed by the farmers in specific area is known as cropping pattern, the different kinds of crops grown in Kharif, Rabi and Zaid seasons. In the total cultivated area, cropped area and area under mechanization were asked to the farmers. Frequency of each pattern was worked out for each crop separately.

Value orientation:

The degree and direction of value orientation of an individual farmer was measured with the scale adopted by Singh (1964) consisted of nine

items arranged against a four points range from ‘strongly agree’ at one end and to ‘strongly disagree’ at the other end. There is no neutral point on the scale, making it difficult for the respondents to escape in the middle.

The concept of four points was communicated to the respondents and the correct meaning of the statements was explained. Questions were asked from the respondents and marked their responses with each statement. Scoring was done by giving them weights.

Constraints / problems faced by the farmers:

It refers to the problems experienced by the respondents regarding getting of loan from the banks in their field situation, i. e. piggery loan.

The list of constraints available in the area of study was prepared and the respondents were asked to indicate the constraints / problems, they faced. Frequency of each constraint was worked out in case of each respondent separately.

ANALYTICAL TECHNIQUES AND TOOLS

The collected data was processed, classified and tabulated and was systematically analyzed by using appropriate statistical tool in fulfilling the various objectives of the study.

Adequacy:

The adequacy of bank finance was studied by the difference of amount of the actual requirement by the borrowers and amount received from the bank.

Utilization:

The utilization pattern of the bank finance was studied by examining the item wise utilization for investment as well as production expenditure.

Repayment Capacity (RC):

Repayment capacity of the farmers refers to the amount available with him after meeting his farm and family needs and obligations to repay the loan under consideration. So, the estimate of the repaying capacity for different category of households will be on the basis of income generation in current year. The gross return would be deflated on the basis of variation in income during the last five years.

$$RC = GI - (WE + FLE + OL + ME + CL)$$

Whereas:

RC = Repaying capacity,

GI = Gross Income / Deflated Gross Returns,

WE = Working Expenses excluding crop loan,

FLE = Family Living Expenses,

OL = Other Loans due,

ME = Miscellaneous Expenditure,

CL = Crop Loan.

Benefit-Cost Ratio (BCR):

It is the ratio of discounted value of all cash inflow to the discounted value of all cash outflows during the life span of the project. It can be estimated by using the following formula.

$$BCR = \frac{\sum_{t=1}^{N} B_t/(1+r)^t}{\sum_{t=1}^{N} C_t/(1+r)^t}$$

Whereas:

BCR = Benefit cost Ratio,

N = Project life,

B_t = Project benefits in the 1st year,

r = Discount rate.

Internal Rate of Return (IRR):

Internal rate of return is the discount rate at which the NPV is Zero. Mathematically it can be defined as:

$$\text{IRR} \quad = \frac{\sum_{t=1}^{n} B_t - C_t}{(1+r)^t} = \quad 0$$

Whereas:

IRR = Internal rate of return,

B_t = Project benefits in the t^{th} year,

C_t = Project cost in the t^{th} year, and

r = Discount rate.

Net Present Value (NPV):

This is the present value of future cash flows, discounted at the appropriate cost of capital, minus the cost of investment. The net present value (NPV) of an investment proposal is given as:

$$NPV \quad = \sum_{t=0}^{N} A_t/(1+K)^t$$

Whereas:

NPV = Net present value,

n = Project life expected,

A_t = the cash flow for period t (net inflow or net outflow),

k = required rate of return.

Pay-Back Period (BBP):

Pay-back period for a project, measures the number of years required to recover a project's total investment from the cash flows it generates it is the expected number of years required to recover the original investment.

$$PBP = \frac{Initial\ Investment\ outlay}{Annual\ cash\ flow}$$

Functional analysis:

In order to establish a functional relationship between the different input variables of piggery enterprise, Cobb-Douglas production function of the following type has been used to assess the impact of input towards the gross return.

$$Y = a\ x_1^{b1}\ x_2^{b2} \text{----------} x_n^{bn}$$

Where, Y is the output and x_1, x_2, x_3 --------- x_n are the inputs or independent variables, b_1, b_2, --------b_n are the elasticity of production of the input factors x_1, x_2 ----- x_n respectively.

Whereas:

a is constant,

x_1 is Piglet cost per animal (in Rs),

x_2 is Human labour per animal (in Rs),

x_3 is Veterinary charges per animal (in Rs),

x_4 is Water cost per animal (in Rs),

x_5 is Machinery cost per animal (in Rs),

x_6 is Farm building cost per animal (in Rs),

x_7 is Miscellaneous cost per animal (in Rs),

y is the total cost of pig per animal (in Rs),

The function becomes linear in logarithmic form and can be expressed as follows:

$$\text{Log } Y = \log a + b_1 \log x_1 + b_2 \log x_2 + \text{---------} + b_n \log x_n$$

The Cobb-Douglas production function allows greater degree of freedom and has the advantage over other types of function as the estimated can be computed conveniently. The regression co-efficient (b_1) in Cobb-Douglas production function directly indicate the elasticity of production which measures the percentage change in output with change in the input (Bhowmick, 1975).

The Cobb-Douglas production function facilitates to examine the resource use efficiency by comparing marginal value product (MVP) to its factor cost. The marginal value product of an input is computed as follows:

$$\text{MVP}_{x_i} = \frac{d_y}{d_x} = \frac{b_i . y}{x_i}$$

Where b_i is the elasticity co-efficient of x_i, x_i and y is the geometric means of input and output respectively.

CHAPTER IV

PROFILE OF DIMAPUR DISTRICT

Chapter IV

PROFILE OF DIMAPUR DISTRICT

Dimapur is the eighth district of Nagaland established in December 1997 and lies between 25° 54' 45" N Latitude and 93° 44' 30" E Longitude. The district is bounded by Assam on its North and West, Kohima on the East and Peren District in the South. The district comprises of four blocks and 11 agricultural circles with an area of 927 Square kilometers. Medziphema block has a total area of 345 sq. km. with 67 revenue villages. Likewise, Dhansiripar block is spread over 130 sq. km. area with 28 revenue villages, Niuland block has a total area of 305 sq. km. with 59 revenue villages whereas Kuhuboto block has a total area of 147 sq. km. with 38 revenue villages. Of the four blocks Niuland and Medziphema sub-divisions are managed by an Additional Deputy Commissioner and rest of blocks are manned by SDO (Civil).

Historical Genesis of the District:

The district has a heterogeneous population with majority comprising of Naga tribes from all over the Nagaland. There is sizable population of non- tribal living in the town areas. Although notified town of Dimapur

district has remained the same, the neighboring villages / settlement have expanded considerably over the years merging with town boundary to form a length of more than 13 km. In addition, there is sizeable rural population in the Sub-division of Niuland, Kuhuboto, Dhansiripar and Medziphema blocks. The total population of the district as per 2011 census is 3, 79,769. The main factor contributing to large increase in population of the district is migration from other parts of state. There is also considerable migration from Assam.

Dimapur the eighth district of Nagaland, was formed out of the Dimapur sub-division and Niuland sub-division of the then undivided Kohima district in December 1997. At present, the district is bounded by Kohima in East, Peren in South, Karbi Anlong district of Assam in the West and Golaghat district of Assam in the North.

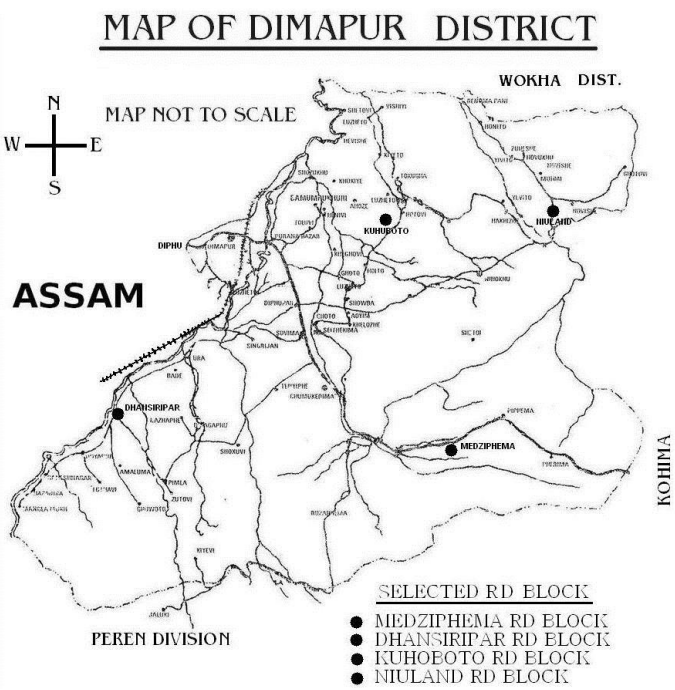

Figure 4.1 Dimapur District Map

Dimapur town is the commercial hub of the state and is the magnet around which the economic and developmental activities of the district are centered; it is one of the fastest developing townships of the North East. The

business of the town can trace their history to British times. The town is also a gateway to Nagaland and Manipur state. It is an important rail head and also has an airport. The National Highway 39 that connects Kohima, Imphal and Myanmar border of Moreh runs through Dimapur District.

Traditional, cultural and social identity of district:

The name Dimapur comes from the Kachari dialect. Etymologically di means "river", ma means "big" and pur means "city", the name means "the city near the great river". The Kachari tribe did not have a name for this city, though the Ahoms called it Che-din-chi-pen, or "the brick city". It was also called Che-dima, meaning "city on the Dima River" and it was once the ancient capital of 13th century Kachari rulers. "Dimapur" is a later appellation.

The ancient Kachari capital Dimapur is one of the important sites of the megalithic culture. Most of the ruins appear to be contemporize with the Kachari civilization, established before the Ahom invasion in the 13th century A.D. There is also evidence of a touch of Hindu influence on most of them, though these are predominantly Non-Aryan, with elaborate rituals and the cult of fertility. Besides the monoliths the ancient Kachari capital Dimapur contains other ruins of temples, embankments and tanks.

Dimapur city, the major commercial hub in Nagaland, has a heterogeneous mix of people from all over India, and for which it is also known as "mini India". Besides the dominant Naga tribes, who comprise about 50 per cent of the city's population, other prominent groups include Bengalis, Assamese, Nepalese, Biharis, Marwaris, Punjabis and also Tamils and Keralites. In the last two decades, Tibetan traders have also settled in the city.

Table 4.1. Demographic over View of Dimapur district during 2011

S N	Total Geographical Area	927 sq. km. (92,700 ha)
1.	Location	25° 54' 45" N Latitude & 93° 44' 30" E Longitude
2.	Number of villages	204
3.	Number of households	28,762
4.	Population	3,79,769
	(a) Male	1,98,163
	(b) Female	1,81,606
	(c) Male / female ratio (per 1,000 male)	916
5.	Density of population	410 per Sq. km
6.	Literacy (%)	85.44 Per cent
	(a) Male	88.07 Per cent
	(b) Female	82.54 Per cent
7.	Climate	Subtropical
8.	Temperature	10^0 to 40^0 C
9.	Soil pH	4.5 to 6.0
10.	Rainfall	1,500 to 2,000 mm
11.	Altitude	140 to 600 m (ASL)
12.	Major rivers	Dhansiri, Diphu, Chathe, Zubza

(Source: Statistical handbook of Nagaland 2011)

In Dhansiripar sub-division, the tribes inhabiting the area is predominantly Angami, Sumi, Kachari and Chakhesang while in Medziphema sub division, the Angami tribe is predominant although a few Kuki and Sumi villages are also found. In Kuhuboto and Niuland sub divisions, the Sumis are the predominant tribe inhabiting the areas. All these tribes have their own customary laws which dominate their social life. The Village Councils are the local bodies through, which such customary laws are enacted. The norms and traditions regarding marriage, divorce, inheritance, death etc. are governed by such customary laws. Disputes regarding land, water and such resources and even personal disputes are very often resolved based on these customary laws.

Agriculture in Dimapur district:

The agriculture in the district is TRC, rainfed and traditional. By and large mono cropping is practiced in the district. The TRC paddy alone covers an area of 35,310 ha whereas Jhum covers about 9,620 ha. Besides the second important crop in the district is Kharif, Maize covers about 6,680 ha. Maize is generally grown as an intercrop with jhum paddy. Winter maize is also grown in certain blocks of the district which covers about 370 and 50 ha respectively.

Table 4.2. Area and Production of major Agricultural Crops in Dimapur district

SN	Crop	Area (ha)	Production (MT)	Productivity (q/ha)
1.	Jhum paddy	9,620	17,170	17.85
2.	TRC paddy	35,310	85,610	24.25
3.	Maize	6,680	13,120	19.64
4.	Bajra	50	40	8.00
5.	Ragi	30	30	10.00
6.	Wheat	370	630	17.03
7.	Barley	60	90	15.00
8.	Oats	50	50	10.00
Total Cereal		**52,170**	**1,16,740**	**22.38**
9.	Tur / Arhar	400	370	9.25
10.	Urd / Moong	90	80	8.89
11.	Cowpea	160	230	14.38
12.	Horse gram	40	40	10.00
13.	Pea	660	600	9.09
14.	Lentil	440	330	7.50
15.	Gram	90	70	7.78
16.	Black gram	110	80	7.27
Total pulses		**1,990**	**1,800**	**9.05**
17.	Groundnut	120	130	10.83
18.	Soya bean	2,010	2,490	12.39
19.	Castor	50	40	8.00
20.	Sesame	620	390	6.29
21.	Sunflower	590	310	5.25
22.	Rapeseed / Mustard	4,120	4,130	10.02
23.	Linseed	1,080	870	8.06
Total oilseed		**8,590**	**8,360**	**9.73**
24.	Sugarcane	1,100	47,840	434.91
25.	Ramie	20	0	0.00
26.	Jute	770	1,390	18.05
27.	Potato	590	7,420	125.76
28.	Tea (green)	2,860	12,720	44.48
29.	Tapioca	90	2,120	235.56
30.	Colocassia	240	2,290	95.42
31.	Mesta	250	470	18.80
Total Commercial Crops		**5,920**	**74,250**	**125.42**

(Source: Statistical handbook of Nagaland, 2011)

Important Pulses are also grown in the district including pea, lentil, black gram, beans, green gram, arhar, These are grown over an area of 1,360 ha, in both Kharif and Rabi season. With the favourable agro climatic condition, oilseeds such as groundnut, soybean, sesame, sunflower, mustard, linseed, etc. are grown in an area of 8,590 ha. Commercially viable crops such as sugarcane, ginger, jute, turmeric, tea, potato etc. are also grown.

H**orticulture of Dimapur district**:

In Nagaland, fruits and vegetables are produced in 25,000 and 26,300 ha with the total production of 25,600 to 32,000 tonnes, respectively of which Dimapur district contributes major portion of production. Commercial cultivation of pineapple, banana, cashew nut and lemon is also followed in the district. The Horticulture Technology Mission (HTM) has helped to a great extent in popularizing the cultivation of horticultural crops including floriculture.

Horticulture Potential:

The state of Nagaland in general and Dimapur in particular has been gifted with a unique topography and varied agro-climatic and soil conditions, which offers opportunities to cultivate a variety of horticultural crops like vegetables and fruits.

Table 4.3. Area and Production of major Horticultural Crops in Dimapur district

SN	Crop	Area (Ha)	Production (MT)	Productivity (Qt/Ha)
1	Sweet Potato	100	1000	100.00
2	Cabbage	110	1000	90.91
3	Cauliflower	70	140	20.00
4	Brinjal	45	300	66.67
5	Chilly	300	2100	70.00
6	Pea	220	1500	68.18
7	Beans	100	700	70.00
8	Bhindi	50	200	40.00
9	Tomato	100	500	50.00
10	Ginger	200	3000	150.00
11	Garlic	10	20	20.00
12	Radish	50	300	60.00
13	Colocasia	100	2,000	200.00
14	Tapioca	450	3,600	80.00
15	Xanthophylum	10	60	60.00
16	Onion	200	256	12.80
17	Naga cucumber	40	240	60.00
18	Leafy Vegetables	500	1,000	20.00
19	Others	600	4,000	66.67
Total Vegetables and Spices		**3,255**	**21,916**	**67.33**
20	Lemon	300	2,400	80.00
21	Pomelo	105	500	47.62
22	Pomegranate	15	50	33.33
23	Papaya	60	400	66.67
24	Banana	310	3,050	98.39
25	Guava	20	100	50.00
26	Mango	50	100	20.00
27	Litchi	70	140	20.00
28	Jack-fruit	25	40	16.00
29	Pineapple	1900	24,000	126.32
30	Mosambi	20	60	30.00
31	Others	120	250	20.83
Total Fruits		**2,995**	**31,090**	**103.81**

(Source: Statistical handbook of Nagaland, 2011)

Among the vegetables spring (cucurbits, bhindi beans), summer (cucurbits, bhindi, beans) as well as winter vegetables (cabbage, cauliflowers, carrot, radish, palak, pea, etc;) are being cultivated in the districts. Fruits like pineapple, guava, lemon, litchi, and mango are the major ones covering the area in district. Among floriculture, the commercial crop is grown is Anthurium.

Animal Husbandry in Dimapur:

Under our socio-economic and socio-cultural condition, the state needs job-led economic growth strategy based on pro-nature, pro-poor and pro-women policies of orientation and its dissemination. The role of livestock and poultry farming in livelihood earning of farmers is enormous. Dairy farming is being practiced by a number of farmers in the district. The milk is being collected by the Dimapur Milk Union Limited at 4th Mile Dimapur and is processed for the production of milk products like milk packets, curd and ghee etc. The dairy farming is mainly practiced by Nepalese and other state people. Piggery and poultry is very common in the district. In rural areas of the district each and every household has minimum 1-2 pigs and 5-6 numbers of poultry birds in the backyard of house. After poultry, duck is being reared in the district. Goat and rabbit limited to small number only.

Table 4.4. Total production of Milk meat and eggs in Dimapur district

SN	Produce	Total requirement	Production	Short fall
1.	Meat (‘000 mt)	13,582.33	11,500.00	(-)2,082.33
2.	Milk (‘000 mt)	23,912.56	34,716.00	(+)10,803.44
3.	Egg (lakh in numbers)	398.54	269.02	(-)129.52

(Source: Department of Veterinary and Animal Husbandry, Kohima)

Table 4.5. Carcass yield of meat animals

SN	Species	Average slaughter age (month)	Average live weight (kg)	Average carcass weight (kg)
1.	Cattle	36	150 to 180	130
2.	Buffalo	36	200 to 250	175
3.	Pig	12	100 to 120	75
4.	Sheep / Goat	12	40 to 50	22
5.	Poultry	2	2 to 5	1.5

(*Source: Department of Veterinary and Animal Husbandry, Kohima)*

Table 4.6. Milk yield by type of Animals

S. No.	Type of Animals	Milk yield (litres / day)
1.	Cross Bred Cattle	3.78 to 5.40
2.	Indigenous Cattle	0.950 to 1.556
3.	Buffalo	0.925 to 1.515
4.	Goat	0.140 to 0.426

(Annon. 2011)

Cattle production system:

In the district most of the farmers leave their cattle for free grazing except during paddy cultivation period. However some farmers' follow stall fed system.

Mithun production System:

The Mithuns are not reared in the district. But in Mezdiphema, block National Research Centre on Mithun was established in 1988. The 76 Mithuns of Nagaland, Manipur, Mizoram and Arunachal Strains are being maintained by NRC-M for experimental purposes.

Poultry Production System:

Most of the farmers follow backyard system of poultry rearing, however, some farmers with higher number of poultry birds follows deep litter system. In case of backyard poultry system, the birds are fed with broken rice / maize seeds in morning and evening. The birds are more prone to diseases due to unhygienic conditions.

P**ig production system**:

In pig production both loose and stall fed system is practiced. In piggery, most of the farmers follow stall fed system with kitchen waste and locally available feeds like Colocacia leaves and stem, rice polish, wheat bran etc. The Veterinary department is trying to provide the health services by organizing the veterinary camps and trainings, where animals are examined, vaccinated and medicines are provided as per need.

CHAPTER V

RESULTS AND DISCUSSION

Chapter V

RESULTS AND DISCUSSION

The present chapter deals with results and their interpretation based on discussion on logical grounds. It comprises of the discussion based on tabular analysis of data collected from the sample households.

The aspects analyzed pertain to the discussion have been presented under the following heads.

Profile Characteristics of the Respondents:

The resource base of a farmer determines the dimension and type of farming, which influences the efficiency of farming in a particular geographic setting. It also shows the financial condition and stability of the farming business of a farmer and thus formulation of different development programmes and their implementation further necessitates a critical examination of the existing resource structure and investment pattern. Farm resource is defined as factor of production. The absolute value of input and output as well as the relationship between them and among the various constituents of input factors determine the farm resource structure. Since farm structure and organization constitute the groundwork of production in

agriculture, the study of farm resource structure is essential for proper analysis of the economy of the farm.

In brief, farm resource structure refers to the extent of land, labour and capital available on a farm. The use of the resource is affected by the availability of natural resources, which determines the nature and type of enterprise to be followed on a farm. The nature and type of enterprise affect use of farm resources on the farm and ultimately economy of a farm.

In order to analyse the distribution pattern and impact of agricultural credit and to evaluate it in systematic way, it is necessary to have a clear understanding of the socio-economic back ground of the beneficiaries. With this in view, the socio-economic back ground of the respondents were analysed and the relevant Tables and charts are presented in the following pages.

The general profile of the respondents was studied in terms of size of holdings, size of family, social participation, educational background, number and type of building possessed and occupation background. The findings of these aspects are presented below under relevant sub-heads.

The data collected for the study were analysed with reference to the objective set and the results are presented and discussed in this chapter. For better understanding of various objectives of the study, the results are presented in the following headings.

Socio-economic characteristics of the sample farmers:

Socio-economics variables used to influence the types of entrepreneurial development. This is because, the enterprises vary in their level and types of resource requirement like land, labour, capital and the managerial skill which is related the outcome of level of education. Hence, a discussion on socio-economic variables of the sample farmers such as level of education, occupational pattern, land resources and its utilization pattern, available labour force, cropping pattern, livestock pattern and plantation crop pattern have been presented.

Farm Size Group and Level of Education:

Table 5.1 shows the sample respondents on different farm size groups and the table revealed that the overall farm size group has 1343 number of pigs with an average of 11.192 per farm and it was found least on small farm size group and maximum on large farm size group, which shows an increasing trend towards the farm size groups. The total numbers of pigs was found to be 456 numbers, 342 numbers and 545 numbers in Group I, Group II and Group III and 340 numbers in non-beneficiaries respectively.

Education standard of the farmer is an important parameter that determines the productivity of different crops grown by the farmers. It helps

the farmer in judicious allocation of different inputs for better production performance.

Table 5.1. Sample respondents on different farm size groups

SN	Category	Total Piggery	Per Farm	Respondent	Percentage
(A).	**Beneficiaries**				
1.	Small Farm	456	5.84	78	65.00
2.	Medium Farm	342	14.86	23	19.17
3.	Large Farm	545	28.68	19	15.83
Pooled		1343	11.19	120	100
(B).	**Non-beneficiaries**	340	8.50	40	100

(Group classified on the basis of semi intensive system 10 Sows + 1 Boar = 11)

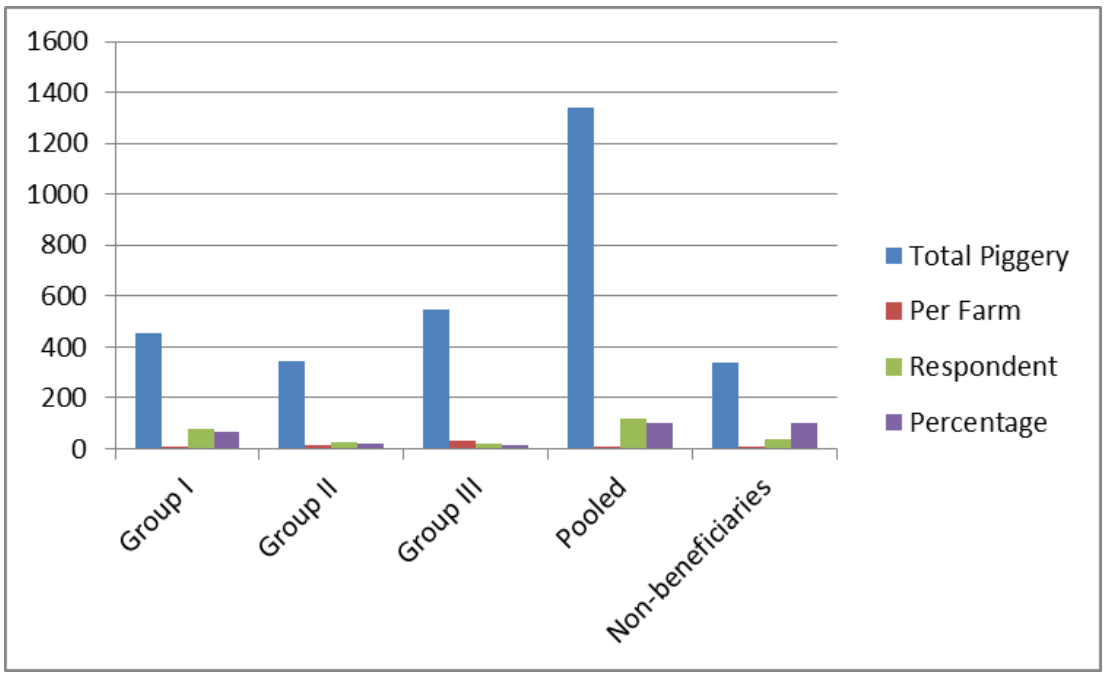

Fig. 5.1 Sample respondents on different farm size groups

Table 5.2. Educational status of family members of respondents of different farm size groups (in numbers)

SN	Category	Small	Medium	Large	Pooled	Non-beneficiaries
1.	Illiterate	18 (23.07)	0 (0.0)	2 (10.53)	20 (16.67)	7 (17.50)
2.	Primary	20 (25.64)	1 (4.35)	1 (5.26)	22 (18.33)	9 (22.50)
3.	Matriculate	14 (17.95)	1 (4.35)	0 (0.0)	15 (12.50)	7 (17.50)
4.	PU / Intermediate	19 (24.36)	12 (52.17)	5 (26.32)	36 (30.00)	11 (27.50)
5.	Graduate & above	7 (8.97)	9 (39.13)	11 (57.89)	27 (22.50)	6 (15.00)
Total literacy		60 (76.92)	23 (100.00)	17 (89.47)	100 (83.33)	33 (82.50)
Total		78 (100.00)	23 (100.00)	19 (100.00)	120 (100.00)	40 (100.00)

(Parenthesis indicate percentage to total)

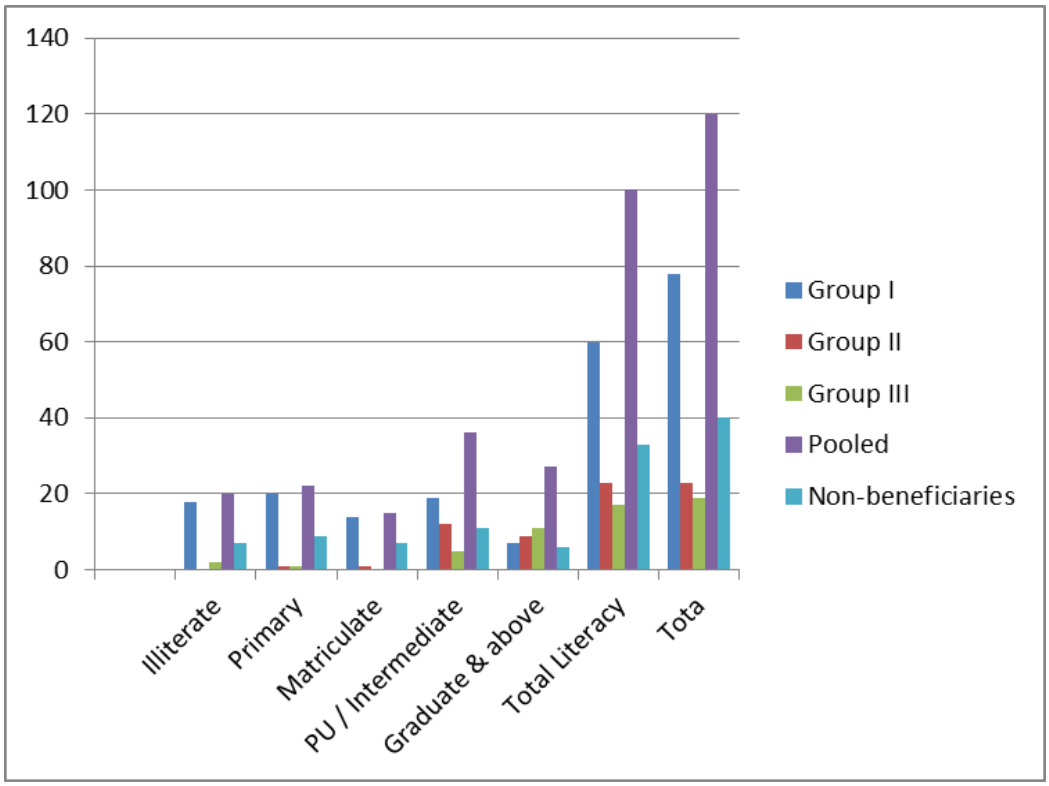

Fig. 5.2 Educational status of the sample farmers

Table 5.2 represents the level of educational with respect to different farm size groups and shows that about 83.33 per cent beneficiaries and 82.50 per cent non beneficiaries were literate and it was found least with 76.92 per cent on Group I maximum on Group II with 100.00 per cent literacy. Intermediate / PU level of education was found to be most prevalent (30.00 per cent) followed by graduate and above level (22.50 percent) and primary level (22.00 per cent) respectively. The findings indicate that the rate of literacy was very high in the study area.

Distribution of sample household according to sex:

Table 5.3 depicts the distribution of sample household according to sex across various size groups.

Table 5.3. Distribution of sample respondent according to sex on different farm size groups (in numbers)

SN	Category	Sample Size	Male	Female	Household
1.	Small	78 (65.00)	45 (57.69)	33 (42.31)	6.615
2.	Medium	23 (19.17)	16 (69.57)	7 (30.43)	7.217
3.	Large	19 (15.23)	14 (73.68)	5 (26.32)	9.211
Pooled		120 (100.00)	75 (62.50)	45 (37.50)	7.142
4.	Non-beneficiaries	40 (100.00)	30 (75.00)	10 (25.00)	6.925

(Parenthesis indicate percentage to total)

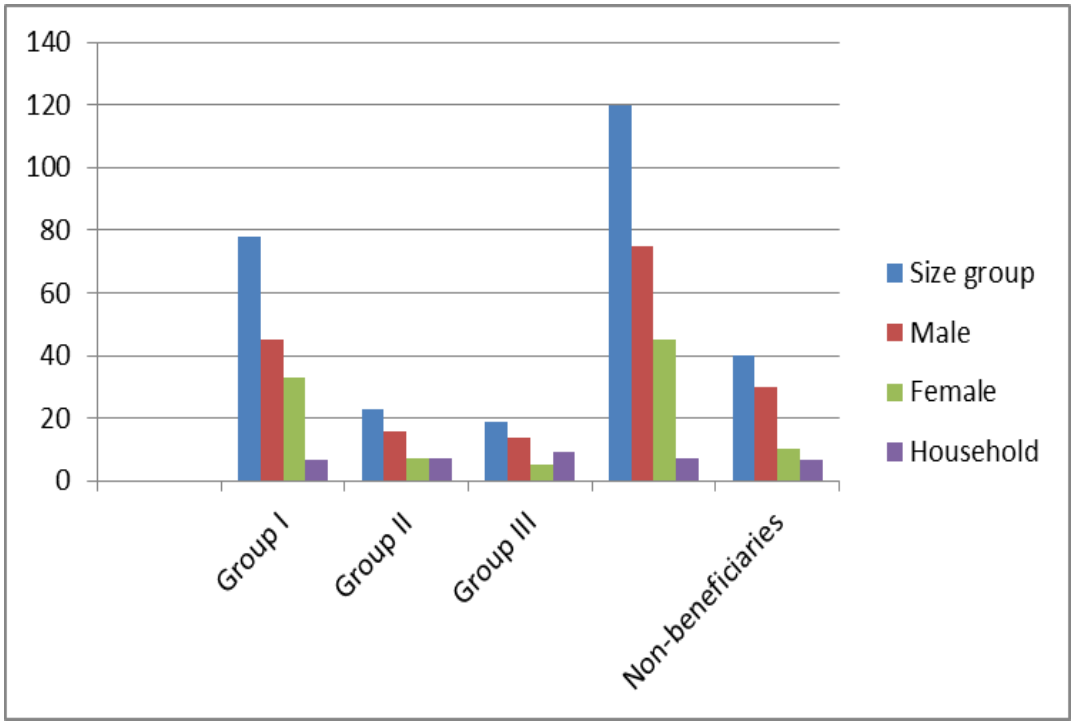

Fig. 5.3 Sample farmers according to sex

The table revealed that male constituted 62.50 per cent and 75.00 per cent for beneficiaries' and non-beneficiaries respectively of the total sample farmers while female constituted 37.50 per cent and 25.00 per cent for beneficiaries' and non-beneficiaries respectively. The household size of the family was found to be 7.14 and 6.93 for beneficiaries and non-beneficiaries.

Distribution of sample population according to economic status:

The results of the distribution of sample population according to economic status are given in Table 5.4 revealed that workers constituted 58.00 per cent for beneficiaries and 44.76 per cent for non-beneficiaries of

the total sample population. Male workers constituted 33.26 per cent and 24.55 per cent while female workers accounted 24.74 per cent and 20.22 per cent for beneficiaries and non-beneficiaries of the total sample population. The percentage of workers in different size groups were 37.34 in group I, 10.27 per cent in group II and 10.38 per cent in group 111. In the sample 17.15 per cent was non-workers and 24.85 per cent was helpers.

The above Table highlighted the fact that worker constitute the major share in working force. Male worker constituted the highest share in working force.

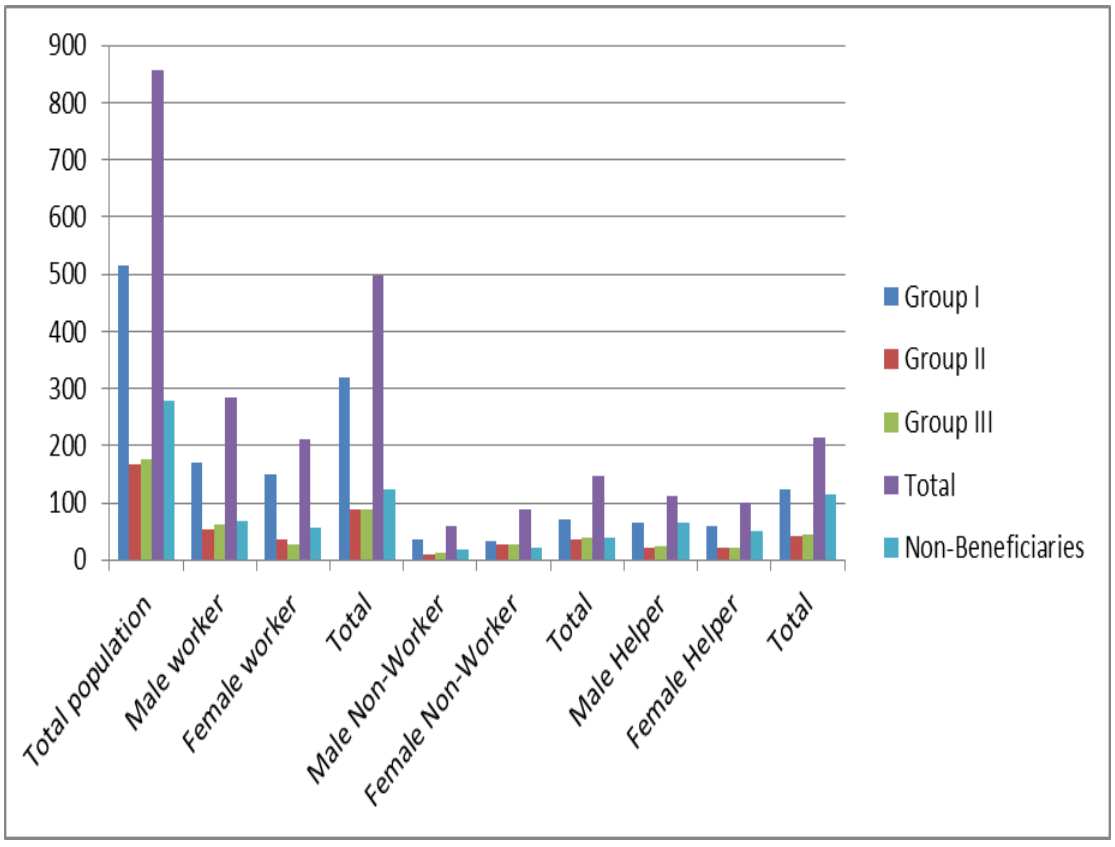

Fig. 5.4 Workforce of the Sample farmers

Table 5.4. Distribution of workforce of different farm size groups (in numbers)

SN	Size group	Total population	Worker			Non-worker			Helper		
			M	F	T	M	F	T	M	F	T
1.	I	516 (100.00)	170 (19.84)	150 (17.50)	320 (37.34)	37 (4.32)	34 (3.97)	71 (8.28)	65 (7.58)	60 (7.00)	125 (14.59)
2.	II	166 (100.00)	52 (6.07)	36 (4.20)	88 (10.27)	10 (1.17)	26 (3.03)	36 (4.20)	22 (2.57)	20 (2.33)	42 (4.90)
3.	III	175 (100.00)	63 (7.35)	26 (3.03)	89 (10.38)	12 (1.40)	28 (3.27)	40 (4.67)	25 (2.92)	21 (2.45)	46 (5.37)
Total		857 (100.00)	285 (100.00)	212 (100.00)	497 (100.00)	59 (100.00)	88 (100.00)	147 (100.00)	112 (100.00)	101 (100.00)	213 (100.00)
4.	Non-Beneficiaries	277 (100.00)	68 (24.55)	56 (20.22)	124 (44.76)	18 (6.50)	20 (7.22)	38 (13.72)	65 (23.47)	50 (18.05)	115 (41.52)

(Parenthesis indicate percentage to total)
(M - Male; F - Female & T - Total)

Table 5.5. Distribution of workforce according to their occupation on different farm size groups (in numbers)

SN	Size group	Agriculture			Business			Service			Others			Total		
		M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
1.	I	16 (13.33)	18 (15.00)	34 (28.33)	4 (3.33.)	8 (6.67)	12 (10.00)	18 (15.00)	6 (5.00)	24 (20.00)	5 (4.17)	3 (2.50)	8 (6.67)	43 (35.83)	35 (28.33)	78 (65.00)
2.	II	4 (3.33)	8 (6.67)	12 (10.00)	1 (0.83)	2 (1.67)	3 (2.50)	4 (3.33)	1 (0.83)	5 (4.17)	3 (2.50)	0 (0.0)	3 (2.50)	12 (10.00)	11 (9.17)	23 (19.17)
3.	III	3 (2.50)	6 (5.00)	9 (7.50)	0 (0.0)	3 (2.50)	3 (2.50)	2 (1.67)	3 (2.50)	5 (4.17)	2 (1.67)	0 (0.0)	2 (1.67)	7 (5.83)	12 (10.00)	19 (15.23)
Total		23 (19.17)	32 (26.67)	55 (45.83)	5 (4.17)	13 (10.83)	18 (15.00)	24 (20.00)	10 (8.33)	34 (28.33)	10 (8.33)	3 (2.50)	13 (10.83)	62 (51.67)	58 (48.33)	120 (100.00)
4.	Non-beneficiaries	14 (35.00)	8 (6.67)	22 (18.33)	3 (2.50)	2 (5.00)	5 (12.50)	10 (25.00)	2 (5.00)	12 (30.00)	1 (2.50)	0 (0.0)	1 (2.50)	28 (70.00)	12 (30.00)	40 (100.00)

(Parenthesis indicate percentage to total)
(M - Male; F - Female & T - Total)

Distribution of sample households according to occupation pattern:

The occupational pattern of the sample household of different farm size group is given in Table 5.5. It is revealed from the table that agricultural, business and service were the main source of employment of the sample farmers. About 45.83 per cent beneficiaries and 18.33 per cent non- beneficiaries of the sample farmers had agriculture as their occupation. The percentage of agriculture as their occupation in different size groups were 28.33 per cent in Group I, 10.00 per cent Group II and 7.50 per cent in Group III, respectively.

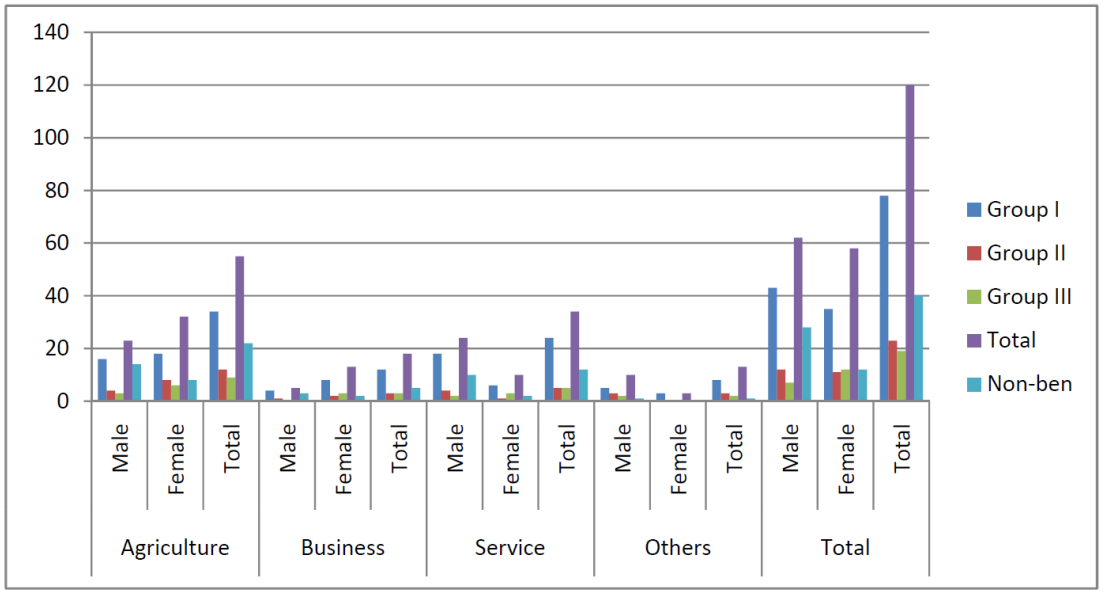

Fig. 5.5 Workforce according to occupation

Distribution of sample households according to land use pattern:

The land use pattern of sample farmers is shown in Table 5.6. It is observed that operational holding constituted about 80.70 per cent beneficiaries and 56.74 per cent non-beneficiaries of the total land. The

average size of operational land holding was found to be 2.51 ha for beneficiaries and 1.42 ha for non-beneficiaries respectively. The total area under piggery was found to be 65.661 Sq. ft; amongst the various size groups of farms, the land holding showed increasing trend with the increase in size.

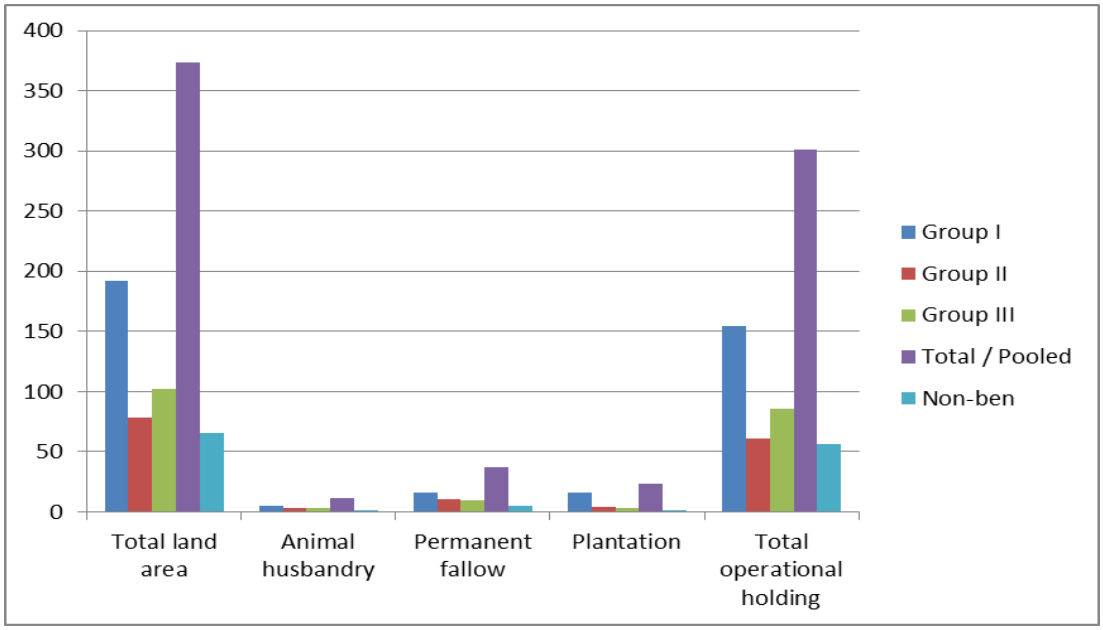

Fig. 5.6 Land use pattern of sample farmers

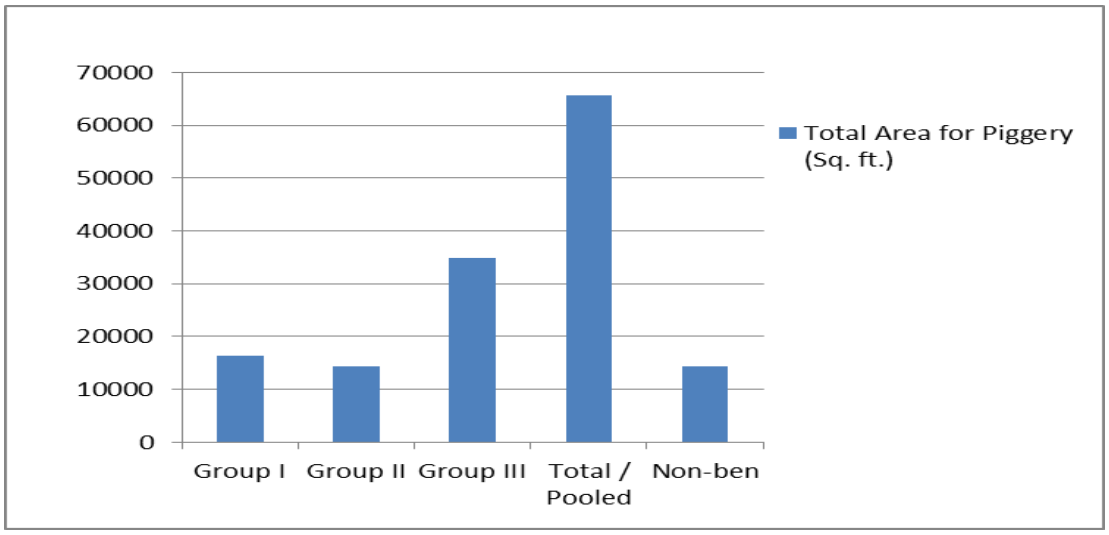

Fig. 5.7 Total Area under Piggery

Table 5.6. Distribution of land use pattern under different farm size groups (in ha)

SN	Size group	Owned land	Total land Area	Animal husbandry	Permanent fallow	Plantation	Total land holding	Total Numbers of Piggery	Numbers of Piggery / house hold	Total Area for Piggery (sq. ft.)	Average Area / Animal (sq. ft.)	Average operational holding
1.	I	78 (65.00)	192.45 (51.54)	5.45 (46.58)	16.35 (44.50)	15.85 (67.16)	154.80 (51.37)	456 (33.95)	5.846	16,416 (25.00)	36.00	1.985
2.	II	23 (17.19)	78.60 (21.05)	3.00 (25.64)	10.50 (28.58)	4.50 (19.07)	60.60 (20.11)	342 (25.47)	14.869	14,364 (21.88)	42.00	2.635
3.	III	19 (15.23)	102.35 (27.41)	3.25 (27.78)	9.89 (26.92)	3.25 (13.77)	85.96 (28.52)	545 (40.58)	4.524	34,880 (53.12)	64.00	4.524
Total / Pooled		120 (100.00)	373.41 (100.00)	11.70 (100.00)	36.74 (100.00)	23.60 (100.00)	301.36 (100.00)	1343 (100.00)	11.192	65,661 (100.00)	48.891	2.511
4.	Non-beneficiaries	40 (100.00)	65.25 (100.00)	1.50	5.25	1.75	56.75	340	8.500	14,280	42.00	1.419

(Parenthesis indicate percentage to total)

Existing pattern of plantation crops:

The pattern of plantation crops for various size groups of sample farmers is shown in Table 5.7. It is clear from the Table that the sample farmers grew a number of plantation crops such as arecanut, bamboo, firewood, banana, teak and gamari. The major plantation crops were found to be teak followed by gamari, bamboo, arecanut, banana and firewood. The sample farmers of various size groups grew a good number of plantation crops, but the area allocation to them was very meager.

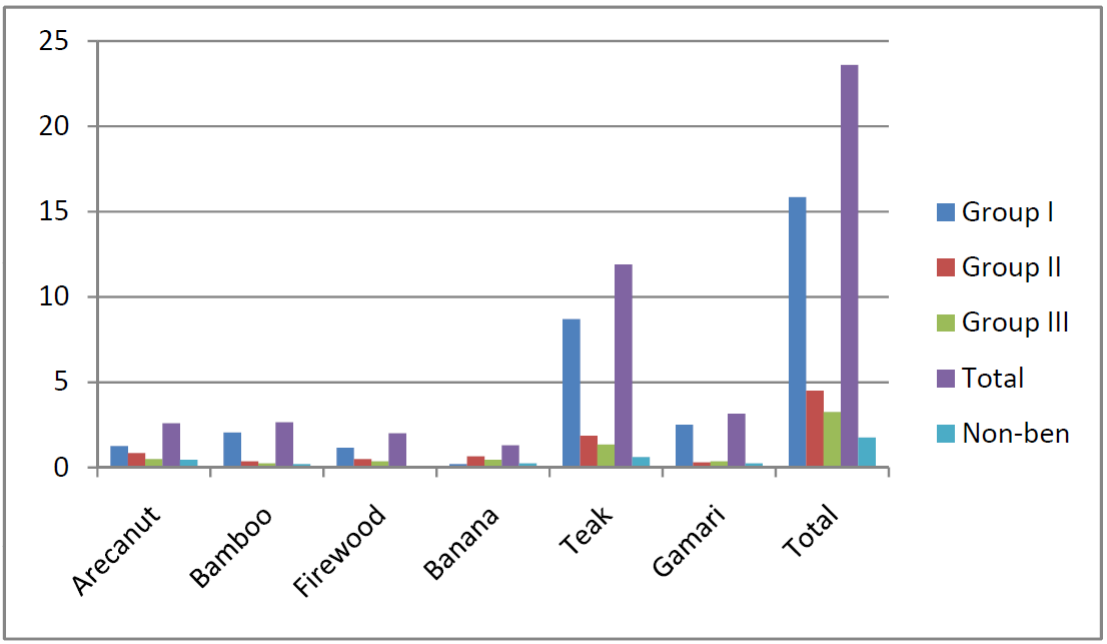

Fig. 5.8 Plantation of the sample farmers

Existing livestock of sample farmers:

Table 5.8 depicts the distribution of sample household according to livestock pattern across various size groups. The sample farmers were found to rear animals / birds such as pig, poultry and dogs, milch cow, goat etc. in

the area. Poultry was found to be more in number (1,433 beneficiaries and 523 non-beneficiaries) followed by pig (1,343 beneficiaries, 340 non-beneficiaries), dog (86 beneficiaries, 18 non-beneficiaries), goat (31 beneficiaries, 08 non-beneficiaries), milch cow (23 beneficiaries, 03 non-beneficiaries) and draft cow (12 beneficiaries, 02 non-beneficiaries).

The results of the livestock asset of sample farmers reveal a picture of very uneconomic size of livestock asset for various size groups. However, poultry was found to be more in number.

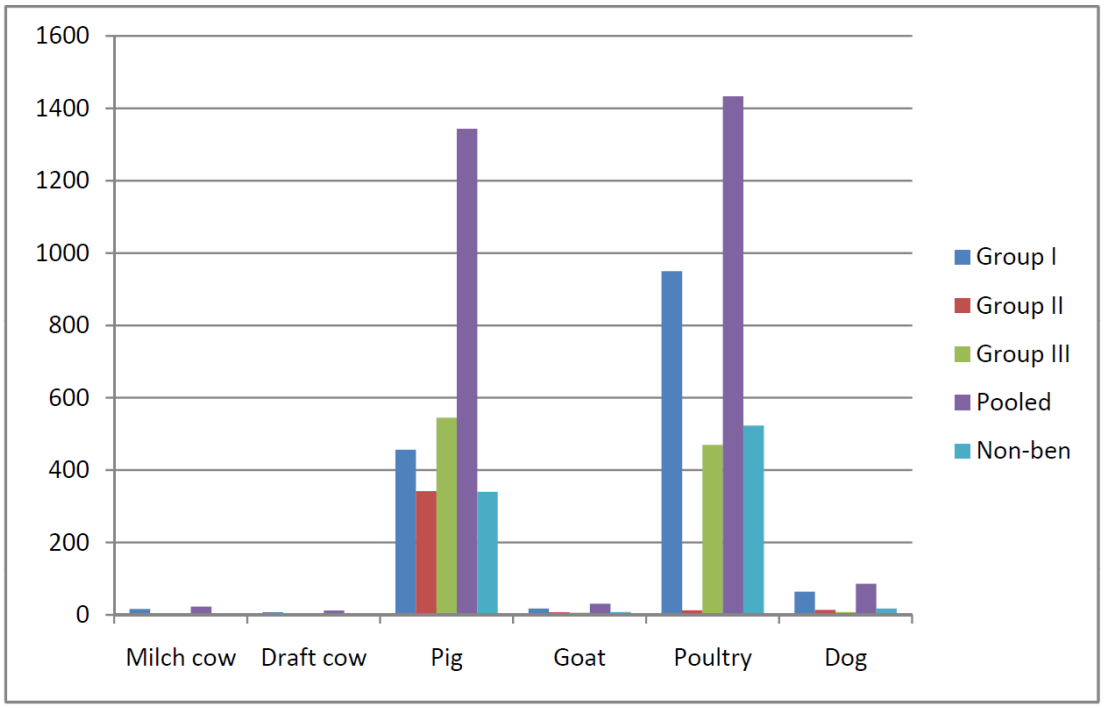

Fig. 5.9 Animal husbandry of the Sample farmers

Table 5.7. Distribution of plantation under different farm size groups (ha)

SN	Size groups	No. of house hold	Plantation crops													
			Arecanut		Bamboo		Firewood		Banana		Teak		Gamari		Total	
			Area	Per farm	Area	Per farm	Area	Per farm	Area	Per farm	Area	Per farm	Area	Per farm	Area	Per farm
1.	I	78	1.25	0.214	2.05	0.037	1.15	0.197	0.20	0.034	8.70	1.488	2.50	0.428	15.85	2.711
2.	II	23	0.85	0.057	0.35	0.024	0.50	0.034	0.65	0.044	1.85	0.124	0.30	0.020	4.50	0.303
3.	III	19	0.50	0.017	0.25	0.009	0.35	0.001	0.45	0.016	1.35	0.047	0.35	0.012	3.25	0.113
Total		120	2.60	0.232	2.65	0.237	2.00	0.179	1.30	0.116	11.90	1.063	3.15	0.281	23.60	2.108
4.	Non-beneficiaries	40	0.45	0.053	0.20	0.024	0.0	0.0	0.25	0.029	0.60	0.071	0.25	0.294	1.75	0.206

Table 5.8. Animal husbandry of the farmers across various size groups

SN	Size group	No. of house Hold	Milch cow		Draft cow		Pig		Goat		Poultry		Dog	
			No	Per farm	No	Per farm	No	Per farm	No	Per farm	No	Per farm	No	Per farm
1.	I	78	16	0.205	7	0.089	456	5.846	18	0.231	950	12.179	64	0.821
2.	II	23	4	0.174	3	0.130	342	14.869	7	0.304	13	0.565	14	0.609
3.	III	19	3	0.158	2	0.105	545	28.684	6	0.316	470	24.737	8	0.421
Pooled		120	23	0.192	12	0.100	1343	11.192	31	0.258	1433	11.942	86	0.717
4.	Non-beneficiaries	40	3	0.075	2	0.05	340	8.500	8	0.200	523	13.075	18	0.45

FINANCIAL FEASIBILITY OF INVESTMENTS IN PIGGERY:

To evaluate the feasibility of investment in piggery, the criteria such as net present value / worth, benefit cost ratio, pay-back period and internal rate of return were employed and the results are presented in Table 5.9**.**

Table 5.9. Feasibility of Investment in Piggery rearing

SN	Particulars	Study Area	
		Chumukdema block	Medziphema block
1.	Net Present Value (Rs)	3,850	3,280
2.	Benefit Cost Ratio (Rs)	1.62	1.54
3.	Pay Back Period (Years)	4.25	4.50
4.	Internal Rate of Returns (%)	45.50	42.35

Net present value (NPV):

Net present worth of an investment is the present value of future cash flows and discounted at the appropriate cost of capital, minus the cost of investment. Net present value (NPV) criterion helps to evaluate the benefits accrued and costs incurred during the project life. One advantage of NPV is that it gives an idea about surplus money that would be generated by a project at a given discount rate. It is an absolute measure and varies with level of investment and discount rates. In this study NPV was calculated by discounting the net cash inflows. The NPV of pig rearing at 12.00 per cent discount rate were Rs 3,850.00/- and Rs 3,280.00/- in Chumukidema and Medziphema blocks, respectively.

The formal selection criterion of NPV is to accept all projects with positive values. Applying this principle net present value of piggery clearly indicated feasibility of investment.

Benefit cost ratio (BCR):

Benefit cost ratio is another tool for appraising the worthiness of investments and it helps to ascertain the profitability of an enterprise. Benefit cost ratio was calculated by taking the ratio of discounted net cash flow and initial investment.

The decision in B: C ratio framework is to select the projects where the ratio is more than one. The B: C ratio was 1.62 in Chumukidema and 1.54 in Medziphema block at 15.00 per cent discount rate which satisfies the rule indicating the worthiness of investment on piggery. The B: C ratio indicates expected returns for each rupee of investment in piggery enterprise.

Pay-back period (PBP):

It is the period required to recover the initial investment made in establishing the piggery. In the present study the pay-back period was 4.25 and 4.50 years in Chumukidema and Medziphema blocks respectively. This

clearly indicated that it would take 4.25 and 4.50 years to recover the entire investment.

Internal Rate of Return (IRR):

IRR is suggested to be very suitable measure for evaluating the profitability of investment on different projects. The IRR is the rate of discount at which the present worth of project is zero or the discounted costs are equal to the discount returns. It is superior over the other measures, since it takes into consideration the re-investment opportunities of enterprises during the life span.

The formal selection criterion of IRR is to accept the projects with IRR more than the opportunity cost of capital. The internal rates of return were 45.50 per cent in Chumukidema and 42.35 per cent in Medziphema block. The IRR represents the maximum rate of interest at which the growers can borrow from lending agencies and invest on piggery. In other words, it is the average earning power of money invested on piggery during its life span. Since IRR was more than the opportunity cost of capital it clearly indicated that investment on piggery was highly profitable economically feasible and financially viable.

Thus all the four criteria of investment feasibility analysis revealed that investment in piggery enterprise is a feasible proposition.

UTILIZATION PATTERN OF BANK FINANCE FOR PIGGERY:

Item-wise break-up of piggery rearing on different farm size group (Rs/farm):

Table 5.10 showed the item-wise break of per farm cost of piggery rearing across different farm size group. The Table showed that from the variable cost, feed cost was found to be highest and among various farm size groups it was found to be highest in group III (Rs 1,14,709.90/-) and lowest in group I (Rs 23,305.08/-). The lowest variable cost for beneficiaries was found to be on watering cost and among various farm size groups it was found to be highest in group III (Rs 5,546.84/-) and lowest in group I (Rs 1,118.40/-). Among the fixed cost, the rental value of farm building was found to be highest and among various farm size groups it was found to be highest in group III (Rs 6,588.95/-) and lowest in group I (Rs 1,520.90/-). The lowest fixed cost for beneficiaries was found to be on depreciation of equipment's and machineries and among various farm size groups it was found to be highest in group III (Rs 5,444.74/-) and lowest in group I (Rs.942.89/-), respectively.

The result also showed that the per farm total cost of piggery rearing in the (pooled) average farm situation for beneficiaries was found to be Rs 80,746.46/- and for non-beneficiaries it was found to be Rs 74,385.74/-. From the total variable cost, feed cost was found to be highest for both beneficiaries (Rs 45,486.07/-) and non-beneficiaries (Rs 38,112.50/-).

Table 5.10. Item-wise cost break-up of Piggery rearing on different farm size group (Rs / farm)

SN	Particulars	Group I	Group II	Group III	Pooled	Non-beneficiaries
A.	**Variable Cost**:					
(i).	Feed Cost	23,305.08 (55.42)	63,175.83 (57.78)	1,14,709.90 (56.16)	45,486.07 (56.33)	38,112.50 (51.24)
(ii).	Human Labour:	4,540.20 (10.797)	8,976.10 (8.210)	20,405.00 (9.991)	7,902.40 (9.787)	4,288.80 (5.766)
(a).	Family Labour	2,740.20 (6.517)	4,776.10 (4.368)	7,500.00 (3.672)	4,305.40 (5.332)	1,500.00 (2.017)
(b).	Hired Labour	1,800.00 (4.281)	4,200.00 (3.841)	12,905.00 (6.318)	3,597.00 (4.455)	2,788.80 (3.749)
(iii).	Water Cost	1,118.40 (2.660)	3,061.09 (2.800)	5,546.84 (2.716)	2,189.58 (2.712)	1,651.25 (2.220)
(iv).	Veterinary Cost	1,246.28 (2.964)	3,127.83 (2.861)	5,636.05 (2.759)	2,300.63 (2.849)	1,442.75 (1.940)
(v).	Miscellaneous	3,878.21 (9.223)	10,701.30 (9.788)	19,529.20 (9.562)	7,701.54 (9.538)	12,022.50 (16.162)
(vi).	Interest on Working Capital	4,235.06 (10.072)	11,012.18 (10.070)	20,571.35 (10.071)	8,132.74 (10.072)	6,762.43 (9.091)
Total Variable Cost		38,323.23 (91.140)	1,00,054.33 (91.512)	1,86,398.34 (91.263)	73,712.96 (91.289)	64,280.23 (86.415)
B.	**Fixed Cost**:					
(i).	Rental value of farm building	1,520.90 (3.617)	3,843.48 (3.515)	6,588.95 (3.226)	2,768.50 (3.429)	5,792.75 (7.787)
(ii).	Depreciation on equip. & mach.	942.89 (2.242)	2,246.74 (2.055)	5,444.74 (2.666)	1,915.58 (2.372)	2,803.38 (3.769)
(iii).	Interest on fixed capital cost	1,261.73 (3.001)	3,190.65 (2.918)	5,811.58 (2.845)	2,349.42 (2.910)	1,509.38 (2.029)
Total Fixed Cost		3,725.52 (8.860)	9,280.87 (8.488)	17,845.27 (8.737)	7,033.50 (8.711)	10,105.51 (13.585)
Total Cost *(A + B)*		42,048.75 (100.00)	1,09,335.20 (100.00)	2,04,243.61 (100.00)	80,746.46 (100.00)	74,385.74 (100.00)

(Parenthesis indicate percentage to total)

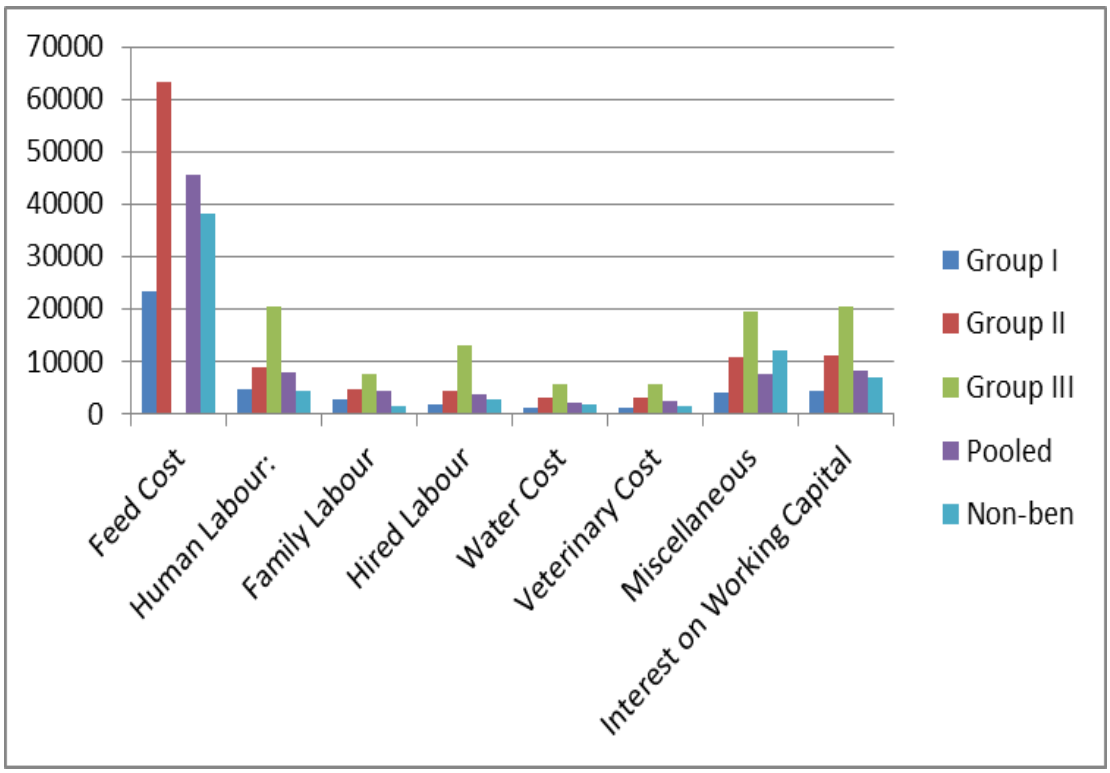

Fig. 5.10 Variable cost of the sample farmers (Rs.)

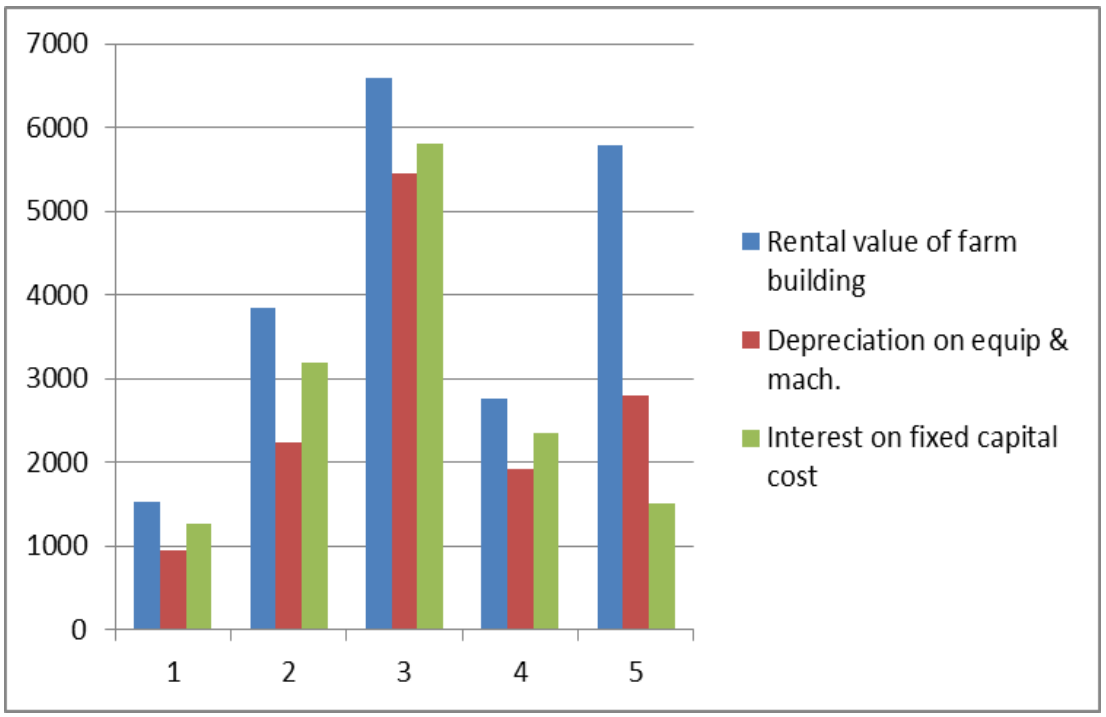

Fig. 5.11 Fixed cost of the sample farmers (Rs.)

The fixed cost was found to be Rs 7,033.50/- for beneficiaries and Rs 10,105.51/- non-beneficiaries. For total fixed cost, the rental value of farm building was found to be highest for both beneficiaries (Rs 2,768.50/-) and for non-beneficiaries it was (Rs 5,792.75/-). The lowest fixed cost for beneficiaries was found to be on depreciation of equipment's and machineries (Rs 1,915.58/-) and for non-beneficiaries it was on interest on fixed capital cost (Rs 1,509.38/-). And for variables cost the lowest was at Rs 2,189.58/- for water cost (beneficiaries) and for non-beneficiaries it was Rs 1,442.75/- on veterinary.

Item-wise break-up of per animal rearing on different farm size group (Rs / animal):

The item-wise break of pig rearing per animal is shown in Table 5.11. The Table showed that from the variable cost, feed cost was found to be highest and among various farm size groups it was found to be highest in group II (Rs 4,248.83/-) and lowest in group I (Rs 3,986.50/-). The lowest variable cost for beneficiaries was found to be on watering cost and among various farm size groups it was found to be highest in group II (Rs 205.87/-) and lowest in group I (Rs 191.31/-). Among the fixed cost, the rental value of farm building was found to be highest and among various farm size groups it was found to be highest in group I (Rs 260.16/-) and lowest in group III (Rs 229.89/-).

Table 5.11. Item-wise cost break-up per animal rearing on different farm size group (Rs)

SN	Particulars	Group I	Group II	Group III	Pooled	Non-beneficiaries
A.	**Variable Cost**:					
(i).	Feed Cost	3,986.50 (55.42)	4,248.83 (57.78)	3,999.09 (56.16)	4,064.16 (56.33)	4,483.82 (51.24)
(ii).	Human Labour	776.63 (10.797)	603.68 (8.210)	711.37 (9.991)	706.08 (9.787)	504.56 (5.766)
(a).	Family Labour	468.73 (6.517)	321.21 (4.368)	261.47 (3.672)	384.69 (5.332)	176.47 (2.017)
(b).	Hired Labour	307.90 (4.281)	282.47 (3.841)	449.90 (6.318)	321.39 (4.455)	328.09 (3.749)
(iii).	Watering Cost	191.31 (2.660)	205.87 (2.800)	193.38 (2.716)	195.64 (2.712)	194.26 (2.220)
(iv).	Vetenary Cost	213.19 (2.964)	210.36 (2.861)	196.49 (2.759)	205.56 (2.849)	169.74 (1.940)
(v).	Miscellaneous	663.395 (9.223)	719.705 (9.788)	680.839 (9.562)	688.129 (9.538)	1414.412 (16.162)
(vi).	Interest on Working Capital	724.437 (10.070)	740.613 (10.072)	717.172 (10.073)	726.656 (10.072)	795.58 (9.091)
Total Variable Cost		6,555.46 (91.140)	6,729.06 (91.512)	6,498.34 (91.263)	6,586.22 (91.289)	7,562.38 (86.415)
B.	**Fixed Cost**:					
(i).	Rental value of farm building	260.161 (3.617)	258.489 (3.515)	229.708 (3.226)	247.364 (3.429)	681.500 (7.787)
(ii).	Depreciation on equip & mach.	161.288 (2.242)	151.102 (2.055)	189.818 (2.666)	171.156 (2.372)	329.809 (3.769)
(iii).	Interest on fixed capital cost	215.828 (3.001)	214.584 (2.918)	202.607 (2.845)	209.919 (2.910)	177.574 (2.029)
Total Fixed Cost		637.28 (8.860)	624.18 (8.488)	622.13 (8.737)	628.44 (8.711)	1,188.88 (13.585)
Total Cost *(A + B)*		7,192.74 (100.00)	7,353.23 (100.00)	7,120.47 (100.00)	7,214.66 (100.00)	8,751.26 (100.00)

(Parenthesis indicate percentage to total)

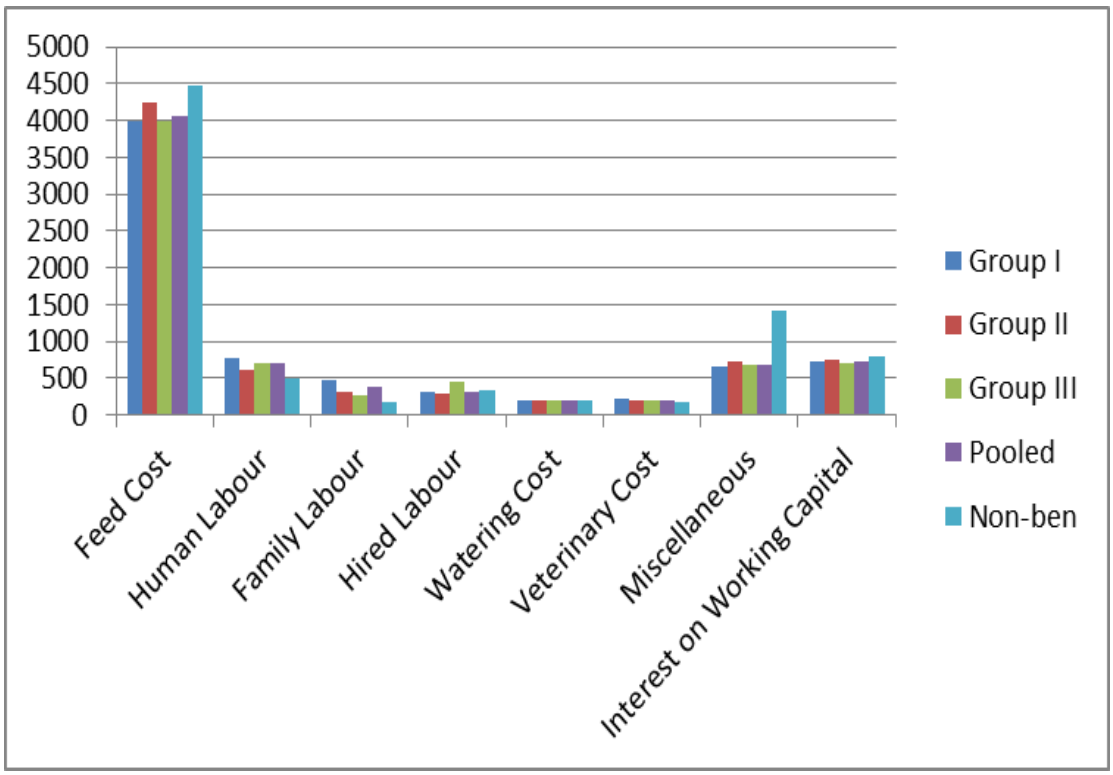

Fig. 5.12 Variable cost per animal of the sample farmers (Rs.)

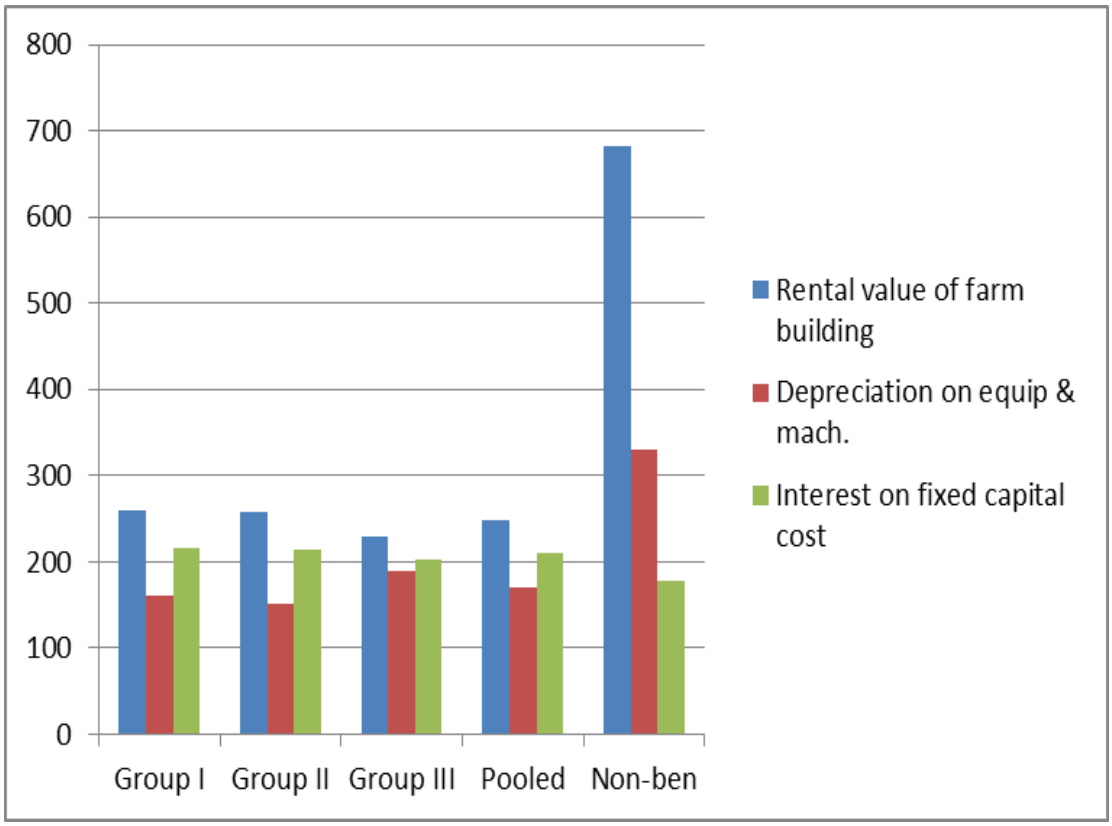

Fig. 5.13 Fixed cost per animal of the sample farmers (Rs.)

The lowest fixed cost for beneficiaries was found to be on depreciation of equipment's and machineries and among various farm size groups it was found to be highest in group III (Rs 189.82/-) and lowest in group II (Rs 151.10/-)

The result also showed that the total cost of pig rearing per animal was Rs 7,214.66/- and Rs 8,751.26/- for beneficiaries and non-beneficiaries respectively. The highest total fixed cost of pig rearing per animal was found in rental value of farm building (Rs 247.36/-) and (Rs 681.50/-) for both beneficiaries and non-beneficiaries and the lowest in depreciation on equipment's and machineries for beneficiaries and at Rs 1,775.74/- on interest on fixed capital cost for non-beneficiaries. In variables cost, the highest cost incurred was found in feed cost (Rs 4,064.16/-) and (Rs 4,483.82/-) for beneficiaries and non- beneficiaries respectively. The lowest was in watering cost (Rs 195.64/-) for beneficiaries and Rs 169.74/- on veterinary cost for non-beneficiaries.

RESOURCE USE EFFICIENCY:

Cobb-Douglas production functions have been used in the present study for the assessment of the resource use efficiency of piggery enterprise in the selected area. The production function of piggery enterprise was fitted as regressing gross return (y), x_1, x_2, x_3, x_4, x_5, x_6 and x_7 in terms of rupees

as independent variables for different farm size groups as well as overall farm size group.

A. Resource production of piggery enterprise:

The Ordinary Least Square (O.L.S.) estimates of parameters of Cobb-Douglas type of production with respect to different farm size groups and overall farm size samples are presented in Table 5.12.

It is clear from the table that the value of co-efficient of multiple determinations (R^2) ranged from 99.99 per cent as maximum in large size group of farm to 84.93 per cent as minimum of the selected sample in overall farm size group, which will be explaining the variation in the dependent variables by the selected independent variable chosen in the equation in different farm size groups and in overall farms. Even on the non-beneficiaries farm size group was also explained 99.98 per cent of the sample farms, which shows as good fit of the selected model. The remaining variation of dependent variable might be due to other variables, which have been used in excess or not properly used.

The regression co-efficient of a (constant) was found to be positively significant at 1 per cent level on marginal, small, large and overall farm size group, which further indicates that model is good fit, while it was found to be negative and non-significant value on medium farm size group, which

further indicate that constant have reverse impact / role towards the gross return. Therefore the contribution of the constant is having an importance if all the selected inputs variables were kept as constant. Whereas on the non-benefiacries was found to be significant at 5 per cent level, which is also an indication of piglet input has been contributing towards the net returns on the farm size group.

The regression co-efficient of x_1 (piglet) was found to be significant at 1 per cent level viz; on marginal, small, medium and overall farm size groups, which shows that the contribution of the input variable were managed by the sample farmers was proving best to the return, even the investment of selected input was found to have an positive impact towards the returns, so it is better to re-invest the inputs to have better returns from the investment in the days to come after re-allocating the no or less potential input variables; further re-investment and further having the meaningful contribution with regard to the input investment, while the non-benefiacries farm size group were also found to be significant at 1 per cent level, which indicates that the x_1 (piglet) is also contributing towards the net returns, respectively.

The regression co-efficient of x_2 (human labour) was found to be significant at 1 per cent level viz; on marginal, small, medium and overall farm size groups, which shows the contribution of the input variable was managed well by the sample farmers towards the good returns, even the

investment of selected input were having an positive impact towards the better returns from the available resources, so it is better to re-invest on the inputs which has less returns at present in the days to come after re-allocating the less potential input variables for further investment and also having the meaningful contribution with regard to the input investment. While non-benefiacries farm size group was also found to be significant at 1 per cent level, which indicates that the x_2 (human labour) input is further contributing towards the net returns, respectively.

The regression co-efficient of x_3 (water charges) was found to be significant at 1 per cent level viz; on marginal, small, medium and overall farm size groups, which shows that the contribution of the input variable were managed by the sample farmers was proving best to the return, even the investment of selected input was found to have an positive impact towards the returns, while the non-benefiacries farm size group were also found to be significant at 1 per cent level, which indicates that the x_3 (water charges) is also contributing towards the net returns, respectively.

The regression co-efficient of x_4 (marketing charges) was found to be significant at 1 per cent level viz; on marginal and small farm size groups both indicates that the contribution of the variable were managed good by the sample farmers to get the better return, even the investment of selected inputs on medium and overall farm size groups were found to be positive but non-significant so it shows further that both variable has less

contribution towards the returns, whereas the non-benefiacries farm size group were also found to be significant at 1 per cent level, which indicates that the x_4 (marketing charges) is also contributing towards the net returns.

The value of x_5 (medicine charges) was found to be significant at 1 per cent level viz; on marginal, small, medium and overall farm size groups, which shows an good contribution of the input variables and further well managed by the sample farmers for getting good returns, even the investment of selected input was found to have an positive impact towards the returns, while the non-benefiacries farm size group was also found to be significant at 1 per cent level, which indicates that the x_4 (medicine charges) is also having contribution towards the net returns on the farm.

The value of x_6 (farm building cost) was found to be statistically significant at 1 per cent level on small, medium and overall farm size groups, which shows the positive significant contribution of the inputs to the gross return, so it will be better to continue the investment on these inputs for getting better prospects as well as benefiting the farmers after reshuffling the input cost. While on marginal farm it was found to be statistically non-significant which is an indication of less returns or contribution towards the net returns, even the non-beneficiaries farm size groups were found to be statistically significant at 5 per cent level, which indicates that in the coming days it is better to invest more to these inputs due to the potentiality variables and to get maximum profit in compare to other inputs.

The value of x_7 (Miscellaneous charges) was found to be statistically significant at 1 per cent level on marginal, small, medium and overall farm size groups, which shows the positive significant contribution of the inputs to the gross return, so it will be better to continue the investment on these inputs for getting better prospects as well as benefiting the farmers after reshuffling the input cost. While the non-beneficiaries farm size groups were found to be statistically significant at 5 per cent level, which indicates that in the coming days it is better to invest more to these inputs due to the potentiality variables and to get maximum profit in compare to other inputs.

By aggregating the cross-sectional data of all the farms in various farm size groups, production has been estimated for all the selected sample farms. The ordinary least square (OLS) estimates of parameters have been showed in table 5.12. The value of R^2 in all farm samples were found to be 0.8493 to 99.98, which shows that minimum of 75 to 99.98 per cent of the variation of dependent variable explained by the independent variation chosen in the equation.

Therefore it may be concluded from the above findings that positive values with statistically significant of regression coefficient on different level were good fit on different farm size groups, so it may be continue in the days to come for having better returns unless it reach to the level of saturation and further providing an no or negative return from the available inputs / resources.

Table 5.12 Elasticity Co-efficient of Piggery enterprise on different size groups

S.N.	No's of obs.	Variables	Regression Co-efficient	t-Statistics	R^2
(a).	**Small farm**:				
1.	78	a	0.744836 (0.025634)	29.05627***	0.849329*** (10.5665)
2.		x_1	0.094419 (0.006435)	14.67353^{NS}	
3.		x_2	0.590524 (0.016969)	34.80086***	
4.		x_3	0.108894 (0.013284)	8.197372***	
5.		x_4	0.033802 (0.01354)	2.496431***	
6.		x_5	0.019355 (0.00448)	4.319982***	
7.		x_6	0.040629 (0.024206)	1.678494*	
8.		x_7	0.01278 (0.021955)	0.58207^{NS}	
(b).	**Medium farm**:				
1.	23	a	0.670494 (0.023268)	28.81666***	0. 999976*** (113.3420)
2.		x_1	0.049855 (0.014433)	3.454132***	
3.		x_2	0.630016 (0.020626)	30.54518***	
4.		x_3	0.093909 (0.005275)	17.80414***	
5.		x_4	0.035442 (0.005342)	6.635183***	
6.		x_5	0.018931 (0.001186)	15.96086***	
7.		x_6	0.024623 (0.009873)	2.493821***	
8.		x_7	0.045226 (0.014786)	3.058764***	

(c).	**Large farm**:				
1.	19	a	0.699298 (0.041812)	1.25041^{NS}	0.999815*** (23.3786)
2.		x_1	- 0.01117 (0.008935)	41.53153***	
3.		x_2	0.65018 (0.015655)	20.99427***	
4.		x_3	0.121412 (0.005783)	6.667546***	
5.		x_4	0.020724 (0.003108)	11.98184***	
6.		x_5	0.031328 (0.002615)	1.74169 ^{NS}	
7.		x_6	- 0.08998 (0.051663)	3.458109***	
8.		x_7	0.158258 (0.045764)	14.1849***	
(d).	**Overall farm**:				
1.	120	a	0.676302*** (0.023225)	29.11994***	0.999872*** (23.51296)
2.		x_1	0.085801*** (0.01419)	6.046552***	
3.		x_2	0.572422*** (0.014811)	38.64741***	
4.		x_3	0.075025*** (0.012832)	5.846533***	
5.		x_4	0.00434^{NS} (0.015571)	0.278723***	
6.		x_5	0.046786*** (0.012246)	3.820429***	
7.		x_6	0.03718*** (0.009091)	4.08966***	
8.		x_7	0.009077*** (0.0024)	3.782542***	

(e)	**Non-beneficiaries farm**:				
1.	40	a	0.73194*** (0.017479)	41.87511***	0.999829*** (21.3098)
2.		x_1	0.087563 (0.005208)	16.81247***	
3.		x_2	0.578458 (0.012625)	45.81958***	
4.		x_3	0.120585 (0.008114)	14.86061***	
5.		x_4	0.038224 (0.00868)	4.403473***	
6.		x_5	0.022432 (0.003257)	6.887465***	
7.		x_6	0.047657 (0.018874)	2.524988***	
8.		x_7	0.012894* (0.017801)	0.724338*	

*(** & * Significant at 1 & 5 per cent level of significance)*

B. Resource use efficiency:

To evaluate how efficiently the piggery respondents or farmers were utilizing their resources in the study area, the marginal value product (MVP) of different inputs were compared with its respective factor cost. As an optimal use of that factor cost was indicated the ratio approach unity. The value of ratio is greater than unity meant that returns could be increased by using more of the resources and if the value of ratio will be less than unity indicate improper use of the resources. The marginal value products of a particular resource indicate the expected addition of that resource to the gross return caused by an addition of one unit of that resource, while other inputs are to be remains as constant. The marginal value product of the factors cost were computed by multiplying the regression coefficient of that resource with the geometric mean of gross return to the geometric mean of each resource. The computed MVP of different strategic variables is shown in table 5.13.

The value of MVP for a (constant) was found to be statistically positively significant on the beneficiaries farm size groups viz; marginal, small, medium and overall farm size groups; indicates that addition of one unit @ Rs 1.00/- will be providing addition of minimum of Rs 1.02/- to maximum of Rs 2.09/- towards the gross returns, so it may be continue in future.

Table 5.13 Result of Marginal Value Product Analysis of Piggery on different farm size group

S N.	Variables	GM	MVP	MFC	Efficiency
(a).	**Small farm**:				
1.	x_1	1.359696	2039.544	974	2.093988
2.	x_2	0.189257	47.31413	128	0.369642
3.	x_3	1.390325	417.0975	136	3.066894
4.	x_4	0.258709	51.74185	48	1.077955
5.	x_5	0.058433	8.764902	56	0.156516
6.	x_6	0.02468	16.04218	245	0.065478
7.	x_7	0.1175	38.18747	320	0.119336
8.	y	0.967456	11919.06	11021	1.081486
(b).	**Medium farm**:				
1.	x_1	0.874582	1530.519	1490	1.027194
2.	x_2	0.104084	27.58232	240	0.114926
3.	x_3	1.698481	523.132	135	3.875052
4.	x_4	0.246585	50.79647	45	1.128811
5.	x_5	0.065116	10.54878	35	0.301394
6.	x_6	0.024518	15.98589	341	0.046879
7.	x_7	0.07335	25.08561	320	0.078393
8.	y	1.000893	13932.43	11505	1.210989
(c).	**Large farm**:				
1.	x_1	0.916407	1612.876	1490	1.082467
2.	x_2	-0.02364	-6.50203	240	-0.02709
3.	x_3	1.759659	559.5715	175	3.197551

S N.	Variables	GM	MVP	MFC	Efficiency
4.	x_4	0.305067	65.89453	190	0.346813
5.	x_5	0.038897	6.690241	56	0.119469
6.	x_6	0.040393	26.74045	234	0.114275
7.	x_7	-0.2538	-89.3388	320	-0.27918
8.	y	1.044848	14836.83	11510	1.289039
(d).	**Overall farm**:				
1.	x_1	0.877366	1544.165	1510	1.022626
2.	x_2	0.178448	49.07321	45	1.090516
3.	x_3	1.56562	497.8672	168	2.963495
4.	x_4	0.185911	40.15675	200	0.200784
5.	x_5	0.008263	1.421273	25	0.056851
6.	x_6	0.061374	40.62938	637	0.063782
7.	x_7	0.102415	36.05001	324	0.111265
8.	y	1.656325	23519.81	11523	2.041119
(e).	**Non-beneficiaries farm**:				
1.	x_1	1.250009	1750.013	1790	0.977661
2.	x_2	0.32742	81.85505	65	1.259309
3.	x_3	0.856187	214.0468	215	0.995567
4.	x_4	0.460556	92.11123	100	0.921112
5.	x_5	0.070226	10.53392	65	0.16206
6.	x_6	0.029053	18.88474	300	0.062949
7.	x_7	0.141969	46.13992	320	0.144187
8.	y	1.042237	10755.88	10258	1.048536

The value of MVP for x_1 was found to be statistically positively significant on overall farm size group, which indicate that addition of one unit @ Rs 1.00/- will be providing addition of minimum of Rs 1.09/- to maximum of Rs 1.25/- towards the gross returns, so it may be continue in future.

The value of MVP for x_2 was found to be statistically positively significant on the beneficiaries farm size groups viz; marginal, small, medium and overall farm size groups; indicates that addition of one unit @ Rs 1.00/- will be providing addition of minimum of Rs 2.96/- to maximum of Rs 3.87/- towards the gross returns, so it may be continue in future.

The value of MVP for x_3 was found to be statistically positively significant on the beneficiaries farm size groups on marginal and small farm size groups, indicates that addition of one unit @ Rs 1.00/- will be providing addition of minimum of Rs 1.07/- to maximum of Rs 1.12/- towards the gross returns, so it may be continue in future.

Further the value of MVP for x_4, x_5 and x_6 were found to be non-significant on beneficiaries as well as on non-benefiacries farm size groups, therefore it may be suggested that rather investment on these inputs should be re-allocated to the potential areas for getting the better returns in the days to come.

The value of MVP for x_7 was found to be statistically positively significant on overall farm size group, which indicate that addition of one unit @ Rs 1.00/- will be providing addition of minimum of Rs 1.02/- to maximum of Rs 2.04/- towards the gross returns, so it may be continue in future.

The cross sectional data of overall farm size have been aggregated and the ratio of MVP to its factor cost was computed. It was observed that ratio of x_1, x_2, x_3 and x_7 were found to be positive values. Positive indicates the greater than unity and indicates that the farmers can incurred more investment on those inputs for getting better returns, while the non-significant or negative values indicating either excess use of inputs and adverse response towards the gross return, which needs to be curtailed immediately and further investment of such inputs must be shifted towards the higher results inputs which will provide the positive contribution to the gross return. While input investment on x_4, x_5 and x_6, were found to be less contributing inputs as compare to other inputs therefore it is an urgent need to pay attention to further stop the investment on these resources and re-allocate it towards the potential inputs to get better returns in the days to come.

The above result showed that maximum of the inputs or resources were used under the optimum efficiency since MVP to factor cost ratio were

Table 5.14. Herd size of sample piggery groups before and after proving finance across the various farm size groups

S. No.	Particulars	Chumukdema block		Medziphema block		Overall	
		Numbers	Percentage	Numbers	Percentage	Numbers	Percentage
(A).	**Before**:						
1.	Small (up to 11)	275	39.74	271	41.63	546	40.66
2.	Medium (12 to 22)	162	23.41	160	24.58	322	23.98
3.	Large (23 and above)	255	36.85	220	33.79	475	35.37
Pooled		692	100.00	651	100.00	1343	100.00
4.	Non-beneficiaries	20	100.00	20	100.00	322	100.00
(B).	**After**:						
1.	Small (up to 11)	228	33.93	228	33.98	456	33.96
2.	Medium (12 to 22)	171	25.45	171	25.48	342	25.46
3.	Large (23 and above)	273	40.62	272	40.54	545	40.58
Pooled		672	100.00	671	100.00	1343	100.00
4.	Non-beneficiaries	20	100.00	20	100.00	340	100.00

not equal to unity, so it further need shift of input variables for getting better prospects from the same investment of inputs.

Herd size of piggery before and after providing finance across various farm size groups:

Table 5.14 revealed that the overall herd before finance was 940 numbers and after financing it has increased to 1,343 numbers. Amongst the various groups after finance, 456 numbers in group I, 342 in group II and 545 numbers in group III. The result showed that herd size of piggery was increased after financing indicating more income and employment.

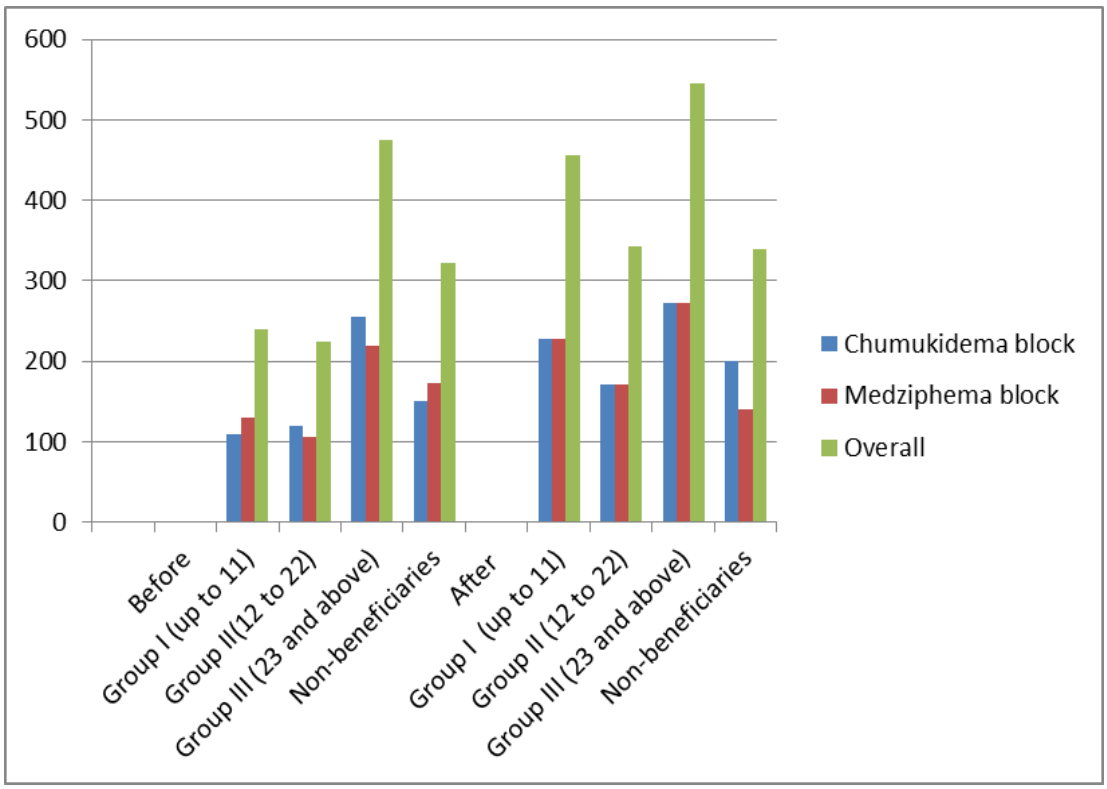

Fig. 5.14 Herd size before and after providing finance

Employment and income level before and after providing finance across various size groups:

Table 5.15 reveals that there was a significant increase on overall farm size group of piggery rearing; the number of days of employment for the beneficiaries after providing micro finance has been recorded an enhancement in mandays employment. Before providing finance the piggery enterprise on group I for less than 26 mandays employment was 43 persons. And after financing it was found that the number of persons has declined to 32 persons which showed increased in mandays employment. It was also reported that 35 persons got employment between 27-57 mandays before finance but has increased to 46 persons after providing finance which clearly indicates more mandays employment generation.

While on group II, it was found that before financing 4 persons get employment for less than 26 mandays and after providing finance all were shifted to more mandays as it was found to be nil. The mandays between 27-57 before finance was 13 persons which was increased to 14 persons after finance while mandays for more than 58 days it was found to increase from 6 to 9 persons which indicates more mandays employment.

Table 5.15. Employment and income level of sample respondent after providing finance

SN	Particulars	Small		Medium		Large		Pooled		Non-beneficiaries	
		Before	**After**	**Before**	**After**	**Before**	**After**	**Before**	**After**	**Before**	**After**
(A).	**Employment (Mandays / Annum)**:										
1.	Low (< 26)	43	32	4	0	0	0	47	32	26	24
2.	Medium (27-57)	35	46	13	14	5	0	53	60	14	15
3.	High (> 58)	0	0	6	9	14	19	20	28	0	1
Total		78	78	23	23	19	19	120	120	40	40
Mean		3026.8	4540.2	5129.2	8976.1	11029.73	20405	4939.0	7902.4	2859.2	4288.8
SD		1143.2	1429	1382.27	2073.4	4536.07	6804.1	4305.5	6458.3	1495.4	2243.1
(B).	**Income (Rs / Annum)**:										
1.	Low (< 3,991)	24	16	11	3	8	5	43	24	33	30
2.	Med (3,992-4,678)	22	20	12	18	9	11	43	49	7	9
3.	High (> 4,679)	32	42	0	2	2	3	34	47	0	1
Total		78	78	23	23	19	19	120	120	40	40
Mean		3310.79	4635.1	2647.64	4368.6	2453.90	4417	2838.2	4541.2	2483.3	3725
SD		764.17	878.8	282.59	423.89	581.38	872.07	535.22	802.83	279.04	418.56

(Parenthesis indicate percentage to total)

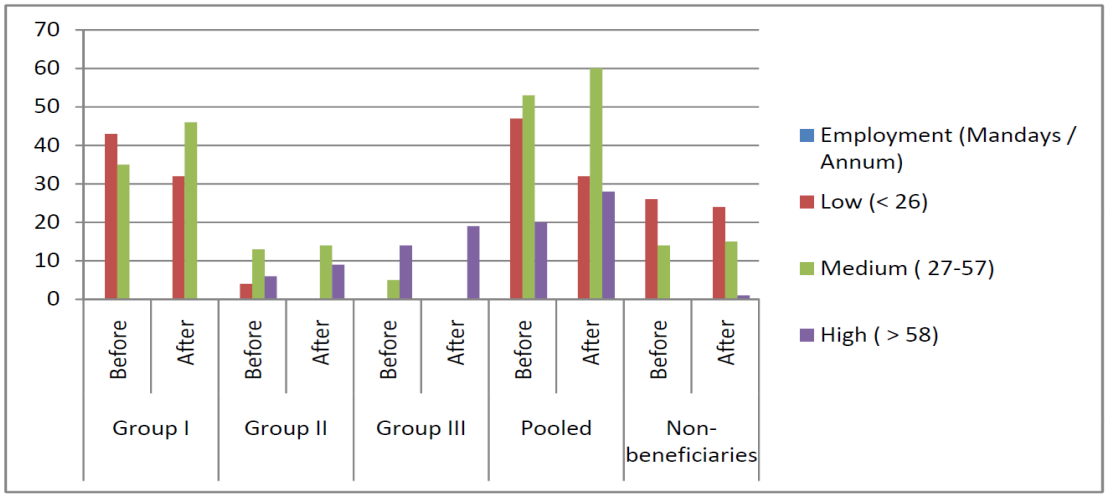

Fig. 5.15 Employment of Sample farmers

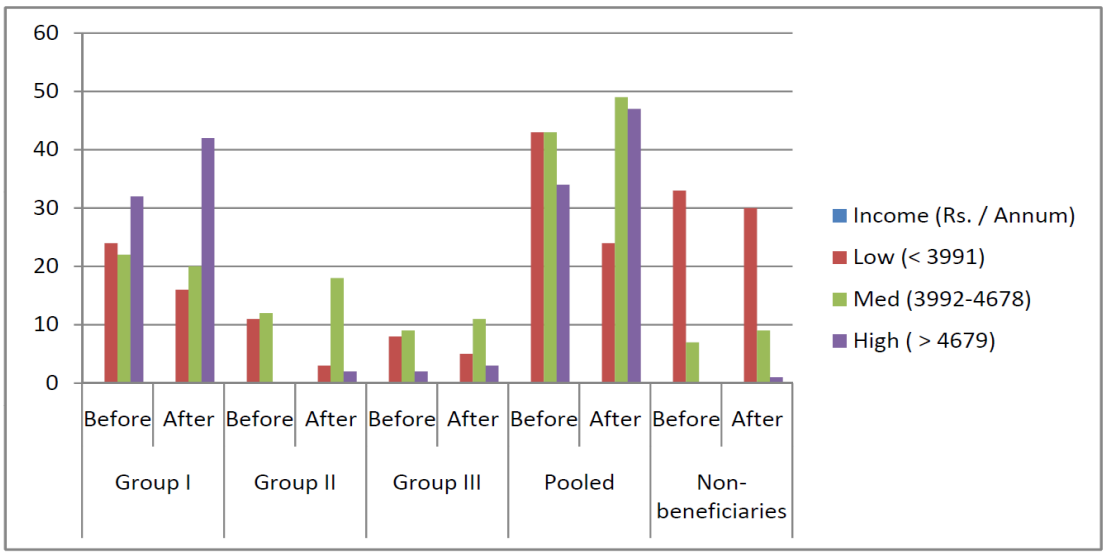

Fig. 5.16 Income of Sample farmers

It has positive response on group III, no persons were found to be employed for less than 57 mandays, while for more than 58 mandays employment, number of persons have increased from 14 to 19 which was the indication of getting more mandays of employment. It also showed that piggery enterprise have a positive effect of generating more mandays on non-beneficiaries group too. So, the study clearly showed the enhancement of future trend to generate more income and employment through piggery enterprise.

Asset position and saving before and after providing finance across various size groups:

Table 5.16 revealed that assets has positive response on overall farm size, 19 persons enhanced their assets, as before the numbers was 67, which was decline to 48 number having an assets of Rs 1,840.00/-. In assets between Rs 1,841.00/- to Rs 3,323.00/- the number has declined from 44 to 43. Whereas in assets more than Rs 3,324.00/-, it has increased drastically from 9 to 29, which clearly indicated that piggery enterprise have a positive effect of enhancement of assets, even it shows the positive response to the non-beneficiaries group too. So, it may be concluded that it may generate more assets in coming days through piggery enterprise.

Further the table reveals that savings also has positive response on overall farm size, 24 persons was found to enhanced their savings, as before the numbers was 49, which was decline to 25 number with more savings capital of Rs 640.00/-, the savings between Rs 641.00/- to Rs 823.00/- the number was increased from 39 to 51. Whereas the assets more than Rs 824.00/- has increased drastically from 32 to 44, which clearly indicate that piggery enterprise has positive effect of the enhancement of savings, it also showed the positive effects to the non-beneficiaries group. So, it may be concluded that it may develop the savings habit of the farmers through more savings power, which certainly will give better bargaining power to the piggery enterprise in coming days.

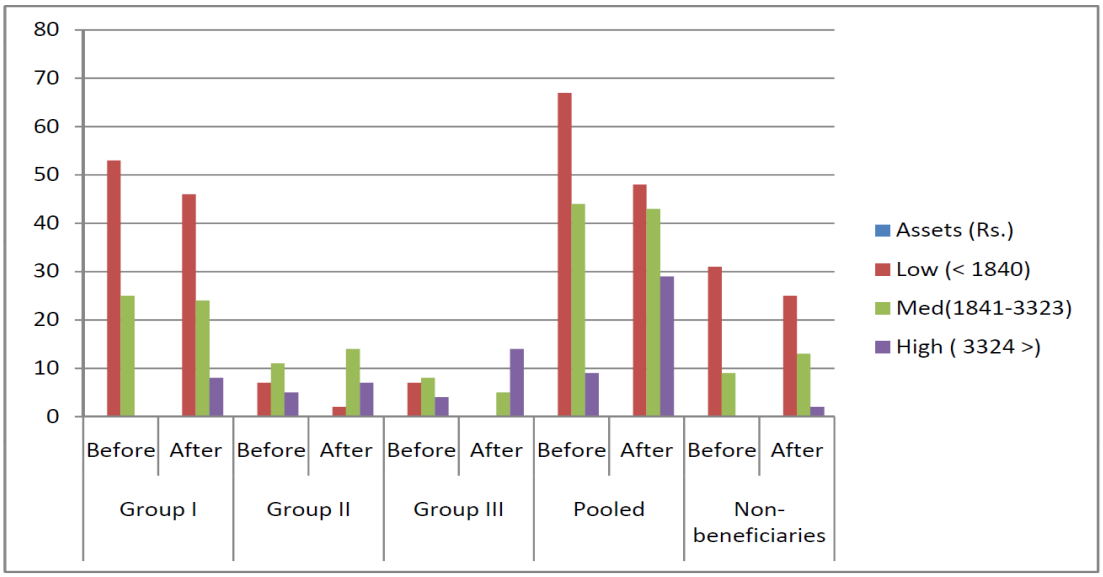

Fig. 5.17 Asset position before and after providing finance

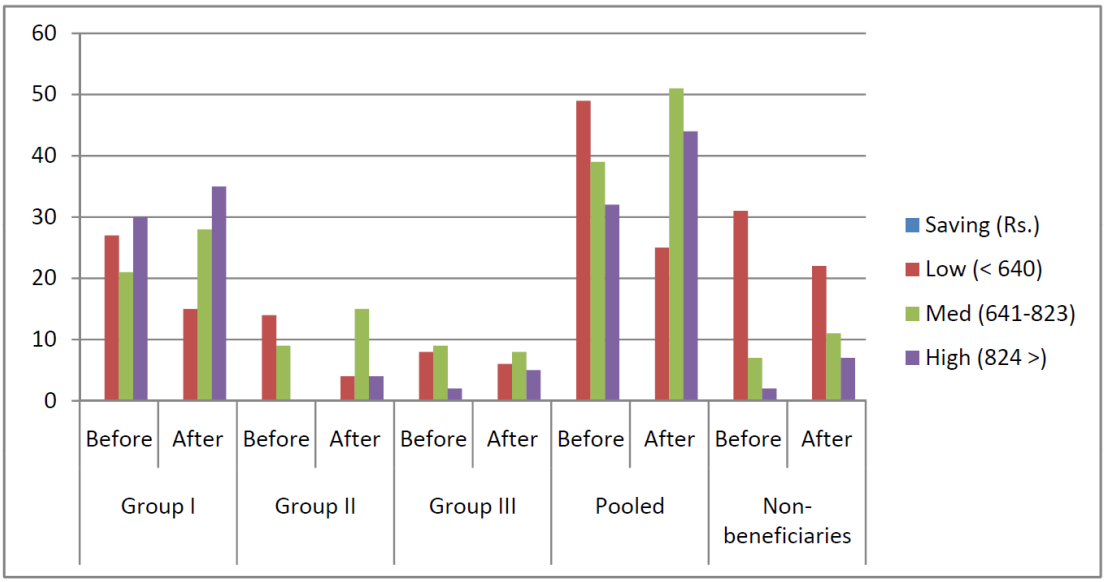

Fig. 5.18 Savings of the samples farmers before and after providing finance

The percentage change in savings was recorded as maximum change over the period of almost 4-5 years that consumer / piggery farmers developed their habit of saving, it was found statistical significant at 1 per cent during t test, which shows good symbol for developing the saving power in the rural community during almost five year period, also it showed positive impact towards the saving habit in coming days, which will also provide the bargaining power of the piggery farmers.

Table 5.16. Assets position and saving of the sample respondent after providing finance

SN	Particulars	Small		Medium		Large		Pooled		Non-beneficiaries	
		Before	**After**	**Before**	**After**	**Before**	**After**	**Before**	**After**	**Before**	**After**
(A).	**Assets (Rs)**:										
1.	Low (< 1,840)	53	46	7	2	7	0	67	48	31	25
2.	Med (1,841-3,323)	25	24	11	14	8	5	44	43	9	13
3.	High (3,324 >)	0	8	5	7	4	14	9	29	0	2
Total		78	78	23	23	19	19	120	120	40	40
Mean		2270.10	2837.60	2761.88	3452.30	2915.00	3643.80	2431.50	3039.40	2144.40	2680.50
SD		714.50	893.13	637.97	797.46	972.01	1215.00	1987.20	2484.00	1121.60	1401.90
(B).	**Saving (Rs)**:										
1.	Low (< 640)	27	15	14	4	8	6	49	25	31	22
2.	Med (641-823)	21	28	9	15	9	8	39	51	7	11
3.	High (824 >)	30	35	0	4	2	5	32	44	2	7
Total		78	78	23	23	19	19	120	120	40	40
Mean		570.47	713.09	537.67	672.09	543.63	679.54	558.91	698.64	458.46	573.07
SD		108.16	135.20	52.17	65.21	107.33	134.17	98.81	123.51	51.51	64.39

(Parenthesis indicate percentage to total)

Employment and income generated through piggery:

The annual income of the selected farmers was studied in terms of total yearly family income including farming income and additional income from non-farm jobs by some members of the family of the farmers. Thus, the total annual income of the families was studied in terms of the earnings by the members of families of the sample farmers. The pertinent data on this aspect is presented in Table 5.17.

It is evident from the table that the overall average annual income of majority (37.50 per cent) of the respondents was in between Rs 25,001/- to Rs 50,000/-, while nearly 8.33 per cent respondents earn between Rs 1,00,001/- to Rs 1,50,000/-, respondents earn between Rs 1,50,001/- to Rs 1,75,000/- it was found to be nil and 2.50 per cent earned above Rs 1,75,001/-. The perusal of the data in forgoing table reveals that all the farmers from both the blocks will enhance their incomes by moving to the next slab.

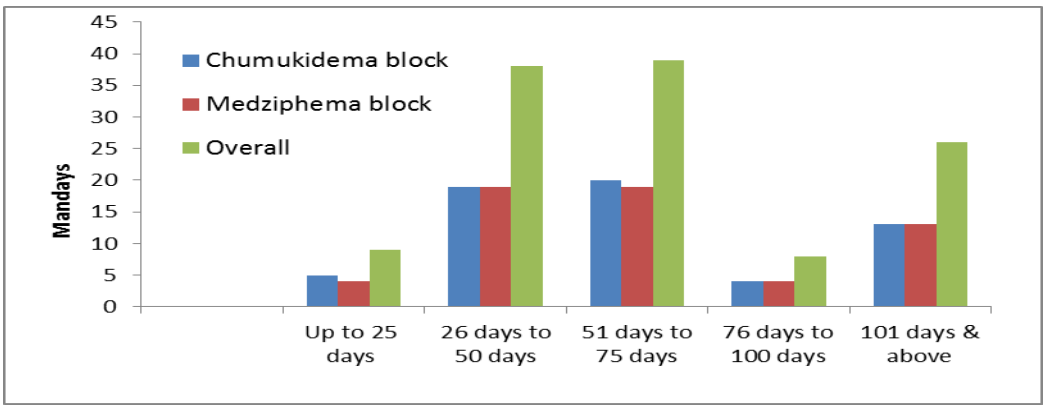

Fig. 5.19 Employment of the samples farmers (Mandays/annum)

Table 5.17. Employment and income generated through Piggery

SN	Particulars	Chumukdema block		Medziphema block		Overall	
		Numbers	Average	Numbers	Average	Numbers	Average
(A).	**Employment (Manday / annum)**:						
1.	Up to 25 days	5	88.25	4	70.60	9	158.85
2.	26 days to 50 days	19	790.75	19	790.75	38	1,581.50
3.	51 days to 75 days	20	1,207.45	19	1,147.07	39	2,354.52
4.	76 days to 100 days	4	348.50	4	348.50	8	697.00
5.	101 days & above	13	180.43	13	180.43	26	4,691.26
Pooled		61	4,820.59	59	4,662.54	120	9,483.13
(B).	**Income (Rs / annum)**:						
1.	Up to Rs 25,000/-	14	2,52,403.33	18	3,24,518.57	32	5,76,921.90
2.	Rs. 25,001 to 50,000/-	24	7,58,318.93	21	6,63,529.07	45	14,21,848.00
3.	Rs. 50,001 to 75,000/-	11	6,75,335.28	10	6,13,941.17	21	12,89,276.44
4.	Rs. 75,001 to 1,00,000/-	4	3,62,918.80	5	4,53,648.50	9	8,16,567.30
5.	Rs. 1,00,001 to 1,50,000/-	6	6,54,178.80	4	4,36,119.20	10	10,90,298.00
6.	Rs. 1,50,001 to 1,75,000/-	0	0	0	0	0	0
7.	Rs. 1,75,001 and above	2	5,70,851.47	1	2,85,425.73	3	8,56,277.20
Pooled		61	30,76,020.99	59	29,75,167.85	120	60,51,188.84

(Parenthesis indicate percentage to total)

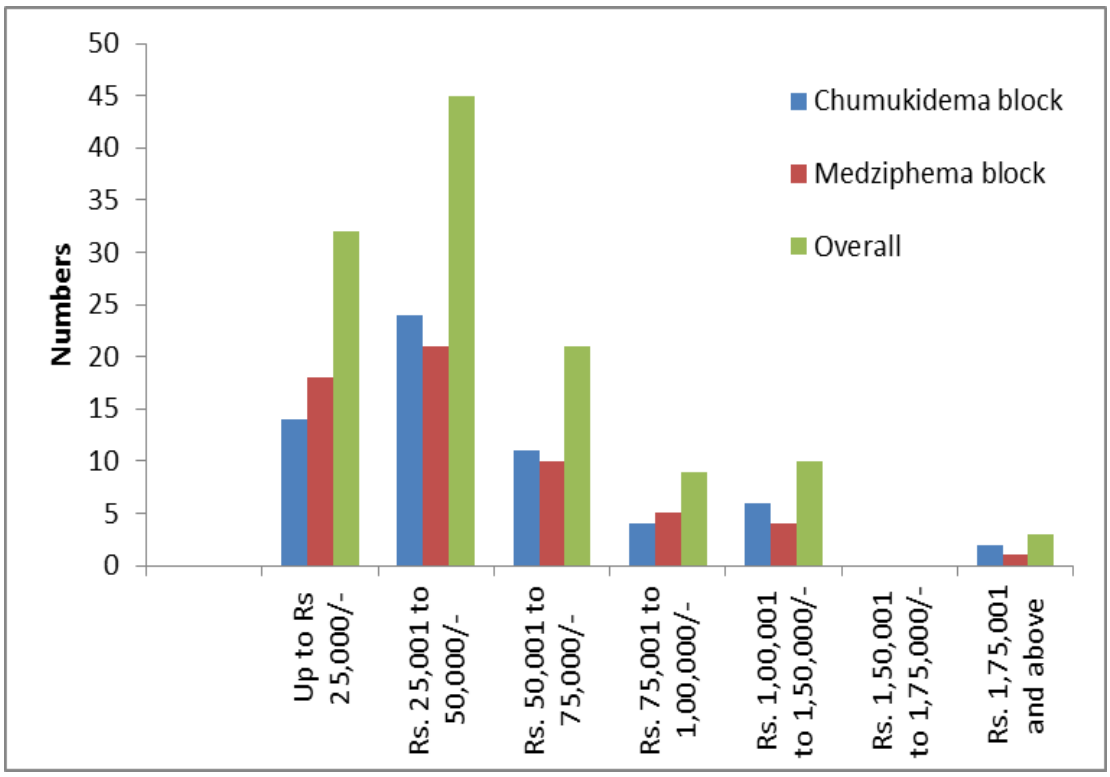

Fig. 5.20 Income of the samples farmers (Rs/annum)

Impact of Micro Finance on Income and Employment:

The impact of bank finance on economic status of piggery rearing before and after providing loan is shown in Table 5.18. The table showed that a significant increase on overall farm size group of piggery rearing; the number of days of employment for the beneficiaries after providing micro finance was recorded as 33.31 per cent enhancement in mandays employment, which was recorded statistical significant at 1 per cent during t-test, which shows future scope of generating more numbers of employment by taking up piggery enterprise.

While the increase percentage was also recorded to enhance the income of the sample piggery farmers after finance it was recorded as 23.01

percent, which shows the statistical significant at 1 per cent of t test, which shows the enhancement of future trend to generate more income through piggery enterprise.

The asset position of the beneficiaries also showed significant change which was 40.10 per cent change over the time period after utilization of loan which indicate positive response in both the blocks, which was statistical significant at 1 per cent of t test, which shows future impact of having more assets in coming days by taking up the piggery enterprise in scientific as well as by adopting improved breed of piggery.

The percentage change in savings was recorded maximum change over the period of almost 4 year that consumer / piggery farmers developed their habit of saving by 53.02 per cent of the sample size, it was found statistical significant at 1 per cent during t test, which shows good symbol for developing the saving power in the rural community during five year period, also it has an positive impact towards the saving habit in future, which will also provide the bargaining power of the piggery farmers.

The total percentage in meat consumption shows the increasing trend with 15.00 per cent in overall impact in both blocks of Chumukedima and Medziphema respectively, which was recorded statistical significant at 5 per cent of t test, which shows increased in market demand as well as saving the money to drain out to the other stake holder at regional as well as national level through piggery enterprise.

Table 5.18. Impact of Bank Finance on economic status of Piggery rearing

SN	Parameters	Before		After		% change	't' Test
		Mean	SD	Mean	SD		
1.	Income (Rs)	38,845.48	31,704.15	50,456.57	47,958.3	23.01	7.20795 **
2.	Employment (Rs)	52.70	37.02	79.02	64.58	33.31	10.4162 **
3.	Assets (Rs)	655.54	69.33	1,092.57	115.55	40.10	8.6102 **
4.	Saving (Rs)	410.80	43.45	874.06	92.44	53.02	6.9548 **
5.	Meat Consumption (Kg)	14,858.96	167.15	17,481.13	184.88	15.00	4.7624 *

*(** & * Significant at 1 & 5 per cent level of significance)*

Constraints faced by the beneficiaries in piggery rearing

Table 5.19 represents the farmers response to different problems encountered which were analyzed and finally the major constraints faced by the farmers were identified. The major constraints identified in the study area were poor quality of feed;, high cost of concentrates, non-availability of veterinary services, costly veterinary services, low price of pork meat, high transportation cost, low level of scientific knowledge level, low technical guidance etc. The major constraints encountered by the farmers under each groups along with their percentage and are discussed below.

The study showed that non-availability of veterinary services was recorded severe with 77 sample farmers (64.17 per cent). Inadequate knowledge about feeding, health care and breeding management was given by producers as their major constraint to improving production. Current extension programs were said to be ineffective and limited in their reach.

Pig production is invariably based on family labour and feeds gathered or produced by the household. Purchases of feeds, apart from some crop and milling by-products, were not frequent and, except for a few small-scale commercial units and government pig farms, the use of commercial concentrate feed was negligible, the quantity and quality of locally available feed resources mainly from household crop by-products limiting the scale and efficiency of pig production. High cost of concentrates was reported severe with 50 sample farmers (41.66 per cent).

The study also revealed low levels of awareness among producers about the diseases that affect their pigs and possible preventive measures despite the fact that diseases especially swine fever, internal worms and piglet diarrhea etc. It was reported severe with 73 farmers (60.83 per cent) of the total sample farmers.

About 59 sample farmers (49.17 per cent) reported lack of financial assistance and capital in the study area because of inadequate credit facilities, government loans, subsidies etc.

Traditional management practices continue to dominate production systems. Market-oriented pig production is integral to the livelihoods of many resource-poor rural households and the continuing increase in demand for pork means that pig production represents a major opportunity to improve livelihood security and increase incomes. Lack of extension support, low scientific knowledge in piggery was reported severe with 71 farmers (59.16 per cent) of the total sample farmers.

So, from the above analysis we can infer that high cost of concentrates, non-availability of veterinary services, lack of capital and low level of scientific knowledge constitute the major constrains of piggery in Dimapur district of Nagaland.

Table 5.19. Constraints faced by the beneficiaries during Piggery rearing

S N	Constraints	Small (N=78)			Medium (N=23)			Large (N=19)			Pooled (N=120)		
		S	M	NS	S	M	NS	S	M	NS	S	M	NS
A.	**Production Problems**												
1.	Poor quality of feed	27 (22.50)	30 (25.00)	21 (17.50)	10 (8.33)	7 (5.83)	6 (5.00)	4 (3.33)	7 (5.83)	8 (6.67)	41 (34.17)	44 (36.66)	35 (29.17)
2.	High cost of concentrate	40 (33.33)	21 (17.50)	18 (15.00)	8 (6.67)	7 (5.83)	8 (6.67)	2 (1.67)	8 (6.67)	9 (7.50)	50 (41.66)	36 (30.00)	35 (29.17)
3.	Non availability of concentrate	32 (26.67)	21 (17.50)	25 (20.83)	6 (5.00)	8 (6.67)	9 (7.50)	4 (3.33)	5 (4.16)	10 (8.33)	42 (35.00)	34 (28.34)	44 (34.17)
4.	Problem of water	35 (29.17)	19 (15.83)	24 (20.00)	7 (5.83)	6 (5.00)	10 (8.33)	2 (1.67)	8 (6.67)	9 (7.50)	44 (34.17)	33 (27.50)	43 (35.84)
5.	Lack of Veteneary services	32 (26.67)	22 (18.33)	24 (20.00)	11 (9.16)	5 (4.17)	7 (5.83)	4 (3.33)	9 (7.50)	6 (5.00)	77 (64.17)	36 (30.00)	37 (30.83)
B.	**Marketing Problems**												
1.	Less demand in local market	12 (10.00)	20 (16.67)	46 (38.33)	6 (5.00)	9 (7.50)	8 (6.67)	5 (4.17)	7 (5.83)	7 (5.83)	23 (19.17)	36 (30.00)	61 (50.83)
2.	Low price of pork meat	35 (29.17)	24 (20.00)	19 (15.83)	12 (10.00)	9 (7.50)	2 (1.67)	12 (10.00)	6 (5.00)	1 (0.83)	59 (49.17)	39 (32.50)	22 (18.33)
3.	High transportation cost	34 (28.34)	26 (21.67)	18 (15.00)	11 (6)	8 (6.67)	4 (3.33)	10 (8.33)	7 (5.83)	2 (1.67)	55 (45.83)	41 (34.17)	24 (20.00)
4.	Meat marketing required more time	14 (11.66)	20 (16.67)	44 (34.17)	8 (6.67)	9 (7.50)	6 (5.00)	8 (6.67)	7 (5.83)	4 (3.33)	30 (25.00)	36 (30.00)	54 (45.00)
C.	**Technical Problems**												
1.	Low Scientific Knowledge	46 (38.33)	21 (17.50)	11 (9.16)	16 (13.33)	5 (4.17)	2 (1.67)	9 (7.50)	6 (5.00)	4 (3.33)	71 (59.16)	32 (26.66)	17 (14.16)
2.	Low Technical Guidance	43 (35.83)	18 (15.00)	17 (14.16)	10 (8.33)	7 (5.83)	6 (5.00)	7 (5.83)	5 (4.17)	7 (5.83)	60 (50.00)	30 (25.00)	30 (25.00)
3.	Low Incidence of Diseases	52 (43.33)	21 (17.50)	5 (4.17)	11 (9.16)	7 (5.83)	5 (4.17)	10 (8.33)	6 (5.00)	3 (2.50)	73 (60.83)	34 (28.34)	13 (10.83)
4.	Lack of capital	35 (29.17)	24 (20.00)	19 (15.83)	12 (10.00)	9 (7.50)	2 (1.67)	12 (10.00)	12 (10.00)	1 (0.83)	59 (49.17)	39 (32.50)	22 (18.33)

(Parenthesis indicates percentage to total; S - Severe; M - Moderate and NS - Not Severe)

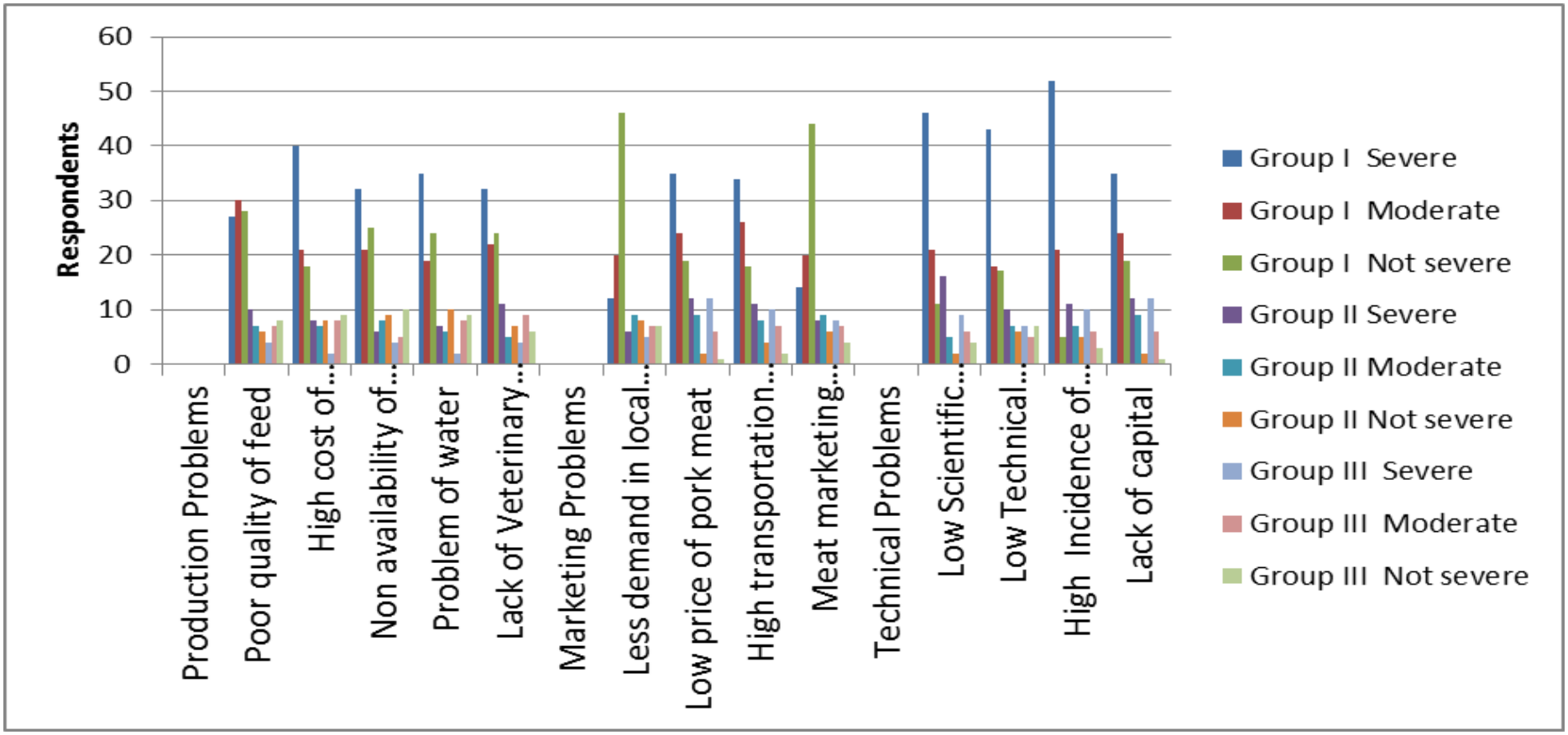

Fig. 5.21 Constraints faced by the sample farmers

CHAPTER VI

SUMMARY AND CONCLUSION

Chapter VI

SUMMARY AND CONCLUSION

The present chapter deals with summary and conclusion based on findings on logical grounds.

Agriculture is the lifeblood of Indian economy and economic growth is substantially influenced by growth of agriculture sector. Agriculture may be means of earning livelihood elsewhere but in India it has been a way of life. For centuries our culture, festivals, traditions and even trade and business were linked to agriculture. Even today it is common saying that the real India lives in villages. In ancient time, agriculture was considered as a pride, notable and honourable occupation. Agriculture is the mainstay of Indian economy not only in terms of contribution to gross domestic product but also the number of people dependent upon it. A high level growth of agriculture is essential both for achieving the objective of food security at macro and micro levels and also to alleviate poverty in India, while approximately 18 per cent (at current price) of the GDP is contributed by agriculture sector almost 54.00 per cent of the country's population is dependent on this sector and accounts for about 12.00 per cent share of the country's exports.

In view of the importance of pig farming in terms of its contribution to rural poor and possible potentials for pig rearing in our country, Government of India has initiated measures to promote the pig farming on scientific lines under its five year plans. The first step towards this direction is establishment of eight bacon factories and organization of pig production in rural areas attached to bacon factories. In order to make available good foundation stock, regional pig breeding stations were established for each bacon factory. Further expansion of pig breeding programmes paved the way for establishment of 115 pig breeding farms (1992-93) throughout the country.

Pig production is considered as one of the most important activities of animal husbandry especially for the improvement of economic status in the tribal areas and north-east-states. Pork is consumed by majority of the population in tribal areas and almost all section of the population in the north-east. To meet the growing demands, pork production is essential. It has both market and price and can be reared in a diversified climatic condition. The pig production business is mainly in the hands of small and marginal farmers and agricultural labourers who maintain as a means to meet the part of their family food requirement and to earn supplementary income. Pig rearing also fits, well with mixed farming and can also be complementary to extensive crop production operations. It is an excellent

source of protein, vitamins, minerals and other nutrients to the human diet by providing a good source of essential nutrients.

Considering the broad based impact of credit on production potential and all-round development of rural people, the present study has been conducted on burning problem entitled, "Impact of bank finance on Income and Employment of the Piggery farmers in Nagaland" with the following specific objectives:

1. To study the adequacy of bank finance for piggery,
2. To study the utilization pattern of bank finance for piggery,
3. To study the repayment performance of borrowers,
4. To study the feasibility of investment in piggery, and
5. To study the impact of bank finance on borrowers income and employment.

Hypothesis:

1. Ho: Bank finance is not adequate for piggery enterprise beneficiaries,
2. Ho: The repaying capacity of borrowers in failure and
3. Ho: Bank finance borrower has no impact on income and employment for piggery enterprise.

How much effective in any investigations turn out depends upon the methodological approach followed, the reliability of methodology followed is reflected as the accuracy within the investigation.

The plan of research study is very important for the conduct of any research work. Without an intelligent planning, the difficulties to be uncounted during the process of work, cannot be anticipated and solved because i.e.; planning includes the possibility of better performance in all jobs. Methodology in fact has the idea of the whole work or the blue print of the study.

A total of 120 borrowers and 40 non-borrowers were selected for the present study by applying multi-state random sampling procedure and were classified on the basis of semi intensive system (10 sows + 1 boar). The study was based on both primary and secondary data. The primary data was collected by using personal interview method with the help of pre-tested schedules and questionnaire. And the secondary data was collected from financial institutions, Directorate of Economic & Statistics, Directorate of Agriculture, Directorate of Animal Husbandry and Veterinary etc. Besides these data on demographic features, population, land use planning, climate, livestock population etc were also be collected to enlighten the socio-economic of the study areas.

Findings:

The main findings pertaining to aforesaid objectives of the study are summarized below:

1. Education standard of the farmer is an important parameter that determines the farmer level with respect to different farm size groups, 83.33 per cent beneficiaries and 82.50 per cent non-beneficiaries were literate. The findings indicate very high rate of literacy in the study area.
2. The sample respondents on different farm size groups has 1,343 number of pigs with an average of 11.192 per farm and it was found least on small farm size group and maximum on large farm size groups.
3. On the distribution of sample household according to sex across various size groups the male constituted 62.50 per cent and 75.00 per cent for beneficiaries' and non-beneficiaries, respectively of the total sample farmers, respectively.
4. The workers constituted 58.00 per cent for beneficiaries and 44.76 per cent for non-beneficiaries of the total sample population, while female workers accounted 24.74 per cent and 20.22 per cent for beneficiaries and non-beneficiaries of the total sample population.
5. The occupational pattern of the sample households of different farm size group were engaged on agricultural, business and service, but

about 45.83 per cent beneficiaries and 18.33 per cent non-beneficiaries had agriculture as an their occupation.

6. The operational holding constituted about 80.70 per cent beneficiaries and 56.74 percent non-beneficiaries of the total land. The average size of operational land holding was found to be 2.51 ha for beneficiaries and 1.42 ha for non-beneficiaries respectively.
7. The plantation crops for various size groups of the sample farmers grew a number of plantation crops viz; arecanut, bamboo, firewood, banana, teak, gamari, but the area allocation to them was very meager.
8. The sample farmers reared animals / birds such as pig, poultry and dogs, milch cow, goat etc. in the area. Poultry was found to be more in number followed by pig, dog, goat, milch cow and draft cow, respectively.
9. The livestock asset of sample farmers was very uneconomic for various size groups, however poultry was found to be more in number.
10. To evaluate the feasibility of investment in piggery, the NPV of pig rearing at 12.00 per cent discount rate were Rs 3,850.00/- and Rs 3,280.00/- in Chumukedima and Medziphema blocks respectively.

11. The benefit-cost ratio was 1.62 in Chumukedima and 1.54 in Medziphema block at 15 per cent discount rate, which satisfies the rule indicating the worthiness of investment on piggery.
12. The pay-back period was 4.25 and 4.50 years in Chumukedima and Medziphema blocks, respectively.
13. The internal rate of return was 45.50 per cent in Chumukedima and 42.35 per cent in Medziphema block. The IRR represents the maximum rate of interest at which the growers can borrow from lending agencies and invest on piggery.
14. The per farm total cost of piggery rearing in the pooled farm for beneficiaries was Rs 80,746.46/- and non-beneficiaries was Rs 74,385.74/-. From the total variable cost, feed cost was found to be highest for beneficiaries (Rs 45,486.07/-) and non-beneficiaries (Rs 38,112.50/-). The fixed cost was found to be Rs 7,033.50/- for beneficiaries and Rs 10,105.51/- non-beneficiaries, respectively.
15. Per animal on variable cost, feed was highest in group II (Rs 4,248.83/-) and lowest in group I (Rs 3,986.50/-). The lowest variable cost on beneficiaries was watering cost in group II (Rs 205.87/-) and it was lowest in group I (Rs 191.31/-).
16. Among the fixed cost, the rental value of farm building was highest in group I (Rs 260.16/-) and lowest in group III (Rs 229.89/-).

17. The total cost of pig rearing per animal was Rs 7,214.66/- and Rs 8,751.26/- for beneficiaries and non-beneficiaries, respectively. The highest total fixed cost of pig rearing per animal was on rental value of farm building (Rs 247.36/-) and (Rs 681.50/-) both for beneficiaries and non-beneficiaries and the lowest on depreciation on equipment's and machineries.

18. The production function of piggery enterprise was fitted as regressing gross return (y), x_1, x_2, x_3, x_4, x_5, x_6 and x_7 in terms of rupees as independent variables for different farm size groups. The R^2 ranged from 84.93 per cent to 99.98 per cent on the overall farm size group. On the non-beneficiaries it was 98.98 per cent on the sample farms, which shows as good fit of the selected model.

19. The value of R^2 in all farm samples was found to be 0.9898, which shows that 99.98 per cent of the variation of dependent variable explained by the independent variation chosen in the equation. It was observed that ratio of x_1 to x_7 were found to be positive and negative both values. Positive indicates the greater than unity and indicates that the farmers can incurred more investment on those inputs for getting better returns.

20. The impact of bank finance on economic status of piggery rearing before and after providing loan showed that a significant increase on overall farm size group of piggery rearing; the number of days of

employment for the beneficiaries after providing micro finance was recorded as 33.31 per cent enhancement in mandays employment, which was recorded statistical significant at 1 per cent during t test.

21. While the increase percentage was also recorded to enhance the income of the sample piggery farmers after finance it was recorded as 23.01 percent, which shows the statistical significant at 1 per cent of t test.
22. The asset position of the beneficiaries also showed significant change which was 40.10 per cent change over the time period after utilization of loan which indicate positive response in both the blocks, which was statistical significant at 1 per cent of t test.
23. The percentage change in savings was recorded maximum change over the period of almost 4 year that consumer / piggery farmers developed their habit of saving by 53.02 per cent of the sample size, it was found statistical significant at 1 per cent during t test.
24. The total percentage in meat consumption showed the increasing trend with 15.00 per cent in overall impact in both blocks of Chumukedima and Medziphema respectively, which was recorded statistical significant at 5 per cent of t test, which shows increased in market demand as well as saving the money to drain out to the other stake holder at regional as well as national level through piggery enterprise.

25. The major constraints identified in the study area were poor quality of feed, high cost of concentrates, non-availability of veterinary services, costly veterinary services, low price of pork meat, high transportation cost, low level of scientific knowledge level, low technical guidance.

Conclusion:

The conclusion of the study revealed that per animal rearing cost was Rs 7,214.66/- and Rs 8,751.26/- and the net return was Rs 4,541.17/- and Rs 3,724.97/- on beneficiaries and non-beneficiaries groups, respectively. The benefit-cost ratio was 1.62 in Chumukedima and 1.54 in Medziphema block at 15.00 per cent discount rate of investment on piggery. The Net Present Value of pig rearing at 12.00 per cent discount rate was Rs 3,850.00/- and Rs 3,280.00/- in Chumukedima and Medziphema blocks respectively. The internal rates of return were 45.50 per cent in Chumukedima and 42.35 per cent in Medziphema block, respectively. It may be concluded that the value of co-efficient of multiple determinations (R^2) ranged from 84.93 to 99.98 per cent on the selected sample groups. Also there was significant impact on the income, employment, assets, saving and meat consumption pattern on the beneficiaries', over the study period it was recorded 23.01, 33.31, 40.10, 53.02 and 15.00 per cent, respectively. The major constraints identified in the study area poor quality of feed, high cost of concentrates, non-

availability of veterinary services, costly veterinary services, low price of pork meat, high transportation cost, low level of scientific knowledge level, low technical guidance.

Policy implications:

The implications based on findings of the current study are as follows. Majority of the beneficiaries obtained finance for piggery enterprise were young and middle aged. In the project, only 200 beneficiaries were provided finance on pilot basis, out of which 120 beneficiaries and to access the impact 40 numbers of non-beneficiaries were selected for the present study. Many more farmers who come forward to start piggery unit may be extended financial support by the banks. To keep one piggery was not sufficient to raise income and employment level. To earn income and generate employment throughout the year few more (one or two) piglet (piggery) should be provided for the beneficiaries by extending micro finance required based on the performance.

The effective supervision of bank loan the Bank officials will ensure the timely repayment of loan in the area. Provision of short-term loan for purchase of green fodder and concentrates will be helpful to make the piggery enterprise more feasible especially for landless labourers and marginal landholding beneficiaries. The finance was extended to only few

poor farmers in the study areas. To establish piggery co-operative societies, financial support should be extended all the poor farmers who are interested to take up piggery enterprise. Piggery is feasible enterprise and very much suitable for rural people especially for women to practice as well as empower them economically and socially. So the financial institutions and NGOs should come forward to extend financial support and guidance for rural people to take up piggery enterprise as an income generating activity.

Veterinary and Animal Husbandry department should focus on piggery development programmes in every village by establishing veterinary hospitals, mobile clinics, development of high yield breeds, and development of waste land to provide adequate grazing facilities. To tide over the problem of shortage of green fodder during summer season, training should be given to beneficiaries about nutrient management and dry fodder to supplement the deficiency of protein and energy in piggery. Extension services must be strengthened in order to make the rural people aware to set up the entrepreneurs more efficient in terms of increasing their management capacities to enhance meat production as well as productivity and net returns of the piggery unit too.

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Annexure - I

Economics of Piggery (3 Sows + 1 Boar)

1. Unit Size: 3 sows + 1 boar
2. Type of animal: Improved breed
3. Unit Cost (Rs.): 76,000
4. Margin Money (Rs.): 7,600
5. Bank Loan (Rs.): 49,400
6. Capital Subsidy (Rs.): 19000
7. Repayment period (years): 6 years including first year grace period
8. Interest rate (per cent p. a.): 12
9. NPW @ 15 per cent DF (Rs.) 83542
10. BCR @ 15 per cent DF 1.49: 1
11. IRR (per cent) >50

Annexure - II

Repayment Schedule

Capital Subsidy: Rs.19,000/-

Bank Loan: Rs. 49,400/-

Interest: 12 per cent p.a.

(Rupees)

Year	Gross Surplus	Bank loan				
		Loan outstanding	Interest @ 12 % p. a.	Repayment of Principal	Total Outgoings	Net Surplus
1.	-	49400	5928	0	5928	-5928
2.	69887	49400	5928	15000	20928	48959
3.	10000	34400	4128	0	4128	5872
4.	64537	34400	4128	17000	21128	43409
5.	10000	17400	2088	0	2088	7912

Annexure - III

Cash Flow Statement

(Rupees)

S. No.	Particulars	I	II	III	IV	V
I.	**Cost**:					
1.	Capital cost	46500	-	-	-	-
2.	Recurring cost:					
a.	Conc. feed adult fattener	8862 *	8862	8862	8862	8862
b.	Waste / Garbage	7560 *	11340** (15120)	18900	15120	18900
	Adult	3450 *	3450	3450	3450	3450
	Fattener	2940 *	4410** (5880)	7350	5880	7350
c.	Veterinary care	600 *	1100** (1200)	700	1200	700
d.	Insurance	525 *	525	525	525	525
e.	Misc. Expenses	213 *	426	213	426	213
	Total Cost	**70650**	**30113 (35463)**	**40000**	**35463**	**40000**
II.	**Benefits**:					
a.	Sale of fattener	-	100000	50000	100000	50000
b.	Salable value of closing stock	-	-	-	-	20000
c.	Residual value of shed / equipment	-	-	-	-	26000
	Total Benefit	**100000**	**50000**	**100000**	**50000**	**146000**
	Net Benefit (TC - TB)	-70650	64537	10000	64537	110537
	DF @ 15%	0.87	0.756	0.658	0.572	0.432
	PW @ 15%	-61465	37714	0	45760	33796
	NPW @ 15%	83542	-	-	-	-
	BCR @ 15%	1.49: 1	-	-	-	-
	IRR	61 %	-	-	-	-

(Capitalised; ** Other than capitalised and @ Figures in parenthesis include the capitalised amount)*

Annexure - IV

Mortality of animals in Piggery unit maintain by beneficiaries in the study area

S. N.	Death of Animals	Chumukidema block		Medziphema block		Overall	
		Numbers	Value (Rs)	Numbers	Value (Rs)	Numbers	Value (Rs)
1.	Adult						
i.	Male	4	17,800	5	18,700	9	36,500
ii.	Female	2	7,800	3	12,600	5	20,400
Total		6	25,600	8	31,300	14	56,900
2.	Young Stock						
i.	Male	7	5,600	9	38,560	16	44,160
ii.	Female	3	2,850	7	26,840	10	29,690
Total		10	8,450	16	65,400	26	73,850
G. Total		16	34,050	24	96,700	40	1,30,750

Annexure - V

Details of Loan availed by the beneficiaries of Piggery rearing in the study area

S. No.	**Particulars**	**Financing Institution**		**Total Amount (Rs.)**	**Average Amount per beneficiaries (Rs.)**
		NSCB	**SBI**		
(A).	Chumukdema block				
1.	Small				
2.	Medium				
3.	Large				
Pooled					
(B).	Medziphema block				
1.	Small				
2.	Medium				
3.	Large				
Pooled					

Annexure – V1

Meat consumption pattern of sample Piggery beneficiaries

S. N	Particulars	Before				After			
		CHK		MDZ		CHK		MDZ	
		No's	Qty (Kgs)	No's	Qty (Kgs)	No's	Qty (Kgs)	No's	Qty (Kgs)
1.	Meat consumption	28	1,13,850	35	1,48,750	38	1,51,435	55	2,14,500
2.	Waste materials	20	54,800	28	1,16,450	16	34,050	24	96,700
3.	Sold as raw meat	532	2,39,400	467	17,86,275	738	36,90,000	605	30,25,000

Annexure – V1I

Repayment of bank loan by the Piggery beneficiaries

SN	Particulars	Chumukidema block	Medziphema block	Overall
1.	Repaid completely	236 (31.98)	138 (22.81)	374 (27.85)
2.	Yet to repay	502 (68.02)	467 (77.19)	969 (72.15)
Total		738 (100.00	605 (100.00)	1343 (100.00)

Annexure VII

Employment and income generated through Piggery

Sl. No.	Particulars	Chumukidema block		Medziphema block		Overall	
		Numbers	Average	Numbers	Average	Numbers	Average
(A).	Employment (Mandays/ annum)						
1.	Group I	39	1,80,609.90	39	1,73,527.10	78	3,54,137
2.	Group II	12	1,05,289.50	11	1,01,160.50	23	2,06,450
3.	Group III	10	1,97,727.00	9	1,89,973.00	19	3,87,700
Pooled		61	4,83,626.40	59	4,64,660.60	120	9,48,287
4.	Non-ben.	10	87,490.50	10	84,059.50	20	1,71,550
(B).	Income (Rs / annum)						
1.	Group I	39	10,53,790	39	10,12,465	78	20,66,255
2.	Group II	12	7,49,363.60	11	7,19,976.60	23	14,69,340
3.	Group III	10	12,82,953	9	12,32,641	19	25,15,594
Pooled		61	30,86,106	59	29,65,083	120	60,51,189
4.	Non-ben.	10	6,50,034.30	10	6,24542.70	20	12,74,577

Pig rearing in farmer’s field

Pig rearing in farmer’s field

Pork market